DISSERTATION

IMPROVING FIRST-YEAR INTERVENTION STRATEGIES AT UNIVERSITIES BY FOCUSING ON MEANING AND PURPOSE IN LIFE

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ABSTRACT

IMPROVING FIRST-YEAR INTERVENTION STRATEGIES AT UNIVERSITIES BY FOCUSING ON MEANING AND PURPOSE IN LIFE

Research has increasingly appreciated the potential benefits of having a higher sense of meaning in life for positive college student development. Drawing on Steger's (2009) meaning development model, this study investigated the effects of a 6-week web-based intervention designed to enhance a sense of meaning in life among college freshmen. The results from a randomized controlled trial with 285 U.S. college students (n = 142 for the intervention group, n = 143 for the control group) revealed that the rates of growth of meaning in life within the two groups did not differ over a period of 8 weeks. The current study also examined the relationships between self-concept clarity, goal progress, and meaning in life. Higher self-concept clarity was associated with a higher sense of meaning in life, and this relationship was found both in between-person and within-person contexts. Additionally, the changes in self-concept clarity and meaning in life were positively related over the course of 8 weeks. Higher goal progress was associated with a higher sense of meaning in life in a between-person context. Overall, these results suggest that self-knowledge and goal pursuit serve as a firm context for cultivating a sense of meaning. Finally, a higher sense of meaning was associated with reports of fewer symptoms of depression and anxiety, but not with a higher GPA and retention to sophomore year. The role of meaning in life in enhancing college students' mental health and educational experiences was discussed. Directions for future intervention efforts to promote a sense of meaning in life among college students were also suggested.

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CHAPTER I

INTRODUCTION

How are colleges and universities assisting their first-year students to thrive in their college lives? This is one of the most central of the classic questions in postsecondary education. Two main markers of college success are 1) retention and academic performance and 2) mental health and well-being. Recognizing the significance of helping their students thrive in these two areas, especially in their early transition periods, colleges and universities have been directing substantial resources towards first-year intervention programs (Allen, Robbins, & Casillas, & Oh, 2008). The categories of intervention types include academic assistance, First-Year Experience courses (e.g., first-year seminar), social integration programs (e.g., learning communities of small groups of students), general orientation, and financial aid (Goodman & Pascarella, 2006; Pan, Guo, Aliknois, & Bai, 2008; Pascarella & Terenzini, 2005).

Regardless of existing extensive efforts, the portrait of current college students calls for further attention to develop better strategies to help first-year students. More college students have been seeking counseling services, with an increase of 42% between 1992 and 2002 (Schwartz & Kay, 2009), demonstrating more complex and severe problems ranging from the relatively normative aspects of college student development and adjustment (e.g., developmental issues, situational problems, academic skills) as well as more severe problems (e.g., depression and anxiety symptoms, substance abuse, and suicide) (Benton, Robertson, Tseng, Newton, & Benton, 2003). Particularly, depression is found in about 15% - 20% of college students, with the number of depressive students almost doubling during the past two decades (American College Health Association, 2007; Gallagher, 2007; Voelker, 2003), while the number of suicidal students tripled (Benton et al., 2003).

Academically, college students also seem to struggle in their educational attainment and persistence; the current average retention rate from first-year to second-year among all U.S. 4-year public institutions is 67.6%, while 6-year graduation rates average at only 44.3% (ACT, 2009). The costs for both students (e.g., financial disadvantage by not completing college education; Day & Newburger, 2002) and universities (e.g., financial exigency, disadvantages in reputation, rankings, recruiting, and mission fulfillment; U.S. News & World Report, 2008) is high.

In response to these challenges, approximately 95% of U.S. 4-year institutions have some type of first-year intervention to improve students' academic achievement and prevent students from attrition (Barefoot, 2000; Jamelske, 2009). Overall, research findings suggest that some type of organized first-year intervention appear to benefit college students to some degree; college students who participate in first year interventions tend to report higher levels of satisfaction, motivation, and social and academic engagement (Allen et al., 2008). Also, they tend to achieve higher grades and eventually graduate at higher rates than students who don't participate (e.g., Braxton, Sullivan, & Johnson, 1997; Cabrera, Nora, & Castaneda, 1993; DesJardins, Ahlburg, & McCall, 2002; Fidler & Moore, 1996; Hotchkiss, Moore, & Potts, 2006; Pan et al., 2008; Pascarella & Terenzini, 2005; Robbins, Allen, Casillas, Peterson, & Le, 2006; Schnell & Doetkott, 2002-2003).

However, these existing intervention efforts have several limitations. First and foremost, first-year interventions are often academically focused, with outcomes of GPA and retention, while college students' mental health and well-being issues may not have received the same level of attention. Perhaps reflecting this trend, previous theoretical models of first-year interventions

(e.g., Tinto's [1975] Student Integration Model and Astin's [1975] Theory of Involvement) do not consider psychosocial factors (Pan et al., 2008).

Second, despite the ubiquitous practice of first-year interventions, empirical understandings of effectiveness of those interventions remain disorganized or inconsistent (Jamelske, 2009) and largely restricted due to the lack of evaluation research and weaknesses in research designs (e.g., failing to use random sampling, experimental trial, longitudinal method, and control variables) (Pascarella & Terenzini, 2005). Also, most evaluation research does not include program characteristics, making it difficult to know how and why some interventions worked (Porter & Swing, 2006). Given that most colleges and universities are currently operating with a tightened budget, strengthening a knowledge base of program effectiveness and potential ways to complement existing interventions is highly demanded.

As one attempts to address these problems, this study proposes that existing first-year interventions could be made more effective by including a focus on *meaning in life*, which refers to an individual's judgment that his or her life makes sense and is significant with a sense of overarching purpose (Steger, 2009). There are several reasons why considering meaning in life in the first-year intervention context would bring benefits.

First, the challenge of establishing enduring identities and beliefs and exploring one's unique niches and lifelong purposes may reach its peak during emerging adulthood, which is defined as a period from the late teens through the twenties, with a focus on ages 18-25 (Arnett, 2000). They typically confront significant changes in their life circumstances and enjoy freedom from roles and expectations, not having fully adopted the duties of adulthood (Baxter Magolda, 1992; Habermas & Bluck, 2000; McLean, 2005; Arnett, 2000).

Second, a growing body of research evidence indicates that meaning and purpose should be positively relevant to college students' mental health and academic outcomes. People who enjoy a higher sense of meaning and purpose tend to experience numerous tangible benefits, such as increased well-being, reduced distress and psychopathology (e.g., Chamberlain & Zika, 1988; Steger, Frazier, Oishi, & Kaler, 2006; Steger, Frazier, & Zacchanini, 2008; Steger, Kashdan, Sullivan, & Lorentz, 2008), and enhanced physical health (e.g., Krause, 2009; Steger, Mann, Michels, & Cooper, 2009; Smith & Zautra, 2004). Moreover, meaning and purpose are closely related to the psychosocial constructs that predict academic performance and persistence such as goal-pursuit (McKnight & Kashdan, 2009) and social connectedness (Baumeister & Leary, 1995). Given the proposed role of meaning in life as a buffer in the face of suffering or difficulties (Frankl, 1963), the focus on meaning in life also fits well in the preventive perspective for academic and mental health problems.

Third, despite the potential benefits of meaning in life, research suggests that unfortunately, current college students are not successfully achieving a satisfying sense of meaning and purpose in their lives, which often places them in a state of "existential vacuum" (Frankl, 1963), drifting with no clear life plans, cynicism, or nihilism (e.g., Damon, 2008), while colleges and universities are failing in effectively helping them (Astin, 2004, Damon, 2008). This phenomena, combined with the unique characteristics of Millennial students (e.g., increasing interest in having personal and fulfilling lives by enriching their spirituality and having meaningful work; DeBard, 2004; Howe & Strauss, 2000; Higher Education Research Institute [HERI], 2004; Lancaster & Stillman, 2002; Smola & Sutton, 2002; Zemke, Raines, & Filipczak, 2000) illustrates the mounting need for focusing on meaning and purpose development.

Finally, having a focus on meaning and purpose in first-year interventions should benefit college students' career development. Endorsing the sense of meaning and purpose in work has been also linked to various positive career development indicators such as more positive work-related outcome expectations and intrinsic motivation to work, greater career decision self-efficacy, higher career decidedness, choice comfort, vocational self-clarity, academic satisfaction, and use of adaptive coping strategies (Dik, Sargent, & Steger, 2008; Dik & Steger, 2008; Duffy, Allan, & Dik, 2011; Duffy & Sedlacek, 2007).

In sum, having a focus on meaning and purpose development should enhance the benefits of existing first-year interventions. Despite these potential benefits from developing a sense of meaning and purpose in the lives of freshmen students, no intervention or research efforts in the first-year intervention context thus far examined the role of meaning and purpose in college students' transition experiences. Indeed, this is not surprising given that the construct of meaning and purpose has not received due attention and has been seldom recognized in research and practice, although substantial progress in empirical research on meaning and purpose has occurred over the past several decades in academic psychology.

For these reasons, the present study proposes that universities' existing first-year interventions can be improved by incorporating an element of facilitating meaning and purpose in life among college freshmen. This 12-month longitudinal randomized controlled trial study investigates whether a 6-week web-based intervention designed to enhance a sense of meaning in life among the U.S. college freshmen 1) increases their sense of meaning in life, 2) decreases their depression and anxiety symptoms, and 3) increases GPA and retention to their sophomore year.

This study will benefit 1) college freshmen by bringing them better outcomes in mental health and academic achievement and 2) colleges and universities seeking to begin a new or improve existing first-year intervention(s) by providing them with a cost-effective and time-efficient theory-driven intervention tool to assist their first-year students. The implications for student affairs include practical issues such as freshmen curriculum design, academic advising, and university counseling center services. In addition to these practical implications, this study intends to improve scientific understandings of the construct of meaning and purpose by empirically investigating 1) how meaning in life develops over time and 2) what factors are related to the development of meaning in life.

CHAPTER II

LITERATURE REVIEW

First-Year Intervention at Universities

Previous First-year Intervention

The first year of college is challenging for many students. Students typically view their enrollment in college as an opportunity to acquire the knowledge and skills that are necessary to succeed in the workplace and to advance their general knowledge and life skills (Carter, Bishop, & Kravits, 2006). However, this period accompanies various psychological distresses because many students are not prepared for the rigors of postsecondary education and life transitions such as leaving home, cultivating new relationships, and navigating their future career life. For example, college freshmen suddenly depart a familiar teacher-directed environment and enter a student-directed environment, where students are required to manage their time and allocate their own resources toward completing their various life tasks (Wratcher, 1991).

Previous research reveals that academic and social involvement (e.g., with faculty and peer groups), family background, peer group, socioeconomic status, and academic preparation influence this transition (Astin, 1984; Kuh, 1995; Terenzini et al., 1994). Accordingly, many universities and colleges have implemented formal or informal forms of interventions that mainly intend to increase students' academic and social involvement, which is considered relatively more modifiable than other predetermined factors. For example, whether the courses or seminars are offered as formal requirements or an option, those programs tend to focus on the development of academic skills and social skills by imparting information and providing opportunities for social interactions with peers, faculty, and university personnel (Barefoot & Gardner, 1993; Gelb, 2007; Howard & Jones, 2000; VanderStoep & Pintrich; 2008; Wratcher,

1991). Often named as First Year Experience (FYE), these programs are designed to supplement the necessary academic and life/social skills. These academic and life skills range from knowing the location of academic facilities (e.g., library, computer lab) to seeking out appropriate personnel when personal issues arise (e.g., counseling staff, academic advisors), as well as specific skills such as note taking, library research, time management skills, and appropriate interpersonal behavior (Kuh, 1995; Kuo, Hagie, & Miller, 2004; Terenzini, Pascarella, & Blimling, 1996; Zhao & Kuh, 2004). Similarly, a study on content effectiveness of first-year seminars found that study skills, academic engagement, and health education have substantial impact on early intention to persist along with college policies, campus engagement, and peer connection (Porter & Swing, 2006).

Taken together, previous research on first-year intervention at universities commonly suggests that students' academic and social engagement is one of the most influential features in successful transition to college life, besides external or predetermined variables such as family background, SES, and precollege academic skills (e.g., high school GPA or SAT scores) that lie outside the direct influence of universities and are not manipulative by intervention; as a result, first-year interventions typically support various skill acquisitions, information releasing, and direct advising.

Findings on first-year intervention outcomes have been mostly encouraging. Students who participated in some type of organized first-year interventions appear to enjoy higher levels of satisfaction, motivation, social and academic engagement (Allen, et al., 2008), and higher grades and graduation rates (e.g., Braxton et al., 1997; Cabrera et al., 1993; DesJardins et al., 2002; Fidler & Moore, 1996; Hotchkiss et al., 2006; Pan et al., 2008; Pascarella & Terenzini,

2005; Robbins, Allen et al., 2006; Schnell & Doetkott, 2002-2003). These results support the significance and legitimacy of existing first-year interventions at universities and colleges.

Limitations of Previous First-Year Intervention

The existing intervention efforts, however, have several limitations. First, the first-year interventions are often academically focused, with outcomes of GPA, retention, or graduation, while college students' mental health and well-being issues may not have received the same level of attention. Although academics are one of the critical parts of college life, students do not struggle only with academic demands. Also, academic thriving is not the only goal of postsecondary education; helping students achieve personal growth and well-being is one of the significant roles of universities and colleges. Furthermore, students' mental health and well-being should be an important target of first-year interventions due to their strong influences on academic performance; for example, research suggests that depressed college students tend to report lower academic performance and retention (Fazio & Palm, 1998; Gallagher, 2007; Pritchard & Wilson, 2003).

Previous theoretical models of first-year interventions such as Tinto's (1975) Student Integration Model and Astin's (1975) Theory of Involvement do not incorporate important psychosocial factors such as students' motivation and social cognitive mechanisms (Pan et al., 2008). Yet psychological constructs such as self-efficacy belief and purpose in life need to be investigated because many of the reasons that college student fails in their transition to college life (e.g., difficult personal adjustment, feelings of isolation and helplessness) are related to students' psychosocial factors and their well-being and mental health (DeWitz, Woolsey, & Walsh, 2009). Many university professors perceive a decrease in student motivation to learn and a willingness to adopt a passive learning approach, as compared to a generation ago (Pitts,

White, & Harrison, 1999). Students may neither be aware of, nor use, existing services (e.g., technology labs, libraries, counseling services) to their advantage if they do not identify their own needs and motivation to seek those services (Crismore, 1984). Thus, further intervention efforts to help freshmen students achieve deeper levels of self-understanding, which often serves as a strong source of motivation and self-efficacy seems still warranted. Recently, several studies began to include psychosocial factors into their college success models. For example, factors such as optimism, motivation, and personal goals are included in a psychological model of retention, showing that higher levels of optimism, motivation, and personal goal progress improve academic performance and retention (e.g., Dweck, 1986; Elliot, 1999; Morisano, Hirsh, Peterson, Pihl, & Shore, 2010; Nes, Evans, & Segerstrom, 2009; Robbins et al., 2004).

Second, empirical understandings of intervention effectiveness remain disorganized or inconsistent (Jamelske, 2009) and largely restricted due to the lack of evaluation research and weaknesses in research designs (Pascarella & Terenzini, 2005). Some research indicates that there are little or no benefits in first-year interventions (Crissman, 2001-2002; Hendel, 2006-2007; Potts, Schultz, & Foust, 2003-2004). Also, most evaluation research does not include program characteristics, making it difficult to know how and why some interventions worked (Porter & Swing, 2006). Although many universities already offer mentoring programs, freshman interest groups, seminars or learning communities, and service-learning programs to help ease the transition to university life and college education (Bean & Eaton, 2001–2002), very few of the studies analyzing their success used rigorous, randomized, and controlled experimental designs, therefore limiting our understanding of what was really helpful from those interventions (Adelman, 1999, 2006; Pascarella & Terenzini, 2005).

In an effort to address these limitations from previous research on first-year intervention, the current study focuses on freshmen's development of a sense of meaning in life (Steger, 2009), which is one of the significant psychological properties that has been linked to various positive psychological and academic outcomes. Also, this study employs 12-month longitudinal randomized controlled trial design as a way to improve the understanding of intervention effectiveness. The next section discusses how meaning in life may relate to college freshmen's lives.

Meaning in Life among the College Population

Definition of Meaning in Life

Meaning has been conceptualized in various ways in the literature (see Steger, 2009). Many of these definitions comprise overlapping components, including: a sense of coherence and order to one's life (Reker, Peacock & Wong, 1987; Reker & Wong, 1988; see also Antonovsky, 1987); an understanding of relationships among things and people (Baumeister, 1991; Baumeister & Vohs, 2002); the pursuit of worthwhile goals and life purposes (Battista & Almond, 1973; Frankl, 1963; Reker, 2000; Reker et al., 1987; see also Damon, Menon, & Bronk, 2003; Ryff, 1989); and a general sense that one's life is significant (Battista & Almond, 1973; Crumbaugh & Maholick, 1964; Yalom, 1980). Taking these viewpoints together, this study adopts Steger's (2009) multifaceted definition of meaning as "the extent to which people comprehend, make sense of, or see significance in their lives, accompanied by the degree to which they perceives themselves to have a purpose, mission, or over-arching aim in life" (p. 682).

In this view, meaning in life has two distinct dimensions: the presence of meaning, which again boils down into *comprehension* of one's life, and having a lifelong *purpose* (Steger,

2012) and the search for meaning (Steger, 2009). Presence of meaning refers to people's judgments that their lives make sense and matter by understanding their own identity, experiences, and unique fit in the world (i.e., Comprehension), and their possession of an energizing, valued, life mission or set of overarching goals (i.e., Purpose). Search for meaning refers to people's desire and efforts to establish and/or augment their understanding of the meaning (Steger, 2009). Among these two dimensions, presence of meaning has received more empirical attentions, and this study also focuses on the presence of meaning because its implication for outcomes is more straightforward than that of searching for meaning dimension. However, search for meaning is also important and was considered as one of the moderator variables because of its unique motivational entity which may influence the process of developing one's presence of meaning.

How Does Meaning in Life Relate to the Lives of College Freshmen?

Meaning and purpose as a developmental task. Cultivating an endurable sense of meaning and purpose in life has been suggested as one of the critical developmental tasks for individuals in late adolescence (Baxter Magolda, 1992; Habermas & Bluck, 2000; McLean, 2005) and emerging adulthood (Arnett, 2000). College freshmen are mostly in these periods, and they are typically given maximum opportunities for exploration in their life because adult commitments and responsibilities are usually delayed while the role experimentation becomes intensifies (Arnett, 2000). They begin or continue from their adolescence, theoretically a formative period of establishing one's own identify and belief system (see Identity theories, Erikson, 1968), to explore their enduring and valued identities and beliefs, their unique niches, and lifelong purposes. Developing internal capacity to define one's beliefs and values, identity, and social relations is one of the important developmental tasks for them, which is referred to as

self-authorship (Baxter Magolda, 1992). Self-authorship is regarded central to one's meaning-making process and foundational for achieving many college learning outcomes (Baxter Magolad & King, 2007).

In addition to this normative developmental perspective, other evidence suggests that current college students, often referred to as Millennial students (Howe & Strauss, 2000), are showing increasing need and interest in having personal and fulfilling lives by enriching their spirituality (HERI, 2004; Howe & Strauss, 2000; Lancaster & Stillman, 2002) and having meaningful work (Smola & Sutton, 2002; Zemke et al., 2000). Cultivating spirituality and meaningful work both involve a common concern for a sense of meaning in their lives.

In sum, developing meaning and purpose appear to be salient to current college students, both as a naturally occurring developmental task and as characteristics of the new generation. Therefore, universities and colleges may want to better accommodate their students' needs related to satisfying development of a sense of meaning and purpose.

Meaning and well-being and mental health. A growing body of research evidence indicates that meaning and purpose should be positively related to college students' mental health and academic outcomes. Much of the meaning in life research has been conducted on emerging adulthood in college settings, overwhelmingly supporting the importance of meaning in various aspects of life (e.g., Debats, Drost, & Hansen, 1995; Steger, 2009). For example, although predominantly correlational, people who enjoy a higher sense of meaning and purpose tend to experience numerous tangible benefits, such as increased well-being (e.g., positive affect, global happiness, satisfaction with life and with self, positive perspectives and outlooks, better coping styles), reduced distress and psychopathology (e.g., negative affect, depression, anxiety,

hopelessness, suicidal ideation, disruptive behaviors), and enhanced physical health (e.g., recovery from surgery, smoking cessation, mortality).

Specifically, experiencing higher meaning in life has been positively related to various psychological well-being indices such as life satisfaction (e.g., Chamberlain & Zika, 1988b), positive affect (e.g., King, Hicks, Krull, & Baker, 2006; Mascaro & Rosen, 2005; Reker, 2005; Steger & Frazier, 2005; Steger et al., 2006; Urry et al., 2004; Zika & Chamberlain, 1987), happiness (Debats, Van der Lubbe, Wezeman, 1993), feelings of high morale (Ryff, 1989), and love, joy, and vitality (Steger et al., 2006). Also, many studies showed that meaning in life is positively related to a number of important markers of happiness such as self-esteem (Ryff, 1989; Steger, 2006; Steger et al., 2006; Debats, 1996), self-acceptance (Garfield, 1973; Ryff, 1989; Steger et al., 2008a), self-actualization and positive self-regard (Ebersole & Humphries, 1991; Phillips, Watkins, & Noll, 1974), work enjoyment (Bonebright, Clay, & Ankenmann, 2000) and resilience and health (Boyle, Barnes, Buchman, & Bennett, 2009; Krause, 2009; Steger, et al., 2008a; Steger et al., 2009a; McKnight & Kashdan, 2009; Yanez et al., 2009; Smith & Zautra, 2004). Conversely, having less meaning has been associated with various psychological distress and psychopathology such as depression and anxiety (e.g., Debats et al., 1993; Steger et al., 2006; Steger & Kashdan, 2009) and suicidal ideation and substance abuse (e.g., Harlow, Newcomb, & Bentler, 1986).

From these findings, it appears clear that college freshmen will benefit from cultivating a strong sense of meaning in achieving better mental health and optimal well-being.

Meaning and academic performance. A substantial body of research has also showed that meaning and purpose are closely related to various psychosocial constructs that predict academic performance and persistence such as goal-pursuit (McKnight & Kashdan, 2009),

motivation, and social and academic engagement (Astin 1984; Kuh, 1995; Terenzini et al., 1994) among college students.

For example, Morisano and colleagues (2010) conducted a longitudinal study and found that participation in a formalized, intensive, online, personal goal-setting program was an effective intervention for struggling university students. The intervention task focused on articulating personal goals (which reflect consciously articulated and personally meaningful objectives that guide perception, emotion, thought, and action; Elliot, Chirkov, Kim, & Sheldon, 2001; Wiese & Freund, 2005) and led to improved academic performance measured with GPA and retention rate. An empirical study (DeWitz et al., 2009) showed that U.S. college students' social or general self-efficacy beliefs were significantly and positively related with reports of purpose in life, suggesting a higher sense of purpose may be one of the important predictors of college retention. The authors proposed the significance of considering students' sense of purpose in life claiming that even though a student feels integrated into a social and academic community with a good fit with the institution, feels supported, is financially able, and has a good GPA, still without a clear sense of meaning and purpose in their lives, the student may not stay in the education system. In the same context, the authors argued that with a clear sense of meaning and purpose, a student who encounters various difficulties in college life may show higher level of persistence in pursuing college education. As such, college freshmen will be also better off in their academic success when they develop a clear sense of meaning and purpose in their lives.

College students failing in experiencing meaning. Research suggests that current college students do not seem to successfully achieve a satisfying sense of meaning and purpose in their lives despite several potential benefits of meaning in life. They often appear to be in a

state of existential vacuum, drift with no clear life plans, and show cynicism or nihilism (e.g., Astin, 2004; Damon, 2008). Furthermore, they seem less concerned with developing a meaningful philosophy of life, and instead, excessively pursuing extrinsic values such as materialism and individualism (Astin, 2004; Pryor, Hurtado, Saenz, Santos, & Korn, 2007; Schneider & Stevenson, 1999; Twenge & Campbell, 2010). Clinical evidence supports these observations; students appear to suffer from a sense of alienation and poor self-understanding, presenting psychopathological symptoms that can be associated with a lack of sense of meaning and spiritual/religious struggles (Bryant & Astin, 2008; Johnson & Hayes, 2003, Lukoff, Lu, & Turner, 1998; Twenge, Gentile, DeWall, Ma, Lacefield, & Schurtz, 2010).

Along with the recent claim that educational environments should more effectively and actively assist their students to cultivate a sense of meaning and purpose (Astin, 2004, Damon, 2008, 2009), universities can (and ought to) offer freshmen students great opportunities to pursue more meaningful and purposeful lives.

Meaning in life and career development. Career development (including deciding one's academic major) has been often one of the primary goals of first-year interventions at universities and colleges. Having a focus on meaning and purpose in first-year intervention should benefit college students' career development. Recent theoretical and empirical research supports that the sense of meaning and purpose in career development is salient among US college students (Duffy & Sedlacek, 2010) and brings lots of benefits, such as greater certainty regarding their future occupation (Tryon & Razdin, 1972), higher career decision self-efficacy, more intrinsic motivation to work (Dik et al., 2008; Dik & Steger, 2008), higher career decidedness, comfort, self-clarity, and use of adaptive coping strategies (Duffy & Sedlacek, 2007; Treadgold, 1999). Qualitative research also demonstrates that calling and vocation

facilitate adaptive career development (Constantine, Miville, Warren, Gainor, & Lewis-Coles, 2006).

Researchers have argued that career development will benefit from incorporating the constructs of meaning and purpose (e.g., calling and vocation into the career counseling process, Dik & Duffy, 2009; Dik, Duffy, & Eldridge, 2009; purpose-centered approach to adolescents' career development, Kosine, Steger, & Duncan, 2008). For example, calling- and vocation-infused career decision-making workshops yielded statistically and practically significant increases in career decision self-efficacy for college students compared with a wait-list control condition (Dik & Steger, 2008).

Taken together, having a focus on meaning and purpose in first year interventions should benefit college students' career development.

Improving Understanding of Meaning in Life among Freshmen

Despite theoretical and practical implications of meaning and purpose for college student development, the current understanding of meaning in life in college students' lives has remained limited for the following reasons. First, although substantial progress in empirical research on meaning has occurred over the past several decades, perhaps in conjunction with a growing focus on positive traits and psychological strengths (Ryan & Deci, 2001; Seligman & Csikszentmihalyi, 2000), with some experimental research (e.g., King et al., 2006), the bulk of published meaning in life studies rely on correlational methods (Steger, 2012). This methodological issue has limited the understanding of causal effects of meaning in life on outcomes variables; the direction of relationships was not clear whether enhanced meaning can increase well-being and decrease negative psychological symptoms or whether people with high well-being and low distress simply experience high level of meaning in life. Therefore, this study employs a

randomized controlled experimental design; which is also one of the recommendations for future research on effectiveness of college freshmen programs (Pascarella & Terenzini, 2005).

Second, to date, there is no longitudinal study that investigates the developmental trajectory of meaning in life among college students, limiting the understanding of the pathway for development of meaning in life, the factors affecting the change process in meaning in life, and the maintenance of intervention effects. Substantial amount of research has consistently argued that a higher sense of meaning in life seems beneficial to various aspects of human lives. The next important question will be how people can enhance and maintain their sense of meaning in life as well as what factors concern the change process. This question of stability and changeability of individuals' well-being level, perhaps including meaning in life, has been rather controversial, therefore increasing the significance of the current study's focus on the change process of meaning in life. For example, some argue that well-being is quite heritable and thus likely to return to initial levels eventually (Lykken & Tellegen, 1996; McCrae & Costa, 1994). Would this be the case when it comes to college students' gains in meaning in the long term? Several studies on the benefits from positive psychological interventions such as pursuing meaningful personal goals (Sheldon & Elliot, 1999) and forgiving transgressors (McCullough, Pargament, & Thoresen, 2000) have demonstrated successful increase in people's well-being levels. However, most of these studies have not addressed the stability of these gains in the long term. Although one longitudinal study of personal goal-pursuit with college freshmen (Sheldon & Houser-Marko, 2001) shows that some students maintained the gains in their global well-being attained from their goals over a year, no previous study has examined specifically the case of meaning in life. Therefore, this study intends to advance our understanding of a growth trajectory of meaning in life by employing latent growth modeling (Singer & Willett, 2003).

Finally, reflecting relatively little empirical attention to effective intervention research in well-being (Lent, 2004; Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001), studies on understanding how to facilitate the development of meaning in life in young people's normative life context is still in the beginning stage (Steger, Bundick, & Yeager, 2012). Although there exist meaning-related interventions (e.g., meaning-centered group psychotherapy; Breitbart et al., 2010; Greenstein & Breitbart, 2000), these usually aim to help older people, chronic or terminally-ill patients, or people with traumatic events, not in the relatively normative life context of college students. Therefore, this study hopes to advance our understanding on empirically validated intervention strategies for improving meaning in life, which is also in the similar vein with the recent efforts in improving positive psychological or well-being interventions.

Facilitating the Development of Meaning in Life: Meaning-Enhancing Intervention

Two Theoretical Components of Meaning: Comprehension and Purpose

Steger (2009) theorizes that the presence of meaning consists of two components: comprehension and purpose. Comprehension represents a cognitive component of meaning in life and refers to people's understandings of who they are, what the world is like, and how they fit in and interact with the world around them (Steger, 2009, see Figure 1). People achieve these understandings as they become able to find patterns, consistency, and significance in the many events and experiences in their lives. People's comprehension of themselves, the world around them, and their unique fit in the world serves as a firm grounding in their lives; the way people comprehend their lives helps people establish a continuous narrative, organize fragmented daily experiences, forge links between familiar experiences and new ones, integrate new experiences

into one's life, bring unity to their lives, and anticipate and regulate their behaviors in adaptive ways.

Purpose comprises the motivational component of meaning and refers to an individual's long-term and overarching goal or mission to which one is highly committed and actively engaged (Steger, 2009). The model of purpose specifies that people may develop their sense of purpose by discerning, committing themselves to, and engaging themselves in their personally meaningful goals (see Figure 1). Having a strong sense of purpose has been included in many well-being theories either as definitional feature or indicators of well-being (e.g., Ryff, 1989; Ryff & Singer, 1998), particularly as one of the essential features in experiencing a sense of meaning in one's life. Purpose provides significant and renewable sources of engagement and meaning because it offers direction that helps an individual organize and stimulate goals, manage behaviors, and make daily decisions by guiding the use of finite personal resources (Mcknight & Kashdan, 2009).

Comprehension and purpose components are reciprocal in that they function together to derive a sense of meaning in one's life; this interaction between the cognitive and motivational components of meaning in life distinguishes meaning from other psychological constructs (Steger, 2009). This implies that without the interaction between the two components, one may not be able to establish a firm sense of meaning in their lives, because the successful formation of each piece may require the information from the other side. Specifically, an individual may be able to come up with any goals, but his or her unique ways of comprehending life (i.e., Comprehension) may provide a foundation from which the person can develop goals or purposes that might be most meaningful and beneficial to himself or herself (Steger, 2009). In this sense, developing a self-integrated sense of purpose may require a set of well-established

comprehension of self and world. Meanwhile, purpose is also woven into a person's identity, behavior, and even personality as a central and predominant theme (McKnight & Kashdan, 2009). This reciprocal loop between comprehension and purpose is facilitated by goal-directed activities (Steger, 2009, see Figure 1).

In sum, theory suggests that people are likely to experience a greater sense of meaning in life as they achieve1) a consistent set of understanding of one's self, the world they live in, and their unique fit in the world (i.e., Comprehension side of meaning) and 2) an overarching set of goals or missions they strive to accomplish (i.e., Purpose side of meaning), with the close interaction between these two components facilitated by their goal-directed activities.

Two Domains of Meaning-Enhancing Intervention

Based on the conceptual components of meaning in life described above, the current intervention is designed to help individuals 1) build a robust set of self-knowledge, which represents one's overall comprehension 2) establish self-concordant goal-progress, which captures the process of elaborating one's purpose(s) (see Figure 2). In this section, the details of how self-knowledge and self-concordant goal-progress relate to the current intervention will be discussed within the framework of the theories of self-concept (Higgins, 1996; Campbell, et al., 1996), self-concordance goal theory (Sheldon & Elliot, 1999), and social cognitive theory (Bandura, 1982, 1986). In addition, specific intervention activities corresponding to each domain will be introduced.

Self-knowledge. Individuals obtain comprehension of their lives by understanding who they are (e.g., one's distinct self-attributes such as abilities, characters and personality, preferences, weaknesses and strengths), what the world is like to them (e.g., worldview, beliefs, external resources), and where they fit in and how they interact with the world as a person (e.g.,

one's roles, one's opportunities and limitations). These overall understandings of themselves and others are conceptualized as *self-knowledge* in this study. Higgins (1996) proposes that self-knowledge represents a summary of one's relations to the world and what the world is like in relation to oneself, which includes not only one's descriptive actual self but also one's relational and social self. He further explains that one's self-knowledge serves self-regulatory functions because this form of self-knowledge takes into account their understandings of the outside world that are meaningfully relevant to the self. In this sense, self-knowledge indeed captures the integration of the three pieces of comprehension (i.e., self, the world, and the self-world interaction), as well as reflects the organizing and regulating function of meaning in life.

One's self-knowledge includes a coherent and clear sense of identity and self-concept (Erikson, 1968; Kegan, 1982), a coherent comprehension of reality (Swann, Rentfrow, & Guinn, 2003), and some understanding of the enduring beliefs and purposes to which to dedicate themselves (Damon et al., 2003). Self-concept clarity (SCC; Campbell et al., 1996) refers to the degree of whether an individual possesses clearly and confidently defined, internally consistent, and temporally stable contents of self-knowledge, which may be a good indicator of one's improved self-knowledge as a result of the current intervention. For this reason, self-concept clarity is conceptualized as one of the mediators of the intervention effects in this study.

To help students improve their self-knowledge, in turn, self-concept clarity, several strategies are adopted from existing research. This study also intentionally includes positive psychological interventions or strength-based interventions because these approaches highlight a person's inner resources, strengths, and positive attributes (Park, Peterson, & Seligman, 2004; Seligman, Rashid, & Parks, 2006).

First, this study uses the purpose-interview protocol which consists of a series of questions that is developed to guide people to effectively think through their lifelong purpose. This semi-structured interview protocol is modified from the Youth Purpose Study interview protocol that was originally developed for studies of self-understanding and identity and adolescents' sense of purpose (see Damon, 2008 for details). The protocol elicits the most important things in the young person's life and the associated explanation for them and widely covers young people's short- and long-term life goals, their hopes and dreams, their values, their occupational aspirations, and the kinds of people they want to become (Yeager & Bundick, 2009).

Second, participants takes the Values in Action Inventory of Strengths (VIA-IS, Peterson & Seligman, 2004), which intends to help them effectively identify their signature strengths and understand their positive attributes and their core value system. An empirical study shows that people who used their signature strengths daily tend to be happier and less depressed (Seligman, Steen, Park, & Peterson, 2005). The VIA-IS measures 24 character strengths by means of a 240-item self-report questionnaire (10 items per strength). All subscales have been found to have acceptable internal consistency reliabilities (all αs > .70; Peterson, Park, & Seligman, 2005). This inventory is a face-valid self-report questionnaire that assesses the degree to which respondents endorse items reflecting the various strengths of character that comprise the VIA classification (e.g., Wisdom, Courage, Love). Participants will be asked to take this survey online and to list their top 5 strengths with a brief description of how they have used the each strength in their lives and how they can use their signature strengths daily to achieve their goals. Empirical findings reveal that using signature strengths is associated with better goal progress,

which is associated with psychological need fulfillment and enhanced well-being (Linley, Nielsen, Wood, Gillett, & Biswas-Diener, 2010).

Third, the intervention will ask participants to take, rate them in terms of importance, and describe photographs of the things that make their lives feel meaningful. This is a form of new research practice developed and used in the area of identity and self-esteem research, called auto-photography, which allows researchers to capture and articulate the ways the participants understand themselves by having them select and record the static images they feel represent them the best (Noland, 2006). This method can generate more authentic data because it enables researchers to look at the participants' world through the participants' eyes, helping researchers to avoid exclusive reliance on potentially culturally biased research instruments such as verbal cultural scripts. This task intends to help participants identify, and express their own sources of meaning. Helping participants identify and express their own sources of meaning will facilitate the integrative comprehension of their lives, because individuals' sources of meaning incorporate modes of conduct and goals in life (Reker, 2000) that reflect the interaction and integration between micro level and macro level (e.g., historically and culturally determined value system) life themes that crystallize people's perception of who they are and how they see themselves in their social life (Bar-Tur, Savaya, & Prager, 2001).

Fourth, the intervention will provide opportunities for participants to improve their own understandings of their academic major and future career. Exploring majors and careers consists of a significant part of college students' self-understanding and is closely related to their short-term and long-term goals, possibly to their lifelong purpose. Exploring and deciding on their major and future career is one of the challenging tasks for college freshmen. To assist this career decision making process, the intervention will ask participants whether they have decided or

have a good idea about their major and career. If participants answer yes, they will be asked to briefly write about their major and career. If no, they will be guided to go through several steps for choosing a major and linking that to future career. The contents will be modified from resources derived from a website designed to help freshmen career planning (http://www.iona.edu/studentlife/career/freshmancorner/gettingStarted.cfm). In addition, at the end of the activities, students will be provided with a link to the CSU Career Center for further career assessment and help for their use if needed.

In particular, they will be also encouraged to explore their major and career not only from conventional viewpoint (e.g., considering individuals' traits such as interests and abilities) but also from the sense of meaning and purpose in work (Dik & Duffy, 2009). Research suggests that this is a good way of building a tight connection between work and life values (Colozzi & Colozzi, 2000), and that work may be one of the most important domains where individuals often experience and expand the sense of meaning in their lives (Dik et al., 2009). In this sense, seeing how their major and career can be meaningful in their lives will help freshmen integrate their current academic activities and future work into their coherent life narratives. Questions will be, for example, 1) in what way is your major meaningful to you?, 2) what would make your job more meaningful?, and 3) in what way would your job be helpful to society or the common good? (Dik et al., 2009).

Finally, participants will be involved in several brief writing projects that will ask them to write about topics such as a personal mission statement, past achievement, current and future best selves. Writing about something important such as one's own priorities and goals or positive or negative emotional experiences has been reported to bring improvements in a wide variety of indicators of positive well-being (Burton & King, 2004; King, 2001; Pennebaker, 1997). In

particular, the creation of coherent narrative sources of meaning and gaining understanding of experiences have been viewed as a crucial mechanism of the benefits of writing (Pennebaker & Seagal,1999). In this sense, participants' involvement of writing projects will function as a way of making sense of themselves and their life experiences.

Self-concordant goal progress. The self-concordant goal progress is conceptualized as one of the central targets of this intervention. Personal goals represent individuals' sometimes tentative and usually difficult attempts to achieve a particular outcome or new levels of performance or positive adaptation within their lives (Bandura, 1986; Emmons, 1986; Locke & Latham, 1990). In particular, self-concordant goals can be defined as goals that are well-integrated with the self, expressing the individual's enduring interests and values (Sheldon & Elliot, 1999). People may cultivate their sense of purpose by pursuing their self-concordant goals, given the following reasons. First, personal goals have been strongly emphasized in extensive literature on well-being, mental health, and performance. Findings on the relation of goals to well-being generally suggest that perception that one is making progress toward meeting one's personal goals is a particularly reliable predictor of well-being such as increased SWB positive affect and life satisfaction (e.g., Diener, Suh, Lucas, & Smith, 1999; Ryan & Deci, 2001). Particularly relevant to eudaimonic perspective in which meaningfulness and personal growth are central to the definition of well-being, studies have suggested that commitment to personal goals lends a sense of agency, life structure, and personal meaning to people's lives (Cantor & Sanderson, 1999) and serves as important vehicles for self-discovery and psychological need satisfaction (Sheldon & Elliot, 1999; Sheldon & Kasser, 1998).

Second, identifying and pursuing personally meaningful goals facilitates the reciprocal interaction between comprehension and purpose (Steger, 2009). To set and implement personally

meaningful goals, people need to actively apply their own comprehension of their lives through reflecting and answering a series of important personal questions such as who they are and what they want to do both in a short-term and long-term timeframe. Also, people upgrade or revise their existing set of self-knowledge using their processes and outcomes of the goal-related experiences. In this way, self-concordant goal progress helps one's comprehension and purpose components function together toward building a sense of meaning in one's life.

Third, personal goals are recognized as apt foci for theoretically informed interventions to enhance personal thriving (Ryff & Singer, 1998; Wadsworth & Ford, 1983) because goal variables are assumed to be more modifiable and malleable) than other personality construct (Emmons, 1989). Goals emphasize the role that people can play as agents of their own well-being. In well-being literature, the significance of setting and choosing to pursue personal goals have been strongly emphasized because goals concerns people's malleability, agency, volition that may enable people to design life conditions that foster both meaning and happiness, compared to the focus on the impact of genetically influenced personality factors (Lykken & Tellegen, 1996) or temperamental set points on well-being (Headey & Wearing, 1989).

Finally, goal progress typically involves not only cognitive (i.e., identifying goals) but also behavioral aspects (i.e., enactment of plans); the theory of participation in valued life task may well represent the significance of behavioral involvement in improving human well-being (Cantor & Sanderson, 1999; Robbins & Kliewer, 2000). The authors suggest that individual's sustained participation in personally and culturally valued tasks is an essential part in improving well-being, because this behavioral participation provides a sense of personal agency and purpose as well as a structure and meaning to daily life. Participation in valued life tasks has also been regarded to be particularly beneficial to people at life transition points (e.g., retirement,

divorce, job loss), where role positions are in flux and questions about life purpose and meaning may be salient (Harlow & Cantor, 1996). College freshmen who undergo various life transitions (e.g., new college environments, leaving home and residence hall life, increased freedom and responsibilities) would not be an exception. As such, the construct of goal progress is comprehensive and useful to explain the potential mechanisms of meaning development because it captures the broad picture of how people make sense of their lives, including what they actually do in relation to those understandings. Specific intervention activities for assisting participants' self-concordant goal progress are developed drawing upon the Self-Concordance model (SCM; Sheldon & Elliot, 1999) and the Social-Cognitive theory (SCT; Bandura, 1997), which are further described in the next section.

The Self-Concordance model. The Self-Concordance model (SCM; Sheldon & Elliot, 1999) emphasizes that a person's goals should represent that person's authentic self in a deeper sense such as that person's own interests and values (Sheldon & Elliot, 1999; Sheldon & Elliot, 1998; Sheldon & Kasser, 1998). Self-concordance of individual's goal-systems refers to the degree to which one's stated goals are well-integrated with the self, expressing his or her own enduring interests and values. This model proposes that people pursuing self-concordant goals put more sustained effort into achieving those goals and thus are more likely to attain them. Also, people who attain self-concordant goals gain greater well-being benefits because of more successful need satisfaction in autonomy, competence, and relatedness from the goal strivings. Through the process of establishing and pursuing self-concordant goals, participants will be engaged in utilizing their self-knowledge. Moreover, they would be able to develop or consolidate their lifelong purpose as they pursue the goals that are personally meaningful and

well-integrated with their selves. For this reason, the current intervention will assist participants to increase the self-concordance of their goals and to make progress on those goals.

Social Cognitive Theory. According to Social Cognitive Theory (SCT), social cognitive variables such as self-efficacy belief, outcome expectation, and goal-relevant environmental supports and resources influence the goals that people set for themselves and their performances in making goal progress (Bandura, 1997, 2001; Cantor & Sanderson, 1999; Lent, 2004; Locke & Latham, 2002; Sheldon & Kasser, 1998). Thus, this intervention addresses several key social cognitive variables to promote participants' goal progress. In particular, Social Cognitive Theory (SCT) posits that environmental resource and support influence individuals' goal selection and progress directly (e.g., by providing necessary resources, like money or instruction) or indirectly (by affecting social cognitive mechanisms such as self-efficacy, outcome expectations, coping skills/ strategies related to one's goal pursuit), which, in turn, affect one's behaviors and performances (Bandura, 1986, 1997). Drawing upon this theoretical framework, the intervention will ask participants to identify and utilize necessary skills, support, and resources they need in order to achieve each goal they listed. Also, they will navigate potential barriers to their goal pursuit (Bandura, 1997; Brown & Lent, 1996; Maddux & Lewis, 1995). Facilitating people's ability to identify and use the environmental support and resources around them in order to achieve their life goals is also in line with enhancing people's understandings of the Self-World interaction, which is the third conceptual piece of comprehension (Steger, 2009). This knowledge of the Self-World interaction may include, but is not limited to, understandings of the sources and types of social support and goal-relevant skills they need as well as the barriers to their goals and the strategies to reduce those barriers. In this way, individuals' understanding of

their Self-World interaction concerns their goal pursuit, demonstrating how the comprehension and purpose components of meaning in life are related to each other.

Incorporating a social cognitive perspective into the intervention strategies captures the attention to a social aspect of meaning development, which has been relatively ignored in the meaning in life discourse compared to attention to individuals' intrapsychic and personal factors. The inclusion of the social aspect of meaning in this study along with the cognitive (i.e., self-knowledge) and motivation-behavioral aspects (i.e., self-concordant goal progress) represents a more multifaceted view of well-being enhancing intervention; for example, the integrative model of normative well-being model (Lent, 2004) posits that dynamic and modifiable constructs such as cognitive, behavioral, and social-relational variables provide the basis for psychological interventions designed to promote well-being because they can represent acquirable skill sets and environmental resources as opposed to innate temperamental qualities or traits. According to this model, people are more likely to achieve greater well-being when they actively pursue and make progress in personally valued goals, with high self-efficacy belief and outcome expectations, and see their environments as supportive of their goals while providing accessible resources for their goals.

In sum, drawing upon the Self-concordance model and Social cognitive model, the current intervention intends to assist participants to make optimal goal progress in their self-concordant goals, which consequently may lead participants to cultivate and consolidate a sense of purpose in their lives.

Potential Mediators and Moderators of the Intervention Effects

Drawing upon theoretical foundation of the current intervention, potential moderators and mediators were examined to address why, how, and when the intervention works. Moving

beyond the basic question of whether an intervention works or not by identifying moderators and mediators of the effects sophisticates a field of counseling theory, research, and practice (Frazier, Tix, & Barron, 2004).

Mediators. The two domains of the current intervention (i.e., self-concept clarity, self-concordant goal-progress) are considered as underlying change mechanisms for influencing intervention outcomes.

Moderators. This study includes two moderators that may influence the intervention effects: 1) searching for meaning (i.e., how strong a person is motivated to seek meaning in their lives) and 2) general self-efficacy (i.e., how confident a person believes in general that he or she can achieve tasks). The intervention effects are hypothesized to be stronger for people who are highly motivated and generally confident in conducting tasks.

Searching for meaning. Search for meaning is one of the two dimensions of meaning in life, which is defined as how strong one is seeking meaning in his or her life (Steger, 2009). Previous research typically indicates that high level of search for meaning has been associated with low level of presence of meaning as well as with negative well-being indices at least with Western populations, implying that people's searching for meaning would represent their unmet needs. However, developmental psychologists regard the search for meaning among young adults is to be universal and a part of normative path toward maturity (e.g., Erikson, 1968; Marcia, 1966). Indeed, among adolescents and young adults, high level of searching for meaning tends to correlate positively with well-being indicators (Bronk, Hill, Lapsley, Talib, & Finch, 2009; Steger, Oishi, & Kashdan, 2009). It is likely that the young people's high level of searching for meaning is more developmentally normal and positive, representing high level of

motivation to understand and integrate their lives in meaningful ways, which might possibly lead them to be more actively engaged in activities that makes their lives meaningful.

In this sense, the current study regards the level of search for meaning as a developmentally proper positive motivational entity which would help young individuals be engaged in meaning-enhancing intervention in a more active and productive way. The search for meaning is a relatively time-stable individual difference (Steger et al., 2008b). Students who are actively seeking for meaning in their lives may benefit more from the current intervention than those who are not.

General self-efficacy. General self-efficacy (GSE) refers to people's characteristic beliefs in their ability to perform across a variety of different situations (Chen, Gully & Eden, 2001). This captures differences among individuals in their tendency to view themselves as capable of meeting task demands in a broad array of contexts, representing the more trait-like stable generality dimension of self-efficacy compared to task specific self-efficacy (Eden, 1988). People who have low GSE are less likely to invest themselves in the current intervention tasks because this general belief about one's ability influences people's amount of effort in conducting a task and the length of time they would persevere through obstacles and difficulties. For this reason, this study expects that students who feel generally competent in conducting tasks may more benefit from the current intervention.

Research Questions

Question 1) How does each student's meaning in life change during the first semester of college?

Question 2) Does the meaning-enhancing intervention predict interindividual differences in intra-individual change in meaning in life?

Question 3) Do the effects of meaning-enhancing intervention differ according to participants' characteristics?

Question 4) What is the relationship between self-concept clarity and meaning in life?

Question 5) What is the relationship between goal progress and meaning in life?

Question 6) Does the meaning-enhancing intervention increase the levels of self-concept clarity and goal-progress?

Question 7) Does self-concept clarity and goal-progress mediate intervention effects on meaning in life?

Question 8) What is the relationship between meaning in life and depression and anxiety?

Question 9) Does meaning in life predict college freshmen's 1-semester and/or 1-year GPA?

Question 10) Does meaning in life predict college freshmen's retention to their sophomore year of college?

CHAPTER III

METHOD

Participants

Participants were recruited from a research pool of freshmen students taking introductory psychology in fall 2010.

Instruments

Meaning in life. The Meaning in Life Questionnaire (MLQ; Steger et al., 2006) assesses the extent to which respondents feel their lives are globally meaningful (MLQ-presence of meaning subscale) and also the extent to which they are actively seeking meaning in their lives (MLQ-search subscale). Each dimension of meaning is measured by five items rated from 1 (*Absolutely Untrue*) to 7 (*Absolutely True*). The two factor structure of the MLQ was replicated via confirmatory factor analyses in multiple samples, and a Multitrait-Multimethod Matrix study demonstrated excellent convergent and discriminant validity (Steger et al., 2006). Sample items from the MLQ-Presence subscale include "My life has no clear purpose" and "I have a good sense of what makes my life meaningful." Sample items from the MLQ-Search subscale include "I am seeking a purpose or mission for my life" and "I am looking for something that makes my life feel meaningful." Both subscales have demonstrated very good internal consistency in previous studies (α's between .82 and .88).

Depression and anxiety symptoms. The brief 21-item version of Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) is a widely used self-report measure of one-week state anxiety, depression, and tension/stress. For the purpose of this study, only 14 items from depression and anxiety subscales were used. Respondents indicated the extent to which they experienced each of the symptoms depicted in the items during the previous week on a 4-

point Likert-type scale between 0 (*Did not apply to me at all*) and 3 (*Applied to me very much, or most of the time*). The factor structure of the DASS-21 is stable and clear, and its scales possess good convergent and discriminant validity and high internal consistency in clinical and in nonclinical samples and in different ethnic groups in adults (Antony, Bieling, Cox, Enns, & Swinson, 1998; Brown, Korotitsch, Chorpita, & Barlow, 1997; Clara, Cox, & Enns, 2001; Crawford & Henry, 2003; Daza, Novy, Stanley, & Averill, 2002; Henry & Crawford, 2005; Lovibond, 1998; Lovibond & Lovibond, 1995; Norton, 2007; Taylor, Lovibond, Nicholas, Cayley, & Wilson, 2005).

The results of a series of factor analyses indicated that the core symptoms of anxiety include physiological arousal (sweaty hands, trembling, increased heart beat), as well as a subjective awareness of anxious affect and escape or avoidance tendencies. The core symptoms of depression were found to include low positive affect, hopelessness, devaluation of life, self deprecation, and inertia. Zlomke (2009) examined the psychometric properties of DASS in an internet administered format (N = 1138) using a 42-item version, and results suggested that DASS may be used with confidence in an online format in terms of reliability and validity.

College retention. Participants' self-report of their enrollment (yes/no) after the drop/add period in the spring semester 2011 and the fall semester 2011 was used.

GPA. The self-report of accumulative GPA of the fall semester 2010 and of the spring semester 2011 were used.

General Self-efficacy. The 9-item New General Self-Efficacy Scale (NGSE; Chen et al., 2001) was used to assess individuals' belief in their ability to perform well in a variety of situations. This measure is unidimensional and consistently yielded appreciably higher content validity and somewhat higher predictive validity. When compared to the two other GSE

measures (Sherer & Adams, 1983; Schwarzer & Jerusalem, 1995), Chen and colleagues' (2001) GSE measure outperformed the others in terms of item discrimination, item information, and the relative efficiency of the test information functions (Scherbaum, Cohen-Charash, & Kern, 2006).

Self-concept clarity. Self-concept clarity was measured using the 12-item Self-Concept Clarity scale (SCC; Campbell et al., 1996). This scale assesses the degree to which individuals feel that they have a strong sense of themselves and that all parts of their self-concept fit together into a cohesive self-unit. Items include, "In general, I have a clear sense of who I am and what I am." and "Sometimes I think I know other people better than I know myself (reversed)." Respondents will answer on a seven-point Likert scale (1 = *strongly disagree,* 7 = *strongly agree*). This scale has satisfactory psychometric properties (see, Campbell et al., 1996) with high average internal consistency reliability among three samples (.86), and test–retest reliability (.79 for 4 months and .70 for 5 months). Research suggested that SCC reflects a relatively stable individual difference that is reliably and validly measured with the SCC scale.

Self-concordant goal progress. First, self-concordance refers to the extent to which people pursue their set of personal goals with feelings of intrinsic interest and identity congruence, rather than with feelings of introjected guilt and external compulsion (Sheldon & Houser-Marko, 2001). To measure the self-concordance of the set of goals, participants were asked to rate their reasons for pursuing each striving in terms of each of the four reasons (i.e., external- "because somebody else wants you to or because the situation seems to compel it", introjected- "because you would feel ashamed, guilty, or anxious if you did not have this goal", identified- "because you really identify with the goal", and intrinsic- "because of the enjoyment or stimulation that this goal would provide you") on a 9-point Likert scale from 1(*not at all because of this reason*) to 9 (*completely for this reason*). As in past research, a single self-

concordance score was formed by summing the identified and intrinsic scores and subtracting the introjected and external scores (Sheldon & Elliot, 1999; Sheldon &Houser-Marko, 2001).

Second, goal commitment and goal progress to each goal were assessed using a single-item question (i.e., "How hard are you trying in pursuing each striving?", "how well are you doing in each goal?", respectively). Response was rated on a 9-point Likert scale ranging from 1 (*not at all hard*) to 9 (*very hard*) (Sheldon & Elliot, 1999). The total score was computed by averaging the ratings across the six goals.

Life stress. The 4-item version of the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to assess the degree to which individuals perceive their life as stressful using a 5-point Likert scale from 0 (*never*) to 4 (*very often*). Psychometric data for the PSS have been found to be adequate, with internal consistency, as measured by Cronbach's alpha, ranging from .84 to .86 (Cohen & Williamson, 1988). Participants were asked to indicate their recent level of perceived stress at each time point of measurement instead of during their previous month as in the original scale. The authors of this scale stated that although they have not collected psychometrics on other time periods, shorter time periods should not be a problem. Life stress level is one of the major correlates of the level of meaning in life, which may potentially confound one's meaning development trajectory (Steger, 2009). Therefore, the present study considers life stress as a time-varying predictor of meaning in life.

Intervention engagement and minutes. To assess the degree of engagement and time spent in completing intervention activities, students in the intervention group rated their degree of engagement (e.g., When you were in the Purpose-interview, how engaged were you in the interview so far? how seriously did you answer the questions?) on a 5-point Likert scale (1 = *not at all*, 5 = *very much*). They also rated the length of time they spent on each intervention activity

(e.g., how long did you spend in completing the purpose-interview?) on an 8-point Likert scale (1 = *less than 5 min*, 2 = *5-10 min*, 3 = *11-15 min*, 4 = *16-20 min*, 5 = *21-25 min*, 6 = *26-30 min*, 7 = *31-35 min*, 8 = *more than 35 min*).

Baseline Similarities Between Groups. To ensure baseline similarities between groups, the following information was collected: age, gender, ethnicity, self-reported average of high school grades, English fluency, whether they were enrolled in any other kind of intervention at the beginning of the study (e.g., workshops offered by the university).

Procedure

This study employed an experimental-control group design with multiple measurement points during 1 year to investigate the effects of a meaning-enhancing intervention with a sample of college freshmen. This study consists of three distinct time phases: 1) Recruiting, study registration and initial survey, 2) a 6-week of intervention and survey, and 3) two times of follow-up survey (see Table 1).

During Phase 1, participants were recruited from a research pool of freshmen students taking introductory psychology in fall 2010. Upon the approval of IRB, a brief description of the current study was posted in a research participation website of psychology department, where students can voluntarily sign up for study participation. This study originally planned to recruit from the entire CSU freshmen pool by obtaining the list of university email addresses from the Registrar's Office at CSU. However, a request of students' email address was not approved by the institution, resulting in recruiting only from introductory psychology classes.

During recruitment as well as during consent procedures, participants were told that 1) this study examines the effects of new program consisting of several personal knowledge activities, 2) they would receive emails containing a link to a study website, where they will be

engaged in brief activities, and 3) they would be given 4 credits upon the completion of the first follow-up survey and they would be given one additional entry in a drawing for US$25 gift certificates for each follow up survey they complete.

Participants signed the online consent form to express their willingness to participate in the study. When they signed the consent form, they were guided to provide their email address they preferred to use for this study (especially in case students did not want to use their university email account because most university emails contained students' first and last name). After participants signed the online consent form, they completed an initial survey which consists of meaning in life (MLQ), depression and anxiety symptoms (DASS), self-concept clarity (SCC), general self-efficacy (GSE), perceived life stress (PSS), and demographic questions. They were also asked to list 6 goals they would like to pursue at least by the end of the semester and rated self-concordance of each goal.

During phase 2, the students who completed the initial assessment were randomly assigned to either an intervention group or control group. Participants in the intervention group received a 30-minute long web-based meaning-enhancing intervention for 6 consecutive weeks and those in the control group only received emails with survey questionnaires at each measurement point. During phase 3, two follow-up assessments were conducted with 3-and 12-month interval from the termination of intervention. A follow-up survey packet included MLQ, DASS, PSS, SCC, and goal-progress, with questions about their GPA and enrollment status. Participants' email address and intervention activity protocols, and survey responses were kept confidential, and access to these materials was limited to the researcher and trained research assistants. All the intervention activities and surveys in this study were administered to participants through an online format.

- *Phase 1 – signing up for study, consent form, initial surveys = 20 minutes*
- *Phase 2 – 6-week web-based intervention and surveys = 180 minutes (30min * 6weeks)*
- *Phase 3 - 2 follow-up surveys = 20 minutes (10min * 2times)*

  ➔ *Total time = 220minutes*

Contents of Intervention

The intervention is structured into a 6-week time frame with one 30-minute session per week. It is broken into four modules that cover 1) introduction, 2) self-knowledge, 3) self-concordant goal progress, and 4) Wrap-up. The themes and major activities for each week are presented in Table 2.

Module 1 (Week 1). The first session consists of an introduction to the current intervention, the Purpose-interview part I. Participants were prompted to imagine that someone wanted to interview them and were guided to describe short answers for the first half of the questions of the purpose-interview protocol. (Prompt: "Pretend that you are being interviewed to explore the aspects of what makes you...well, you. There will be no right or wrong answers. You will be the only person who will decide the extent to which you respond to each activity. The only purpose of these suggested activities is to guide your journey to deeper understanding of your life from the various aspects discussed." "Imagine that someone wants to interview you. Perhaps it is the school newspaper, your favorite magazine, or even a television show. Whoever it is, they really want to get to know you. Here are some questions they might ask. Please elaborate and include any details you can think of when answering these questions.")

After the interview task, participants were asked to take the Values in Action Inventory of Strengths (VIA-IS) and to take 10~15 pictures that gives them meaning at any time by the 2nd intervention session.

To assess goal-progress, the 6 goals which participants created at the initial measurement were individually emailed before the week 1 intervention. Then, they were asked to rate goal progress for each goal. Two additional questions about their attitude to meaning in life were also asked (i.e., How interested are you in living a meaningful life? (or making your life more meaningful?, How confident are you that your life will be meaningful?). Participants rated on a 5-point Likert scale (1= *not at all*, 5= *very much*) and provided short answers to the question, "if you are not confident, what makes it difficult for you to live a meaningful life?".

Module 2 (Week 2 and Week 3). Module 2 consists of the second and third session, which mainly focuses on increasing self-knowledge.

Week 2. Participants first performed the Purpose -interview part II by answering the second half of the interview protocol. Next, using the results from their VIA survey, they were asked to list their top 5 character strengths in order. Then, they were asked to describe how they were using those strengths in daily life (or how they wanted to use those strengths) by providing specific examples. Finally, using the photos they took, they were asked to rate them in terms of importance and describe those photos of things that make their lives feel meaningful.

Week 3. Participants were first asked to explore the issues of their academic major and future career by reading through prompts presented in the intervention and completing a career plan guide which was emailed to them. A career plan guide contains a collection of career self-assessment that is designed to offer insight into different aspects of personality, interests, skills, and values. Participants were told that they can select assessment parts or questions that might be useful to them. They did not have to send the results of career assessment back to researchers, but they were asked to describe 1) how they used the career plan guide and 2) what they found about themselves in relation to their major and/or career focusing on their "career blue print." In

the next step, several practical questions addressing major and career choices were presented (i.e., "What are the major requirements in terms of core courses and electives? How many credits are required? Are there prerequisites before you're admitted to the program? Is there a certain GPA I need to maintain? Does the major require a practicum or field study? Can I do a double major? Or minor? Am I on track (or behind) with my classes and credits?). Then, they were asked to describe what major options they were thinking about, what other information they needed, and how they were going to go about getting that information. If they already declared their major, they were asked to describe more about their major, for example, how they decided their current major, how they felt about their decision, and what else they needed to pursue their major. The next step addressed how specific majors could lead to different career options. A link to the CSU career center was provided which contains information about how to translate majors to various career options.

The final step for major and career task included introducing the idea of calling and meaningful work. They were asked to describe short answers to the following questions; In what way is your major (or your current education, if you're not decided) meaningful to you? What would make your (future) career meaningful to you? In what way would your career be helpful to society or the common good? Further, they were asked to describe one person whose career they found inspiring to them (i.e., "If you were to choose one person who inspired you in terms of what he or she did/ does for their career.. Who would that be? Is there any person (well, you don't have to know the person personally!) who you thought had a cool/interesting/meaningful career? Please share about the person- what the person was doing and what was impressive to you?").

Finally, participants were asked to create a brief personal mission statement by considering what they have done so far (i.e., previous intervention activities). Several examples of personal mission statements written by college students were presented.

Module 3 (Week 4 and Week 5). Module 3 consists of the fourth and fifth session, which focuses on integrating their self-knowledge into goal strivings.

Week 4. The main purpose of the fourth session is to help participants generate self-concordant goals and action plans. The five steps are modified from the contents of the goal-training program (Sheldon, Kasser, Smith, & Share, 2002) and the goal-setting intervention (adapted from Peterson & Mar, 2004) to assist participants to generate self-concordant goals and to make progress in their identified goals.

Step 1. Brainstorm 12 goals: Following Emmons' (1986) procedures and instructions, participants were asked to list 10 goals that would last "at least through the end of this semester OR next semester." Goals were defined as "projects that we think about, plan for, carry out, and sometimes (though not always) complete or succeed at."

Step 2. Better goals: Participants were given information about the benefit of the better types of goals and the benefits of selecting self-concordant goals in a format of brief presentation with several examples. Specifically, the SMART model of goal (S = Specific, M = Measurable, A = Attainable, R = Realistic, T = Timely) and the four reasons of goal pursuit (Because somebody else wants you to or because the situation seems to compel it, Because you would feel ashamed, guilty, or anxious if you did not have this goal, Because you really identify with the goal, Because of the enjoyment or stimulation that this goal would provide you) were introduced with examples.

Step 3. Apply what you have learned: Participants were asked to self-evaluate each goal from their brainstorming based on several criteria which are reported to improve goal progress (i.e., the SMART goal model, whether the goals are intrinsically valued and autonomously chosen, approached at a feasible level, and facilitated in [one's] daily life context using brief scales used in other studies (Ryan & Connell, 1989; Sheldon & Kasser, 1998; Cantor & Sanderson, 1999).

Step 4. Finalize 6 goals to keep: Participants were asked to carefully examine the result of their self-evaluation on each goal and extract 6 goals that they wanted to keep at least until the end of the semester. Then, they were asked to rate their reasons for pursuing "each" of the goals they just finalized on a continuum of perceived locus of causality for behavior (Ryan & Connell, 1989). It has been suggested that the very process of representing the future consequences of a goal might provide a cognitive source of motivation (Bandura, 1997; Schunk, 1991). Thus, to help students form a more detailed understanding of the importance of the goal and the consequences of its attainment, they were asked to describe what impact achieving each goal would have on specific aspects of their lives and/or the lives of others (i.e., the future consequences of achieving their goals).

Step 5. Enactment of the goals: Participants were asked to elaborate on their specific plans for goal pursuit. Research suggests that complex goals require the setting and completion of subgoals, which provide clear benchmarks of progress (i.e., feedback; Latham & Seijts, 1999; Locke & Latham, 2006; Morgan, 1985). Goal progress is further bolstered by detailed implementation plans (Gollwitzer, 1999; Locke, Shaw, Saari, & Latham, 1981). Therefore, students went through a process of 1) developing an enactment plan that is feasible and realistic in daily life context (i.e., What can you do in your "everyday life" to achieve your goals?) 2)

determining subgoals and concrete strategies for achieving each goal (i.e., What are some concrete strategies for achieving each goal?), 3) marshalling or developing goal-relevant supports, resources, and skills (i.e., What kind of supports, resources, and skills do you need to achieve each goal? How can you get those?), and 4) anticipating and managing external and internal barriers or obstacles to effective goal pursuit (i.e., What would be some specific barriers or obstacles?). Detailing the path to goal attainment should also serve to increase the perceived attainability of the goal, thereby increasing motivation.

Week 5. Participants received an individual email containing their finalized 6 goals from the previous session and were asked to rate goal progress on each goal. Then, for each of the 6 goals, they were asked to answer the following questions: 1) if you are making progress, please briefly describe what is helping you. 2) if you are not, please briefly describe the barriers associated with the goal. Next, to increase participants' self-efficacy of goal pursuit, they were asked to describe 1) one or two things that were challenging in their life and how they overcame those challenges, 2) their 3 instances of positive and negative self-talk after reading the definition and impact of self-talk, and 3) 3 compliments they could give themselves about their college life so far. They also described how they would change their negative self-talk by creating alternative self-talk. Finally, they were asked to create or revise their action plans to improve their goal commitment and progress with the prompt, "Let's think this way- One of your friends thinks you're the wisest and smartest person he or she knows. What kind of advice do you want to offer?"

Module 4 (Week 6). In the last session, participants were encouraged to put together all the pieces they have gained about themselves and the world around them. As a task of integrating the comprehension and purpose aspect of meaning, participants were asked to create

a draft of a last speech in their lives and to craft their personal mission statement. To give them a better idea about what their "last lecture or speech" could look like, a link to a video clip of a lecture titled "*The Last Lecture: Really Achieving Your Childhood Dreams*" was provided. This is a popular lecture that Randy Pausch, an American professor who was diagnosed with terminal cancer, delivered to college students before he died in 2008. Then, participants were prompted to think, "Hypothetically, if you were going to die, what would you tell your students? What would be your last message that you want them to remember when you think about you and your life?" and were asked to write a brief draft of their own last speech. Finally, they were asked to craft their personal mission statement by adding or removing things from their original personal statement which was created in the second session.

Web-based Intervention

This study implemented a four-module intervention during six weeks via a web-based program. The participants received emails with a link to a website in which they were asked to be engaged in various activities (ranging from simple information reading and watching brief video clips to more active tasks such as writing). Web-based interventions have been used in diverse physical and mental health areas such as smoking cessation, eating disorders, panic disorder, and diabetes self-management (Ritterband et al., 2003), showing effectiveness of those interventions.

Interventions in web-based format have a number of potential advantages such as convenience and ease of access, time-efficiency and cost-effectiveness. Also, web-based interventions are easy to implement with the capability of reaching large numbers of people, reducing certain critical barriers to delivery of mental health assistance such as cost or geographical isolation (Benight, Ruzek, & Waldrep, 2008). Yet, web-based interventions involve

problems such as requirements of computer or internet access and infrastructure and technology competencies, which are often related to demographic characteristics such as SES and age (e.g., older and poorer populations with low access or competency) (e.g., Selwyn, 2006). However, these potential problems were less likely to occur in this study because college students can easily access computers on campus and mostly have basic computer skills.

Data Analytic Strategy

Question 1) How does each student's meaning in life change during the first semester of college?

To examine individual trajectories of the presence of meaning (Pres), Latent Growth Modeling (LGM) was employed for the seven repeated measures Pres of utilizing Mplus, Version 6.12 (Muthén & Muthén, 1998-2011), applying a full information maximum likelihood estimator with robust standard errors. The LGM method captures the temporal shape of the individual trajectory, whereas cross-sectional study does not reveal patterns of change and two-wave study only can capture whether change has occurred from beginning to end. Moreover, this method can accommodate any number of waves of data, and multiple predictors and correlates of change can be included in the analysis, addressing the mechanisms governing the change process. Although this study conducted two follow-up measurements at 3- and 12 months from the baseline, this data was not used for further analyses due to low retention rate (only 23.2% and 25.9% of retention rates for the intervention and control group, respectively, $n = 70$, at 12-month).

A growth model is a specific type of multilevel model in which Level 1 represents measurement occasions and Level 2 represents individuals. The following equation represents the Level 1 model:

$$Pres_{ij} = \pi_{0i} + \pi_{1i}Time_{ij} + \varepsilon_{ij}.$$

This model asserts that a student's level of Pres measured over time can be described by an intercept (π_{0i}) and a slope (π_{1i}). The *i* subscript denotes that each individual (*i*) has his or her own trajectory that is described by his or her own intercept (level of Pres when Time = 0, which in this analysis is defined at the time of initial measurement) and slope (rate of change over time). The residual term in the Level 1 equation (ε_{ij}) captures the scatter of the within-person residuals around each student's trajectory (Singer & Willett, 2003).

A growth model is not complete until the Level 2 or between-persons model is considered. The Level 2 model reveals the average trajectory in the population and how individuals differ on their growth parameters. The unconditional, Level 2 model is written as follows:

$$\pi_{0i} = \gamma_{00} + \zeta_{0i}$$

$$\pi_{1i} = \gamma_{10} + \zeta_{1i}$$

The Level 2 model in the baseline model is represented by two equations: The first equation indicates that the Level 1 intercept (π_{0i}) is described by a fixed effect (γ_{00}—the average level of Pres at the baseline) and a random effect (ζ_{0i}— the extent to which individuals varied in their Pres at the baseline). Similarly, the second equation indicates that the Level 1 slope (π_{1i}) is described by a fixed effect (γ_{10}—the average rate of change in Pres) and a random effect (ζ_{1i}— the extent to which individuals varied in their rate of change).

First, to investigate whether there is systematic variation in Pres over the 8 weeks that is worth exploring and where that variation resides (within-person Vs between-persons), an unconditional mean model was estimated. Separate LGMs were fit for intervention group and control group to examine the ICCs and the model fits of each group before fitted for the entire

sample. The factor loadings for the slope were set at 0, 2, 3, 4, 6, 7, and 8, with 0 representing the baseline week when the initial measurement was conducted and 2~8 representing weeks passed since the initial measurement (e.g., 2 representing Time2 measurement conducted 2 weeks later from the initial measurement).

Second, an unconditional LGM was estimated to investigate the shape of each student's pattern of change in Pres over the 8 weeks and interindividual differences in change of reported Pres. Likelihood ratio tests (LRTs) for a quadratic term and a random slope were used to select best growth models that fit the data. Following the recommendations of Bollen and Long (1993), a variety of global fit indices was used, including indices of absolute fit and indices of relative fit. These include the traditional overall chi square test of model fit (which should be statistically non-significant to declare a good fit, but it is difficult to get a non-significant chi-square when samples sizes are much over 200 or so, even when other indices suggest a decent fitting model, Bollen, 1990), the Root Mean Square Error of Approximation (RMSEA; which should be less than 0.08 to declare a satisfactory fit), Tucker-Lewis index (TLI) and the Comparative Fit Index (CFI; which should be greater than 0.95 to declare good fit); and the standardized root mean square residual (SRMR; which should be less than 0.05 to declare a good fit) (see Bentler, 1990).

Question 2) Does the meaning-enhancing intervention predict interindividual differences in intra-individual change in meaning in life?

To assess the main effects of intervention, a conditional LGM model was fit. The growth parameters were regressed on the binary treatment indicator.

Question 3) Do the effects of meaning-enhancing intervention differ according to participants' characteristics?

The third research question assessed whether the effects of intervention differed according to participant characteristics. Specifically, the baseline Pres, searching for meaning, general self-efficacy, and self-concept clarity were considered as potential moderators of intervention effects. Interaction terms were created by multiplying intervention variable and a centered version of each moderator. For each moderator, a conditional growth model was estimated with intervention, a centered version of a moderator, and an interaction term as predictors of growth parameters of Pres. The growth parameters were regressed on the binary intervention indicator, the moderator of interest, and the intervention by moderator interaction term.

Question 4) What is the relationship between self-concept clarity and meaning in life?

Self-concept clarity (Scc) was entered into the multilevel growth model as a time-varying covariate. The relationship between Scc and Pres was examined from the three perspectives presented below.

Contemporaneous. First, the contemporaneous effect of Scc on Pres (i.e., Is a student's concurrently reported Scc associated with his or her level of Pres during the same 8-week period?) was examined. A conditional growth model was fit with Scc predicting Pres at each measurement occasion. In addition to time specified as a linear trend (i.e., week across the measurement occasions), Scc was specified to have a direct effect on Pres at each respective measurement occasion.

Within-person and Between-persons effects. Second, the within-person effect and the between-persons effect of Scc on Pres were disentangled. Because time-varying predictors are usually composed of two sources of variation (i.e., a between-person effect and a within-person effect), they are usually really two variables instead of one. The between-person and within-

person effects of time-varying predictors are likely to differ from each other, if not in direction, almost certainly in magnitude (Hoffman & Stawski, 2009).

Raudenbush and Bryk (2002) suggested strategies to disentangle the within-person effect from the between-persons effect. To estimate within-person effects of Scc, a person-mean-centered version of the Level 1 Scc variable was computed (i.e., the person-mean of Scc is subtracted from one's original Level 1 Scc score) and added to a Level 1 change model. To estimate between-persons effects of Scc, a grand mean centered version of the Level 2 Scc variable was computed (i.e., the aggregated mean of Scc is subtracted from the aggregated Scc of each student) and added to a Level 2 change model.

In this decomposed model, the Level 1 effect represents the extent to which within-individual change in Scc (i.e., being above or below one's own norm at a particular measurement occasion) is associated with Pres. The Level 2 or between-persons effect represents the difference in the average level of Pres between two students that differ by one unit in their average level of Scc, not controlling for their Level 1 Scc. The contextual effect is defined as an additive effect of the predictor at the person aggregate level of analysis after adjusting for the effect of the time-varying covariate. For example, given two students who, at a certain measurement occasion, demonstrated the same level of Scc, the student with the higher average level of Scc across all measurement occasions would have reported higher Pres if a contextual effect was present. The contextual effect is computed as the total between persons effect minus the within person effect.

Cross-domain analysis of change. Finally, cross-domain analysis of change was fit to examine whether changes in Scc is associated with the change in Pres. Individual changes in Scc and Pres were simultaneously modeled as latent growth models and the relationship between the

two sets of individual growth parameters were investigated by allowing them to be freely correlated (Singer & Willet, 2003).

Question 5) What is the relationship between goal progress and meaning in life?

Students' goal progress is another time-varying covariate considered in this study. Goal progress was measured at three measurement occasions (i.e., Time 2, Time 6, and Time 7). All the analyses were conducted following the same steps used in estimating the relationship between Scc on Pres.

Question 6) Does the intervention increase the levels of self-concept clarity and goal-progress?

The current intervention was originally designed to impact students' Scc and their self-concordant goal progress because these two constructs were theorized to be essential building blocks of meaning in life development. To examine whether the intervention predicted changes in Scc and goal progress, a LGM was fit with Scc and goal progress as an outcome variable. Growth trajectories of Scc and goal progress were first estimated using a unconditional growth model, and then intervention was included as a time-invariant predictor of the growth parameters of Scc and goal progress.

Supplemental Analyses regarding self-concordance. The current intervention intended to help students pursue *self-concordant* goals, not just *any* goals drawing upon the SCM (Sheldon & Kasser, 1998). Self-concordance was assessed at the first measurement occasion (for the entire participants) and assessed again after goal-training activities for the intervention group. Self-concordance of a student's each goal is computed using ratings on the four different reasons of extrinsic, introjected, identified, and intrinsic (Sheldon & Kasser, 1998). However, some students only rated on some of the reasons (e.g., rating on only the intrinsic reason, leaving other

reasons blank) despite an instruction, possibly due to misunderstandings of the instruction. Thus, self-concordance score of each goal was calculated only with students who rated on all the four reasons. Self-concordance scores of each goal were all positively correlated although not all of them were significant. A student's total self-concordance score was computed by summing self-concordance score of each goal as in other previous studies (e.g., Sheldon & Kasser, 1998).

Among the intervention group, does self-concordance scores increase? The intervention aimed to increase students' self-concordance because previous research indicated that students are more likely to make goal progress and receive more benefit in their psychological well-being from their goal pursuit (Sheldon & Kasser, 1998). The intervention presented brief education regarding the meaning and benefits of pursuing self-concordant goals (i.e., "why" of goal pursuit) and asked students to reflect on and evaluate their initially brainstormed goals in terms of self-concordance. Based on their self-rating, they were advised to select goals which are identified as more self-concordant than other goals. Thus, students in the intervention group were expected to report a higher level of self-concordance compared to their self-concordance score which was reported at baseline with their initial goals.

A Paired Samples T-Test (Pre-Post) was conducted to examine whether there was significant differences between baseline self-concordance and post-intervention self-concordance.

Does self-concordance moderate the effects of goal progress on Pres? To examine whether self-concordance scores moderated the relationship between goal -progress and meaning in life, an interaction term was created from a product of z-scores of self-concordance and goal-progress. A multiple regression analysis was conducted with self-concordance, goal progress, and the interaction term as predictors of Pres.

Question 7) Do self-concept clarity and goal-progress mediate intervention effects on meaning in life?

Self-concept clarity (Scc) and goal progress were theorized to be major building blocks of meaning in life development, and thus, considered as potential mediators of intervention effects on Pres. Although intervention effects on Pres were not significant (i.e., the absence of significant association between the *independent* and *outcome variable*), mediation analysis was conducted under the framework of inferred mediation (Shrout & Bolger, 2002). Some statisticians have suggested that mediation analysis proceed on the basis of the strength of the theoretical arguments rather than on the basis of the statistical test of X on Y and argued that the Baron and Kenny (1986) condition for the significant relationship between the independent and dependent variables should not be required when small effect sizes are predicted or when the mediator acts as a suppressor of the independent-dependent variable relationship (e.g., Shrout & Bolger, 2002). In this study, small effect size is one possibility of finding null intervention effects on Pres and the mediating role of Scc and goal-progress has strong theoretical background. Thus, indirect effect was estimated by fitting the growth trajectories of both the outcome (Pres) and the mediator (Scc) constructs simultaneously (MacKinnon, 2008). Only Scc was considered as a potential mediator because the effects of intervention on goal-progress were not significant.

Question 8) What is the relationship between meaning in life and depression and anxiety?

The relationship between Pres and Depression (Dep) and Anxiety (Anx) was examined from both contemporaneous and change perspectives following the same steps that were taken in examining the relationship between self-concept clarity/goal progress and Pres. First, an unconditional LGM was estimated to investigate individual trajectories of Dep and Anx over the

8 weeks. Second, a conditional LGM for Dep and Anx with Pres as a time-varying covariate was fit to. Within-person and between-persons effects of Pres on Dep/Axn were also investigated. Finally, cross-domains analysis of change was conducted to examine interrelationships between changes in Pres and Dep/Axn. Depression and anxiety variables were censored from below because approximately 20% of participants reported a score of 0 at every measurement occasion.

Question 9) Does meaning in life predict college freshmen's 1-semester and/or 1-year GPA?

A multiple regression analysis was used to examine the effects of intervention and Pres on students' GPA (1-semester and 1-year GPA).

Question 10) Does meaning in life predict college freshmen's retention to their sophomore year of college?

Logistic regression analysis was conducted to examine the effects of intervention and the presence of meaning on retention. Retention status was coded as binary (1= stayed, 0= dropout) and post-intervention Pres was entered as a predictor of the odds that a student will stay or leave.

CHAPTER IV

RESULTS

Preliminary Analysis

Descriptive Statistics. Table 3 presents Cronbach's alpha, means, and standard deviations for all of the continuous variables used in the models. All scores appeared to have adequate internal consistency. Correlations of these variables are presented in Table 4. Students' level of presence of meaning is correlated positively with self-concept clarity, self-concordance of goals, general self-efficacy, and negatively with perceived stress, searching for meaning, depression, and anxiety.

Missing Data. Since recruitment was occurring at various time points and participants were allowed to leave or return to the study at any time, missing data was mostly due to the design of the study and participant characteristics. For all models analyzed using Mplus, Version 6.12 (Muthén & Muthén, 1998-2011), missing data were handled using full information maximum likelihood (FIML) (Little & Rubin, 2002). This allows individuals with just one or two data points to still be included in the analysis (Bollen & Curran, 2006).

Attrition Analysis. A total of 285 students completed the consent form and initial survey and they were then randomly assigned to the intervention group (n = 142) and the control group (n = 143). At post-intervention measurement, 88.7% of the intervention students (n = 126) and 95.8% of the control group (n = 137) remained in the study, indicating that during the period of 8 weeks, 22 students dropped out of the study. At 3-month follow-up, 139 students remained, and at 12-month follow-up, 70 students remained (23.2% and 25.9% of retention rates for the intervention and control group, respectively). Greater loss of data was observed at these two follow-up measurement occasions than the data loss during the first 8 weeks of the study. This

may be due to the fact that participants were required to complete measurements until the end of the 8th weeks of this study in order to obtain research credits for the class they were taking, whereas responding to the two follow-up measurements was completely voluntary. Because the data from the two follow-ups (at 3-months and at 12-months) was considered to provide less reliable information, the research questions were addressed within a shorter framework of 8-week than originally designed, during which sufficient data was obtained.

To investigate whether those who dropped out of the study at the post-intervention occasion ("droppers") differed from those who remained ("stayers") by intervention membership, gender, ethnicity, and initial measurement (i.e., the presence of meaning, searching for meaning, perceived stress, self-concept clarity, self-concordance, general self-efficacy, depression, anxiety), a series of t-test (for continuous variables) and chi-square test (for categorical variables) were conducted. Droppers were not significantly different from stayers on the initial measurement (all ts < 1.10, all ps > .29). There were no significant differences in terms of ethnicity, $\chi^2(2, N = 273) = 5.46$, $p > .05$. There was a relationship between participants' intervention membership and attrition at post-intervention, $\chi^2(1, N = 273) = 4.71$, $p = .03$, with a small effect size of .13. Among 22 droppers, 16 students were from the intervention group and 6 students were from the control group. Intervention group students seemed to be more likely to leave the study, possibly due to more complicated activities required in the study process compared to simply filling out extra questionnaires in the control group, although the total amount of time was supposed to be similar across the both groups. It is possible that the results of this study may more strongly reflect the characteristics of participants assigned to the control group compared to the intervention group. There was also a relationship between gender and attrition at post-intervention, $\chi^2(1, N = 273) = 12.78$, $p < .001$, with a small effect size of .22.

Among 22 droppers, 13 students were male and 9 students were female, indicating that male students were more likely to drop out. Taken together, droppers were more likely to be male and students who were assigned to the intervention condition.

Outliers. Using a box plot screening, potential outliers were identified and 7 outliers which were considered to be illegitimately included in the data were eliminated (i.e., suspected random responses, data input error).

Demographics. At the time of the initial measurement, participants were 73.3% female, 18.3 years old on average, 20.2% first generation, and 82.1% European American, 9.1% Hispanic American, 2.1% African American, and 2.1% Asian American/Pacific islander.

Participants' academic major was 34.0% undeclared, 13% Health and food sciences, 11.2% Psychology, 7.7% Business/economics, and 7.4% biological sciences.

Regarding religion, participants reported that they are Christian (49.1%), Catholic (25.6%), Atheist (8.1%), Agnostic (9.8%), Buddhist, Muslim (n = 2 for each), Jewish (n = 6), Other (n = 3, 1 Sikhism, 2 didn't specified), Spiritual but no religion (n = 5), and 4.2% (n = 12) didn't answer.

English fluency was asked on a scale from *0 (not at all fluent)* to *100 (very fluent)*, and most students reported that their English fluency was 100, with 2.5% of students rating 90. One participant reported 30 on this scale and this student was removed from further analyses because all the intervention activities and surveys were conducted in English.

When asked at the end of the intervention, participants reported degree aspiration as Bachelor's Degree (34.4%), Master's Degree (Academic or Professional) (35.1%), Doctorate (Academic or Professional) (22.5%), and 8.1% didn't answered. Regarding work hours per week,

68.4% reported none, 1~5 hours per week (4.9%), and 6~10 hours (6%). Participants reported that they take 12-15 credits per week (60%) and 16~18credits (33.8%).

Baseline Equivalency across the intervention and control group. A result from t-test revealed no significant differences between intervention and control group for the background variables of gender, race/ethnicity, and other initial measurements (all *p*s > .05).

Main Analysis

Question 1) How does each student's presence of meaning (Pres) change during the first semester of college?

The intraclass correlation (ICC) was calculated as the variance in Pres between-persons divided by the total variance in Pres over the 8 weeks. The ICC was .808 for the intervention group and .769 for the control group, indicating that 80.8% and 76.9% of the variance of Pres was due to individual differences for each group. For the entire sample, the ICC was .787, indicating that 78.7% of the variance in the presence of meaning is due to between person differences, the remainder is due to within person changes over the 8 weeks.

Results from LRTs indicated that a model with random intercept and random linear slopes provided the best fit for the Pres over the 8 weeks.

Unconditional growth model for the Intervention group. The unconditional LGM for Pres among the intervention group provided a good fit to the data χ^2 (23, N = 138) =26.97, p = .26; *CFI* = .99; *TLI* = .99; *RMSEA* = .04; 90% *Confidence Interval (CI)* = .000, .082; SRMR = .059.

The intercept and its variance were both significant (*p*s < .001), which indicated that on average, the intervention students' predicted level of Pres was 26.32 (*SE* = .50) at Time1 and they varied in their initial status of Pres (var = 30.46, *SE* = 3.98). The estimated mean slope was

not significant (b = .05, SE= .05, p = .27), while its variance was significant (var = .164, SE= .043, p < .001), indicating that intervention students varied in their rate of change over the 8 weeks, although the average predicted positive slope was not significant. Lastly, the covariance of the slope and intercept was marginally significant (b = -.64, SE= .35, p = .067), indicating that higher intercepts were associated with lower rates of change.

Unconditional growth model for Control group. The unconditional LGM for Pres among the control group provided a good fit to the data $\chi^2(23, N = 135) = 39.94$, p = .016; *CFI* =.975; *TLI* = .977; *RMSEA* = .074; 90% *Confidence Interval (CI)* = .032, .111; SRMR = .070.

The intercept and its variance were both significant (ps < .001), which indicated that on average, the control group students' predicted level of Pres was 25.05 (SE = .49) at Time1 and they varied in their initial status of Pres (var = 27.1, SE = 4.05). The estimated mean slope (b = .11, SE= .05, p =.03) and its variance was also significant (var =.19, SE = .05, p < .001), indicating that on average, control group students' level of Pres increased by .11 points as one week passed and they varied in their rate of change over the 8 weeks. Lastly, the covariance of the slope and intercept was not significant (b = -.007, SE = .303, p = .98).

Unconditional growth model for the entire sample. The unconditional LGM for Pres provided a good fit to the data $\chi^2(23, N = 273) = 33.07$, p = .08; *CFI* =.991; *TLI* = .992; *RMSEA* = .040; 90% *Confidence Interval (CI)* = .000, .069; SRMR = .058.

The intercept and its variance were both significant (ps < .001), which indicated that on average, the predicted level of Pres was 25.66 (SE = .35) at Time1 and participants varied in their initial status of Pres (var = 29.1, SE = 2.88). The mean slope (b = .086, SE = .04, p =.015) and its variance was also significant (var =.175, SE = .047, p < .001), indicating that on average, the level of Pres increases by .114 points per week and participants varied in their rate of change

over the 8 weeks. Lastly, the covariance of the slope and intercept was not significant (b = -.324, SE = .23, p = .16).

Within-person residuals from unconditional mean model (7.88) were reduced to 6.299 when linear Time was entered in the unconditional growth model, indicating that 20% of the within-person variation in Pres over the 8 weeks is attributable to linear time (7.88-6.299)/7.88= .20).

When Perceived stress was added to the model as a time-varying covariate to control for the effect of PSS on Pres, the predicted mean slope for Pres decreased to 0.051 and became non-significant (p = .16), indicating that perceived stress significantly accounts for within-person changes. Accounting for the students' linear trajectories, greater stress was associated with lower levels of Pres (b =-.337, SE = .05, p < .001).

Question 2) Does the meaning-enhancing intervention predict interindividual differences in intra-individual change in meaning in life?

After examining growth trajectories of the presence of meaning (Pres) without any predictors of interest, intervention status was added to the latent growth model as a as a predictor of the intercept and slope. For the control group, the average student had an estimated mean intercept of 25.04 and an estimated mean slope of .11 (p = .03) which indicated that on average, the presence of meaning increased by .11 points per week. For the intervention group, the average student had an estimated mean intercept of 26.27 and an estimated mean slope of .06 which indicated that on average, the presence of meaning increased by .06 points per week.

The effect of intervention was marginally significant on the growth intercept (p = .08), indicating that the baseline Pres among the intervention group was 1.23 scale points higher than that of the control group. Intervention did not significantly predict the growth slope (p = .43),

indicating that there was no discernible intervention effect on the rate of change in Pres. The equations are following:

Pres = 25.04 + .11**Time* + 1.23**Intervention* - 0.06**Intervention***Time*

-For Control group: *Pres* = 25.04 + .11**Time*

-For Intervention group: *Pres* = 26.273 + .057**Time*

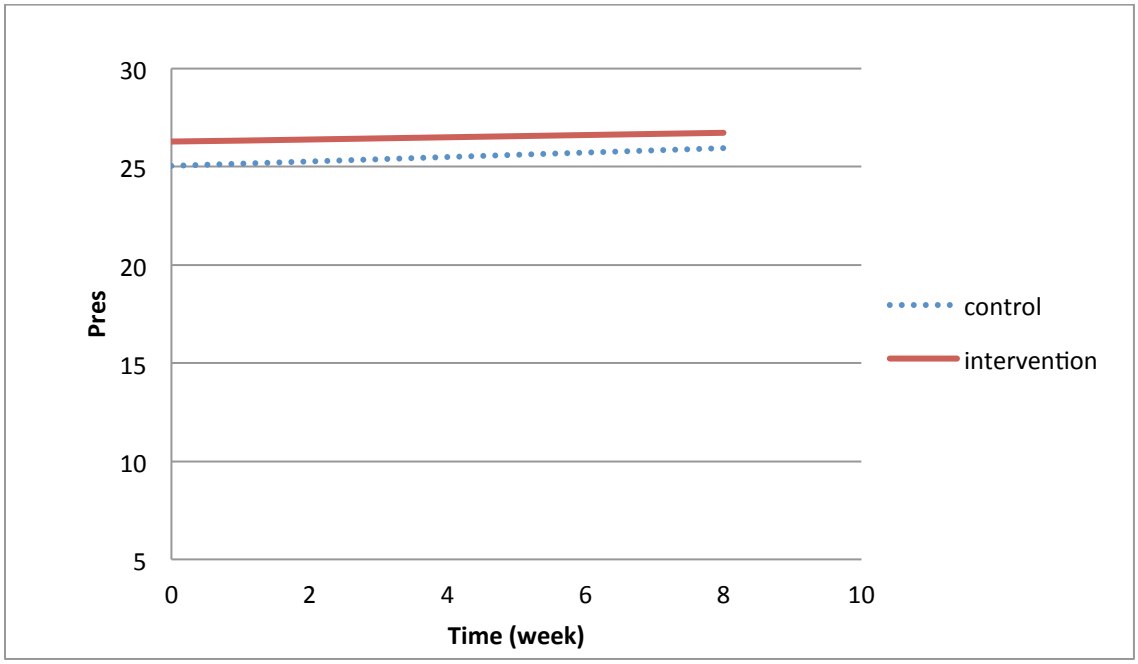

Figure 1 The mean trajectories of the presence of meaning (pres) over 8 weeks.

Question 3) Do the effects of meaning-enhancing intervention differ according to participants' characteristics?

Next, to examine whether interaction effect differed by the baseline presence of meaning (Pres), search for meaning (Srch), general self-efficacy, and self-concept clarity (Scc), a conditional Growth Model was estimated with intervention, a moderator, and the interaction term for each of the moderators.

Baseline Pres. Baseline Pres score was centered at its mean and a growth model for Pres was fit from the second measurement occasion (Time2_Pres) because baseline Pres was included as a moderator. The main effects of intervention and baseline Pres on the rate of change for Pres were not significant (b = -.10, SE = .08, p = .21 for intervention; b = -0.001, SE = .01, p = .91 for baseline Pres). The interaction effect of intervention and baseline Pres was not significant (b = -.015, SE = .016, p = 0.33).

Baseline Srch. The main effects of intervention and baseline Srch on the rate of change for Pres were not significant (b = -.044, SE = 0.07, p = 0.53 for intervention; b = .007, SE = .009, p = .43 for baseline Pres). The interaction effect of baseline Srch was not significant (b = .008, SE = .01, p = .45), indicating that the effect of intervention did not differ according to students' baseline Srch level.

General self-efficacy. The main effect of general self-efficacy on the growth intercept for Pres was significant (b = .464, SE = .135, p < .001), indicating that a one unit increase in general self-efficacy is related to .464 unit increase in Pres among control group. The main effects of intervention and general self-efficacy on the rate of change for Pres were not significant (b = -.125, SE = .60, p = 0.83 for intervention; b = -.005, SE = 0.013, p = 0.725 for general self-efficacy). The interaction effect of general self-efficacy on the growth slope for Pres was not significant (b = .002, SE = .018, p = .904), indicating that the effect of intervention on the rate of change in Pres did not differ according to students' general self-efficacy.

Baseline self-concept clarity. The main effect of baseline Scc on the growth intercept for Pres was significant (b = .187, SE = .035, p < .001), indicating that one unit increase in baseline Scc is related to .187 unit increase in Pres among control group. The main effects of intervention and baseline Scc on the rate of change for Pres were not significant (b = -.054, SE = .07, p = .44

for intervention; b = .001, SE = 0.004, p = 0.857 for Scc). The interaction effect of baseline Scc was not significant (b = -.008, SE = 0.005, p = 0.13), indicating that the effect of intervention did not differ according to students' baseline Scc level.

Question 4) What is the relationship between self-concept clarity (Scc) and the presence of meaning (Pres)?

Contemporaneous. A conditional growth model for Pres with Scc as a time-varying covariate provided a satisfactory fit to the data χ^2 (71, N = 235) =110.06, p = .002; *CFI* =.975; *TLI* = .975; *RMSEA* = .048; 90% *Confidence Interval (CI)* = 0.030, 0.065; SRMR = .169. After accounting for linear time, a one unit increase in Scc was significantly associated with a .14 unit increase in Pres (b =.14, SE = .016, p < .001).

Within-person and Between-person effects. The results indicated that a student's average level of Scc across all measurement occasions was a significant predictor of Pres (b = .24, SE = .02, p < .001) *and* that during times when a student scores high on Scc, relative to his or her usual level, he or she also scores high on Pres, relative to his or her usual level (b =.11, SE = .011, p < .001). These results indicate that Scc has both an interindividual effect (i.e., students who reported higher Scc reported higher levels of Pres, not controlling for their Scc at a certain measurement occasion) and an intraindividual effect (i.e., within-person increases in Scc were associated with within-person increases in Pres on a given occasion). Contextual effect was also significant (b = .13, SE = .02, p < .001), indicating that after controlling for Scc scores of two students at a certain measurement occasion, a student who has one unit higher average Scc is expected to report .13 unit higher average Pres. The fact that the difference of the within-person and between-person effects (*i.e.*, the contextual effect) is significant indicates that the use of a

composite effect of Scc (*i.e.*, not formally differentiating within- and between-person variation) would not yield a correct estimate for either its within-person or between-person effects.

Proportional Reduction in Error (PRE) indicated that inclusion of Scc as a Level 1 person-mean centered covariate in the level 1 model reduced Level 1 residual variance from 7.88 to 7.39, a reduction of about 6% (i.e., [7.88– 7.39]/ 7.88= 0.06). PRE at Level 2 was also calculated by comparing the model with just a level 1 predictor (person-mean centered Scc) and the model with a level 1 predictor and a level 2 predictor (a grand mean centered aggregated person-level Scc). The level 2 variance component dropped from 29.41 to 18.64– a drop of about 36.6% (i.e., [29.41– 18.64]/ 29.41 = 0.366), indicating that 36.6% of between-persons variances are explained by individual differences in Scc.

Cross-Domain Analysis of Change. To examine whether the change in Pres is related to the change in Scc, growth models of Scc and pres were simultaneously specified and the growth parameters were allowed to covary. Growth intercepts of Pres and Scc were positively related (r = .597, SE = .048, $p < .001$), indicating that students with high baseline Scc tend to report high baseline Pres. In addition, a positive relationship between change in Scc and Pres was observed (r = .505, SE = .128, $p < .001$), indicating that students who demonstrated an increase in their Scc over the course of 8 weeks tended to also demonstrate an increase Pres. The intercept for Pres and the slope for Scc were also positively related (r = .190, SE = .086, p = .026), indicating that when a student's initial level of Pres is high, he or she tends to show steeper rate of increase in Scc. The intercept for Scc and the slope for Pres were not significantly related (r = -.141, SE = .085, p = .096), but there was a trend that when a student's initial level of Scc is high, he or she tends to show shallower rate of increase in Pres.

Question 5) What is the relationship between goal progress and the presence of meaning (Pres)?

Contemporaneous. A conditional growth model for Pres with goal progress as a time-varying covariate provided a satisfactory fit to the data $\chi^2(43, N = 219) = 73.203$, $p = .0.0028$; *CFI* =.976; *TLI* = .977; *RMSEA* = 0.057; 90% *Confidence Interval (CI)* = 0.033, 0.078; SRMR = .151. After accounting for linear time, goal progress was not significantly associated with the presence of meaning ($b = -0.001$, $SE = 0.004$, $p = 0.87$).

Within-person and Between-person effects. The results indicated that a student's average level of goal progress across all measurement occasions was a significant predictor of Pres ($b = .28$, $SE = .04$, $p < .001$), indicating that goal progress has a significant interindividual effect (i.e., students who reported one unit higher goal progress reported a .28 unit higher levels of Pres, not controlling students' goal progress at a certain measurement occasion). However, an intraindividual effect was not significant ($b = -.001$, $SE = .02$, $p = .98$), indicating that within-person increases in goal progress were not associated with increases in Pres. Contextual effect was significant ($b = .29$, $SE = .049$, $p < .001$), indicating that when comparing two students who have the same levels of goal progress at a certain time point, a student with a higher average goal progress reports higher average Pres. Between goal progress and Pres, there was a strong relationship at Level 2 (the person level) whereas a much weaker relationship at Level 1 (within-person level) observed.

The results of PRE at Level 2 revealed that 14.7% of between-persons variances of Pres were explained by individual differences in students' average goal progress (i.e., [29.62– 25.58]/ 29.62 = 0.147).

Cross-Domain Analysis of Change. Growth intercepts for Pres and goal progress were positively related (r = .31, SE= .17, p = .07), indicating that students with a high baseline goal progress tended to report a high baseline Pres. Growth slopes for goal progress and Pres were not significantly correlated (r = .01, SE = .11, p=.31).

Question 6) Does the intervention increase the levels of self-concept clarity and goal-progress?

Self-concept clarity. The ICC of Scc over the 8 weeks was .813, indicating that 81.3% of the variance in Scc was due to between-persons differences. LRTs revealed that a model with random intercept and random linear slope best fits to the data. The unconditional LGM for Scc provided a good fit to the data χ^2 (23, N = 273) =53.449, p = .0003; *CFI* =.977; *TLI* = .979; *RMSEA* = .070; 90% *Confidence Interval (CI)* = .045, .094; SRMR = .04.

The estimated mean of intercept and slope for Scc was significant (b = 56.94, SE = .792; p < .001; b = .58, SE = 0.078, p < .001), indicating that on average, students' Scc increased by .58 units per week. Although Scc tends to increase over the 8 weeks, the slope was small and correlations among scc scores from time1 to time 7 ranged from .72 to .79, suggesting that on average, the levels of Scc appeared to be fairly stable. The variance of intercept and slope were both significant (var = 149.31, SE = 12.58; var = 0.95, SE = 0.17, both ps < 0.001, respectively), indicating that students' initial status and the rate of change of Scc over the 8 weeks significantly differed across students.

Next, Intervention was added to the growth model as a time-invariant covariate to examine intervention effects on the change of Scc. Intervention group reported a significantly higher rate of change than control group (b = .309, SE = 0.16, p = .048).

Goal-progress. The ICC of goal progress over the 8 weeks was .526, indicating that 52.6% of the variance in goal progress is due to between-persons differences. LRTs revealed that a model with random intercept and random linear slope best fits to the data. . The unconditional LGM for Gprog provided a satisfactory fit to the data $\chi^2(1, N = 260) = 2.831$, $p = .0924$; *CFI* =.979; *TLI* = .938; *RMSEA* = .070; 90% *Confidence Interval (CI)* = . 0.000, 0.260; SRMR = .023.

The estimated mean intercept and slope for goal progress were significant ($b = 34.26$, $SE = .70$, $p < .001$; $b = .28$, $SE = 0.11$, $p = .01$), indicating that on average, students' goal progress tends to increase by .28 unit per week over the 8 weeks. The variance of intercept and slope were both not significant (var = 51.60, $SE = 51.90$; var = 1.12, $SE = .95$, ps > .05, respectively), indicating that students' initial status and the rate of change in goal progress over the 8 weeks did not significantly differ across students.

Next, Intervention was added to the growth model as a time-invariant covariate to examine intervention effects on changes in goal progress. Intervention did not significantly explained students' changes in goal-progress ($b = -.10$, $SE = .21$, $p = .64$).

Supplemental analyses regarding goal-construct

Among intervention group, is there significant increase between baseline self-concordance and post-intervention self-concordance? Within the intervention group, there were significant mean differences ($t = 2.28$, $df = 83$, $p = .03$) between baseline self-concordance ($M = 31.08$, $SE = 22.05$) and post-intervention self-concordance ($M = 24.44$, $SE = 26.24$). The mean score of self-concordance decreased at post-intervention, which was contrary to the hypothesis that predicted an increase of self-concordance at post-intervention.

Does self-concordance moderate the relationship between goal progress and Pres?

First, a moderation test was conducted with only intervention group. Post-intervention self-concordance and goal progress score for the following week were entered into the regression equation as predictors of Pres. An interaction term was created by multiplying Z-scores of self-concordance and goal progress and then entered into the next step of the equation. There was no main effects of self-concordance (b = .098, SE = .06, p = .11) and goal progress (b = .005, SE = .02, p = .84) on Pres (F = 1.39, df (2, 92), p = .25). The interaction effects were not significant (b = .33, SE = .66, p = .62).

Second, a moderation test was conducted with the entire sample, following the same steps as above, except using baseline self-concordance instead of post-intervention self-concordance. There were significant main effects of baseline self-concordance (b = .047, SE = .02, p = .01) and goal progress (b = .14, SE = .05, p = .002) on Pres (F = 10.03, df (2, 187), $p <$ 001). The interaction effects were not significant (b = .12, SE = .44, p = .78), indicating the effects of goal progress did not differ by the baseline level of self-concordance although both higher self-concordance and goal progress were related to higher Pres.

Supplemental analyses regarding intervention engagement and minutes

Do intervention engagement and minutes predict changes in self-concept clarity and goal-progress? To examine whether students who reported higher levels of engagement and/or minutes spent on the intervention activities reported higher levels of self-concept clarity (Scc) and goal-progress, a LGM was separately fitted for Scc and goal-progress with intervention engagement and minutes as time-varying covariates. After adjusting for linear time, intervention engagement and minutes did not significantly predict the scores of Scc and goal progress (all ps > .05).

Question 7) Does self-concept clarity and goal-progress mediate the effects of the intervention on Pres?

Since a significant effect of the intervention on the mediator is a requirement of mediator, goal progress was excluded from further mediation analysis.

To investigate whether Scc mediates the relation between Intervention and Pres, a path model was tested using Mplus Version 6 (Muthen & Muthen, 1998-2011). Intervention effect on Scc was marginally significant (b = .29, SE = .157, p =.06) and Scc significantly predicted Pres (b = .23, SE = .06, p < .001). Given the small sample size, bootstrap standard errors and confidence intervals were estimated (Hayes & Preacher, 2010). It generally produces preferable standard errors for the indirect effect test by taking into account the skewed shape of the sampling distributions of indirect effects. The test was performed with 10,000 bootstrap samples using maximum likelihood (ML) estimation and showed that the indirect effect was not significant (b = .066, SE = .044, p = .14).

Supplemental analyses regarding moderated mediation. Since the intercept for Pres and the slope for Scc were positively related (r= 0.19, SE = .086, p = 0.03), a test of moderated mediation was conducted to examine whether the magnitude of an indirect effect may depend on the level of baseline Pres, in other words, on the level of a moderator (Preacher, Rucker, & Hayes, 2007). Two groups were created according to the baseline Pres scores (above mean and below mean) and a multigroup LGM was fit for each group. The indirect effects were not significant for both groups (b = .066, SE = .081 for students with low Pres, n = 123; b = .081, SE = .054 for students with high Pres, n = 150; both ps > .05). Wald test of parameter constraints revealed that these indirect effects were not significantly different across the two groups (Wald Test = .024, df = 1, p > .05).

8) What is the relationship between meaning in life and depression and anxiety?

Depression. The ICC of depression over the 8 weeks was .571, indicating that 57.1% of the variance in Depression is due to between person differences and the remainder is due to within person changes over time. LRTs indicated that a model with random intercept and linear slope best fits to the data. An unconditional LGM for uncensored depression variable provided a satisfactory fit to the data $\chi^2(23, N = 273) = 49.737$, $p < .01$; *CFI* =.932; *TLI* = .938; *RMSEA* = .065; 90% *Confidence Interval (CI)* = .040, .090; SRMR = .054. The estimated mean intercept and slope were significant ($b = 5.09$, $SE = 0.41$; $b = -.73$, $SE = .08$, both ps $< .001$), indicating that on average, students' depression decreased by .73 unit over the 8 weeks. The variance of the intercept and slope were also significant (var = 35.78, $SE = 5.5$; var =.72, $SE = .13$, ps $< .001$), indicating that students varied in their rate of change in depression over the 8 weeks. Lastly, the covariance of the slope and intercept was not significant ($b = -.437$, $SE = .64$, $p = .48$).

The relationship between the presence of meaning and depression was examined from both contemporaneous and change perspectives.

First, a conditional LGM with Pres as a time-varying predictor of Depression (Dep) was fit. After accounting for linear time, greater Pres was associated with lower levels of depression ($b = -.38$, $SE = .04$, $p < .001$).

Second, the results from a decomposed model indicated that the average level of Pres across all measurement occasions was a significant predictor of Dep ($b = -.41$, $SE = .04$, $p < .001$) *and* that during times when a student's Pres was elevated, his or her Dep was decreased ($b = -.30$, $SE = .04$, $p < .001$). These results indicate that Pres has both an interindividual effect (i.e., students who reported higher Pres reported lower levels of Dep) and an intraindividual effect (i.e., within-person increases in Pres were associated with within-person decreases in Dep). A

contextual effect was also significant (b =- .11, SE = .06, p < .05), indicating that one unit increase in an individual's average level of Pres is associated with .11 unit decrease of Dep controlling for the individual's current report of Pres.

PRE indicated that inclusion of Pres as a Level 1 person-mean centered covariate in the level 1 model reduced Level 1 residual variance from 16.39 to 15.76, a reduction of about 3.8%. PRE at Level 2 was also calculated by comparing the model with just a level 1 predictor (person-mean centered Pres) and the model with a level 1 predictor and a level 2 predictor (grand-mean centered aggregated person-level Pres). The level 2 variance component dropped from 17.32 to 12.29– a drop of about 39%, indicating that 39% of between-persons variance of depression are explained by individual differences in Pres.

Finally, cross-domain analysis of change revealed that growth intercepts for Pres and Dep were negatively related (r = -.59, SE = 0.06, p < .001), indicating that students with higher baseline Pres tended to report lower baseline Dep. Growth slopes for Pres and Dep were negatively related (r = -.40, SE = 0.134, p = .003), indicating that increase of Pres was associated with decrease in Dep.

Anxiety. The ICC of anxiety over the 8 weeks was .612, indicating that 61.2% of the variance in anxiety was due to between person differences and the remainder is due to within person changes over time. LRT indicated that a model with random intercept and linear slope best fits to the data. An unconditional LGM for anxiety with uncensored provided a good fit χ^2 (23, N = 273) =33.068, p = .08; *CFI* =.991; *TLI* = .992; *RMSEA* = .040; 90% *Confidence Interval (CI)* = .000, .069; SRMR = .058. The estimated mean intercept and slope were significant (b = 5.49, SE = 0.45; b = -.93, SE = .09, both ps < .001), indicating that on average, students' anxiety decreased by .93 unit over the 8 weeks. The variance of the intercept and slope were also

significant (var = 45.51, *SE* = 6.28; var =.79, *SE* = .13, *p*s < .001), indicating that students varied in their rate of change in anxiety over the 8 weeks. Lastly, the covariance of the slope and intercept was not significant (*b* = -.78, *SE* = .73, *p* = .28).

First, a conditional LGM with Pres as a time-varying predictor of Anxiety (Anx) was fit. After accounting for linear time, greater Pres was associated with lower levels of anxiety (*b* = -.21, *SE* = .06, *p* < .001).

Second, the results from a decomposed model indicated that the average level of Pres across all measurement occasions was a significant predictor of Anx (*b* = -.23, *SE* = .05, *p* < .001) *and* that during times when a student's Pres was elevated, his or her Anx was decreased (*b* = -.18, *SE* = .04, *p* < .001). These results indicate that Pres has both an interindividual effect (i.e., students who reported higher Pres reported lower levels of Anx) and an intraindividual effect (i.e., within-person increases in Pres were associated with within-person decreases in Anx). A contextual effect of Pres was not significant (*b* =- .05, *SE* = .06, *p* > .05).

PRE indicated that inclusion of Pres as a Level 1 person-mean centered covariate in the level 1 model reduced Level 1 residual variance from 15.03 to 14.86, a reduction of about 1.1%. PRE at Level 2 was also calculated by comparing the model with just a level 1 predictor (person-mean centered Pres) and the model with a level 1 predictor and a level 2 predictor (grand-mean centered aggregated person-level Pres). The level 2 variance component dropped from 18.69 to 17.16– a drop of about 8.1%, indicating that 8.1% of between-persons variances of anxiety are explained by individual differences in Pres.

Finally, cross-domain analysis of change revealed that growth intercepts for Pres and Anx are negatively related (*r* = -.33, *SE* = 0.08, *p* < .001), indicating that students with higher baseline Pres tended to report lower baseline Anx. Growth slopes for Pres and Anx were

negatively related (r = -.26, SE = 0.12, p = .035), indicating that increase of Pres was associated with decrease in Anx.

9) Does meaning in life predict college freshmen's GPA?

A MLR models showed that only high school GPA significantly predicted students' 1-semester GPA (i.e., for the semester during which intervention was administered; b = 1.44, SE = .28, p < .001) and their 1-year GPA (i.e., for the following semester; b = 1.48, SE = .35, p < .001). The presence of meaning at baseline and post-intervention did not significantly predict students' GPAs (all ps > .05).

10) Does meaning in life predict college freshmen's retention to their sophomore year?

All of the students who responded to the question of one-semester retention indicated that they were enrolled (i.e., 100% retention). Thus, logistic regression was conducted only with 1-year retention which was measured at the 12-month final follow-up. Among 96 students who responded to the question of 1-year retention, 10 students reported that they did not enroll. The presence of meaning at Post-intervention did not significantly predict the odds of retention (OR = 1.03; 95% CI: .923 - 1.146, p > .05).

CHAPTER V

DISCUSSION

Meaning in life during the first semester of college

The primary focus of this study was on understanding different patterns of change in meaning in life. Students' self-knowledge and goal progress were individual characteristics that may relate to different patterns of change across students. A 6-week web-based meaning-enhancing intervention was designed to promote these two theoretical features of meaning development, which was expected to explain why some students may show greater increase in meaning compared to others.

The results from this study indicate that on average, a student's level of meaning in life tends to show a small amount of linear increase during the first semester of college, with individual differences in patterns of change. This study originally sought to systematically investigate both short-term and long-term trajectories of students' meaning in life by employing multiple measurements. Unfortunately, this study suffered from a high attrition rate at 3-month and 1-year follow-up measurements, which restricted the focus of this study to a short-term 8-week trajectory of meaning. It is notable that the levels of meaning in life assessed with a global measure, not a state measure, did show change even during a short period of 8 weeks among college freshmen. This suggests that students' global sense of meaning in life can be changed, thus, can be a reasonable target of intervention efforts. This notion of change is consistent with the finding from a previous longitudinal study of meaning, which reported a substantial amount of change in the sense of meaning over 2~3 years among U.S. noninstitutionalized, retired older adults (Krause, 2007). Yet the small amount of change found in the current study also suggests that meaning seems to be fairly stable, at least for a short period of time. Indeed, college students'

levels of meaning in life were found to be stable over 1 year (Steger & Kashdan, 2007) and the scores of meaning in life measured at 2~3 years intervals were significantly related in Krause's (2007) study despite the changes detected between the two measurement points. These findings suggest that an individual's trajectory of meaning may not change much even over a relatively long period of time. A recent study reports that meaning appears to be heritable and tied to some unidentified genetic factors (Steger, Hicks, Krueger, & Bouchard, 2011), which may partly explain this stability. If this is the case, expecting one's sense of meaning to substantially change would be unrealistic; however, some degree of change also seems inherent in the very nature of meaning because an individual's meaning experience is considered an ongoing, lifelong process that is influenced by one's cognitive, intrapersonal, and interpersonal development, shifts in an individual's value system, and changing life circumstances (e.g., McAdams, 1996; Reker & Chamberlain, 2000). Further longitudinal research is warranted to better understand variability and stability of meaning in life as well as their implications for intervention efforts.

Intra-individual change in the presence of meaning was significantly related to the individual's perceived stress and self-concept clarity after accounting for a linear time; a student is likely to feel that his or her life is more meaningful when feeling less stressful and clearer about who they are as a person. While providing valuable information on within-person variability of meaning experiences, this study only reveals limited understandings of change in meaning. First, the duration of observation of this study was relatively short. It is possible that the amount and patterns of change would be different when observed for a longer-term period. For example, the linear trend identified from this study may be only because the estimated slope was small and the limited study duration made the underlying curvature almost imperceptible. In a similar vein, it is unclear from the current data whether the observed linear pattern represents

somewhat durable change or rather transient fluctuation. Second, it is also plausible that there was little room for detecting intra-individual increase because, on average, the level of presence of meaning among the current sample already fell a lot above the midpoint of 20 on the MLQ-P scale, indicating that participants were more likely, rather than less likely to feel their lives are meaningful. Thus, intra-individual changes in a group of people with low initial levels of meaning may present different patterns of change. Finally, intra-individual changes may occur differently according to individuals' developmental stages. The small intra-individual change observed from this study may be that for college freshmen (late adolescence and emerging adulthood), the fundamental levels of meaning are already set, allowing little change over time. It is possible that younger students (early to middle adolescence) would show more increase because they are not too young to generate a global life judgment and not too old to possess a rather fixed set of framework of understandings of self and the world around them.

Students manifested different baseline levels and patterns of change in their sense of meaning. This highlights the importance of understanding individual differences accounting for this variability of people's experiences of meaning. Regarding initial levels of meaning at the beginning of college, students with lower levels of perceived stress, depression, and anxiety and higher levels of general self-efficacy, self-concept clarity, self-concordance of goals, and goal progress tended to report higher levels of meaning. These findings are consistent with previous studies that reported relationships between meaning in life and self-concepts (e.g., Schlegel et al., 2009; Schlegel et al., 2011), goal appraisal (King et al., 2006), self-efficacy (DeWitz et al., 2009; Tsuno & Yamazaki 2007), and psychological distresses (e.g., Chamberlain & Zika, 1988; Crumbaugh & Maholic, 1964). The current intervention was a primary predictor of different

patterns of change in the levels of meaning. The next section will more closely examine the effects of the intervention.

The effects of a 6-week web-based meaning-enhancing intervention

Students who participated in the intervention were expected to show greater increase than the students who were in the control group. However, the results from this study did not support this hypothesis, indicating that students in the intervention and control group did not show significantly different patterns of changes in their meaning in life. In addition, intervention effects were not significantly different according to students' baseline levels of the presence of meaning, searching for meaning, general self-efficacy, and self-concept clarity, indicating no significant moderation effects of these participant characteristics.

There are various possibilities about the null effects of the intervention from this study. First, a period of 8 weeks may have been too short for students to generate detectable changes in their sense of meaning. Students often enter college with a worldview they have learned in the course of childhood and adolescence (Perry, 1999) and these unique mental models about themselves and the world may change gradually, taking a certain amount of time to be consolidated enough to be reliably detected. To examine whether the intervention may have delayed effects rather than immediate effects, long-term follow-ups would be critical.

Second, it may be difficult for college students to change how they feel about their lives. Developmentally, most of them fall into emerging adulthood, which is argued to be a critical period to cultivate and consolidate a sense of meaning and purpose through continued exploration and construction of identity and understandings of social world (e.g., Arnett, 2000; Baxter Magolda, 1992; Habermas & Bluck, 2000; McLean, 2005; Steger, Bundick, et al., 2012). Individuals in this period are assumed to experience substantial development in their meaning

system because this is typically a time of life when the scope of independent exploration of life's possibilities is greater than it will be at any other period of the life course. This period offers the most opportunity to explore a variety of possible life directions in love, work, and worldviews (Arnett, 2000). However, it is possible that college freshmen already established the most fundamental basis of their meaning systems because development of a system of cognitive capacities through which they can understand and reason about their worlds actually begins earlier in their lives such as early adolescence, if not earlier (Steger, Bundick, et al., 2012). Thus, although not immutable, change in meaning may take substantial effort for people in late adolescence or emerging adulthood. In this sense, younger students might respond better to this kind of intervention. Meaning in life has usually been studied with elderly people and college students, with relatively less attention to meaning development in younger ages such as children and adolescence (Steger, Bundick, et al., 2012). However, developmental literature on cognitive development, identity formation, and life story construction consistently suggests that making sense of oneself and one's life begins at younger ages such as early adolescence (e.g., Habermas, Ehlert-Lerche, & de Silveira, 2009; Peterson & McCabe, 1983). The abilities to narrate personal experiences and integrate them into a coherent framework for the construction of life stories begins to develop during this period, allowing them to build a skeletal cognitive "life story schema" (Habermas & Bluck, 2000; McAdams, 1993; Steger, Bundick, et al., 2012). The basis of leading a meaningful life may begin to develop in early life stages, suggesting that intervention efforts may be more effective for younger populations. More recently, empirical studies on meaning and purpose among youth have been increasing (e.g., Bronk, 2011, Dik, Steger, Gibson, & Peisner, 2011; Pizzolato, Brown, and Kanny, 2011; Yeager & Bundick, 2009), and continued research with younger students is warranted.

Third, it is possible that the intervention did not make a difference in most of the participants' meaning experiences because they may have been feeling their lives as fairly meaningful even before the intervention. For the control and intervention group, students showed the average levels of Pres were 25.04 and 26.27, respectively, which were above the midpoint of the scale indicating moderate to high levels of meaning. Further, despite a random assignment, the initial level of meaning was even higher among intervention group students with a marginal statistical significance. Thus, only people who have difficulty finding and experiencing meaning may benefit from this kind of intervention. Even though no significant interaction effect of the initial levels of Pres was detected in this study, this may be due to the fact that most students were reporting fairly high levels of meaning.

The initial status of an individual's meaningfulness or meaninglessness may be one of the potential reasons for the reported null effects from recent intervention efforts in promoting meaning and purpose with youngsters under normative life conditions who are less likely to report crisis in meaning or purpose. For instance, using a pretest-posttest experimental design with 102 American college students, Bundick (2011) examined the benefits of a one-on-one purpose discussion that was designed to facilitate the processes of reflecting on and discussing one's core values, life goals, and purposes in life. This intervention yielded benefits to college students' goal directedness and life satisfaction, but no significant effect on the sense of purpose itself. Another trial was a quasi-experimental pilot study that evaluated a three-module school-based intervention designed to help eighth grade American adolescent youth explore, discover, and enact a sense of purpose in their early career development (Dik et al., 2012). There were no significant effects on items directly related to purpose, although it increased several purpose-

related outcomes such as a clearer sense of career direction, a greater understanding of their interest, strengths, and weaknesses, and a greater sense of preparedness for the future.

Contrary to these results, several meaning-oriented interventions developed to help people with adverse life conditions or challenges such as traumatic life events or terminal/chronic illness report significant effects on meaning-related constructs. Due to use of general spiritual well-being or quality of life outcomes without direct measures of meaning and purpose, it is not clear whether these studies actually yielded significant effects on meaning and purpose. However, there is at least one experimental trial that reports significant increase in meaning as measured with the Meaning subscale of the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-sp-12) (Meaning-Making intervention, MMi; Henry et al., 2010). This intervention was conducted with patients with advanced ovarian cancer diagnosis who underwent surgery before participating with a mean age of 55. Most of the participants of this line of intervention were patients with life threatening medical illness who may presumably undergo intense existential crisis and they were usually significantly older (e.g., terminally-ill cancer patients with a mean age of 74, Ando et al., 2008). In addition, they agreed to participate in the trials knowing the purpose of the study. Given that interventions seem to contain similar ingredients (i.e., activities of self-exploration and goals-strivings), these different characteristics of participants may create differences in their pre-intervention status of meaningfulness and existential crisis as well as their needs and motivation for intervention. Understanding the potential role of these factors may be important for future intervention efforts for young people under normative life conditions. This study tried to examine whether students' levels of searching for meaning moderated the intervention effects but found no significant interaction effects. However, a high level of search for meaning among these students does not

necessarily mean a lack of meaningfulness, which may be, to some degree, one of the potential prerequisites for intervention effects. Future research needs to examine these possibilities to gain better understandings of conditions promoting development of meaning and purpose among adolescents and young adults.

Fourth, the intervention may have not been sufficient enough to address core mechanisms of meaning development. Self-concept clarity and goal-progress explained substantial variance of meaning in life, supporting Steger's (2009) meaning development model that presented these two constructs as potentially important change mechanisms. Thus, the idea of targeting these two constructs seems tenable. However, the current intervention does not seem to be successful to bring enough effects on these two targets; the intervention increased students' self-concept clarity with a very small effect and it did not significantly increase their goal-progress. There are several reasons why the current intervention may have failed to bring sufficient effects on these two variables, which provide important considerations for the development of future interventions for promoting meaning in life.

Considerations for Future meaning-enhancing interventions

First, the intervention may have failed to bring significant effects due to the lack of adherence to and engagement in intervention activities by participants. Students were expected to perform all of the intervention activities independently. At the same time, research credits were awarded on the basis of completion of assignment rather than on the basis of quality of work or compliance with the assignment's instructions and spirit. Thus, it is possible that participants did not complete the intervention as instructed, did not take the assigned activities seriously, or were unwilling to be invested in the activities. It is argued that positive psychological interventions may be effective only when participants are fully aware of the purpose of the research and

motivated to take intentional actions which are required to enhance well-being (Sheldon & Lyubomirsky, 2004). Likewise, only students who are aware and motivated to participate in the current intervention activities may benefit from them. However, other possibilities should be also considered because students' self-rated engagement and minutes spent on the intervention activities and the level of interest in living a meaningful life (even though they were not still unaware of the purpose of the current intervention) were not significantly associated with the levels of self-concept clarity and goal progress in this study.

Second, there may be issues with the modality and amount of the intervention. The current intervention took a form of self-help which is done by participants alone without any feedback or assistance. Given that the intervention activities actually require engaging in a substantial level of self-exploration and reflection with follow-through of various steps, the one-way web-based self-help modality may not have been effective for students to achieve actual benefits, possibly even for students who adhered to the intervention processes. Interventions administered with some interactions with other people may help people stay engaged in a deeper level than they would be by themselves, being less distracted and follow through activities as designed. Previous intervention efforts that reported some benefits asked participants to engage in conversations with another individual without particular types of feedback or assistance (even though not an expert). Future research needs to consider possible variations of modalities that may increase intervention effectiveness.

In a similar vein, the current intervention consists of 6 sessions taking 20~25 min for each (excluding 5-10 measurement minutes), which could have been too short to bring significant effects. The issue of modality and amount of intervention seem to be most problematic in generating sufficient effects on students' self-concordant goal-striving. This study

adopted a goal-training program, hoping that learning how to set and implement goals and self-assessing self-concordance increase participants' ability to select "self-concordant" goals (which would result in a higher self-concordance score) and make progress on those goals. However, the intervention did not significantly increase students' self-concordance among the intervention group; rather, the scores were lower than those at baseline. There is no good explanation available for this, but it seems to be clear that brief education about self-concordance and self-evaluation of their reasons for pursuing goals would not necessarily make them select more self-concordant goals. As other researchers pointed out, pursuing (even identifying) self-concordant goals is a difficult skill, requiring both accurate self-perceptual abilities and the ability to resist social pressures that may sometimes push one in inappropriate directions (Deci & Ryan, 1991; Sheldon, 2004). The current intervention expected that participants enhanced this skill through integrating their self-knowledge including life goals and purposes into their goal strivings. It seems that this process requires extensive efforts and possibly guidance or assistance. Although the concept of self-concordance has been studied in many research endeavors, strategies to enhance people's self-concordance have not been addressed much. Developing effective strategies for this would be critical to help people actually enjoy the benefits of pursuing self-concordant goals, not just *any* goals (Sheldon & Kasser, 1998). Incorporating insight-based technique for exploring deeper reasons and historical roots of goal choices would be one possibility (Wadsworth & Ford, 1983).

In addition, the intervention did not increase students' goal-progress, suggesting that the current self-help mode of goal-training may have not been sufficient to elicit motivational and behavioral changes. In fact, previous attempts of a goal-training program designed to help college students better regulate goal-related experiences and increase goal-progress (with a

60min group session and a 30min individual counseling) did not report significant main effects on goal progress (Sheldon et al., 2002), suggesting the difficulty creating actual changes in students' goal strivings. Compared to cognitive changes, making goal progress may require substantial levels of willingness and commitment to participate in change process, which is considered a crucial element of change in therapy (Prochaska & DiClemente, 1982, 1983). Thus, future intervention needs to consider more carefully how to enhance participants' investment, along with longer intervention sessions such as at least 8-10 sessions suggested in a brief psychotherapy model for generating changes (Hughes, 1990).

Third, considering the role of positive and/or negative emotions may increase intervention effectiveness. Steger's model of meaning development put more emphasis on cognitive and motivational/behavior aspects of meaning compared to other models that include affective components of meaning (e.g., Reker & Wong 1988; Reker et al., 1987). Accordingly, the current intervention does not explicitly incorporate affective components. Whether or not the affective component of meaning is considered core to the construct, individuals' affective states have substantial impacts on their cognition and behavior, and the effects of positive emotions on meaning experiences are well-documented (e.g., King et al., 2006). The effects of emotion on meaning judgment can be just momentary, serving as an easily accessible source of information or response biases and errors (Schwarz, 2001; Schwarz & Clore, 1996). Another possibility is that positive emotion facilitates a formation of a stable meaning system by influencing the cognitive and motivational aspects of meaning, which may contribute to bringing a durable sense of meaning. Drawing upon the broaden-and-build theory (Fredrickson, 1998, 2001, 2002), King and colleagues (2006) proposes that positive affect may help people think broadly, think creatively, and flexibly in their efforts to comprehend how their daily existence is connected to a

larger system of meaning. Therefore, attending to participants' emotional states may be one thing future interventions want to consider. Brief qualitative analyses of participants' responses revealed that some students do not feel confident about living a meaningful life because they feel overwhelmed, discouraged, disappointed, and anxious regarding this issue. Addressing these emotional barriers may be significant to increase intervention effectiveness.

Steger's (2009) conceptual model of meaning in life

Self-knowledge and meaning development. The current findings add to the existing literature by providing empirical evidence for the positive association between self-concept clarity and meaning. Because of the longitudinal multilevel design of this study and the use of a sophisticated methodology that assesses both between-persons and within-person effects, this study was able to examine this relationship not only from between-persons analysis but also from a framework of change; during times when a student's self-concept clarity is elevated (compared with his or her own norm), his or her levels of meaning is also likely to be elevated.

These findings provide empirical support for the theoretical notions that have consistently asserted that having a coherent self-understanding should be crucial for meaning development (Steger, 2009). In eudaimonic well-being research tradition, discovering and expressing self has been argued as something that separates meaning in life from hedonic functioning, which serves as an important basis for experiencing meaning (e.g., Frankl, 1963; Keyes & Haidt, 2003; McGregor & Little, 1998; Ryan & Deci, 2001; Ryff & Singer, 1998; Waterman, 1984, 1993; Waterman, Schwartz, & Conti, 2008). Using social cognitive techniques, some experimental studies also show that a greater sense of true self-concept accessibility (Schlegel et al., 2009) and the subjective feeling of knowing one's true self were related to increased perceptions of meaning, even after controlling for a variety of other important predictors of meaning; Schlegel

et al., 2011). The central role of individual's subjective sense of clearly defined self in the experience of meaning in life among adolescence and emerging adulthood particularly corresponds to identity development theories (e.g., Erikson, 1968; Marcia, 1966; Waterman, 1993) and the construct of self-authorship (Baxter Magolda, 1992, 2001; Kegan, 1994). For instance, the identity capital model (Côté, 1996, 1997) posits that a stable and clear sense of self engenders a capacity to 1) understand their experiences by viewing them in light of the personal goals individuals may possess and 2) manage and negotiate everyday experiences by enhancing their recognition of obstacles and opportunities most relevant to them, which is thought to be central in meaning-making. Similarly, the ability to author one's thinking, feeling, beliefs and values, and social relations is regarded central to the meaning-making process. Although little empirical research has been conducted regarding the link between identity and meaning development, using a large and ethnically diverse sample of adolescents, Kiang and Fuligni (2010) recently showed that greater levels of ethnic identity afford youth a deeper sense of meaning and purpose, which, in turn, contributes to more adaptive functioning and well-being.

Causal inferences between self-knowledge and meaning cannot be made from the current findings. Yet there is some empirical evidence that supports the claim that self-understanding serves as a firm context for cultivating the sense of meaning (Burrow & Hill, 2011; Kiang & Fuligni, 2010) rather than the claim that meaning or purpose commitment engenders greater identity commitment. Also, understanding of self may be more approachable, concrete, and specific than making sense of one's life. Thus, an attempt to promoting self-knowledge to enhance the sense of meaning seems reasonable. A more detailed picture about possible directional pathways is subject to future research; yet employing various activities designed to help students to explore their beliefs and values, unique personal characteristics, relations with

others, and lifelong missions and purposes seems to be one of the promising ways to promote meaning in life among young people in educational and/or counseling settings.

Future empirical research on identity and self-concept as critical personal resources that students can use to make sense of their lives may need to attend not only to identity "status" (Marcia, 1966) but also "identity processing style" (Berzonsky & Kuk, 2005), which refers to the processes individuals within the statuses use to make decisions, resolve problems, and process self-relevant information. Much research on identity formation has utilized Marcia's (1966) concept of identity status which concerns the presence or absence of identity commitments (i.e., achievers, moratoriums, foreclosures, and diffusions). Berzonsky (1990) suggests three identity processing styles; information-oriented individuals are skeptical about their self-views and they are willing to suspend judgment until they can process and evaluate relevant information. Students with a normative identity style deal with identity conflicts by conforming to expectations and prescriptions of significant others in a relatively automatic manner. Students with a diffuse-avoidant style are reluctant to face up to and confront personal problems and decisions. Considering the significance of active exploration of self and the world in meaning development, identity processing style seems to be closely related to students' meaning-making process. For instance, students with informational processing style seem to benefit in meaning development because they tend to invest themselves in obtaining, integrating, and evaluating knowledge and experiences of self and the world, which is thought to be essential in achieving the sense of meaning. Empirical findings appear to support this notion; an informational identity orientation has been found to be positively associated with self-reflection, problem-focused coping efforts, a rational epistemic style, a high need for cognition, cognitive complexity, planful decision making, conscientiousness, experiential openness, and identity achievement (Berzonsky

& Kuk, 2000; Berzonsky & Neimeyer, 1994; Berzonsky & Sullivan, 1992; Dollinger, 1995; Streitmatter, 1993). Further, students who entered college with an informational identity style were found to have a clear sense of educational purpose, along with other indicators of successful college adjustment such as high levels of academic autonomy, social skills, and a tendency to perform well academically (Berzonsky & Kuk, 2005).

Future research on the comprehension side of meaning may need to include other constructs of self-understanding. For example, self-concept clarity focuses on consistency of self across various circumstances. However, consistency of self may not reflect most important aspects of self-knowledge in some contexts such as East Asian cultures, where the concept of dialectical self is endorsed (see dialectical self-perception, Spencer-Rodgers, Boucher, Mori, Wang, & Peng, 2009).

Goal-strivings and meaning development. Greater goal strivings were associated with meaning, supporting the theoretical contention that goal-directed activities should contribute to meaning development (Steger, 2009). Although smaller than the variance explained by self-concept clarity (i.e., 39%), individual differences in goal-progress explained about 17% of the variance of meaning. This finding provides empirical evidence for the theories that have argued that the ability to formulate and pursue goals or personal projects should be essential to experiencing life as meaningful or purposeful (e.g., Ryff & Singer, 1998; Klinger, 1977, 1998) and devoting effort and making progress toward personal goals provides a sense of agency, life structure, and a significant and renewable source of personal meaning to people's lives (Cantor & Sanderson, 1999; McGregor & Little, 1998; McKnight & Kashdan, 2009; Sheldon & Elliot, 1999; Sheldon & Kasser, 1998). This is also consistent with the previous study which found that goal appraisal of college students explained the variability in global meaning, although the goals

were simply generic goals, not necessarily self-concordant goals (King et al., 2006). Thus, as Steger's model proposes, goal strivings seem to provide a proactive route to cultivating a sense of meaning, possibly because people may cultivate and elaborate their sense of purpose by discerning, committing themselves to, and engaging themselves in their personally meaningful goals. The importance of goal progress may be particularly salient for college students' experience of meaning because they are likely to perceive their future time as less limited. This future time perspective may lead them to draw meaning from relatively stable and endurable sources such as long-term goals that prepare for the future, whereas people who believe they have fewer opportunities left to pursue their goals tend to rely on their current mood to appraise whether their lives are meaningful or meaningless (Hicks & King, 2009; Hicks, Trent, Davis, & King, 2012).

However, unlike self-concept clarity, the significant relationship between goal-progress and meaning was detected only in a between-persons context, not from a change framework. That is, being a person who tends to achieve one's goals seems to contribute to greater meaningfulness of one's life, whereas a student's within-person change in goal progress seems less relevant to one's experience of meaning. This may be due to non-significant intraindividual change in goal progress over the 8 weeks of this study. A daily diary study showed that an individual reported greater meaning in life when engaging in eudaimonic behaviors (Steger, Kashdan, & Oishi, 2008). The eudaimonic activities involve goal pursuit behaviors such as *persevering at a valued goal even in the face of obstacles* and *writing out [my] goals for the future.* This finding suggests that goal progress may be related to meaning, not only in terms of 'who' (i.e., between-persons effects) but also in terms of 'when' (i.e., within-person effects). It is also possible that the function of goal progress is different than that of self-concept, although

both appear to hold important places in experiencing meaning in life. Future research may need to examine how variability of goal-progress relates to experience of meaning.

Another aspect of goal progress that is subject to future research is the significance of *self-concordance* of goals. Self-concordance is reported to increase the benefits from goal progress in well-being (see SCM, Sheldon & Kasser, 1998), and the extent to which personal projects reflect core aspects of the self predicts the experience of meaning (McGregor & Little, 1998). Therefore, it is reasonable to expect that goal progress on self-concordant goals, compared to *any* goals, may further benefit meaning development. However, the current study did not find additional effects of self-concordance in the link between goal-progress and meaning, suggesting that the reasons of goal pursuit do not seem to matter. Furthermore, in Steger's model, goal-directed activities are implied to be 'self-concordant goals' that reflect an individual's central, enduring interests and values (Sheldon & Elliot, 1999), because they are considered occurring in the context of interplay between one's self-knowledge and purpose. However, as McKnight and Kashdan (2009) point out, most studies did not directly measure this assumption about self-concordance of goals, while only measuring the degree to which strivings are intrinsically motivated and self-determined. The current study was not an exception, leaving the question of whether participants' selected goals truly reflect their core aspects of self unanswered. Thus, how to conceptualize and assess the concept of *self-concordant goals* needs further clarification to better understand the relationship between goal pursuit and meaning development. In addition, research shows that both *what* goals people pursue (i.e., whether they strive for extrinsic vs. intrinsic goal contents) and *why* people pursue them (i.e., whether they strive for autonomous vs. controlled motives) make significant independent contributions to psychological well-being (Sheldon, Ryan, Deci, & Kasser, 2004). It is possible that 'what' of goals may matter

in meaning development, warranting further attention to this issue in elaborating theories and, in turn, designing interventions.

In sum, this study provides empirical support for the overall framework of Steger's conceptual model of meaning in life (2009), demonstrating that a coherent self-understanding and personal goals pursuits explains almost 60% of people's experiences of meaning.

Meaning and college mental health and academic achievement

Meaning and depression and anxiety. Consistent with previous studies that support the importance of meaning in life to well-being among emerging adults in college settings (e.g., Debats et al., 1995; Steger et al., 2009b), a higher sense of meaning is found to be related to fewer symptoms of depression and anxiety and this relationship exists in both intraindividual and interindivdiual contexts. Given that interindivdiual effects appeared stronger than intraindividual effects, a student's short-term intraindividual fluctuations in his or her sense of meaning do not seem to have much impact on their report of depressive and anxiety symptoms. However, if a student sees less meaningfulness in general in his or her life, the student is more likely to experience symptoms of depression and anxiety. About 15% - 20% of college students were reported to experience depression, with the number of depressive students being on the rise (American College Health Association, 2007; Gallagher, 2007; Voelker, 2003). Almost 40% of individual differences in the experience of depressive symptoms were explained by meaning in life, which restates the important link between meaning and depression (e.g., Debats et al., 1993; Steger et al., 2006; Steger & Kashdan, 2009).

Meaning and academic achievement. This study also attended to students' GPA and retention rate which are central issues in postsecondary education. Little is known how meaning in life is associated with short-term or long-term educational attainment and persistence,

compared to relatively well-documented potential benefits of meaning in the areas of mental health and well-being. Students' experience of meaning was not significantly associated with a higher GPA or higher retention rate to their sophomore year, suggesting that the role of meaning in life in students' academic achievement seems to be minimal, at least within a short-term perspective. However, the relationship between students' experience of meaning and their educational attainment and persistence warrants further investigations. It is possible that GPA and retention was not a pressing issue for most freshmen participants. Academic work tends to be less challenging during the first year of college when compared to those of upper school years because students become more involved in their major-related courses which usually poses more academic challenges. Research also shows that college dropout occurs more as students move on to upper school years, meaning that students tend to stay for their second year, but showing the lack of continuous and progressive enrollment. In fact, first to second year retention rates average 74% for four-year institutions (ACT, 2006) while 6-year graduation rates average 53% (Carey, 2004). Participants in this study showed a high rate of retention both to their second semester and to their second year (100% and 89.6%, respectively). Thus, studying enrollment status of upper school years will be important to understand the role of meaning and academic achievement. For example, looking at third-year enrollment status was emphasized rather than first year retention because third-year enrollment status may be a more reasonable proxy for degree attainment and students who return for their second year may drop out or transfer (Allen et al., 2008).

Theories and empirical findings in the area of college student development suggest that psychosocial factors such as self-efficacy, engagement, motivation, and social connectedness are associated with academic performance and persistence in college (e.g., Robbins et al., 2004).

Given that meaning has been frequently linked to these psychosocial factors, future research may want to look at the interplay among the experience of meaning and other psychosocial factors in their impact on students' academic achievement. For instance, Pizzolato and colleagues (2011) showed that a short-term intervention focusing on students' sense of purpose and internal control (i.e., motivational processes) increased high school GPA among youth in high-risk academic environments. Although this study is a good example of empirical studies that directly incorporates the construct of purpose and motivation in investigating students' academic achievements, it is not clear whether academic attainment occurred because of the sense of purpose or motivational gain, or both. Also, the participants of this study were students who fell one or two standard deviations below the mean on internal control and a sense of purpose in high-risk academic environments, suggesting that the effects of having meaning and purpose on academic achievement may exist only with students who are academically struggling. More detailed understanding of the interplay among the sense of meaning, other psychosocial factors, and educational attainment is subject to future study; a greater sense of meaning may help students better contextualize their academic strivings within their long-term life goals, potentially leading them to be more intentional and effortful in their academic pursuits.

Future research may also target the potential benefits of meaning in life in various aspects of positive college student development besides their psychological health and well-being and academic success. Among many contributors to health and success, college students' risk behavior would be one of the important areas to examine, because the prevalence of several types of risk behavior is reported to peak during emerging adulthood (ages 18-25), possibly due to their pursuit of life experimentation and exploration of novelty and freedom (Arnett, 1992; Bachman, Johnston, O'Malley, & Schulenberg, 1996). Although the chances of engaging in risk

behaviors such as binge drinking, unprotected sex, substance use, and risky driving behaviors substantially increase in a college context, previous research has mostly focused on adolescent risk behaviors, warranting more attention to protective factors of risk behaviors among college students. A student's well-developed meaning system may serve as a useful and powerful filter that blocks maladaptive risky life experiences, while still accepting and pursuing chances for new life experiences. Although limited in making a causal assertion due to correlational nature of studies, previous research seems to support the potential benefit of meaning in decreasing risk behaviors; for instance, among adolescents, a higher sense of meaning was associated with lower levels of health drug use (Addad & Himi, 2008; Nicholson, Higgins, Turner, James, Stickle, & Pruitt, 1994), heavy drinking (Brassai, Piko, & Steger, 2011; Newcomb & Harlow, 1986), sedative use (Brassai et al., 2011; Koushede & Holstein, 2009), unsafe sex (Brassai et al., 2011), and increased health behavior (Myrin & Lagerström, 2006).

In sum, although significant effects of a meaning-enhancing intervention did not emerge in this study, the potential benefits of meaning in life are implicated in various aspects of college student life. A robust relationship between meaning in life and depression and anxiety was indicated in this study. Additionally, meaning seems to relate to college students' educational attainment and persistence, although the current study did not find a significant relationship. Thus, promoting meaning in life among college freshmen may be beneficial in helping their college experiences, which speaks to the possibility to improve colleges and universities' First-year intervention by focusing on students' meaning development.

Limitations and Directions for Future Research

First, this study suffered from a high attrition rate, which prevented the use of follow-up data. Attrition is a common problem of longitudinal research. Thus future research needs to use

strategies to increase participant retention rate. As with other intervention research, whether the effectiveness is maintained or not and, if so, within which time frame, are important issues for the practical implementation of intervention. Without reliable follow-up information, our understanding would remain limited in these issues. Ideally, long-term trajectories of meaning in life spanning an individual's different developmental stages would provide valuable information regarding more complete picture of how one's experience of meaning develops. Researchers claimed more longitudinal intervention studies in educational and psychological and behavioral research where attitude, opinions, and behavior are likely to change across time (Moerbeek, 2008; Pascarella & Terenzini, 2005), although a great deal of time, money, and labor and the persons' willingness to participate make it difficult for researchers to conduct longitudinal research.

Second, future intervention research may target sources of meaning (especially with young people) and incorporate them into intervention agenda. The current intervention aimed to provide useful tools for explorations that would help the formation of meaningfulness, but did not provide specific sources of meaning. There is some available knowledge regarding what usually makes people's lives meaningful (e.g., Bar-Tur et al., 2001; Wong, 1998). Knowing several common sources of meaning would be particularly beneficial for young people who are navigating through many diverse values and directions and experimenting various ways of living. Some aspects of life such as social relationship (e.g., Baumeister, 1991; Hicks & King, 2009; Lambert et al., 2010) and work (e.g., Steger & Dik, 2010) seem to be nearly universal and more foundational or at least influential to the experience of meaning, which may offer more straightforward paths to meaning.

Third, this study was conducted with a convenient sample of college students (dominantly European-American students at one U.S. institution). Although there were no differences between minority and nonminority students in variables studied in this study, this does not mean that such differences do not exist; such a small number of students with non-white ethnicity may not have allowed even a meaningful comparison. There may be specific patterns of change that occur in specific groups of minority students, because culture is very relevant to an individual's experience of meaning (Bar-Tur et al., 2001).

Finally, it is important to note that this study only used self-reported measures of all variables. Also, there may have been issues from taking the same measures repeatedly – for instance, measurement error, random response, and practice effects. In addition, the measures used to assess the constructs of primary interest may be conceptualized and measured in a variety of ways. Future research needs to examine whether similar results will be found with the use of other instruments of those constructs.

Table 1 Study Procedure

	Recruiting	**Intervention (Control group-only Survey)**						**Follow-up**	
Data collection	T1	T2	T3	T4	T5	T6	T7	T8	T9
Sessions/ surveys	**Initial survey**	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**1st**	**2nd**
Intervention Group	Registration and Consent form	Interview I	Interview II VIA PICs	Career Mission	Goal-training I	Goal-training II	Last speech Mission-R	N/A	N/A
		Survey	Survey	Survey	Survey	Survey	Same	Survey	Survey
Control Group	Initial survey	Survey	Survey	Survey	Survey	Survey	Survey	Survey	Survey
SURVEY PACKET (Questions)	-MLQ -DASS -GSE -PSS -PSSM -Demos -SCC -6goals -Selfcon	-MLQ -DASS -PSS -SCC -Goal comm -Goal prog	-MLQ -DASS -PSS -SCC	-MLQ -DASS -PSS -SCC	-MLQ -DASS -PSS -SCC -Selfcon (only for interventi on group)	-MLQ -DASS -PSS -SCC -Goal comm -Goal prog	-MLQ -DASS -PSS -SCC -Goal comm -Goal prog -GPA for Fall 2010 (estimated) -Retention for Spring 2011(Intenti on)	-MLQ -DASS -PSS -SCC -Goal comm -Goal prog -Selfcon -GPA for Fall2010 (actual) -GPA for Spring 2011 (estimated) -Retention for Spring 2011(Actual)	-MLQ -DASS -PSS -SCC -GPA for Spring 2011 (actual) -GPA for Fall 2011 (actual) -Retention for Fall 2011 (Actual)

Table 2 Contents of Intervention

	Module 1	**Module 2**		**Module 3**		**Module 4**
Theme	Introduction	Self-knowledge		Self-concordant goal-progress		Wrap-up
Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Major Activities	-Introduction -Purpose interview part I	-Purpose interview part II -VIA-IS results description -Meaningful photos description	-Major and Career -Writing personal mission statement	-5 steps of goal-training -Self-efficacy	-Monitoring and evaluation on goals -Improving goal-progress	-Monitoring and evaluation on goals -Creating last speech -Crafting personal mission statement

Table 3 Cronbach's alpha (α) at Time 1, Means (*M*) and standard deviations (*SD*) of variables

variable		T1		T2		T3		T4		T5		T6		T7		T8		T9	
	α	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Pres	.90	25.24	5.88	25.31	6.11	25.20	6.23	25.50	6.43	25.38	6.29	26.06	6.39	25.93	6.90	26.01	6.25	26.05	6.28
		25.94	6.13	26.50	5.72	26.96	5.50	26.90	5.86	26.87	5.63	26.86	5.86	26.79	5.85	26.78	6.01	27.11	6.21
Srch	.88	24.70	6.54	23.94	6.76	22.67	7.00	22.43	7.88	23.27	8.18	22.95	7.98	23.21	8.16	23.75	7.70	22.81	8.01
		23.89	7.06	24.64	7.08	24.81	7.16	24.71	7.07	24.78	8.02	24.33	7.67	24.82	7.85	23.12	8.40	23.54	7.42
Scc	.90	56.47	13.89	56.87	13.21	56.54	14.17	57.27	14.85	57.99	15.58	58.06	16.28	59.81	15.85	57.92	16.19	57.22	14.09
		57.32	14.65	56.69	14.59	58.36	14.70	59.94	14.13	61.37	15.14	60.86	15.73	61.96	16.25	60.73	16.17	60.55	15.00
Gprog	-	-	-	35.30	7.96	-	-	-	-	-	-	36.65	8.76	36.79	9.56	36.18	8.95	36.19	8.74
		-	-	34.39	9.28	-	-	-	-	-	-	34.27	9.74	35.85	9.56	37.04	10.45	36.12	11.03
Dep	.87	6.55	6.61	5.87	6.30	5.23	6.08	4.78	6.51	5.32	7.41	4.76	6.87	4.71	6.65	5.49	6.79	6.65	6.53
		6.59	6.91	5.82	6.38	4.68	6.10	4.42	6.41	3.44	5.88	4.77	7.37	3.78	6.49	4.52	6.03	6.55	7.93
Anx	.82	6.98	6.68	6.14	6.62	5.19	6.44	4.77	7.02	4.91	7.35	4.20	6.69	3.78	6.18	5.27	6.88	6.49	8.40

		6.72	6.93	5.87	6.18	5.21	6.08	4.44	6.20	4.05	6.04	3.81	6.05	3.56	5.77	4.43	5.52	6.73	8.38
Pss	.75	6.02	2.92	6.17	2.70	6.07	2.91	5.76	3.01	5.69	3.43	5.85	3.20	5.60	3.37	5.76	3.21	6.14	3.21
		6.20	2.87	5.80	3.00	5.92	3.01	5.82	2.99	5.20	2.86	5.39	3.15	5.35	2.84	5.39	3.48	5.27	3.46
SelfCon	.68	33.13	23.39	-	-	-	-	-	-	-	-	-	-	-	-	25.39	25.71	-	-
		30.38	23.10	-	-	-	-	-	-	-	-	-	-	-	-	19.92	28.52	-	-
Ngse	.89	32.39	3.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		32.94	4.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note. Upper level of each row indicates control group, lower level indicates intervention group.
Pres = the presence of meaning; Srch = the search for meaning; PSS = perceived stress scale; Scc = Self-concept clarity; Gprog = Goal-progress; Dep = DASS-depression, Anx = DASS-anxiety; SelfCon = Self-concordance of goals; NGSE = New general self-efficacy

Table 4 Correlations among variables

	Pres	Srch	Pss	Scc	Gprog	Dep	Anx	SelfCon	NGSE
Pres	_	-.135*	-.415**	.569**	.314**	-.381**	-.234**	.215**	.348**
Srch	-.165**	_	.140*	-.213**	.019	.093	.069	-.115	-.057
PSS	-.300**	.192**	_	-.462**	-.257**	.540**	.330**	-.330**	-.312**
Scc	.456**	-.347**	-.471**	_	.242**	-.460**	-.350**	.166*	.418**
Gprog(t2)	.111	-.077	-.230**	.204**	_	-.299**	-.168**	.190**	.276**
Dep	-.402**	.230**	.552**	-.536**	-.294**	_	.592**	-.242**	-.301**
Anx	-.230**	.210**	.471**	-.433**	-.144*	.574**	_	-.235**	-.184**
SelfCon	.260**	-.184**	-.321**	.202**	.193**	-.317**	-.291**	_	.229**
NGSE	.353**	-.056	-.392**	.341**	.267**	-.356**	-.216**	.229**	_

Note. $^{*}p < .05$, $^{**}p < .01$.

Pres = the presence of meaning; Srch = the search for meaning; PSS = perceived stress scale; Scc = Self-concept clarity; Gprog(t2) = Goal-progress at Time2; Dep = DASS-depression, Anx = DASS-anxiety; SelfCon = Self-concordance of goals; NGSE = New general self-efficacy; Above Diagonal indicates correlations of variables at Time7 and below diagonal indicates correlations of variables at Time1.

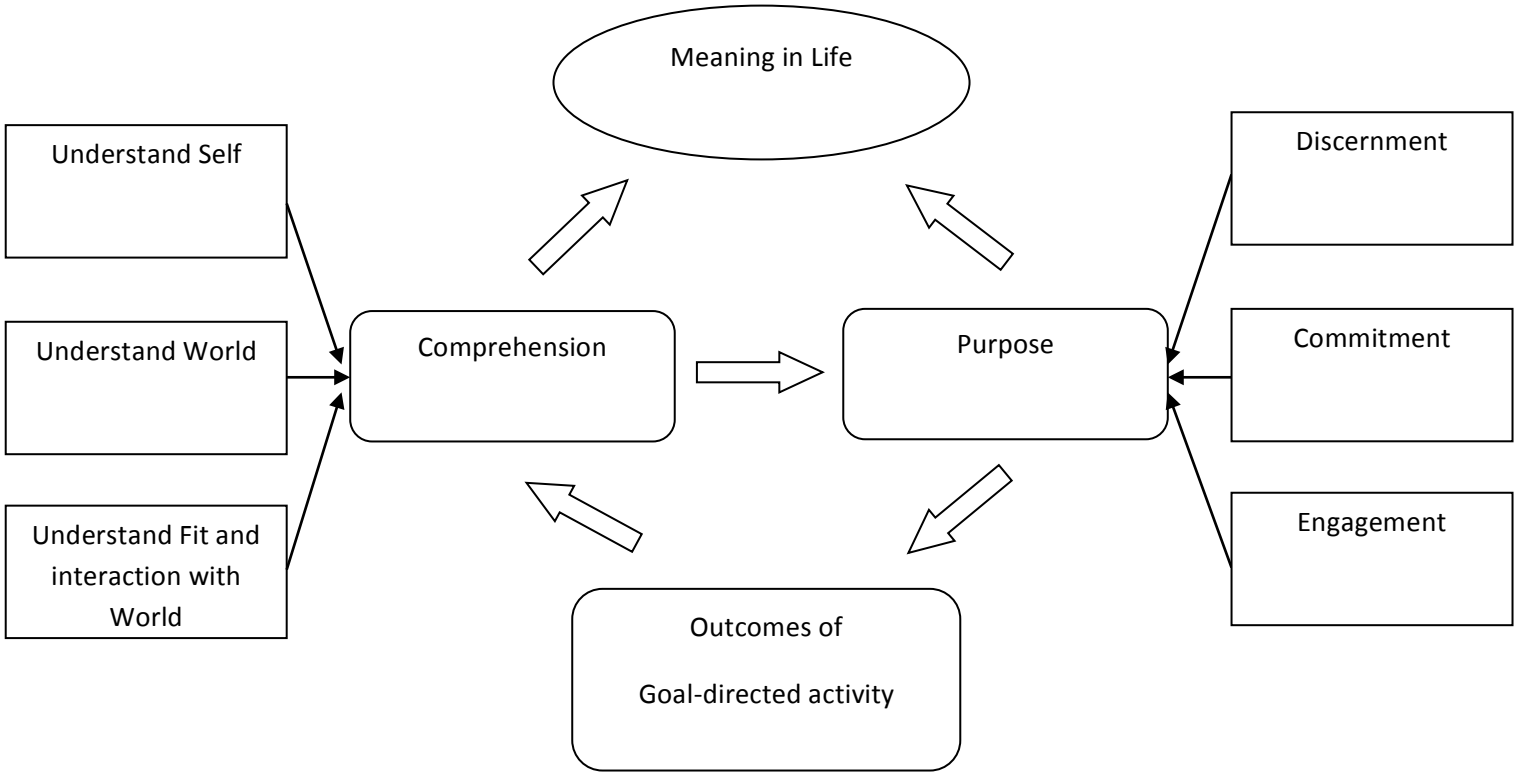

Figure 2 Theoretical model of meaning in life proposed by Steger (2009).

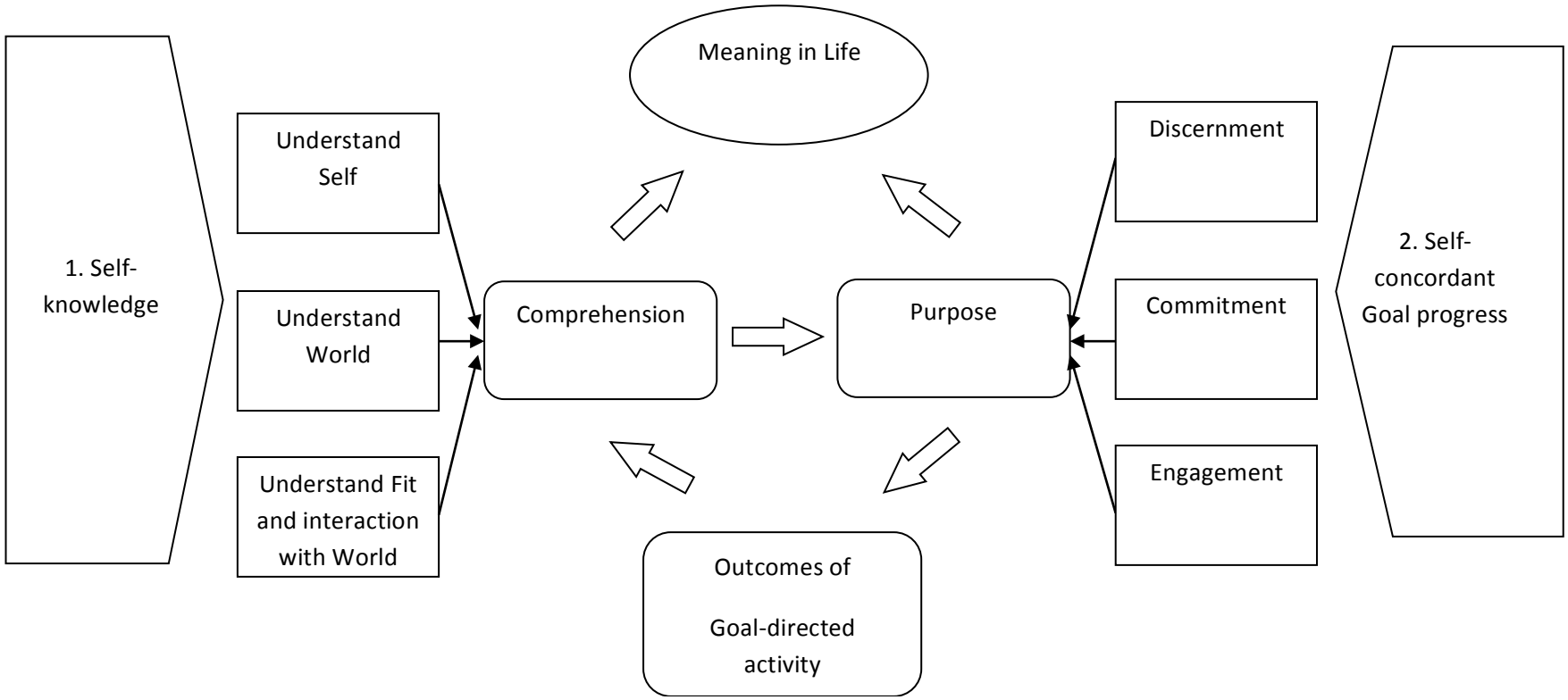

Figure 3 Two domains of meaning-enhancing intervention.

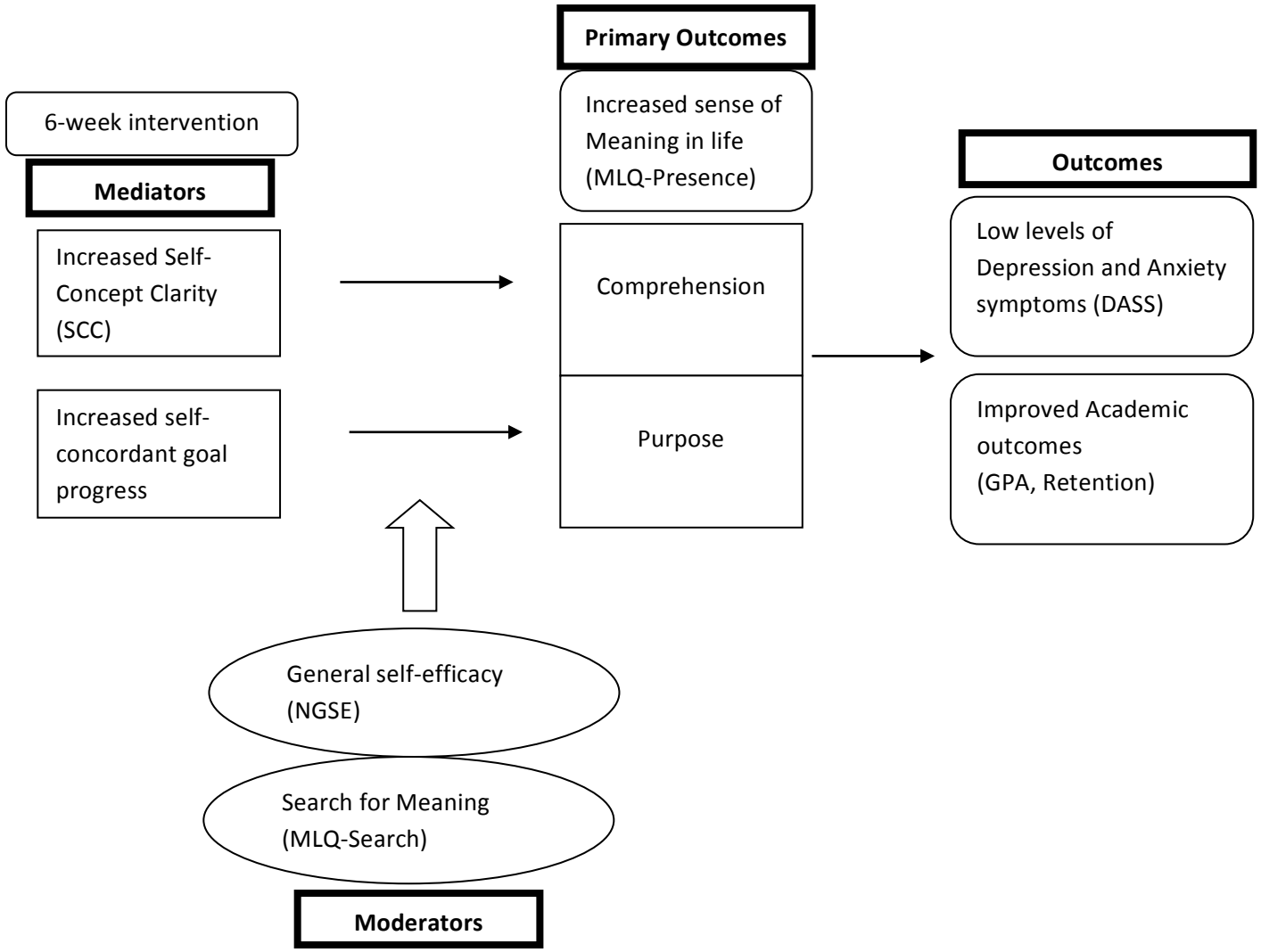

Figure 4 Hypothesized model of intervention effectiveness with mediators and moderators.

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