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Personal Goal Attainment, Psychological Well-Being Change, and Meaning in Life

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

Doctor of Philosophy

in

Psychology

by

Nicholas George Stauner

March 2013

Dissertation Committee:

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The Dissertation of Nicholas George Stauner is approved:

Committee Chairperson

University of California, Riverside

I dedicate this work to my beloved parents: to Daniel, whose shoes it has been my lifelong aspiration to fill with the same brilliance and humanistic dutifulness; and to Diane, whom I know I can trust to read every word I write with the same boundless joy and love I have received throughout my happy and truly fortunate life as your son. Your kind and thoughtful regard has been my most dependable inspiration. I surely hope you're right about its product, and that you will prove well ahead of the curve in applying these insights fruitfully, as to my delight, you both have already demonstrated one can. If I thrive, it is due to the foundation of wisdom you have provided. If I have built upon it anything that shall last, then that has been my greatest achievement and honor.

My every success I owe to you, and with them, my deepest gratitude.

ABSTRACT OF THE DISSERTATION

Personal Goal Attainment, Psychological Well-Being Change, and Meaning in Life

by

Nicholas George Stauner

Doctor of Philosophy, Graduate Program in Psychology

University of California, Riverside, March 2013

Dr. Daniel J. Ozer, Chairperson

Does goal attainment relate to the development of meaning in life and psychological well-being? If so, do these relationships depend on the nature of the goal and why one pursues it? This study sought to generalize the relationship between goal attainment and subjective well-being to meaning in life and psychological well-being, and to test whether goal characteristics, contents, or motives moderate this relationship. At two times about seven weeks apart, 360 undergraduates rated their meaning in life and subjective and psychological well-being. Results replicated the relationship between subjective well-being change and goal attainment, and confirmed that attainment also relates to changes in meaning in life and psychological well-being. This evidence offers new support for theories describing goals as sources of meaning, though interpretations based on alternative causal assumptions deserve further consideration. In addition, the results of moderation analyses demonstrate that not all goals relate equally to change in well-being or meaning in life. However, these results also pose challenges to the finer points of existing theories that describe the inequalities among goals in terms of their

supposed service to well-being. Many direct relationships and goal attainment moderators from the literature on self-determination theory failed to replicate, extrinsic motivation being the primary exception to this surprising trend of null results. Mixed results also emerged for theories regarding other goal characteristics. Retrospective ratings of environmental support and inter-goal facilitation (versus conflict) moderated the relationship of goal attainment with overall well-being change, and environmental support related to well-being change directly. Time frame, willingness to invest, extrinsic motivation, and overall self-determination predicted changes in well-being directly, but no other motives or characteristics did so prospectively. Only extrinsic motivation and expectations of success prospectively moderated the relationship between goal attainment and well-being change. This relationship with attainment held across most varieties of goal content, most notably vanishing with goals that participants identified as financial in nature, though independent judges' categorizations of goal content did not support this distinction. Furthermore, important limitations to the evidentiary value of the research paradigm have gone unacknowledged in prior literature, as discussed last.

Table of Contents

Introduction.....	1
Connections and distinctions among well-being constructs.....	3
Goals and well-being.....	8
Theoretical differences among goals’ semantic content and underlying motives.....	10
Depth of meaning.....	11
Self-determination theory.....	14
Theoretical background.....	14
Empirical research.....	16
Critique of Self-Determination Theory.....	18
Other goal characteristics relevant to well-being.....	24
Probability of success and self-efficacy.....	24
Social and environmental support.....	28
Effort.....	30
Goal conflict.....	32
Purpose and hypotheses of the present study.....	35
Method.....	37
Participants.....	37
Materials.....	38
Well-being measures.....	38
Goal assessments.....	40
Procedure.....	41
Results.....	43
Exclusion criteria.....	44
Differences by assessment time.....	47
Effects of sex, age, and ethnicity.....	49
Goal attainment and well-being change.....	55
Convergent validity of well-being composite.....	58
Self-determination of goal motives.....	61
Goal characteristics.....	64
Goal content.....	69
Discussion.....	72
Generality of well-being relationship with goal attainment.....	73
Well-being prediction and attainment moderation by self-determination.....	74
Well-being prediction and attainment moderation by goal characteristics.....	76
Moderation of attainment by goal content.....	81
Limitations and future directions.....	85
Subjectivity and discriminant validity.....	85
Generalizability.....	88
Conclusions.....	90
References.....	92
Footnotes.....	110
Appendix A. Comprehensive list of measures administered.....	112

Table of Contents (continued)

Appendix B. Goal self-categorization task.....	113
Appendix C. Goal ratings.....	114
Appendix D. Current revision of goal content taxonomy.....	115

List of Tables

Table 1. Descriptive statistics.....	48
Table 2. Correlation matrix of well-being indices.....	59

List of Figures

Fig. 1. Scree plot of factor and parallel analyses of well-being subscales.....	60
Fig. 2. Extrinsic motivation moderating goal attainment's link to well-being change...	63
Fig. 3. Probability of success moderating goal attainment's link to well-being change.	66
Fig. 4. Environmental support moderating goal attainment's link to well-being change	68
Fig. 5. Goal conflict moderating goal attainment's link to well-being change.....	69

Personal Goal Attainment, Psychological Well-Being Change, and Meaning in Life

The phenomenology of meaning in life has interested psychologists broadly, and some profoundly. Some existential psychologists have defined themselves by the proposition that people desire and seek to understand the meanings of their lives actively, naturally, and universally (Maslow, 1943; Frankl, 1946/1963; see also Heine, Proulx, & Vohs, 2006). Such claims vary in scope, Frankl's being among the boldest: he suggested one could ultimately find the roots of all motives and behaviors in the will to meaning, much as Freud emphasized the will to pleasure as fundamental, or Nietzsche the will to power.

Modern existential psychology has expanded the application of theory to research on the ways relatively healthy people experience meaning, and the sources from which they derive it (Crumbaugh & Maholick, 1964; Klinger, 1977; Baumeister, 1991; Wong & Fry, 1998; Reker & Chamberlain, 2000; Steger, Frazier, Oishi, & Kaler, 2006). Meaning in life accrues naturally through the aging (and presumably maturing) process itself (Reker, 2005); sparse empirical research exists to demonstrate how, but theorists nominate many plausible mechanisms. Klinger (1977, 1998) postulates that all humans recognize naturally desirable outcomes or the prevention of the undesirable as incentives. Theoretically, these incentives inform value judgments through operant conditioning: people learn to value lifestyles and ethical systems that optimize behaviors and their outcomes. In turn, values motivate goals that comprise systems of meaning: people experience meaning as they progress toward goal fulfillment, and define their lives'

purposes in terms of their most strongly motivated goals and values. Frankl's (1946/1963) proposition that meaning derives from the transcendence of self-interest might seem to conflict with this emphasis on personal goals, but personal goals need not serve oneself exclusively, as exemplified by goals with self-transcendent themes (Emmons, 1999, 2005).

Theory aside, empirical bases for developing existential well-being interventions appear limited at best. Emmons (1999, 2005) also claims people build meaning in life through goal pursuits, and provides correlational evidence to support this to some extent. Many other correlational studies describe positive relationships between meaning in life and other personality constructs, including religiousness (Chamberlain & Zika, 1988; Steger & Frazier, 2005; Schettino, 2012), the Big Five traits (Steger et al., 2006), and right-wing authoritarianism and dogmatism (Steger, Kashdan, Sullivan, & Lorentz, 2008). These results may possess the potential to suggest mechanisms that promote meaning, if one assumes that causal influence flows in one direction from personality to the outcome of subjective life evaluation (McCrae & Costa, 1999).

Specific, naturally occurring events with positive relationships to the acute experience of global life meaning and changes therein include religious conversion (Paloutzian, 1981), recovery following traumatic bereavement (Davis, Wortman, Lehman, & Silver, 2000), parenthood (Nelson, Kushlev, English, Dunn, & Lyubomirsky, 2012), near-death experiences (Bauer, 1985; Flynn, 1986; Greyson, 2006; Ring, 1985), and peak experiences in general (Fredrickson, 2000). However, these studies concern essentially uncontrollable or ethically sensitive life events, which permit neither

experimental control to establish causality nor targeted therapeutic intervention based on such assumptions. Meanwhile, the sparse experimental manipulations of meaning in published research rely on manipulations of positive affect (King, Hicks, Krull, & Del Gaiso, 2006), mortality or uncertainty salience followed by an opportunity to defend one's cultural worldview (Simon, Arndt, Greenberg, Pyszczynski, & Solomon, 1998; van den Bos, 2009; Van Tongeren & Green, 2010), or social exclusion (Stillman et al., 2009). Still, studies employing these manipulations have not yet demonstrated lasting changes in global meaning. These manipulations might also carry undesirable consequences if used widely and routinely. Thus at present, the field appears to lack practical methods for individuals seeking to actively and permanently build a sense of meaning in their own lives. Furthermore, the only means of intervening to build meaning in others' lives appears to consist of rather intensive therapy guided by highly trained professionals.

Connections and Distinctions Among Well-Being Constructs

The subjective sense of meaning in life shares close ties with a variety of psychological and behavioral health indicators. These include happiness (Debat, van der Lubbe, & Wezeman, 1993; Robak & Griffin, 2000), life satisfaction (Chamberlain & Zika, 1988; Steger & Kashdan, 2007), work enjoyment (Bonebright, Clay, & Ankenmann, 2000), positive emotionality, self-esteem, optimism (Steger et al., 2006; Weinstein & Cleanthous, 1996; Zika & Chamberlain, 1992), self-efficacy (Auhagen, 2000; DeWitz, 2004) or empowerment (Strack, 2008), self-rated mental, physical, and general health (Chigbo, 2012), health-related quality of life (Hodges, 2008), health behaviors (Sennott, 2011), better response to treatment for alcoholism (Krentzman,

2008), more effective coping (Debats, Drost, & Hansen, 1995), optimal adjustment following spinal cord injury, internal rather than external locus of control over one's health, sociability (Thompson, Coker, Krause, & Henry, 2003), ethnic identity achievement (Martinez & Dukes, 1997), optimal family functioning (Shek, 1997), prosocial behavior (Shek, Ma, & Cheung, 1994), positive social relationships, personal growth, a positive attitude toward the past (Steger et al., 2008), and overall psychological well-being (Mulders, 2011). Negative relationships with symptoms of psychological distress (Scheier & Newcomb, 1993) also include reduced anxiety, depression (Debats et al., 1993; Kállay, 2008; Smith & Zautra, 2004), explicit fear of death (Fried-Cassorla, 1981; Drolet, 1990) and death-related depression (Robak & Griffin, 2000), psychopathy (Crumbaugh & Maholick, 1964), criminality (Reker, 1977), violent behavior (DuRant, Cadenhead, Pendergrast, Slavens, & Linder, 1994), fewer psychiatric symptoms (Strack, 2008), decreased incidence of alcohol use (Schnitzer, 2011), substance abuse (Kinnier et al., 1994; Waisberg & Porter, 1994; Nicholson et al., 1994; Minehan, Newcomb, & Galaif, 2000; Newcomb & Harlow, 1986; Padelford, 1974), self-harming tendencies and suicidality (Edwards & Holden, 2003; Harlow, Newcomb, & Bentler, 1986; Dukes & Lorch, 1989; O'Connor & Chamberlain, 1996), and less ruminative brooding; meaning in life also relates negatively to all facets of neuroticism and negative emotionality (Steger et al., 2006, 2008). Case reports from logotherapy practitioners (who promote the discovery of meaning in their clients' lives) also describe successes in improving coping with schizophrenia (Lantz, 1984; Lantz & Belcher, 1987) and reducing boredom (Lantz, 1987), familial dysfunction, habits and attitudes that promote unhealthy bodily weight

gain (Lantz & Harper, 1988a; Lantz, 1989), tobacco addiction (Gyamerah & Lantz, 2002), hypochondria (Lantz & Harper, 1988b), and posttraumatic stress in Vietnam War veterans (Lantz & Greenlee, 1990; Lantz, 1990, 1991) and others (Lantz, 1992, 1996).

Though meaning thus connects to well-being, it retains a degree of independence from subjective well-being (SWB). The prevalent theory in positive psychology defines SWB as negative affect (NA) subtracted from the sum of positive affect (PA) and life satisfaction (Andrews & Withey, 1976; Diener, 1984; Diener, Lucas, & Oishi, 2002). However, theory regarding the structure of psychological well-being (PWB) indicates this composite only directly represents about a third of PWB more broadly defined (Ryff, 1989). Environmental mastery and self-acceptance relate strongly to SWB, but four other dimensions of PWB (purpose, positive relations, personal growth, and autonomy) are relatively independent (Ryff & Keyes, 1995). Empirical research on well-being often forgoes consideration of these aspects of psychological health, despite considerable emphasis in theoretical structures of well-being's components.

Lent (2004) argues that SWB and PWB represent different perspectives on happiness corresponding to hedonic and eudaimonic philosophical traditions, respectively. The hedonic lifestyle in psychological literature idealizes happiness as a fundamental value and end in itself worth seeking, characteristically via the direct pursuit of pleasure and recreation (Waterman, 1993). In contrast, a eudaimonic lifestyle prioritizes other aspects of "the good life" over happy feelings, which one might expect to result as a byproduct of a life lived with moral virtue and purposeful goal pursuits in service of personal growth, social contribution, and self-actualization, even (and perhaps

more so) when these pursuits present considerable challenge (see also Ryan & Deci, 2001). However, not all theorists embrace this distinction (Kashdan, Biswas-Diener, & King, 2008).

Unfortunately, structural issues have troubled measures used in empirical research on purpose in life. Even the Purpose in Life test (Crumbaugh & Maholick, 1964, 1969), despite outperforming other popular measures of global meaning in life (Chamberlain & Zika, 1988), has exhibited an unstable factor structure and correlations with all components of SWB that appear strong enough to raise the statistical specter of multicollinearity (Reker, 2000; Steger et al., 2006). To address these concerns, Steger and colleagues (2006) introduced a highly reliable measure of meaning in life that maintains its intended structure consistently. Their Meaning in Life Questionnaire (MLQ) reduces its correlations with affect and life satisfaction to levels that still reflect strong relationships without threatening discriminant validity. Steger and Kashdan (2007) have also demonstrated that the MLQ-Presence subscale predicts a person's future score on the same subscale at a later assessment much better than life satisfaction, which supports the discriminant validity of meaning as distinguishable from life satisfaction across time.

The distinction between subjective well-being and purpose in life may play out in important and subjectively perceptible ways. Action in service of one's life purpose may sometimes require the sacrifice of pleasure or endurance of suffering, though such effort may produce meaningful experiences of progress (Waterman, 1984; Klinger, 1977; Baum & Stewart, 1990). One study indicated that people may not consider experiences of self-

actualization or meaning among their most satisfying experiences (Sheldon, Elliot, Kim, & Kasser, 2001), which suggests that people may commonly experience meaning and satisfaction as different.

Others have reasoned that the distinction between meaning in life and happiness may explain the “parenthood paradox”—the contrast between a measured decrease in the frequency of PA among parents and their perceptions that their children increase their happiness (Baumeister, 1991; Lyubomirsky & Boehm, 2010). Though parents also report low PA when spending time with their children relative to their PA during other activities, raising children may cultivate a different form of happiness that parents experience less in the emotions of the moment and more in nostalgic reflection upon the changes children introduce to their life narratives. In another particularly vivid example, Baumeister (1991) also speculates that soldiers engaged in guerrilla warfare might feel very strongly that their lives serve an important purpose despite enduring conditions that surely sour their moods. Case studies of Iraq War combat veterans afflicted with PTSD support the notion that the experience of war brings salience to issues of life purpose and connects veterans to the concerns of their comrades, even in the context of severe depression and distress (Macpherson, 2011).

Distinguishing between happiness and meaning in life has also enriched psychological models of the relationship between well-being and religiousness. Three studies have found evidence that meaning in life may mediate the relationship between happiness and religiousness, both at the level of holistic self-reflection (French & Joseph, 1999; Stauner, 2006) and the level of daily experience (Steger & Frazier, 2005). An

additional study reported that purpose and positive social relations mediated the link between religiousness and psychological adjustment (Schettino, 2012). Thus independent assessment of meaning in life and SWB has benefitted both the psychological community's understanding of how people may experience well-being idiosyncratically and of how to conceptualize and model well-being nomothetically. Moreover, these arguments imply one cannot assume without empirical evidence that given relationships with SWB generalize to other dimensions of well-being as a whole. This point pertains to more than theory that over-generalizes PA, NA, and life-satisfaction, since theorists have also interpreted results regarding autonomy (Sheldon et al., 2004) and meaning in life (Klinger, 1977, 1998; Emmons, 1999) as representative of well-being as a whole.

Goals and Well-Being

Longitudinal research on subjective well-being mostly supports the notion that SWB benefits from goal attainment (Brunstein, 1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002; Sheldon, 2008). The cited studies found increases in participants' SWB over time occurred in proportion to their reports of progress toward their goals, both concurrently and prospectively. Sheldon (2008) found these gains endured over the course of three years (see also Sheldon & Houser-Marko, 2001). Though Sheldon and Kasser (1998) specifically studied participants' personal projects, and Sheldon and Elliot (1999) studied personal strivings, Ozer (1997) found general equivalence among the projects, strivings, and personal goals participants listed regardless of which instruction set they received. Thus these studies

uphold the general correlation between SWB gains and progress toward personal goals, projects, and strivings, which Little (1999) referred to collectively as personal action constructs.

Beyond life satisfaction and optimized affect, goal progress predicts increases in self-rated vitality and higher retrospective ratings of self-actualization, and marginally predicts increases in overall PWB (Sheldon et al., 2002). However, Pomaki, Karoly, and Maes (2009) failed to find a relationship between goal progress and improvements in job satisfaction and emotional exhaustion in a sample of nurses when controlling for age, gender, and ratings of goal attainability and self-efficacy, though the bivariate correlation between progress and job satisfaction emerged significantly positive (emotional exhaustion did not). This suggests that various aspects of well-being broadly construed do not necessarily share identical relationships with goal progress. Hence the question of whether any effect of goal attainment on well-being generalizes to meaning or purpose in life remains unanswered.

Though many theorists claim that goal progress produces meaning (Emmons, 1999, 2005; Klinger, 1977, 1998; Reker, 2000; Reker & Wong, 1988; Bell, 2007), claims regarding SWB have much more empirical support thus far. Well-being measures employed in existing research rarely include an existential measure that explicitly assesses cognitive judgments of meaningfulness or purposefulness as distinct from happiness, satisfaction, or affect (Ryff & Keyes, 1995). Psychologists of religion have acknowledged that existing research connecting religion to well-being has construed well-being somewhat too narrowly at times (Lewis, Lanigan, Joseph, & de Folkert, 1997;

French & Joseph, 1999; Steger & Frazier, 2005). McGregor and Little (1998) point out this shortcoming in positive psychological research on goals as well and call for the assessment of links between goals and subjective life meaningfulness. Their demonstration of positive relationships between well-being and ratings of goals' meaningfulness supports predictions of such a link, but does not establish a direct relationship between meaningful goals or progress toward them and well-being change over time, as the present study aims to accomplish.

Theoretical Differences Among Goals' Semantic Contents and Underlying Motives

Multiple theories of motivation and well-being describe systematic differences in the relationships between well-being and goals concerning objectives in different life domains. Maslow (1943) proposed an early theory of how the contents of one's focal concerns shift to increasingly advanced needs as more basic needs meet fulfillment. In proposing that people pursue personal growth more when relatively fulfilled overall and pursue material, financial, and emotional security when relatively deprived, Maslow presaged later theories regarding differences in need satisfaction based on the motives and content of one's pursuits. This section will review these theories, beginning with existential psychological research on sources of meaning in life and relative differences in the depth of their meaningfulness. A review of self-determination theory (Deci, 1975, 1980; Deci & Ryan, 1985a, 1991, 2000; Gagné & Deci, 2005; Ryan & Deci, 2000; 2001) will follow, including a detailed examination of empirical research that supports its claims about intrinsic and extrinsic motives and which goals satisfy basic psychological needs intrinsically instead of relying on extrinsic rewards.

Depth of meaning.

As one of the first influential writers in existential psychology, Maslow set the tone for research to come regarding systematic differences among sources of fulfillment based on their focal content. By redefining Goldstein's (1939/1995) term *self-actualization* as the orientation toward boundless personal growth and associating it with optimal need satisfaction and psychological health, Maslow (1943, 1968) foreshadowed a trend in existential theory claiming that relatively abstract and long-term pursuits serve higher-order needs of the self. His hierarchy of motives included self-transcendence and identification with a greater whole or social entity such as a cause of society or humanity itself among these higher-order needs, and distinguished more basic needs such as physical sustenance or security.

More recent theory and research echo Maslow's (1943, 1968) emphasis on self-actualization in their demonstrations of the principle that not all ways in which people seek fulfillment relate equally to the experience of life as full of meaning. For instance, people frequently volunteer and endorse pleasure as a source of meaning in their lives, but pleasure has exhibited negative relationships with global meaning. Conversely, those who prioritize self-transcendent sources of meaning such as religion and spirituality are more likely to report greater meaning in life, as do those who prioritize social relationship-building and support-giving (Crandall & Rasmussen, 1975; Reker, 2000). Reker conceptualizes each of these sources of meaning as occupying different levels of meaning. He posits that hedonistic sources of meaning are less deeply meaningful than

personal growth or achievement, and that social relationships and self-transcendent sources of meaning are even more deeply meaningful.

A correlational analysis of a global meaning index and an independently, empirically developed questionnaire assessing the importance of undergraduates' normative personal goals lent further support to the theory that depth of meaning varies across different goals and values (Stauner & Ozer, 2010). Religious goals and values related most strongly and positively to the presence of meaning (see also Emmons, Cheung, & Tehrani, 1998), whereas immediate financial goals and valuing financial security and pleasure related negatively. Thus at present, both theory and evidence indicate that sources of meaning rank by depth of meaning in the following order from deepest to shallowest: self-transcendence, social relationships, personal growth and achievement, and materialism and hedonism.

One complication for this theory of priority structure arises when considering heterogeneous age groups. Numerous studies have demonstrated differences in the sources of meaning most popular among cohorts covering the lifespan from childhood beyond retirement. In some studies, the pattern of most popular sources across ages follows roughly the same hierarchy as Reker's (2000) theory, with older groups favoring social relationships and younger groups favoring materialistic sources (Bar-Tur, Savaya, & Prager, 2001). Some studies have failed to replicate this pattern (Ebersole & DePaola, 1987; Prager, 1996, 1997). Nevertheless, Sheldon and Kasser (2001) also found differences in the content of personal strivings relating to age in a manner consistent with

Reker's theory, which suggests research on sources of meaning may apply to goal constructs in general.

This does not demonstrate that younger people find their most popular sources of meaning any less meaningful than older groups' preferences; if anything, it demonstrates the contrary and challenges the validity of this theory as applied to children, teenagers, and young adults. Furthermore, overall meaning in life correlates positively with age (Meier & Edwards, 1974; Reker, Peacock, & Wong, 1987; Ebersole & DePaola, 1989; Van Ranst & Marcoen, 1997; Reker, 2000), though Reker and colleagues (1987) noted more meaninglessness in old age relative to middle age. Also, Ebersole and DePaola (1989) found their older participants' descriptions of their life purposes less deeply meaningful than younger participants' purposes as rated by the primary author using previously published criteria (DeVogler-Ebersole & Ebersole, 1985). An earlier study indicated undergraduates can judge the depth of their personal meaning with some degree of objective accuracy (Ebersole & DeVogler, 1981), so perhaps older participants overestimate the depth of their lives' meaning. They may also report greater certainty about the presence of meaning in their lives despite any relative shallowness in their sources of meaning.

Regardless, to whatever extent meaning does increase with age and older groups favor theoretically deeper sources of meaning, age is confounded with depth of meaning. Existent research cannot distinguish developmental effects on depth of meaning from generational effects. Though these points do not challenge the validity of results found within samples with homogeneous age ranges, they raise the standard of evidence

necessary to support an overarching theory that can apply equally to all age groups at once.

Literature in positive psychology offers indirect support for the relevance of Reker's (2000) hierarchy to SWB. Behavior that benefits society or serves a greater life purpose relates positively to SWB, whereas hedonic behavior does not (Steger, Kashdan, & Oishi, 2008). These correlations manifest with SWB ratings both on the day of the behavior and on the following day. Similarly, pursuit of meaning relates more strongly to SWB than the pursuit of pleasure (Schueller & Seligman, 2010).

Self-determination theory.

This section will offer a review of self-determination theory (SDT), especially as applied to the study of goals and well-being. Numerous studies offer evidence to support the claims of SDT regarding moderators of the relationship between goals and well-being. A critique of these studies will follow.

Theoretical background.

SDT claims to explain the apparent inferiority of materialistic pursuits to social and self-transcendent pursuits in their service to well-being broadly defined. Self-determination theorists assert that when one does not find a pursuit intrinsically enjoyable and motivating, and instead relies on an external source of reward for motivation, this engenders a form of suffering: deprivation of the fundamental psychological need for autonomy (Deci, 1971, 1972a, 1972b, 1975, 1980; Deci, Koestner, & Ryan, 1999a, 1999b; Deci & Ryan, 1985a, 1991, 2000; Gagné & Deci, 2005; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Ryan & Deci, 2000; Ryan et al., 1999; Kasser & Ryan, 1996;

Sheldon & Kasser, 1995, 1998; Sheldon, Ryan, & Reis, 1996; Sheldon et al., 2004).

Since these theorists conceive materialistic pursuits as routinely producing a reward only at the conclusion of the pursuit, they suppose that materialistic pursuits deprive one of autonomy by requiring extrinsically controlled, unpleasant behavior in the immediate present, in spite of one's natural inclinations. For instance, a telephone salesperson might engage in long, uncomfortable hours of unpleasant and repetitive conversation, delaying any urges to eat, relax, or pursue enjoyable activity, with only a paycheck to look forward to at the end of the month.

Self-determination theorists also consider many social image and status goals extrinsic. Rather than relatively healthy social goals to build relationships or help others, extrinsic social goals aim to attract attention, receive praise, or gain popularity. Like most financial goals, these rewards rely on others to award them instead of occurring naturally within oneself. Furthermore, they often require unrewarding or unpleasant activity, and often only represent the means to other desired ends. For these reasons, self-determination theorists describe such social goals as equally extrinsic to materialistic goals.

In contrast, intrinsically motivated goals produce their rewards more through the acts of pursuit themselves, thus guiding and motivating action autonomously. As one engages in such activity, the activity rewards the person with positive emotions and energy. This appeals to human nature far more than less immediately rewarding actions, which require willpower to summon energy and patience to tolerate any unappealing circumstances and delay gratification of more immediate desires along the way. Self-

determination theorists define intrinsic goals to include those regarding intimate and nurturing relationships, personal meaning and growth, and contribution to society. In addition to the likelihood that people pursue such goals voluntarily and autonomously, these goals may also reward their pursuers directly by satisfying needs for relatedness and competence.

Empirical research.

This contrast between autonomous and controlled motives reflects itself in the relationships of each with well-being change. Intrinsically rewarding and autonomously motivated goals demonstrate more positive relationships with well-being than do extrinsically rewarding and motivated goals. Some studies have demonstrated this link between intrinsic motivation and well-being with cross-sectional correlations (Sheldon & Kasser, 2001; Kasser & Ryan, 2001; Schmuck, Kasser, & Ryan, 2000). Others have utilized longitudinal designs for predicting well-being change concurrent with reports of progress and in weeks following, with intervals ranging from five days to one year (Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002, 2004). Furthermore, Sheldon and colleagues (2004) provide longitudinal evidence that endorsing goals of extrinsic content relates independently to well-being losses when controlling for the autonomy expressed in reasons for pursuing the extrinsic goals. To explain this, they suggest that the valuation of extrinsic pursuits may relate to unhealthy traits such as insecurity, a propensity for excessive social comparison, or a lack of self-esteem, social connectedness, or enjoyable activity. The speculativeness of the explanations offered

implies a need for more in-depth analysis of basic personality traits and psychological well-being measured concurrently with goal content, motivation, and SWB.

Some SDT studies on goals have considered well-being indicators other than SWB. Ryan et al. (1999) found that ratings and rankings of intrinsically rewarding goals as more important than extrinsically oriented goals from a predefined list of possible goals related to greater self-esteem, self-actualization, life satisfaction, and less depression in Americans and Russians (excepting female Russians with regard to depression and life satisfaction, and self-esteem as related to rankings). Ratings of current attainment of these intrinsic goals also related to greater self-esteem, self-actualization, life satisfaction, and less depression, whereas current attainment of extrinsic goals only related to self-actualization and life satisfaction before controlling for intrinsic goal attainment in America and Russia. Among Russian participants only, current attainment of extrinsic goals also related to less depression before controlling for intrinsic goal attainment and more life satisfaction after controlling for intrinsic goal attainment.

Sheldon and colleagues (2002) found that vitality relates to a preponderance of intrinsic motivation and relatively low extrinsic motivation. Nix, Ryan, Manly, and Deci (1999) found that good task performance benefits happiness regardless of one's motives, but only benefits vitality when autonomously motivated. Sheldon and Kasser (1995) found conflicting results across two studies regarding vitality and the degrees to which participants' goals serve outcomes that SDT classifies as intrinsically or extrinsically valuable. One study found a positive relationship with goals serving extrinsic objectives

when controlling for intrinsic objectives, whereas the second found a positive relationship with goals serving intrinsic objectives when controlling for extrinsic objectives. In the second study, Sheldon and Kasser also examined participants' journal entries for frequency of meaningful and distracting activities. The degree to which participants' goals served intrinsically valuable objectives related positively to the frequency of meaningful activities when controlling for extrinsically valuable objectives. In contrast, the degree to which participants' goals served extrinsically valuable objectives related positively to the frequency of distracting activities when controlling for intrinsically valuable objectives. While this mostly supports the notion that relationships with SWB should generalize to meaning in life, the inconsistency of these results regarding vitality further demonstrates the need to assess the variety of well-being outcomes directly before assuming relationships generalize across all dimensions of well-being.

Critique of Self-Determination Theory.

Existing research has reported promising evidence that the relationship between goal attainment and well-being change depends on motives and goal contents in general, but many finer points of this principle remain unclear or insufficiently demonstrated. Do intrinsic and extrinsic motives still operate equally and oppositely when considered separately? What about intrinsic and extrinsic goal contents considered separately? Are all intrinsic goal contents equally intrinsic, and vice versa regarding extrinsic goals? The following section will review the limitations of existing studies that prevent them from addressing these questions, which the present study will.

Though many separate studies have demonstrated that motives and goal content moderate the relationship between goal attainment and well-being (Sheldon & Kasser, 1995, 1998, 2001; Sheldon & Elliot, 1999; Sheldon et al., 2002, 2004), methodological inconsistency diminishes the cumulative weight of evidence reported in this research. Only two studies have considered each component of motivation (extrinsic, introjected, identified, and intrinsic) separately (Sheldon & Kasser, 1995; Sheldon et al., 2004). The other four aggregated all four aspects in apparently inconsistent ways (earlier studies weighted extrinsic and intrinsic motivation to bear twice the influence of introjected and identified motives, whereas more recent studies seem to weigh all four motives equally), and only provided statistical results regarding these aggregates representing the balance of autonomous versus controlled motives. While results using the aggregate of autonomous versus controlled motivation have considerable consistency, the relatively sparse information about extrinsic and intrinsic motivation considered separately appears inconsistent with the aggregate. Extrinsic and intrinsic motivation do not relate to well-being oppositely, much less equally so. These results warrant further consideration of all aspects of motivation as potentially independent constructs, rather than as indicators of latent self-determination.

SDT postulates systematic differences in the self-determination of goals based on their semantic content, but supporting evidence has only described general relationships between latent constructs based on aggregates of motives and content. As with the latent self-determination of motives, three studies subtracted ratings of the extent to which goals served extrinsic purposes from ratings of service toward intrinsic purposes, and

reported analyses using only this latent construct representing overall preponderance of intrinsic orientation over extrinsic orientation (Sheldon & Kasser, 1995, 1998; Sheldon et al., 2004). Though this construct coheres with SDT's framework, Sheldon and Kasser reported strong positive correlations between ratings of goals' service toward intrinsic and extrinsic purposes, as do Carver and Baird (1998), which indicates that people do not experience these oppositely scored orientations as mutually exclusive opposites or even contrasting. Thus a latent dimension that contrasts intrinsic orientation against extrinsic orientation may not apply meaningfully to any given goal that serves neither or both purposes, which may include the majority of people's goals.

Moreover, Sheldon and colleagues (2002) described their calculation of the orientation aggregate as a simple average, rather than extrinsic orientation subtracted from intrinsic orientation as described in the previous studies cited above. This raises the question of whether the authors of these four studies estimated the latent orientation construct in a consistent manner, especially in light of the similar concerns previously mentioned regarding the latent self-determination of motivation construct. Thus considerable ambiguity remains in the meaning of correlations between external variables and this latent construct that may or may not contrast goals' service toward purposes that may co-occur more than they contrast. Their positive relationships between well-being and what they describe as the simple average of intrinsic and extrinsic motivation would seem to threaten the validity of theory that portrays extrinsic motivation as unhealthy. Hence the theoretical impact of this evidence hinges on whether their calculation was consistent with previous work but was described imprecisely, or vice versa.

Setting this ambiguity aside, the preponderance of goals' service toward intrinsic outcomes over extrinsic outcomes correlated positively with latent self-determination of motivation in the two articles that report this correlation (Sheldon & Kasser, 1998; Sheldon et al., 2004). However, latent self-determination of motivation correlated positively with ratings of goals' service toward both intrinsic and extrinsic outcomes in the only two articles to report separate analyses of these theoretically contrasting orientations, the first of which reports this result as arising consistently from two separate samples (Sheldon & Kasser, 1995; Carver & Baird, 1998). This further undermines the empirical validity of the authors' system for estimating the orientation of goals' content as intrinsic or extrinsic, since a preponderance of intrinsic over extrinsic motivation appears to characterize goals with both intrinsic and extrinsic orientations more often than not. Only Carver and Baird (1998) reported analyses of correlations between motives (both intrinsic extrinsic) and orientations (both intrinsic and extrinsic) without aggregating the intrinsic and extrinsic ratings first.

No evidence has demonstrated that people pursue theoretically extrinsic goals mainly because of external pressure or guilt. A negative relationship with intrinsic motivation could shape correlations with the self-determination aggregate regardless of the relationship with extrinsic motivation. Hence the postulate that people pursue goals that serve the purposes classified as extrinsic for extrinsic reasons instead of intrinsic reasons appears unsupported by the evidence at hand, if not tentatively falsified by weakly positive correlations between the self-determination aggregate of motivation and

goals that serve outcomes that SDT considers extrinsic like financial gain and physical attractiveness (Sheldon & Kasser, 1995; Carver & Baird, 1998).

This evidentiary gap admits the possibility of complex relationships between goals' contents and motives. SDT research on goals does not report analyses of the specific relationship between intrinsic orientation and intrinsic motives (let alone the three other possible combinations including extrinsic orientation or motives), despite results that indicate unequal relationships and even independent predictive "effects" on other variables. Intrinsic or extrinsic contents and motives may occur independently or relate in other ways that defy theory, especially in certain populations or classes of goals. Among student populations that still depend on their parents more than older populations (such as those recruited for the majority of psychological research, including the relevant SDT research on goals), extrinsic and introjected motives occur more frequently (Sheldon & Kasser, 2001). These motives may conceivably apply to any goal, even those goals possessing content of such theoretically intrinsic orientations as spiritual growth, meaningful career achievement, or familial relationship maintenance (Carver & Baird, 1998). For instance, one would likely consider the goals, "Be a better Christian," "Become a doctor," or "Keep in touch with my parents" intrinsically oriented in their content according to SDT's classification of personal growth and social closeness as intrinsic outcomes. Yet students whose parents demand religious adherence, impose career goals upon them, or might refuse or neglect to pay tuition if relational upkeep lapses might volunteer these overtly intrinsic goals for entirely extrinsic reasons. Though such cases may not represent the majority of even the student population, the proportion

of the population to which it does apply remains unclear until researchers analyze relationships between the content of goals and the separable aspects of their underlying motives.

Existent research has also not addressed the possibility that classifications of goals' content as intrinsically or extrinsically oriented may not fit equally well across the various goals that fall into each theoretical designation. In data analytic practice, SDT research on goals has treated personal growth and relational intimacy as equally intrinsic possible futures, and physical attractiveness and financial gain as equally and oppositely extrinsic possible futures. If two of a person's goals serve personal growth and relational intimacy separately but equally, no evidence exists to support the assumption that the person pursues both goals for equally intrinsic reasons, let alone that both goals intrinsically reward the person equally. Such evidence would only arise from independent analyses of the intrinsic motivation lending energy to or the intrinsic reward gained from goals belonging to each category of intrinsic content, which the present study aims to provide.

Last, SDT research on goals' content has approached the assessment of goal content orientation in a somewhat indirect and subjective manner. Rather than coding the exact content of participants goals as they volunteered them, participants have rated the degree to which their goals serve six specific "possible future" outcomes chosen by researchers. This threatens to incorrectly classify presumably intrinsic goals like, "Become a doctor and help people like I've always dreamed," as extrinsic if a participant sees such a goal's potential to bring financial success or popularity, even if only the

realization of personal growth and the opportunity to contribute meaningfully to society actually motivate the individual. This method also rests the validity of content categorizations on the participants' inevitably varying comprehension of the rating exercise itself. Coding systems exist to guide independent judges in classifying others' goals objectively, and may suit the aims of SDT research on goals far better than the methods employed in research to date (Ford, 1992; Kaiser & Ozer, 1997; Emmons, 1999).

Other Goal Characteristics Relevant to Well-Being

Aside from goals' contents and underlying motives, researchers have identified other goal characteristics related to well-being. These include perceived attainability, social or environmental support, goal conflict, and amount of effort expended in goal pursuit. This section will review theory and research regarding each of these characteristics and their connections to well-being in turn.

Probability of success and self-efficacy.

Existing research depicts a complex relationship between well-being and the perceived probability of attaining one's goals. People's judgments of the likelihood that they will succeed at their goals relate to life satisfaction and the difference of positive and negative affect, but not to positive affect alone (Emmons, 1986). Probability of success also relates negatively to lower negative affect (NA) when controlling for their ratings of the degree to which they have fulfilled past goals. This relationship with NA has a curvilinear aspect as well: people who express a great deal of confidence that they will

achieve their goals also report moderately higher NA than people with moderate expectations of success.

In discussing these results, Emmons (1986) cites Diener's (1984) point that people's unmet expectations of their own lives may cost them happiness. However, Emmons acknowledges the tendency of theorists to make causal claims about strivings in regard to presumptive effects on well-being without sufficient empirical support, and also offers an alternate interpretation: NA may express itself through a pessimistic outlook regarding one's goals. Since each interpretation only offers an explanation for high NA in the case of high or low probability of success, respectively, perhaps both explanations possess equal validity regarding the connection between NA and the respective extremes of success probability. When unusually optimistic, a person may expose oneself to future experiences of irritation, distress, guilt, or shame. Conversely, pessimism about one's goals may result from other sources of irritation, distress, guilt, or shame in a person's life. Since pessimism about one's most salient goals also poses a plausible cause of fear, distress, nervousness, or shame, causal pathways may flow bidirectionally between a poor outlook and overall affect. This would produce the potential for exacerbating feedback, which might explain why people who expect failure express the most NA of all.

In other studies, Roberson (1984) found probability of success correlated with job satisfaction. Ruchman and Wolchik (1988) conducted a principal axis factor analysis of 17 goal ratings, including ratings of progress and expectations of desirable outcomes. These two ratings loaded on the same varimax-rotated factor with loadings over .50,

implying a positive correlation. Individuals' factor scores correlated positively with well-being and negatively with distress. Though these analyses disallowed separate consideration of well-being's relationships with progress, perceived attainability, and other components of Ruehlman and Wolchik's (1988) goal mastery factor, the results followed the general trend others reviewed here. Moreover, Ruehlman and Wolchik's interpretation of their results emphasized likelihood of success as the decisive element connecting their mastery factor to well-being, but echoed Emmons (1986) in noting that dispositional characteristics such as depression might just as plausibly cause pessimism as result from it.

Goal researchers have also studied goal-related self-efficacy (for a review, see Eccles & Wigfield, 2002), which bears considerable semantic and empirical resemblance to the likelihood of success. Karoly and Ruehlman (1995) and Sheldon and Kasser (1998) presented measures of goal-related self-efficacy that asked participants to rate the degree to which they have the abilities their goals require for success. Though some degree of distinction exists between consciously possessing the ability to succeed and considering oneself likely to do so, this measure of self-efficacy related negatively to depression (Karoly & Ruehlman, 1995), much as probability of success related negatively to NA (Emmons, 1986), and positively to aggregate subjective well-being (Sheldon & Kasser, 1998). Little's (1989) review of goal research also emphasized self-efficacy as a product of goals that foster well-being.

In a longitudinal study of nurses' job satisfaction, emotional exhaustion, and goals, Pomaki and colleagues (2009) assessed goal-related self-efficacy and attainability

separately. They defined attainability as goals' combined lack of difficulty, independence from external determinants of success, and absence of interference from external sources of stress. Self-efficacy combined participants' ratings of confidence in their ability to succeed with ratings of the degrees to which they possessed the requisite skills and energy. As such, neither construct corresponds directly and uniquely to Emmons' (1986) probability of success survey item, though this formulation of self-efficacy at least includes a semantically equivalent rating as an estimator and combines it with equivalents of others' self-efficacy constructs (Karoly & Ruchman, 1995; Sheldon & Kasser, 1998), whereas this attainability aggregate combines difficulty, locus of control, and environmental support (as discussed below).

Pomaki and colleagues' (2009) self-efficacy and attainability constructs correlated moderately and positively, but predicted changes in job satisfaction oppositely: self-efficacy predicted increases, whereas attainability predicted decreases. However, when entered simultaneously with goal progress and all interaction terms in multiple regression, only the interaction of goal progress and attainability and the three-way interaction of these with self-efficacy predicted changes in job satisfaction and emotional exhaustion. Pure self-efficacy ratings (possessing skills and resources regardless of probability of success) have also failed to predict change in subjective well-being over time (Sheldon & Kasser, 1998). These results underscore the need for further longitudinal investigation of difficulty, success probability, and environmental support as moderators of the relationship between well-being change and goal attainment.

Social and environmental support.

Results thus far regarding the relationship between well-being and external support have also failed to reach consensus. Ratings of social support received for one's goals related to life satisfaction in two studies (Palys & Little, 1983; Bowie-Reed, 1984, as cited in Ruchman & Wolchik, 1988) and quality of life in the latter study, but did not relate to psychosocial adaptation in another study (Altman, 1992). In a fourth, support for one's goals from the three most important people in a person's life related to well-being, but only the most important person's support related negatively to distress (Ruchman & Wolchik, 1988), whereas hindrance from all three related positively to distress and negatively to well-being. Only the most important person's support predicted well-being in hierarchical regression controlling for goal mastery, strain, and personal involvement though, and only that person's hindrance predicted distress in a similar analysis. In a study of collective goals, job satisfaction related positively to perceptions of the degree to which an organization's shared goals were clear to its individual members and each individual's fellow members (Haas, Sypher, & Sypher, 1992). Still, in the relatively recent longitudinal study reviewed above, Pomaki and colleagues' (2009) attainability construct, which included ratings of external interference (reverse-scored), predicted decreases in nurses' job satisfaction over time, as did its interaction with attainment ratings of work goals, which also predicted increases in emotional exhaustion.

Nonetheless, most theory regards social and environmental support as beneficial. Ryff's (1989, 1995) structural theory of psychological well-being counts positive social

relationships among the components of psychological well-being. Research on longevity suggests a social life supports physical health as well (Buettner, 2009, 2010). Little (1989) argues that goals improve well-being when socially supported. Sennott (2011) reported a positive correlation between life satisfaction and a measure of social support not specifically related to goals. Ruchman and Wolchik (1988) interpret the positive implications of social support for well-being as operating indirectly through presumed effects on goal attainment, rather than connecting well-being to the experience of social contact and cooperation directly.

Some theorists disagree as to whether sharing one's goals with others predicts more (Shteynberg & Galinsky, 2011) or less activity relevant to them (Gollwitzer, Sheeran, Michalski, & Seifert, 2009), but the empirical evidence supporting both positions lacks direct assessment of social support, disregards other auspicious (or inauspicious) circumstances, and does not connect these constructs to well-being. In addition, Gollwitzer and colleagues (2009) did not assess goal attainment or subjective effort, so the decrease in goal-directed activity they documented may not have reflected decreases in these at all: less activity may have reflected earlier attainment thanks to increased social support. Further study that measures all of these factors concurrently, directly, and distinctly appears due.

Brunstein (1993) conducted one such study in which he assessed goal attainability as the combination of his participants' ratings of their everyday opportunities to pursue, internal locus of control regarding, and social support received for their goals. This aggregate predicted increases in well-being over time, though the strength of this

relationship depended on participants' individual degrees of commitment to their goals. Furthermore, Brunstein's (1993) attainability construct, commitment, and their interaction all related to goal progress, which partially mediated the relationship between the attainability-commitment interaction and well-being change. This lent partial support to Ruchman and Wolchik's (1988) suggestion that social support affects well-being through goal progress, though Brunstein (1993) did not test for mediation of his attainability construct apart from commitment, nor provide firm causal evidence.

Sheldon and Kasser (1998) claimed a failure to replicate Brunstein's results, but used a single-item-per-goal rating of self-efficacy where Brunstein used three-item-per-goal ratings of independence and support from one's environment. Since Pomaki and colleagues' (2009) self-efficacy and attainability constructs predicted opposite changes in job satisfaction over time, Sheldon and Kasser's (1998) efficacy item may have tapped a psychological construct that differs from Brunstein's attainability construct at least as much as subjective well-being differs from meaning in life. Again, the need for further investigation seems implicit in this disparity.

Effort.

Emmons (1986) found evidence that subjective ratings of effort invested in goal pursuit relate to positive affect (PA), but do not relate to NA, despite his initial hypothesis to that effect. It appears he based this hypothesis on the apparent similarity of effort and difficulty ratings, which correlated strongly with one another and loaded negatively on a factor of goal ratings contrasting probability of success without action, environmental opportunity, and frequency of past successes against difficulty and effort.

Nevertheless, difficulty related to NA with marginal significance and correlated negatively with PA (albeit insignificantly) and the difference of participants' PA and NA. Effort's opposite correlations with these affect variables differed significantly. This implies a caveat to Brunstein's (1993) recommendation that researchers may reduce correlated goal ratings to unidimensional scores based on a common factor when predicting well-being: secondary analyses should test each rating separately, as subtle distinctions between very strongly correlated goal ratings can clearly carry important consequences.

Effort predicted PA independently of value and past attainment ratings in multiple regression (Emmons, 1986). Emmons cited Klinger (1977) as arguing that valuing a goal should lead to increased effort, which in turn should promote attainment and PA. Emmons presented a positive correlation of effort with value, but no direct correlation with past attainment, only a negative correlation with an aggregate of past attainment, frequency of success, and satisfaction with success. He also suggested effort that produces attainment may bolster self-efficacy as a mediator of the relationship between attainment and PA. The aforementioned aggregate of past fulfillment related to probability of success, PA, and life satisfaction, but probability of success related to subjective well-being in more complex ways as reviewed above. In sum, Emmons offered clear implications for further mediational analyses of the attainment-to-well-being relationship, but left some tests undone, and presented results of others that might challenge his own mediational assumptions. Replication and more thorough mediational analysis may provide valuable insight for this unfinished theory. Flow theory argues that

challenging activity fosters well-being as well (Csikszentmihalyi, 1975, 1990). Optimally challenging activities may produce experiences that satisfy the need for competence (White, 1959; Reis et al., 2000; Sheldon et al., 1996) and prevent people's minds from wandering, which may relate negatively to happiness (Killingsworth & Gilbert, 2010). This theory suggests possible well-being benefits derive from the experience of effortful goal pursuit rather than from the presumably increased likelihood of attainment as Emmons' (1986) theory proposes. However, an upper threshold likely applies to the flow experience just as it does to performance (Yerkes & Dodson, 1908; Anderson, Revelle, & Lynch, 1989), so attainment may moderate any relationship of effort with well-being to whatever extent it indicates that the challenge a goal poses does not exceed its pursuer's ability.

Goal conflict.

The overall degree of conflict among individuals' goals relates to a number of indicators of well-being and psychological distress. People with conflicted personal projects report lower life satisfaction (Palys & Little, 1983). They also express lower emotional well-being (Riediger & Freund, 2008), including more negative affect (Emmons, 1986; Boudreaux & Ozer, in press) and symptoms of somatization, anxiety, and depression when experiencing conflict among their personal strivings, ratings of which also predict increases in these problematic feelings over time (Emmons & King, 1988). A study of goal integration (as opposed to conflict) found a positive relationship with vitality among Dutch people, though not among Spanish people (van Dierendonck, Rodríguez-Carvajal, Moreno-Jiménez, & Dijkstra, 2005). In as much as meaning in life

relates to life satisfaction (Chamberlain & Zika, 1988; Steger et al., 2006; Steger & Kashdan, 2007) and psychological distress (Debats et al., 1993; Kállay, 2008; Strack, 2008), goal conflict may predict changes in meaning in life as well. However, Sheldon and Kasser (1995) failed to replicate Emmons and King's (1988) correlation between goal conflict and negative affect.

Emmons and King's (1988) participants also reported fewer activities related to their strivings in proportion to the amount of conflict among their strivings. Though this study did not assess participants' attainment of their strivings, these results regarding striving-related activity concord with recent evidence that conflict relates to goal attainment as well (Boudreaux & Ozer, in press). In light of other theorists' claims that goal attainment promotes well-being, goal conflict may reduce well-being by preventing goal attainment. To whatever extent this mechanism produces the relationship between conflict and well-being, it would imply goal attainment mediates this relationship.

However, Emmons and King (1988) mostly discuss the dysphoric and psychologically distressing qualities of the experience of conflict as mechanisms for the relationship between goal conflict and well-being. Since goal conflict and attainment relate, regressions predicting well-being must control for goal attainment to establish a direct, unmediated relationship with (let alone an effect of) goal conflict. Regardless, to whatever extent goal conflict produces dysphoric or psychologically harmful experience, conflict may moderate the relationship between goal attainment and well-being just as motives do. Since SDT theorists have proposed enjoyable experience and fulfillment of psychological needs *en route* to goal attainment as the mechanism by which self-

determined motivation strengthens the relationship between goal attainment and well-being, one might also expect the opposite effects of goal conflict to weaken the link.

Moreover, attainment of conflicted goals might reduce well-being as a conclusion-contingent effect, setting aside any effects of the dysphoric or unhealthy experience throughout the process that concludes upon goal completion. Attainment of a goal that conflicts with a person's other goals may actually set progress back on other goals if the conflict arises due to mutually incompatible outcomes rather than scarcity of time or energy. For instance, the goal to take a cruise need not conflict with the process of saving money if one receives paid vacation time, but succeeding at such a goal would certainly distance a person from any financial goal toward which one concurrently strives. This kind of goal attainment (even taking a cruise) might conceivably reduce overall well-being if the relationship with goal attainment depends less upon the quality of the pursuit experience than upon the overall discrepancy one perceives between one's actual and ideal achievements, as self-discrepancy theory would suggest (Higgins, 1987; Boldero & Francis, 2002). If instead people judge their subjective well-being by reflecting on the quality of recent experiences rather than by their actual-ideal discrepancy, the experience of progressing toward a conflicted goal might produce well-being nonetheless, as Klinger's (1977, 1998) theory would suggest, unless one also experiences the loss of progress toward other goals consciously and concurrently.

Goal attainment might also moderate the relationship between goal conflict and well-being, in that goal attainment could resolve conflict and alleviate its supposed effects on well-being, a possibility that Emmons and King (1988) imply. Lewin's (1935)

theory on various forms of goal conflict also predict effects of goal progress on goal conflict under certain circumstances, mostly ameliorative; though in the case of approach-avoidance conflict, this theory predicts conflict to rise as completion nears. Regardless of such exceptions, if goal attainment tends to resolve conflict more often than not, attainment may attenuate any negative effects of conflict over time by reducing the duration of one's suffering. Unfortunately, this possibility would introduce ambiguity into the interpretation of a significant predictive relationship between well-being and the interaction between goal attainment and conflict in the presence of independently significant main effects from each, since either variable could plausibly moderate the potential main effect of the other.

Purpose and Hypotheses of This Study

This study aims to test whether the relationship of goal progress with emotional SWB generalizes to existential and psychological well-being, and whether goal content and autonomous motivation moderate any such relationships in the same manner they moderate the relationship with SWB. That is to ask, does the relationship between goal attainment and SWB gain (Brunstein, 1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002) generalize to changes in meaning in life and psychological well-being (and each of its six dimensions) as well? If so, do the relationships of meaning and PWB to goals depend on goal contents and motives in the same way as the relationship of SWB?

In summary, this study will test the following hypotheses:

1. The positive relationship of goal attainment with changes in subjective well-being (Brunstein, 1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002) will generalize to changes in psychological well-being and the presence of meaning in life. This hypothesis finds support in theories that identify goals as sources of meaning (Klinger, 1977, 1998; Emmons, 1999; Reker & Wong, 1988; Reker, 2000; Bell, 2007), and in evidence that SWB relates strongly to meaning (Steger et al., 2006) and PWB (Ryff, 1989).
2.
 - a. Participants' ratings of their goals' underlying motives will moderate the aforementioned relationships between their overall goal progress and all kinds of well-being change, such that these relationships will emerge stronger when participants rate their goals as more intrinsically motivated and less extrinsically motivated. Studies have demonstrated this pattern of moderation in the relationship of goal progress to SWB (Sheldon & Kasser, 1995, 1998, 2001; Sheldon et al., 2004; Kasser & Ryan, 2001).
 - b. This relationship will also strengthen when participants rate their goals as more meaningful, congruent with their values and life purpose, and attainable at the outset, and less conflicted, more effortfully pursued, better enjoyed, and supported by their environments in retrospect.
3. Goal content will also moderate the aforementioned relationships between goal progress and all kinds of well-being change. Greater well-being gains will occur when participants report progress on goals of intrinsic content or deep meaning, as

opposed to extrinsic or relatively shallow goals. Self-determination theorists define materialistic goals and goals to receive attention, admiration, or other rewards from people as extrinsic, whereas goals regarding close relationships, personal fulfillment, and contribution to society exemplify intrinsic goals (Sheldon & Kasser, 1995, 1998, 2001; Sheldon et al., 2004; Kasser & Ryan, 2001). These studies support a positive link of SWB to intrinsic goals and a negative link to extrinsic goals. Reker (2000) ranks self-transcendent sources of meaning as most deeply meaningful, followed by social relationships, personal growth and achievement, and hedonism least of all. Cross-sectional correlations demonstrate links to global meaning among these specific sources that follow this pattern (Stauner & Ozer, 2010; Emmons et al., 1998).

Method

Participants

Undergraduates at the University of California, Riverside (UCR) were recruited through the subject pool, which is composed of students seeking to fulfill the research participation requirements of their introductory psychology courses. In total, 407 individuals participated during the Spring and Fall academic quarters of 2011, of whom 360 provided data at both the first and second assessment points within their respective quarters. Participants were mostly young adults (mean age = 19.6 years, range = 17 – 44), female (69%), freshmen (43%), and enrolled in a full-time course load (89%). The sample represents the ethnic diversity of UCR, claiming East Asian, “Asian,” and Pacific Islander (42%), Hispanic and Latin (27%), European and “White” (14%), African-American, African, and “Black” (6%), Western and South Asian (5%), and multiple (5%)

ethnicities. Participants estimated their respective families' annual incomes as less than \$50,000 (46%), between \$50,000 and \$75,000 (20%), between \$75,000 and \$100,000 (12%), between \$100,000 and \$125,000 (10%), or more than \$125,000 (13%). This distribution resembles that of annual household income in the US (US Census Bureau, 2011).

Participants identified their respective religious affiliations at the second assessment point, and gave their romantic relational status and employment status. Majorities reported their statuses as not in a committed romantic relationship (58%) and unemployed (71%). A small majority of participants affiliated with Christianity (51%); the largest minority self-identified as atheist, agnostic, or otherwise non-religious (22%); the remainder affiliated with Buddhism (8%), Islam (2%), Hinduism (1%), or another religion (2%). Participants who did not return to complete the second assessment (15%) did not give their religious affiliations.

Materials

The survey began with a brief demographics questionnaire. Following this, participants completed a large battery of measures. Only those used in the current study appear below. (See Appendix A for a complete list.)

Well-being measures.

The Meaning in Life Questionnaire (MLQ; Steger et al., 2006) consists of 10 statements rated for agreement on a seven-point Likert scale. These include five evaluations of the presence of a global, subjective sense of meaning in one's life (e.g., "My life has no clear purpose," a negatively coded item), and five expressions of the

motivation to search for meaning in life (this subscale was not used in the present analyses). This study only employed the Presence subscale to represent existential well-being.

The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) consists of five statements evaluating the global sense of satisfaction with one's life (e.g., "I am satisfied with my life"), also rated for agreement on a seven-point Likert scale. The Positive And Negative Affect Schedule (PANAS; Watkins, Tellegen, & Clark, 1988) consists of 20 emotion words rated for the degree to which they represented a participant's experiences over the past few weeks on a five-point Likert scale ranging from "Very slightly or not at all," to "Extremely." Ten of these words are coded as positive (e.g., "Excited"), and the other half are coded as negative (e.g., "Distressed"). To represent subjective well-being (SWB) as a whole, a composite variable combined the standardized and averaged scores for life satisfaction, positive affect (PA), and reverse-scored negative affect (NA; Andrews & Withey, 1976; Diener, 1984).

Last, the Psychological Well-Being (PWB; Ryff, 1989; Ryff & Keyes, 1995; Springer & Hauser, 2006) index consists of 54 statements rated on a six-point Likert scale, which forces participants to agree or disagree at least slightly. These items are divided evenly across six subscales, including environmental mastery (e.g., "I often feel overwhelmed by my responsibilities," a negatively coded item), self-acceptance (e.g., "In general, I feel confident and positive about myself"), purpose (e.g., "My daily activities often seem trivial and unimportant to me," a negatively coded item), autonomy (e.g., "I tend to be influenced by people with strong opinions," a negatively coded item), positive

relations (e.g., “I know I can trust my friends, and they know they can trust me”), and personal growth (e.g., “I am not interested in activities that will expand my horizons,” a negatively coded item). The average of these six subscale scores represented overall PWB.

Goal assessments. Participants completed an open-ended goal listing questionnaire (Kaiser & Ozer, 1997). For each of the 10 goals listed, the survey asked for a sentence elaborating on why the participant pursues the goal. A brief set of instructions offering examples preceded the goal listing task. After completing this task, participants assigned each goal to one of eight normative categories provided (see Appendix B).

Participants then rated each of their goals on a variety of dimensions (see Appendix C), including their meaningfulness, difficulty, expected probability of attainment, degree of consistency with the participants’ own personal values (value concordance) and deeper life purposes (life purpose concordance), the participants’ willingness to invest time and energy in the pursuit, time frame for completion, and the four self-concordance dimensions used by Sheldon and Elliot (1999). These four questions asked the extent to which participants’ reasons for pursuing each of their goals matched each of four theoretical categories (in order of decreasing self-concordance): intrinsic motivation (for fun or personal interest), identification (for the importance or personal value of the goal), introjection (to avoid feeling guilt, shame, or anxiety), and extrinsic motivation (a social or situational demand). This survey also requested a fifth rating of extrinsic reward (material gain or avoidance of material loss) to separate such

reasons from extrinsic demand, though other researchers rarely assess these two aspects of extrinsic motivation separately. With the exception of time frame, all goal ratings used four-point Likert scales. The time frame ratings used a five-point scale with the following anchors in order of decreasing time frame: “Enduring life goal or guiding value (e.g., ‘Make the most of life’),” “Next few years (more than 1 year),” “Next few months (less than 1 year),” “Short term (less than 1 month),” and “Day-to-day goal (e.g., ‘Take out the trash’).”

At the second assessment time point, the same measures of well-being were employed. First, each participant’s goals from the first time point were displayed and rated on the amount of progress attained in the elapsed time. Additional retrospective ratings included effort expended, support perceived from the social environment, facilitation from versus conflict with other goal pursuits, and meaningfulness; again, each used a four-point Likert scale.

Procedure

Participants logged in to UCR’s research participation website to sign up for the study. Each participant provided an email address, at which each received a personalized hyperlink to the survey, which Qualtrics.com hosted. Participants followed this hyperlink to complete the survey at their own choice of place and time. All Spring quarter participants responded to the first part of the survey near the beginning of the quarter, and returned to finish the second part near the end. The intervening intervals for these participants ranged from 29 – 60 days (mean = 41, $SD = 4$). All Fall quarter participants

responded on a similar schedule; their intervening intervals ranged from 43 – 65 days (mean = 56, *SD* = 4).

To supplement participants' own categorizations of their goals' content, panels of judges provided independent and relatively objective categorizations of the sample's goal content. These judges used content codes from a comprehensive taxonomy of undergraduates' goals at the University of California, Riverside, which was derived empirically from over a decade of research and a sample of goals numbering in the tens of thousands (Kaiser & Ozer, 1997; see revised version in Appendix D). This taxonomy organizes all normative goals into eight broad categories: Academic/Occupational, Social Relationships, Financial Concerns, Health, Organization, Affect Control, Independence, and Moral or Religious. Each of these categories also subdivides hierarchically into two further levels of categories with increasing specificity. For example, a goal like "Spend more time studying" corresponds to content code 1.12, "Study harder," which is a specific subgroup of category 1.1, "Perform well at school or job," which is itself a subgroup of Academic/Occupational goals.

In the first round of coding, three judges assigned each goal the codes that they believed best represented the content of the original goal. When two judges chose the same code, that code was retained. When two judges chose different codes that belonged to the same higher-level category, that higher-level category's code was used. When all three judges coded a goal as belonging to entirely separate top-level categories, a fourth judge offered an additional chance for two codes to agree by the same criteria. Finally, when this fourth judge chose a different top-level category than the other three, a panel of

at least eight judges met to resolve coding disagreements. Thus this procedure provided a code for every goal. For the sake of simplicity, all analyses presented herein considered only the highest level of each goal's code (i.e., treated "Study harder" and "Achieve meaningful career goal" as equivalent Academic/Occupational goals).

Results

Participants' subjective, existential, and psychological well-being were compared across two times near the beginning and end of an academic quarter. The second measurements of well-being served as the primary dependent variables of the study. Each participant's goal progress and success ratings were standardized and averaged across all of his or her goals to produce a single overall goal attainment rating for each person. These individual ratings correlated very strongly ($r = .79$). This attainment rating served as the primary independent variable, and was entered with the first measurement of the well-being measure of interest in multiple regression predicting the second well-being measurement (Cohen & Cohen, 1983). Other goal ratings and their interactions with attainment were also added as predictors to subsequent regressions to test for moderation of the link between goal attainment and well-being change as per the second hypothesis.

To test the third hypothesis, separate multiple regressions were conducted predicting well-being change from only the attainment ratings of goals belonging to one content category at a time. The first round of these analyses considered the participants' own categorizations of their goals; the second round used the judges' goal codes to categorize participants' goals objectively.

Exclusion Criteria

Concerns arose regarding the attentiveness of participants who completed the survey in exceptionally brief amounts of time. To reduce error in the data due to careless responding, all analyses excluded data from participants who completed the first survey in under 20 minutes (median completion time for all participants = 74 min.) or the second survey in under 10 minutes (median completion time = 31 min.). These minimum completion times would correspond to a response rate of approximately 22 questions per minute at the first assessment and 25 questions per minute at the second, not including any time to read instructions. Analyses also excluded participants whose completion time for either survey exceeded 48 hours. These participants failed to complete the survey in one sitting as intended, and so were excluded to reduce within-person variation in random context effects, which could not otherwise be managed through the online assessment procedure.

By these criteria, 45 participants were excluded, leaving a total of 315 participants who responded to both parts of the survey in acceptable time frames. Participants who only responded at the first assessment time did not differ in any of the variables of interest from participants who responded at the second assessment as well. However, a multivariate analysis of variance (MANOVA) found significant differences between the excluded participants and those remaining among all the variables of interest ($p < .05$; test excluded end-of-quarter reassessments to maintain independence of observations). Following this, Welch's two-sample t -tests compared remaining participants to those excluded. Welch's t -test corrected for any inequality of variances by replacing the

pooled variance estimate in the denominator with a variance estimate produced by the Welch-Satterthwaite equation (Welch, 1947).

Excluded participants reported significantly higher NA and significantly lower SWB, PWB, autonomy, environmental mastery, and composite well-being at both assessments, as well as lower presence of meaning in life, purpose, positive relations, and personal growth at the second assessment, and greater overall motivation from extrinsic demand (all $ps < .05$). The absolute magnitude of the effect sizes for these significant differences ranged from $r = .11$ (for early-quarter environmental mastery) to $r = .18$ (for purpose at the second assessment). These excluded participants also expressed marginally greater overall motivation by extrinsic reward and introjection, marginally less intrinsic motivation, and marginally lower early-quarter personal growth, end-of-quarter life satisfaction, and self-acceptance at both assessments (all $ps < .10$).

As an additional countermeasure against careless responding, analyses excluded data from questionnaires to which participants gave excessively invariant responses. For each questionnaire composed of 10 or more questions to be scored on multiple subscales (i.e., excluding only the Satisfaction With Life Scale and Spiritual Transcendence Index), standard deviations of responses across all items were calculated within participants. Any participant's responses to any of these particular questionnaires were treated as missing if their standard deviation across all responses on that measure was less than 10 percent of the median standard deviation for all participants on that measure.

The criteria thus established were so low as to only exclude participants' responses when responses to all questions on one of these measures were identical. For

example, the sample's median standard deviation across all MLQ item ratings was 1.43; hence participants whose ratings of the 10 items of the MLQ had a standard deviation less than .14 (which could only occur if a participant rated all ten items equally across both subscales, including the reverse-scored item) were excluded from any analyses of meaning in life. Effectively, these distribution-dependent criteria could be simplified to the universal requirement to exclude responses to any measure that did not vary whatsoever. Though this criterion required as minimal a degree of within-measure variance as logically possible for measures at least ten items long, this partially eliminated responses to both parts of the survey from between one and 18 (for the MLQ) additional participants (of those that had not already been excluded casewise based on invalid completion time) per measure subject to this criterion.¹ This caused the sample sizes used in the following analyses to vary based on which constructs they analyzed. When computing composites of the index scores to which these criteria applied, averaging instead of summing prevented missing scores from reducing the composite scores. For example, if a participant rated all 20 items of the PANAS equally, analyses disregarded that data and used his or her standardized life satisfaction score as the sole basis for his or her SWB score. Finally, to maintain the reliability of goal ratings at the person level (averaged across all of individual participants' goals), all analyses excluded 12 participants who listed fewer than five goals.

All exclusion criteria were applied before further data analysis. After performing all analyses on the truncated sample presented henceforth, excluded participants were included and the sample analyzed again to determine whether these criteria affected

results. All repeated analyses yielded similar results except in two instances as noted. Means, standard deviations (across within-person averages with regard to goal ratings), and the number of responses remaining after the combined application of all exclusion criteria and attrition between the two assessment points of the survey appear in Table 1 for all variables employed in further analyses. No variable's median differed from its mean by more than .28 standard deviations (in the case of investment, which possessed a negatively skewed and leptokurtic distribution as described later in greater detail).

Differences by Assessment Time

Paired-samples *t*-tests revealed that the average participant's PA and NA, presence of meaning in life, purpose, and meaningfulness ratings of their goals (rated for each goal at both assessments, then averaged across each person's full set of five to ten goals) worsened significantly (all *ps* < .04) between assessments. The absolute magnitude of the Cohen's *d* effect size estimates for these differences ranged from .26 (for presence of meaning in life, which decreased) to .42 (for NA, which increased). Environmental mastery, self-acceptance, personal growth, and overall PWB also decreased with marginal significance (all *ps* < .10). This small drop in most indicators of well-being over the course of the academic quarter may have resulted from increased stress due to looming coursework deadlines and final exam anxiety. Perhaps abandonment of goals or frustration caused through goal pursuit drained meaning from goals over time.

A MANOVA in all indices assessed (excluding end-of-quarter reassessments to maintain independence of observations) found significant differences between

Table 1. Descriptive statistics.

Well-being variable	Beginning of quarter			End of quarter			Change	
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Overall well-being	.00	.89	295	-.01	.87	294	-.02	.55
Subjective well-being	.00	.74	295	.00	.72	294	-.01	.57
Positive affect	3.43	.75	293	3.34	.71	290	-.10	.67
Negative affect	2.28	.75	293	2.44	.74	291	.16	.74
Life satisfaction	4.55	1.24	295	4.61	1.26	294	.04	.83
Meaning in life	5.02	1.28	291	4.90	1.33	281	-.12	.97
Psychological well-being	4.30	.63	295	4.27	.67	283	-.04	.38
Environmental mastery	4.05	.77	295	3.99	.79	288	-.05	.55
Self-acceptance	4.16	.89	295	4.11	.91	288	-.06	.59
Personal growth	4.64	.66	295	4.58	.73	286	-.06	.59
Positive relations	4.33	.89	295	4.31	.92	289	-.02	.57
Purpose	4.50	.84	295	4.40	.79	290	-.11	.58
Autonomy	4.12	.78	295	4.15	.80	290	.04	.50

Goal ratings	Beginning of quarter			End of quarter			Change	
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Goal attainment				0.00	.96	289		
Progress				2.51	.53	282		
Success				2.34	.53	279		
Overall self-determination				.35	1.03	280		
Intrinsic motivation				2.81	.66	242		
Identification				3.33	.48	195		
Introjection				2.28	.69	209		
Extrinsic demand				1.91	.63	207		
Extrinsic reward				1.99	.60	244		
Goal meaningfulness	3.35	.35	238	3.27	.45	231	-.08	.42
Goal purposefulness	3.18	.49	219					
Value concordance	3.33	.45	189					
“Want” vs. “ought”	3.14	.44	216					
Difficulty	2.81	.45	276					
Probability of success	3.22	.41	245					
Investment	3.39	.40	223					
Time frame	2.91	.82	276					
Facilitation (vs. conflict)				2.86	.58	248		
Environmental support				2.78	.51	266		
Enjoyment				2.79	.52	267		

participants from separate academic quarters ($p = .03$). A second MANOVA also found significant differences in amount of change over time observed in the variables measured twice ($p = .02$). Independent samples t -tests revealed significant differences in well-being change (early-quarter ratings subtracted from end-of-quarter ratings) between samples from each quarter (all $ps < .03$). Fall participants' average PA, SWB, PWB, environmental mastery, self-acceptance, and overall well-being worsened over the quarter, whereas Spring participants' averages improved. Purpose decreased marginally more for Fall participants ($p = .08$). Spring participants also began the quarter with lower SWB than Fall participants, especially lower PA, and reported significantly less overall (averaged across each person's 10 goal ratings) less intrinsic motivation and more extrinsic motivation (all $ps < .05$). For the significant differences between each quarter's participants, Hedges' g effect size estimate ranges in absolute magnitude from .25 (for early-quarter SWB) to .44 (for extrinsic motivation). Spring participants also began the quarter with marginally less purpose and ended the quarter with marginally more positive relations (both $ps < .10$). The upward trend reported by Spring participants may reflect joyful anticipation of the break from academic rigor over the summer. Fatigue from the previous two quarters might also explain the relatively lower reports of well-being in the Spring quarter.

Effects of Sex, Age, and Ethnicity

Analyses of covariance (ANCOVAs) were used to test for effects of sex, age, and ethnicity simultaneously while controlling for each other's independent influences. All possible interactions among the three demographic factors were also controlled to reduce

error, but will not be reported here. Effect sizes are reported as partial η , which may be evaluated by the same standards as Pearson's r coefficient of correlation.

Age correlated positively with meaning in life, autonomy, purpose, and personal growth; these effect sizes ranged from $r = .10$ (for early-quarter presence of meaning in life) to $.17$ (for end-of-quarter purpose and for autonomy at both assessments). Age also correlated negatively with NA and positive relations ($r = -.12$ and $-.11$, respectively). However, these calculations included four older-aged outliers. Excluding these four participants, and controlling for sex and ethnicity, only the correlations with purpose (partial $\eta = .15 - .16$ at both assessment times) and end-of-quarter presence of meaning in life (partial $\eta = .13$) remained significant (F s = $6.42 - 6.59$ and 4.61 , p s = $.01$ and $.03$, respectively). Age also correlated marginally with participants ratings of their goals' difficulty averaged across all of their five to ten individual goals ($r = .12$, partial $\eta = .12$, $F(1,246) = 3.75$, $p = .05$), but did not correlate with any other goal ratings (averaged within participants across each person's ratings of his or her five to ten goals).

When controlling age and ethnicity, men reported somewhat lower end-of-quarter NA ($M = 2.27$) than women ($M = 2.52$, partial $\eta = .16$, $F(1,261) = 6.61$, $p = .01$), as well as marginally higher PA (M s = 3.44 and 3.29 , partial $\eta = .11$, $F(1,260) = 3.30$, $p = .07$) and composite SWB (M s = $.5$ and $-.1$, partial $\eta = .11$, $F(1,264) = 3.39$, $p = .07$). Men also rated their goals (averaged across all five to ten of each man's goals) as marginally more enjoyable in retrospect ($M = 2.89$, women's $M = 2.76$, partial $\eta = .17$, $F(1,237) = 3.74$, $p = .05$). No other goal ratings (averaged within participants across each person's ratings of his or her five to ten goals) differed significantly by sex.

ANCOVAs in well-being change scores tested for differences by sex while controlling for age and ethnicity; where significant, paired-samples *t*-tests established whether males or females changed significantly over time when considered apart from the opposite gender. Over the course of the study, women's average PA decreased slightly (initial $M = 3.45$, final $M = 3.30$; $g = -.29$, $t(209) = -3.02$, $p = .003$) more than men's (partial $\eta = .13$, $F(1,259) = 4.15$, $p = .04$), whose average PA remained relatively stable (initial $M = 3.41$, final $M = 3.43$). Though effects of sex on change in NA and life satisfaction fell short of significance, men's average SWB improved marginally (initial $M = -.00$, final $M = .10$, $g = .29$, $t(81) = 1.90$, $p = .06$), and slightly more than women's (partial $\eta = .13$, $F(1,264) = 4.52$, $p = .03$), whose average SWB decreased insignificantly (initial $M = .00$, final $M = -.04$, $g = -.10$).

As with SWB, when controlling for age and ethnicity, men's average overall well-being (the composite of standardized SWB, PWB, and presence of meaning in life; convergent validity discussed after the next subsection of results) increased marginally (initial $M = -.06$, final $M = .05$, $g = .26$, $t(81) = 1.68$, $p = .10$), and slightly more than women's average (partial $\eta = .14$, $F(1,264) = 5.06$, $p = .03$), which decreased insignificantly (initial $M = .02$, final $M = -.03$, $g = -.15$). Sex did not affect meaning in life in stability or change, but women's overall PWB decreased slightly (initial $M = 4.30$, final $M = 4.24$, $g = -.23$, $t(202) = -2.32$, $p = .02$), and marginally more than men's (partial $\eta = .11$, $F(1,253) = 2.85$, $p = .09$), who held their ground (initial $M = 4.29$, final $M = 4.30$). Men's average score on the positive relations subscale of PWB improved marginally (initial $M = 4.23$, final $M = 4.34$, $g = .27$, $t(79) = 1.70$, $p = .09$), and

significantly more than women's (partial $\eta = .15$, $F(1,259) = 6.19$, $p = .01$), whose positive relations scores worsened marginally (initial $M = 4.38$, final $M = 4.30$, $g = -.17$, $t(208) = -1.71$, $p = .09$). No other effects of sex on PWB subscales achieved statistical significance, but women's average scores across all well-being subscales and composites consistently decreased more or increased less than men's averages in this sample.

ANCOVAs controlling for age and sex indicated significant differences among ethnic groups in autonomy, purpose, early-quarter environmental mastery, and end-of-quarter life satisfaction (partial η s = $.22 - .26$, F s = $2.62 - 3.69$, p s = $.02 - .003$). Differences in early-quarter PA, presence of meaning in life, and self-acceptance, and end-of-quarter environmental mastery also achieved marginal significance (partial η s = $.19 - .20$, F s = $1.95 - 2.12$, p s = $.06 - .09$). Modestly sized ethnic differences in well-being composites also achieved significance for overall well-being, early-quarter PWB, and end-of-quarter SWB (partial η s = $.20 - .25$, F s = $2.26 - 3.59$, p s = $.05 - .004$), and marginal significance for early-quarter SWB and end-of-quarter PWB (partial η s = $.19$ and $.20$, F s = 2.06 and 2.03 , respectively; both p s = $.07$).

Participants of Caucasian and "White" ethnicities had consistently higher means than participants of East Asian, Pacific Islander, and "Asian" origins and American ethnicities on all well-being indices (including reverse-scored NA). Tukey's Honestly Significant Difference (HSD) post-hoc tests identified significant differences in autonomy, overall PWB, early-quarter purpose and environmental mastery, and end-of-quarter SWB and overall well-being (p s = $.03 - .001$). Estimates of these effects' sizes ranged from moderate (Hedges' $g = .50$ for end-of-quarter overall well-being) to fairly

large ($g = .72$ for early-quarter purpose). Moderate differences between these ethnic groups in end-of-quarter purpose and early-quarter self-acceptance, SWB, and overall well-being also achieved marginal significance ($gs = .47 - .48$, $ps = .05 - .09$). No other differences among all ethnic groups in well-being indices achieved significance. Participants of African-American ethnicity began the study with considerably higher meaning in life and autonomy than participants of East Asian and Pacific Islander ethnicities (Hedges' $gs = .78$ and $.74$, respectively), but given only 14 participants remaining in the African-American group after applying the exclusion criteria, these differences only reached marginal significance ($ps = .08$ and $.06$).

Among tests of ethnic differences in change over time across all well-being subscales, only the univariate ANCOVA in presence of meaning change found a significant effect of ethnicity while controlling for sex and age (partial $\eta = .21$, $F(5,250) = 2.42$, $p = .04$). Tukey's HSD tests indicated that meaning in life decreased much more for participants of Western and South Asian ethnicity than for participants of Caucasian ethnicity ($g = .84$, $p = .04$) and marginally more than for participants of East Asian and Pacific Islander ethnicities ($g = .81$, $p = .06$). However, given only 13 participants of Western or South Asian ethnicity (after applying exclusion criteria), their moderate decrease in meaning only reached marginal significance apart from the rest of the sample ($M = -.86$, $g = -.56$, $t(12) = -2.0$, $p = .07$).

Further ANCOVAs controlled for sex and age while testing for ethnic differences in goal motives, which were averaged across each participant's set of individual goal ratings. Only modest differences in identified motivation achieved significance (partial η

= .28, $F(5,166) = 2.75$, $p = .02$); small differences in intrinsic and extrinsic reward motivation achieved marginal significance (partial η s = .21 and .22, F s = 2.02 and 2.17, p s = .08 and .06). Tukey's HSD tests found participants of Hispanic and Latin origins and American ethnicities rated their identified motivation moderately but marginally lower than participants of non-Hispanic Caucasian ethnicity ($g = .56$, $p = .08$). Ethnically Hispanic and Latin participants rated their intrinsic motivation considerably lower than African-American participants ($g = .82$, $p = .05$). Last among significant post-hoc results for motivation ratings, participants of non-Hispanic Caucasian ethnicity rated their motivation by extrinsic rewards moderately lower than participants of East Asian and Pacific Islander ethnicities ($g = .60$, $p = .04$) and marginally lower than ethnically Hispanic and Latin participants ($g = .55$, $p = .08$). No other post-hocs conducted on goal motive ratings achieved even marginal significance.

Last, ANCOVAs tested for ethnic differences among the remaining goal characteristic ratings while controlling for age and sex. An ANCOVA in value concordance found significant ethnic differences (partial $\eta = .28$, $F(5,160) = 2.64$, $p = .03$), while others suggested marginally significant differences by ethnicity in probability of success, time frame, and goal meaningfulness rated at the first time point (partial η s = .19 – .22, F s = 1.88 – 2.03, p s = .08 – .10). Tukey's HSD tests followed, indicating that participants of non-Hispanic Caucasian ethnicity rated their goals as more concordant with their values than ethnically Hispanic and Latin participants and multiethnic participants to a large, statistically significant degree (g s = .84 and 1.96, respectively; p s = .006 and .04). The moderately higher probability of success ratings given by

participants of Caucasian ethnicity differed marginally from those given by participants of East Asian and Pacific Islander ethnicities ($g = .53, p = .05$). Participants of Western and South Asian ethnicities rated their goals as much more meaningful at the outset than multiethnic participants ($g = .89$), but given only 11 participants in each ethnic group (after applying the exclusion criteria), this difference only approached significance ($p = .07$). No other HSDs did so, including all tests of differences in time frame ratings among all ethnicities.

Goal Attainment and Well-Being Change

The SWB composite was used to attempt a replication of the established relationship between SWB change and goal attainment (Brunstein, 1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002). The Presence subscale of the MLQ was then substituted in for the well-being aggregate to test whether said results generalize to meaning in life. Each subscale of the PWB index as well as the mean of all six subscales (representing overall PWB) was also tested in this manner, predicting the second measurement from the first measurement and from goal attainment (Cohen & Cohen, 1983). Together, these analyses tested the first hypothesis regarding the relationship between goal attainment and well-being change.

Results supported all aspects of the first hypothesis. Goal attainment, when entered as a predictor with beginning-of-quarter SWB to predict end-of-quarter SWB in multiple regression, emerged as significant ($\beta = .18, t(286) = 3.98, p = .00009$). Thus this study successfully replicated a series of previous studies' results on goal attainment and SWB change, albeit with a smaller effect size than previously demonstrated (Brunstein,

1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002). When substituting presence of meaning in life for SWB in this analysis, goal attainment emerged again as a significant predictor ($\beta = .12$, $t(274) = 2.86$, $p = .005$), thus effectively extending goal attainment's relationship with SWB to existential well-being. Likewise, when substituting overall PWB for SWB, goal attainment again emerged as a significant predictor ($\beta = .10$, $t(277) = 2.84$, $p = .005$), thus extending goal attainment's relationship to PWB as well, and replicating marginally significant results with a shorter PWB measure (Sheldon et al., 2002).

Since age related to meaning in life and the purpose subscale of PWB, supplementary multiple regressions added age and its interaction with goal attainment as predictors of end-of-quarter meaning in life and purpose to test whether age suppressed or moderated the relationship between goal attainment and well-being change. These analyses again excluded the four older-age outliers to reduce biasing of regression coefficients due to these participants' excessive leverage. When predicting final meaning (controlling for beginning meaning), age contributed independently but marginally ($\beta = .07$, $t(268) = 1.75$, $p = .08$). Age also appeared to suppress the independent relationship of attainment very slightly ($\beta = .13$, $t(268) = 2.96$, $p = .003$), but did not moderate it. When predicting final purpose (controlling for beginning purpose), age did not moderate its relationship with goal attainment nor relate directly and independently.

To test whether goal attainment's correlation varies across the dimensions of PWB, each subscale substituted for overall PWB in successive multiple regressions. Attainment remained a significant predictor of end-of-quarter environmental mastery ($\beta =$

.18, $t(282) = 4.56$, $p = .000008$) and self-acceptance ($\beta = .13$, $t(282) = 3.61$, $p = .0004$) when controlling for early-quarter assessments. These effect sizes resemble that of attainment predicting SWB ($\beta = .18$), suiting the theory that environmental mastery and self-acceptance overlap most with SWB (Ryff & Keyes, 1995; see also Table 1). Attainment also significantly predicted positive relations ($\beta = .08$, $t(283) = 2.14$, $p = .03$) and personal growth ($\beta = .10$, $t(280) = 2.28$, $p = .02$), but did not achieve significance as a predictor of purpose ($\beta = .06$, $t(284) = 1.41$, $p = .16$) or autonomy ($\beta = .04$, $t(284) = 1.08$, $p = .28$).

Though these standardized regression coefficients of goal attainment vary in size and significance across the PWB subscales, the 90% confidence intervals for these coefficients for goal attainment overlapped in all but the case of the largest difference (predicting changes in environmental mastery versus autonomy, where confidence intervals overlapped before reaching 95% confidence). Hence these differences may not represent meaningful distinctions among the relationships of goal attainment with the dimensions of PWB. Goal attainment weakly predicted psychological well-being improvements of every kind in this sample. The task of determining whether goal attainment predicts significantly less (or any) improvement in purpose or autonomy for the general population may require replication with a larger or more reliable sample.

However, a closer look at the relationship between goal attainment and SWB change revealed a difference among the components of SWB. Goal attainment predicted moderate PA gains significantly ($\beta = .27$, $t(282) = 5.4$, $p = .0000001$), but only predicted marginal gains in life satisfaction ($\beta = .08$, $t(286) = 1.9$, $p = .05$), and did not predict

change in NA ($\beta = -.04$, $t(283) = -.7$, $p = .48$). The confidence interval for the magnitude of the standardized regression coefficient of goal attainment predicting change in PA did not overlap with the corresponding confidence intervals for regressions of change in NA or life satisfaction until confidence levels exceeded 96.5%.

This suggests the relationship between goal attainment and well-being change may vary more among the components of SWB than beyond them, as with meaning in life or PWB, or across the subscales of PWB. Nonetheless, the 90% confidence interval for goal attainment predicting change in affective balance (PA - NA; $\beta = .20$, $t(281) = 4.0$, $p = .0001$) overlapped with corresponding confidence intervals for goal attainment predicting change in all three of the SWB components, as well as overall well-being, SWB, meaning in life, PWB, and all of the PWB subscales except autonomy (where confidence intervals overlapped before reaching 95% confidence). In sum, the only indication that goal attainment might relate differently to change in any aspect of well-being with less than a 5% chance of this difference occurring due to sampling error appears in regard to PA, and disappears when combining PA and NA.

Convergent Validity of Well-Being Composite

Since results demonstrated the general equivalence of the relationships between goal attainment and change in affective, cognitive, existential, and psychological well-being constructs, all following moderation analyses used a composite of these constructs to facilitate simplicity in interpretation and reporting. This general well-being composite standardized and averaged SWB (itself the average of standardized life satisfaction, PA, and reverse-scored NA), the Presence subscale of the MLQ, and PWB (the raw mean of

all six PWB subscale scores) to generate an overall well-being score for each participant at each of the two assessments (standardized alpha reliability = .86). The relationship between goal attainment and change in this well-being composite remained significant ($\beta = .14, t(286) = 3.81, p = .0002$). All following analyses performed with this well-being composite yielded roughly similar results with SWB, MLQ-Presence, or PWB substituted for overall well-being, except in the case of value concordance, as noted in the section below discussing moderation by goal characteristics.

Table 2 contains a correlation matrix of all well-being indices at each assessment. Most correlations exceeded $r = .50$ in absolute magnitude. The primary exceptions were NA (a likely result for the one negatively weighted subscale of the lot) and the subscales of PWB that overlap less with SWB theoretically (Ryff & Keyes, 1995).

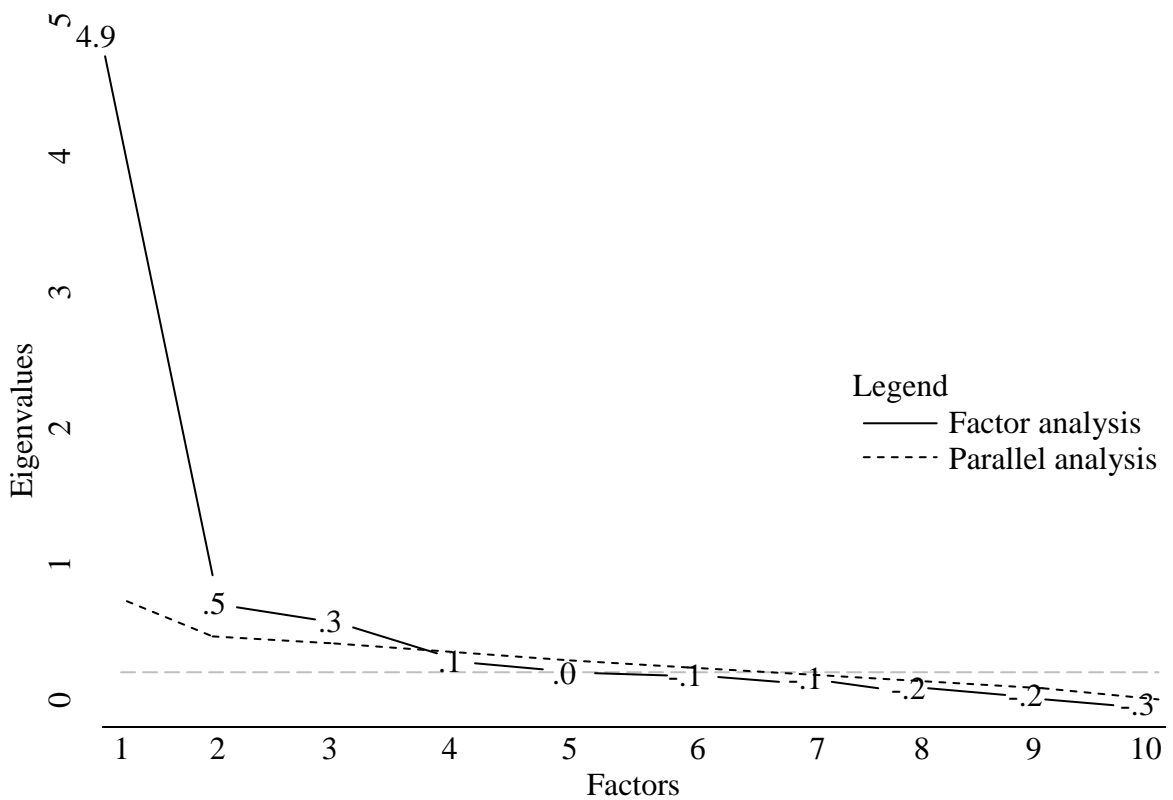
Table 2. Correlation matrix of well-being indices.

Index	PA	NA	SWLS	ML	EM	SA	PG	PR	Purpose	Autonomy
Pos. Aff.	.57	-.15	.52	.55	.50	.60	.44	.47	.61	.37
Neg. Aff.	-.14	.50	-.29	-.24	-.54	-.44	-.21	-.40	-.29	-.31
SWLS	.42	-.29	.78	.57	.59	.71	.23	.56	.46	.34
Meaning	.47	-.21	.47	.72	.51	.61	.34	.46	.64	.46
Env. Mast.	.53	-.46	.61	.52	.75	.76	.42	.62	.60	.52
Self-accept.	.55	-.39	.68	.55	.77	.78	.40	.64	.62	.51
Pers. Grow.	.38	-.22	.31	.45	.51	.49	.64	.40	.62	.46
Pos. Relat.	.45	-.40	.55	.45	.66	.69	.53	.80	.47	.36
Purpose	.51	-.31	.44	.62	.62	.68	.67	.54	.74	.49
Autonomy	.36	-.27	.37	.42	.56	.56	.54	.46	.59	.80

Note. Correlations between early-quarter and end-of-quarter assessments appear in bold along the diagonal. Early-quarter correlations appear above the diagonal with $N = 290$ and all $ps < .02$. End-of-quarter correlations appear below the diagonal with $N = 270$ and all $ps < .03$. PA = Positive affect, NA = Negative affect, SWLS = Satisfaction with Life Scale, ML = Meaning in life, EM = Environmental mastery, SA = Self-acceptance, PG = Personal growth, PR = Positive relations.

Figure 1 displays the scree plot of a principal axis factor analysis and parallel analysis performed on these subscale scores at the first assessment (results for the second assessment being nearly identical). Both clearly indicated a single factor at the subscale level, with all subscales loading strongly on the first unrotated factor (all factor loadings $\geq .50$ in magnitude). The same analyses performed on end-of-quarter assessments bore almost identical results.

Figure 1. Scree plot of factor and parallel analyses of well-being subscales.



Note. Eigenvalues of factor analysis appear between dashes. $N = 290$.

Self-Determination of Goal Motives

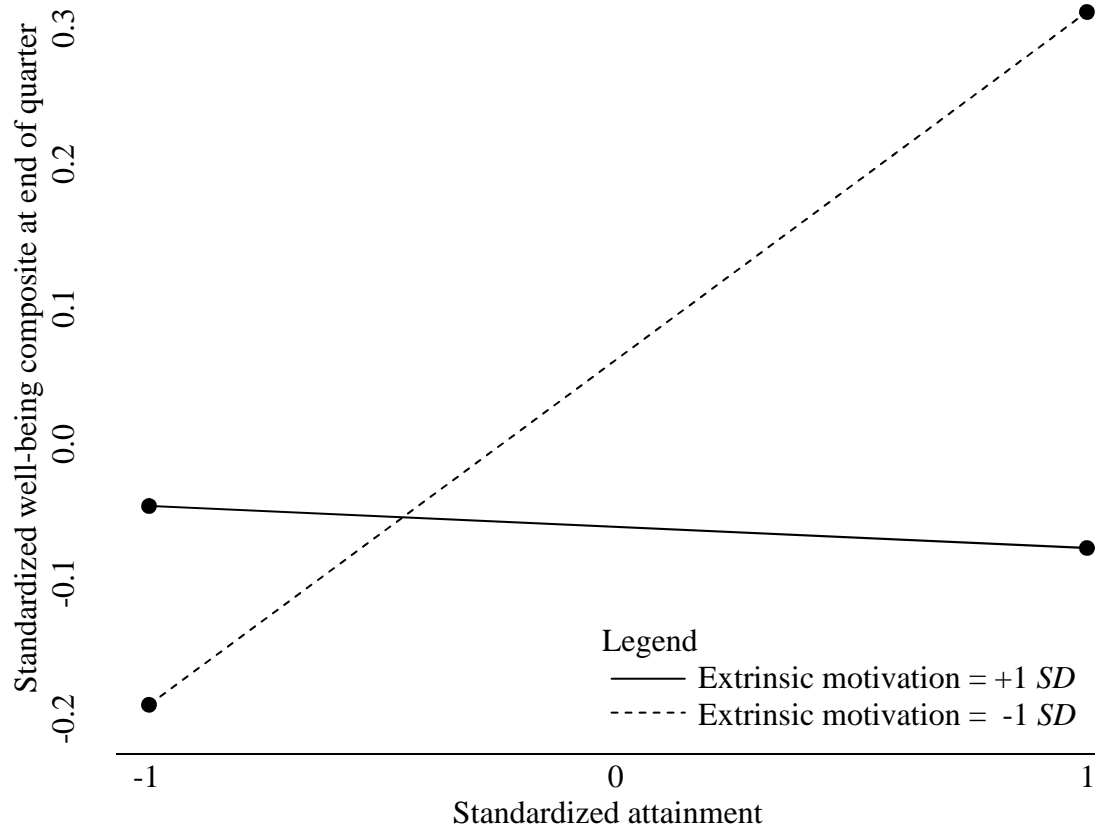
The next set of analyses tested moderators of the relationship between goal attainment and overall well-being change by adding the products of goal attainment and goal ratings as additional predictors to the multiple regressions predicting end-of-quarter well-being from early-quarter well-being and goal attainment. The goal ratings were also entered as predictors to test and control for direct relationships between goal ratings and well-being change. The first analysis attempted a replication of the direct relationship between well-being change and self-determination of motivation, as well as the relationship between well-being change and the interaction of self-determination and goal attainment (Sheldon & Elliot, 1999; Sheldon et al., 2004). The self-determination composite used here averaged ratings of intrinsic motivation (fun or personal interest), identification (importance), reverse-scored introjection (avoidance of guilt and anxiety), and reverse-scored extrinsic motivation (itself the average of extrinsic demand and extrinsic reward) to represent the balance of autonomous versus controlled motivation. This analysis supported a direct relationship of well-being change with the self-determination composite in the hypothesized direction ($\beta = .08, t(270) = 2.19, p = .03$), but the previously documented relationship with the interaction of goal attainment and self-determination achieved marginal significance in the counter-hypothetical direction ($\beta = -.06, t(270) = -1.80, p = .07$).²

Further analyses substituted each individual kind of motivation for the self-determination composite in successive multiple regressions. This tested whether these components of motivation behaved more in accordance with existing theory as

independent elements than when aggregated to the level of the overall self-determination composite. The hypothesized direct relationship of well-being change emerged significant with extrinsic reward ($\beta = -.10, t(236) = -2.54, p = .01$) and extrinsic demand ($\beta = -.09, t(199) = -1.99, p = .05$). The interaction of goal attainment with extrinsic demand significantly predicted well-being change as hypothesized ($\beta = -.09, t(199) = -2.08, p = .04$), whereas the interaction with extrinsic reward did not reach significance by itself ($\beta = -.03, t(236) = -.76, p = .45$).

An extrinsic motivation composite was formed by standardizing the distributions of extrinsic reward and extrinsic demand ratings that had been averaged within participants across each person's five to ten goals, then averaging these two standardized distributions. When substituted into multiple regression for extrinsic reward or demand, the direct relationship weakened slightly ($\beta = -.06, t(182) = -1.40, p = .16$), while the interaction with attainment emerged slightly stronger ($\beta = -.13, t(182) = -3.11, p = .002$) as portrayed in Figure 2. This interactive relationship disappeared when the analysis included participants whom the primary sample had excluded based on extreme completion time, response invariance, or failure to list at least five goals ($\beta = -.02, t(353) = -.73, p = .47$), while the direct relationship of well-being reached its greatest significance with the extrinsic motivation composite in the full, uncut sample ($\beta = -.09, t(353) = -2.86, p = .005$). However, extrinsic demand ratings correlated only moderately with extrinsic reward ratings ($r = .32, N = 190, p = .000005$), supporting the notion that while these motives bear considerable similarities, participants may make meaningful

Figure 2. Extrinsic motivation moderating goal attainment's link to well-being change.



Note. The extrinsic motivation composite combines extrinsic reward and extrinsic demand ratings. This regression controlled for early-quarter well-being, so the difference from zero in end-of-quarter well-being represents change over the quarter. $N = 187$.

distinctions between extrinsic rewards and extrinsic demands when allowed to rate each separately.

No other dimensions of self-determination related significantly to well-being change, nor did their interactions with goal attainment. Moreover, their regression slopes did not follow theoretical directions consistently.³ Thus results regarding self-

determination of motivation only partly supported the hypothesis regarding well-being change's negative relationship with extrinsic motivation and its negative moderation of the relationship with goal attainment.

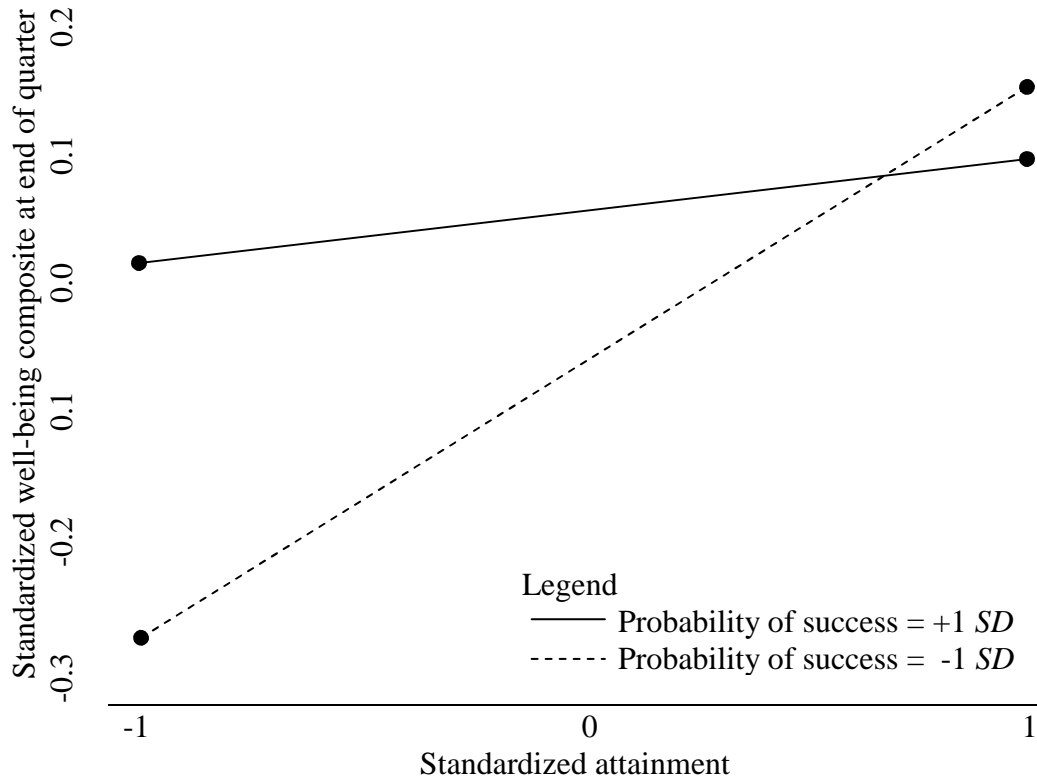
Goal Characteristics

Analyses of the remaining goal ratings generated similarly weak evidence regarding the hypothesized moderators of the relationship between goal attainment and well-being change. Time frame predicted well-being change directly ($\beta = .09$, $t(267) = 2.61$, $p = .009$), such that participants who rated their average time frame for accomplishing their goals as relatively longer than others reported levels of overall well-being that had changed slightly more positively on average between assessments. Investment predicted well-being change directly ($\beta = .08$, $t(214) = 2.04$, $p = .04$) only, yielding an insignificant interaction with attainment. Investment ratings averaged across all of each participant's goals formed a non-normal distribution (skewness = -1.46; kurtosis = 4.67) as determined by a Shapiro-Wilk test of normality ($W = .891$, $p < 1e^{-10}$; Royston, 1982a, 1982b, 1995). A few participants appeared to have excessive leverage in determining the slope of the regression line. Tukey's fences identified two outliers well below the lower bound. These observations also had the highest covariance ratios and highest values among the diagonal elements of the hat matrix (Hoaglin & Welsh, 1978). When excluded, the standardized regression coefficient for investment fell below the critical value for conventional statistical significance ($\beta = .06$, $t(212) = 1.45$, $p = .15$), which suggests interpretation of this predictive relationship might be premature without replication.

When predicting well-being change without goal attainment, participants' subjectively estimated probability of succeeding at their goals achieved significance ($\beta = .09, t(241) = 2.19, p = .03$). When including goal attainment and its interaction with probability of success in the regression, probability of success weakened somewhat as a direct predictor ($\beta = .06, t(235) = 1.34, p = .18$), but the attainment-attainability interaction term reached significance ($\beta = -.09, t(235) = -2.34, p = .02$) as depicted in Figure 3. These results revealed that as probability of success increases, the relationship between goal attainment and well-being change weakens. These results also provided modest replicative evidence that participants' predictions of success relate to well-being (Emmons, 1986; Roberson, 1984; Pomaki et al., 2009).

No other early-quarter goal ratings significantly moderated the attainment relationship or related directly to well-being change themselves. Multiple regression analyses failed to replicate the relationship of well-being change with the interaction of success probability and commitment using early-quarter probability of success and investment ratings in lieu of the six separate ratings Brunstein (1993) used ($\beta = .002, t(198) = .06, p = .95$); using environmental support instead of probability of success also produced a failure to replicate ($\beta = .01, t(201) = .24, p = .81$). Similar analyses evaluated direct relationships of well-being change with, and moderations of goal attainment relationships by participants' average subjective ratings of their goals' consistency with their personal values, service to their deeper purposes in life, relative emphasis on personal desire for achievement over feelings of obligation, difficulty, and meaningfulness. All produced similarly null results, with one exception: participants'

Figure 3. Probability of success moderating goal attainment's link to well-being change.



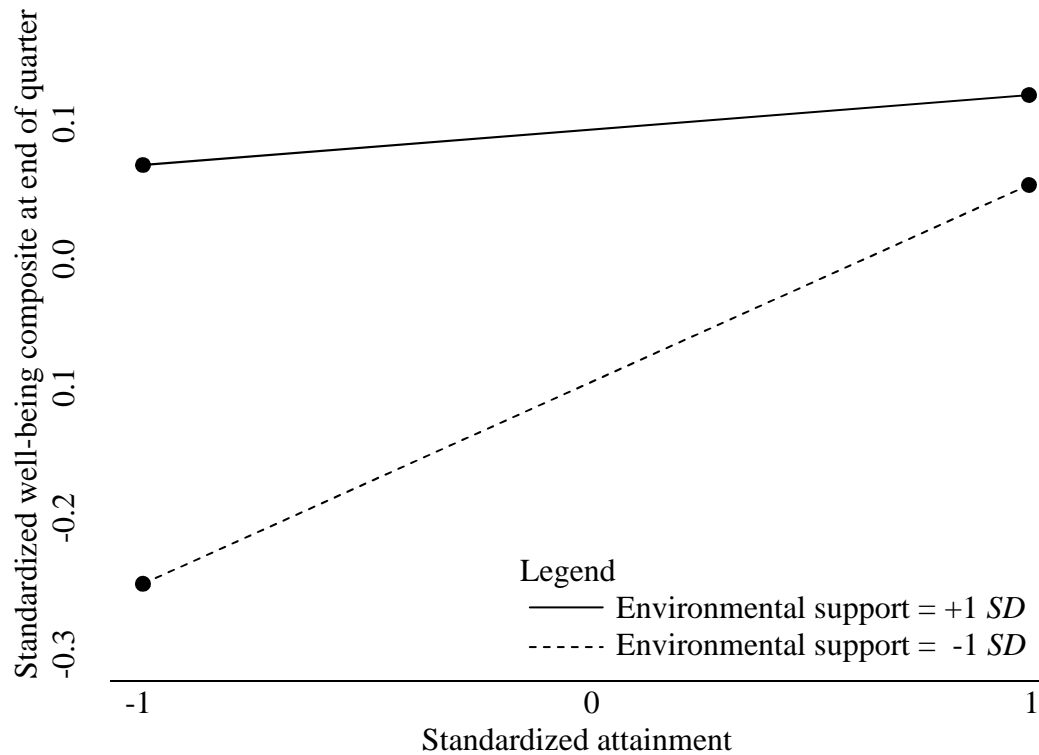
Note. This regression controlled for early-quarter well-being, so the difference from zero in end-of-quarter well-being represents change over the quarter. $N = 240$.

ratings of their goals' concordance with their values predicted increases in presence of meaning in life ($\beta = .16, t(177) = 3.36, p = .001$) when controlling for goal attainment and its interaction with value concordance. Value concordance did not predict change in SWB ($\beta = -.01, t(179) = -.10, p = .92$) or PWB ($\beta = .01, t(179) = .19, p = .85$), though its interaction with attainment predicted decreases in SWB only ($\beta = -.14, t(179) = -2.27, p = .02$).

Multiple regression analyses predicting well-being change at the second assessment from concurrently-rated goal characteristics and attainment and previously-reported well-being also produced problematic results for other prevailing theories regarding effort and environmental support. First, retrospective ratings of effort expended in goal pursuit did not moderate the relationship between goal attainment and well-being change ($\beta = -.03$, $t(260) = -.96$, $p = .34$). Next, a direct relationship between participants' average retrospective ratings of support received for their goal pursuits from their respective environments and well-being change manifested ($\beta = .10$, $t(259) = 2.22$, $p = .03$). Environmental support also negatively moderated the relationship with goal attainment with marginal significance ($\beta = -.06$, $t(259) = -1.98$, $p = .05$) as shown in Figure 4. Though environmental support for one's goals related to well-being gains directly, it appeared to diminish the relevance of goal attainment when present, and increase it when absent. Participants generally gained well-being over time when they felt their environments supported their goals regardless of whether they attained those goals. In contrast, participants who felt their environments did not support their goals expressed significant losses in well-being when they failed to attain their goals, but made modest gains despite their environments when successful.

Goal facilitation (versus conflict) moderated the relationship of well-being change with goal attainment in the same direction as environmental support. Though participants' average retrospective ratings of relative amount of facilitation versus conflict experienced in the pursuit of a given goal due to their other goal pursuits did not relate directly to well-being change when controlling for goal attainment ($\beta = .05$,

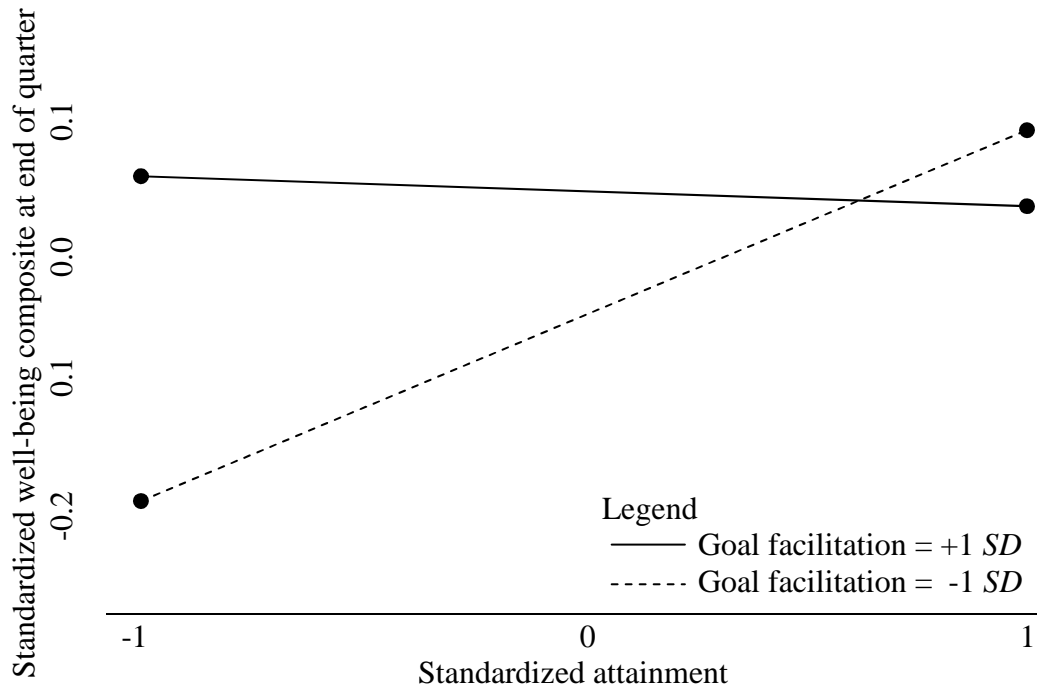
Figure 4. Environmental support moderating goal attainment's link to well-being change.



Note. This regression controlled for early-quarter well-being, so the difference from zero in end-of-quarter well-being represents change over the quarter. $N = 264$.

$t(241) = 1.02, p = .31$), these ratings moderated the attainment to well-being change relationship ($\beta = -.08, t(241) = -2.11, p = .04$) as shown in Figure 5. High ratings indicated the perception that one's goals facilitated each other's success, whereas low ratings indicated the perception of conflict. Thus, as with supportive external environments, those who felt their own goals supported one another exhibited no connection between their goal attainment and well-being change. Those whose goals conflicted lost a considerable amount of well-being when their goals went unattained, but

Figure 5. Goal facilitation moderating goal attainment's link to well-being change.



Note. Goal facilitation scores (mean = 2.9, $SD = .6$) below 2.5 represent intergoal conflict. This regression controlled for early-quarter well-being, so the difference from zero in end-of-quarter well-being represents change over the quarter. $N = 246$.

gained some well-being when successful. When excluding attainment, goal facilitation related to well-being gain directly ($\beta = .10, t(245) = 2.62, p = .01$).

Goal Content

Given effects of overall goal progress, goal codes provided by both judges and participants were used to test if this effect varies by goal content. In these analyses, progress ratings were not averaged across all of each participant's goals, but instead only

ratings of goals from one particular content domain at a time were entered as predictors of well-being change for those who had the goals.

Most participants did not list a goal belonging to each category. All goal categories went unused at least seven times (in the case of academic goals) across all participants not subject to exclusion criteria, which caused the df_{residual} of these analyses to vary across categories. The median number of goals each participant listed and categorized as academic was two ($SD = 1.1$, maximum = 6); for social goals, the median was also two ($SD = 1.2$, maximum = 7). The median was one for material wealth ($SD = .9$, maximum = 5), health ($SD = .9$, maximum = 4), affect control ($SD = 1.1$, maximum = 5), and independence ($SD = 1.0$, maximum = 6) goals. The median was zero for organization ($SD = 0.7$, maximum = 3) and religious ($SD = 1.0$, maximum = 6) goals.

Participants' self-categorizations of the content of their goals moderated the relationship of goal attainment with well-being change, lending indirect support to the second and third hypotheses. Analyses that demonstrated this regressed end-of-quarter well-being onto early-quarter well-being as above, but added as an additional predictor the averages of each participant's progress and success ratings only where they pertained to goals the participant had matched to a category in question. The strengths of these relationships between well-being change and category-specific goal attainment were compared to one another and the overall relationship of general goal attainment ($\beta = .14$) to detail how goal content moderated the overall relationship.

Attainment remained a significant predictor for goals belonging to the health ($\beta = .16$, $t(205) = 3.70$, $p = .0003$), organization ($\beta = .13$, $t(99) = 2.06$, $p = .04$), affect control

($\beta = .10$, $t(165) = 2.34$, $p = .02$), academic ($\beta = .10$, $t(279) = 2.62$, $p = .009$), and social ($\beta = .10$, $t(277) = 2.68$, $p = .008$) categories. Independence ($\beta = .06$, $t(192) = 1.39$, $p = .17$) and moral and religious ($\beta = .06$, $t(141) = 1.17$, $p = .25$) goal attainment did not achieve significance, but their effect sizes differed very little from other goals. In the most notable exception, attainment ratings of material wealth goals reversed the slope of the regression line, producing an insignificantly negative relationship with goal attainment ($\beta = -.04$, $t(178) = -.90$, $p = .37$).

Though these standardized regression coefficients of goal attainment vary in size and significance across content domains, the 95% confidence intervals for these coefficients for goal attainment overlapped in all but the case of the largest difference (financial versus health goals, where confidence intervals only overlapped once confidence reached 98%). Hence these differences among content domains in the relationship of goal attainment with well-being may not generalize to the undergraduate population, let alone different populations. Attainment of goals from every content domain except financial goals weakly predicted well-being improvements in this sample. The task of determining whether financial goal attainment predicts significantly less (or any) improvement in well-being for the general population may require replication with a larger or more reliable sample.

A slightly different pattern of content moderation emerged when using independent judges' codes to categorize goals by their content. Attainment still related strongest to well-being change for health goals ($\beta = .14$, $t(165) = 3.05$, $p = .003$), and significantly for organization goals ($\beta = .13$, $t(114) = 2.33$, $p = .02$), affect control goals

($\beta = .10$, $t(213) = 2.21$, $p = .03$), and academic goals ($\beta = .13$, $t(260) = 3.72$, $p = .0002$), but did not relate significantly for goals independently categorized as social ($\beta = .04$, $t(256) = 1.07$, $p = .29$). The relationship remained insignificant for moral and religious goals ($\beta = .08$, $t(133) = 1.62$, $p = .11$), independence goals ($\beta = .02$, $t(87) = .40$, $p = .69$), and financial goals ($\beta = .02$, $t(161) = .36$, $p = .72$). Nonetheless, all of these regression coefficients fell within each other's 95% confidence intervals, further compelling rejection of the third hypothesis that goal content moderates the relationship of goal attainment to well-being change.

Discussion

This study replicates evidence of the relationship between subjective well-being change and goal attainment (Brunstein, 1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002), and generalizes it to other aspects of psychological well-being, though not all. This evidence offers new support for theories describing goals as sources of meaning (Klinger, 1977, 1998; Emmons, 1999; Reker & Wong, 1988; Reker, 2000; Bell, 2007), thus confirming the primary hypothesis, though the causal direction of this connection remains unestablished. In addition, the results of moderation analyses concord with prior research that demonstrates not all goals relate equally to well-being change (Sheldon & Kasser, 1995, 1998, 2001; Sheldon et al., 2004) or meaning in life (Reker, 2000), thus supporting the basic premises of the second and third hypotheses.

However, these results also pose challenges to the finer points of these theories that describe the inequalities among goals in terms of their supposed service to well-

being. Many direct relationships and goal attainment moderators from the literature on self-determination theory failed to replicate, extrinsic motivation being the primary exception to this surprising trend of null results. Mixed results also emerged for theories regarding other goal characteristics, including time frame, attainability, effort, environmental support, goal conflict, and goal contents, as detailed below. Furthermore, important limitations to the evidentiary value of the research paradigm have gone unacknowledged in prior literature, as discussed last.

Generality of Well-Being Relationship with Goal Attainment

First and foremost, the results of this study support the main hypothesis and generalize the relationship of goal attainment with subjective well-being (SWB) change (Brunstein, 1993; Elliot et al., 1997; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Sheldon et al., 2002) to existential and psychological well-being (PWB). On average, the overall, subjective experience of life improves in general over short periods of time when one can claim many personal accomplishments, and worsens when one can claim few or none. This pattern does not seem to depend on the nature of the well-being construct in question, be it affective, cognitive, existential, multidimensional, or relatively abstract or contextualized. Evidence for this link between goal attainment and improvement in the autonomy and purpose dimensions of PWB appears less conclusive, in that these relationships do not differ significantly from zero; nevertheless, they do not differ significantly from the relationships of other PWB dimensions either.⁴

These data reinforce the relevance of goals to psychological health in general, indicating the relationship extends beyond emotional experiences to influence a variety of

cognitive evaluations of life quality, including the sense of meaning in life. Previous research found a marginally significant relationship between goal attainment and PWB change (Sheldon et al., 2002); these data replicate this relationship and establish its relative consistency across the dimensions of PWB. This study also reinforces the theoretical role of goals as sources of meaning (Klinger, 1977, 1998; Emmons, 1999; Reker & Wong, 1988; Reker, 2000; Bell, 2007).

However, whether goals truly serve as causal sources of meaning and not mere correlates remains unknown. Since this study cannot offer any more causal evidence than previous research on this relationship, it may not be the case that goal attainment affects well-being unilaterally; perhaps improvements in one's life circumstances or outlook facilitate goal attainment. Likewise, depression or hardship of external origins might deplete the willpower necessary to persevere in pursuit of one's goals, leading to unproductiveness, failure, or the abandonment of one's goals. Theory suggests positive affect may motivate goal pursuit, and thus attainment (Aarts, 2007).

Well-Being Prediction and Attainment Moderation by Self-Determination

Beyond the basic relationship between goal attainment and well-being change, these results demonstrate moderation of this relationship by motivation, but these moderators only follow hypothesized directions inconsistently. Not all goals relate equally to global well-being in terms of both the propensity to set and to attain goals of various kinds. However, the inequalities in this sample differ from prevailing theoretical models, which emphasize autonomous motivation and intrinsic content as boons to the same degree that controlledness and extrinsic content are banes.

Extrinsic motivation associates with decreasing well-being in the same general sense as goal attainment relates to increasing well-being. This study's evidence for this conclusion replicates others' results regarding extrinsic motivation and SWB (Sheldon & Kasser, 1995, 1998, 2001; Sheldon et al., 2004) and generalizes them broadly across well-being domains just as it does for goal attainment. Yet in recognition of the present study's limitations regarding causal inference (as well as to challenge prevalent interpretations of similar studies), extrinsic motives might just as readily result from downward trends in well-being as cause them, or result from externally-generated stressors that drive well-being down of their own accord. For instance, economic troubles could directly compel one to avoid material loss, grow sensitive toward the demands of one's superiors, and experience the erosion of one's well-being, all without necessitating any direct interaction among these distinct consequences.

Extrinsic motivation also disconnects people who attain their objectives from any immediate benefits of those achievements, and perhaps to a lesser extent disconnects them from any costs of unproductiveness or failure. To whatever extent well-being change might affect goal attainment, it would seem extrinsic goal pursuits stand to gain or lose less from changes in well-being than more voluntary goals. Perhaps these goals owe the independence of their outcomes to their obligatory nature; people generally must work, fulfill their material needs, and reckon with other social and situational pressures regardless of changes in the quality of their lives (excluding extreme changes).

This study also suggests the possibility of meaningful distinctions between extrinsic motivation oriented toward material rewards versus social and situational

demands. Though the evidence at hand does not warrant a firm conclusion to this effect, the modest correlation between these ratings does not suggest the same degree of convergence upon a single cohesive construct that the correlations among the well-being measures do (see Table 1), let alone the correlation between progress and success ratings. Any differences thus indicated between motivation by extrinsic reward versus extrinsic demand may also justify the observed differences in the power of these motives to predict well-being change and moderate its relationship with goal attainment. However, the sizes of these differences fall short of statistical significance, curtailing the conclusiveness of any such interpretations.

Regarding the other dimensions of motivation assessed here (introjection, identification, and intrinsic motivation), all other expected relationships failed to replicate (Sheldon & Kasser, 1995, 1998, 2001; Sheldon et al., 2004).³ Only the direct relationship between the overall self-determination composite and well-being change differed from zero in the expected direction. These results challenge existing theory, which strongly emphasizes the psychological benefits of intrinsic motivation.

Well-Being Prediction and Attainment Moderation by Goal Characteristics

This section will consider results regarding other goal characteristics including probability of success, environmental support, and conflict. These three ratings moderated the relationship between goal attainment and well-being change, and some related to well-being change directly. All other results supported their respective null hypotheses, including results regarding retrospective ratings of effort.

Results indicated the previously unknown moderation by attainability of the link between well-being change and goal attainment as portrayed in Figure 3. Expectations of success do not alter the relationship between well-being increases and goal attainment, but when people foresee failure or stagnation, these outcomes appear to relate to well-being losses more directly than when unforeseen. People may lose well-being by interpreting poor outcomes as confirmation of negative beliefs about their self-efficacy, whereas people with greater self-efficacy may take such outcomes less personally.

However, the subjectivity of attainment ratings or memory of one's early-quarter well-being ratings might also permit self-beliefs to produce confirmatory biases in goal outcome and well-being ratings at the end of the quarter, creating bidirectional effects. Alternately, one might interpret a focus on attainable goals as foreshadowing a relatively easy, stress-free, or at least manageable phase of life, over the course of which a person's evaluation of life might naturally improve, regardless of whether that person attains those goals, whereas goal attainment might partially mitigate the equal and opposite effects of difficult times. This could explain the marginal direct relationship between attainability and well-being change.

This study identifies another predictor of well-being improvement among goal characteristics: the length of the time frame in which participants expect to achieve their goals. As suggested above with attainable goals, a focus on long-term goals may mark a period of relative thriving during which well-being naturally improves, in as much as a preponderance of long-term goals implies the relative freedom or emotional detachment from pressuring concerns with immediate consequences (e.g., tests, rocky romantic

relationships, or short-term finances). Though college students enjoy relatively stable life conditions as compared to less privileged people, conditions may yet vary sufficiently to manifest the differentiating effects of basic need satisfaction. Theoretically, those who meet their basic needs regularly tend to develop more advanced, complex, and longer-term goals (Maslow, 1943; Kenrick, Griskevicius, Neuberg, & Schaller, 2010), so those who haven't developed these goals might more likely lack basic need satisfaction and thus well-being. Conversely, if long-term goals do indeed promote well-being, this would support eudaimonic theories that emphasize the psychological benefits of identifying more closely with lifelong growth pursuits than with opportunities for immediate gratification, which may carry as many negative consequences for long-term well-being as positive (Lent, 2004; Waterman, 1993; Ryan & Deci, 2001; Steger et al., 2008).

When considering factors external to goals themselves, the support received in pursuing goals from one's environment stands out as particularly relevant to well-being change. First, social support and auspicious life circumstances relate to well-being gains directly (see Figure 4). This bolsters claims from theory that social support plays an important role in well-being (Ryff, 1989, 1995; Buettner, 2009, 2010), especially as applied to goals (Little, 1989), and extends existing evidence to this effect (Palys & Little, 1983; Ruchman & Wolchik, 1988; Bowie-Reed, 1984, as cited in Ruchman & Wolchik, 1988; Pomaki et al., 2009; Sennott, 2011; Brunstein, 1993). On the other hand, improvements in happiness might have biased environmental support ratings positively by making the roles others played seem better through proverbial "rose-colored glasses,"

or by making external obstacles one experienced along the way seem not so bad in retrospect.

In addition, environmental support moderates the relationship between goal attainment and well-being change. Participants who describe their situations as supportive toward their goals generally gain well-being over time, even if they make little progress toward their goals. Actually attaining goals seems to make little or no difference in how they feel about their lives as a whole. Receiving aid may prevent personal success from inflating satisfaction much further than the privilege of receiving aid in itself, or perhaps vice versa if the aid seems superfluous.

External aid may also come at the cost of whatever satisfaction of the need for competence one might gain from being able to claim sole responsibility for one's success. Self-determination theory emphasizes the importance of overcoming challenges in the fulfillment of this need for competence. External aid may rob a goal of its challenge, and thus rob the pursuer of affirmations of competence and satisfaction of a theoretically fundamental need (Deci, 1971, 1972a, 1972b, 1975, 1980; Deci, Koestner, & Ryan, 1999a, 1999b; Deci & Ryan, 1985a, 1991, 2000; Ryan & Deci, 2000, 2001). Likewise, flow theory identifies optimal challenge as a factor that fosters the enjoyable and psychologically salutary experience of flow (Csikszentmihalyi, 1975, 1990). Perhaps this experiential benefit stands apart from any practical benefits contingent upon attainment, such that people who attain goals that facilitate one another only gain the benefits of attainment for lack of challenge. Thus one might expect these people to gain no more

well-being than people who attain conflicted goals, whose flow experiences during pursuit may only narrowly compensate for the concurrent stress of goal conflict.

As for those who feel they lack aid in their goal pursuits, goal attainment seems much more intertwined with well-being. One might interpret this as an indication that environmental support acts as a safety net when people fall short of their aspirations. When necessary, social support may translate into consolation, and other auspicious circumstances may offer alternative opportunities. This relationship might also reflect a tendency to sacrifice goal attainment when well-being drops for external reasons, perhaps in favor of other goals that become more pressing. Since well-being drops less when one perceives the environment as supportive, goal abandonment may occur more voluntarily and thus detract less from well-being than when tough times force undesirable choices.

The general role that external support plays in moderating the relationship between goal attainment and well-being change appears similar to the role of intrapersonal support versus conflict. Just as in supportive environments, when people succeed at goals that support each other, they appear to gain no additional well-being relative to those who fail at mutually facilitative goals. Furthermore, just as in unsupportive environments, when people fail at goals that do not support and may conflict with one another, they tend to lose a significant amount of well-being, whereas gains tend to accompany attainment even when goals conflict. These results recast goal conflict as less of a direct threat to well-being than as an exacerbating risk factor—the diathesis to a lack of goal attainment’s stress.

This evidence that well-being decreases more drastically when people fail at conflicted goals than when people fail at mutually facilitative goals concurs with other research. Riediger and Freund (2004) demonstrate that intergoal conflict relates more strongly to well-being than does intergoal facilitation. Though the method of assessment employed herein hinders consideration of conflict as independent from facilitation, the direct relationship between well-being change and conflict (versus facilitation) seems to depend on attainment as much as it depends on the distinction between conflict and facilitation. Future research would do well to consider conflict and facilitation separate, as Riediger and Freund (2004) do (see also Boudreaux & Ozer, in press), and investigate whether their separate moderating influences on the relationship between goal attainment and well-being change differ from their combined influence shown here. The direct relationship between well-being change and goal conflict failed to achieve significance, but attainment (or its interaction with conflict) may explain the same variance in well-being better than conflict can. Other studies demonstrating a direct relationship (Emmons, 1986; Emmons & King, 1988; Riediger & Freund, 2008; Palys & Little, 1983; van Dierendonck et al., 2005) have not controlled for direct or interactive influences of goal attainment.

Moderation of Attainment by Goal Content

Goal content also appears to moderate the relationship between attainment and well-being change. This supports the basic principle of the third hypothesis. Yet as with goal characteristics, the direction of moderation by goal content only inconsistently matches hypothesized differences based on existent theory.

Attainment of material wealth-seeking goals related to well-being change the least of all, suiting applications of self-determination theory (SDT) to extrinsic goal content (Sheldon & Kasser, 1995, 1998, 2001; Sheldon et al., 2004). This also echoes mounting concerns in psychological research literature about the potential pitfalls of materialism (Carver & Baird, 1998; Kasser & Sheldon, 2000; Ryan, Sheldon, Deci, & Kasser, 1996; Kasser & Ryan, 1993, 1996; Kasser, Ryan, Zax, & Sameroff, 1995; Deci & Ryan, 1985b; Fromm, 1976).

Physical health goal attainment related most strongly to well-being improvements, and significantly more than material wealth goals. While SDT does not explicitly assign a specific place on the intrinsic-versus-extrinsic goal content continuum for physical health goals, they resemble personal growth goals the most closely of those categories that have specified places. Aside from their literal emphasis on personal physical growth, some evidence suggests enjoyment (the basis of intrinsic motivation) may accompany exercise. An experience-sampling study of subjective happiness during a variety of activities found that exercising associates with concurrent subjective happiness more strongly than any other activity except sex (Killingsworth & Gilbert, 2010).

That being said, the sort of enjoyment that SDT refers to as intrinsically motivating may not motivate physical health goal pursuit as much as personal identification with the value of such pursuits (i.e., a belief in their importance). Likewise, self-directed negative emotions such as guilt, shame, and anxiety resulting from evaluations of one's overall fitness, body shape, or weight may motivate physical health goals through introjection just as easily, as might the desire for extrinsic reward (e.g., an

athletic or modeling career) or the sensitivity to extrinsic demand (e.g., the expectations of one's coach, teammates, or the opposite sex). Therefore to whatever extent the usual sources of motivation for goals of a given content category determine that category's place on the SDT continuum, physical health goals may not represent the theoretical notion of intrinsic goals very consistently; nor does the first-place finish these goals achieve when predicting well-being improvements from goal attainment fulfill the predictions of SDT very well.

Meanwhile, theories linking physical health benefits to subjective and psychological well-being benefits (e.g., Chigbo, 2012; Hodges, 2008; Sennott, 2011; Krentzman, 2008; Thompson et al., 2003) certainly find new support in these results. Still, as argued with the overall attainment-improvement relationship at the outset of the discussion, well-being improvements may facilitate health goal attainment as easily as the opposite, and auspicious circumstances may promote both equally.

Nevertheless, that even meaning in life may grow with physical health suggests intriguing implications for existential theory. Perhaps physical vitality staves off the existential threats of mortality, frailty, and ineffectuality. Perhaps strength and clarity of life purpose translates to strength of willpower, determination, and adherence to one's exercise regimen. Though these data do not facilitate further disambiguation, future studies might address such possibilities and interpretive challenges readily with designs more focused on addressing them directly.

Since the absence of evidence for differences among most goal categories may not firmly evince the absence of differences, this study's results compel further scrutiny

of prevalent theory. Taken as a whole, these results establish only the generality of the relationship between goal attainment and well-being change, as the overall relationship emerges significant while differences among the corresponding relationships of each individual goal category do not. However, considered in isolation, results regarding religious and affect control goal attainment do not emerge significant, while organization goal attainment does. Though the most parsimonious explanation of these differences in conclusions might cite the joint effects of possible sampling error and a conventional but otherwise arbitrary evidentiary standard, alternate explanations deserve some consideration as well.

Despite hypotheses to the contrary, these data seem to favor a link between well-being gain and organizational achievement over religious achievement and affect control goals. Though subtle at best, these differences (or even the lack thereof) suggest the theoretical emphasis currently placed on relationships between religious goals and various kinds of well-being (Emmons, 1999; Reker, 2000) might better focus on more practical concerns such as health, organization, and academic achievement, at least for this age group. If for no other reason, these kinds of concerns may respond better to interventions that might need to change the way a troubled person views and develops his or her status as compared to religious concerns, which may resist external influence and belief change, or encounter ethical issues preventing intervention altogether.

The relatively weaker relationship between religious goal attainment compared to other kinds of goals undermines the theory that religious goals contribute to well-being (Emmons, 1999). Nevertheless, importance ratings of religious goals relate moderately

to the concurrent experience of meaning in life (Stauner & Ozer, 2010). If this relationship reflects direct causation, the relative lack of evidence for a relationship between religious goal attainment and change in the presence of meaning implies that religious goals more likely result from the sense of meaning than generate it. Alternately, both religious goals and a sense of meaning may result from a third construct causing each, such as trait religiousness itself (Steger & Frazier, 2005), which religious goal attainment may not affect substantially. Such causal pathways might result in the well-established cross-sectional correlations between religious goals and well-being, while allowing religious goal attainment and well-being change to remain relatively independent as demonstrated here.

Limitations and Future Directions

A number of factors limit the evidentiary value of these data. Many are inherent to the method employed and the constructs in question, such as the subjective nature of self-report data, the difficulty of distinguishing existential well-being from affective well-being, and the possible introduction of error due to the automated administration of the survey via the internet. Other limitations might be more easily addressed by future studies, such as the short time frame and lack of diversity in demographic characteristics such as age and occupation. Experimental interventions to test causal directionality may be plausible as well, but these might pose additional challenges.

Subjectivity and discriminant validity. The basic question of the present study requires the use of self-report survey methodology to access participants' subjective experiences and life evaluations. This makes some degree of biasing practically

inevitable. However, the degree evident in this data necessitated the exclusion of a substantial number of cases; fewer might have been excluded completely if this survey had asked other, less subjective or less abstract (and hence cognitively taxing) questions.⁵ For instance, more concrete indicators of well-being (or the lack thereof) such as an inventory of physical symptoms of distress might resist causes of response invariance such as uncertainty, acquiescence, and fatigue. Furthermore, the successful generalization of the link with goal attainment across all well-being measures suggest such an attempt to extend these relationships to even less subjective aspects of well-being like physical health might succeed as well. In addition to bolstering the epistemic foundations of these conclusions, further generalizability to concrete, objective health constructs would increase the impact of goal attainment theory on positive psychology and health psychology alike.

The generality of the relationship across the measures of well-being employed herein presents its own limitation: much of the impact of these conclusions depends on the validity of distinctions among these well-being constructs, because these data do not support distinctions in themselves. Moreover, the additional dimensions of PWB described by Ryff's (1989) theory are underemphasized in research, as Ryff and Keyes (1995) point out themselves; hence evidence of these dimensions' discriminant validity from other researchers is somewhat scarce and conflicted (van Dierendonck, 2005; Springer & Hauser, 2006; for Ryff's response, see Ryff & Keyes, 2006). Furthermore, the MLQ (Steger et al., 2006) was developed in part to address discriminant validity concerns regarding other measures of existential well-being constructs such as purpose in

life (Crumbaugh & Maholick, 1964, 1969) and life regard (Battista & Almond, 1973), which relate somewhat too strongly to constructs like life satisfaction (Diener et al., 1985).

If anything, the present study's results further challenge the validity of distinctions among these well-being constructs, which are certainly all inherently subjective. The correlation between the MLQ's Presence subscale and the SWLS in the present data set is stronger than in Steger and colleagues' (2006) study, and the factor analysis presented herein indicates a single general factor at the level of the subscale score.² In as much as this study's impact depends on its demonstration of the relationship between goal attainment and well-being change outside of SWB, it depends on additional research to demonstrate that these well-being constructs truly lie outside of SWB (for a contemporaneous example of mixed evidence, see Nelson et al., in press).

Similarly unresolved issues exist with goal ratings due to their similar subjectivity. The primary independent variable, a composite of progress and success ratings, required participants to judge the degree to which they had progressed or succeeded at their goals. The standards by which participants judged their actions, as well as the degrees of biasing due to acquiescence, self-enhancement, or the reconstructive recall process are all unknown in this sample and may have varied substantially across participants. While the exclusion criteria employed in the present study removed cases with exceptionally problematic response sets, their thresholds were set to tolerate fairly large degrees of invariance, which remained otherwise unaddressed in the retained subsample.

Future replications may consider two approaches to building countermeasures against such sources of error into the method: direct assessment of bias, and more objective operationalization of the goal characteristics in question. The inclusion of dedicated measures of response styles such as acquiescence, self-enhancement, and non-discrimination or inattentiveness might permit the estimation and control of these problems even as they occur in less extreme cases than would meet the exclusion criteria employed in the present study. If participants exhibit problematic response styles that would otherwise go unnoticed, one set of analyses could exclude these participants as well; otherwise, some estimate of the degree to which these sources of error influence other analyses could prove valuable.

Generalizability.

These results may generalize to a limited degree outside of student populations. Are career and occupational goals equivalent to academic goals? Is financial goal attainment still unrelated to well-being among self-reliant adults with families to support? Replication of this study with a community sample of older adults might answer some such questions that this study cannot.

Cross-cultural replication of this design would also help to address other such questions. For instance, does the link between goal attainment and well-being change depend upon the fulfillment of culturally instilled or socially salient expectations of the self, or does personal goal achievement inherently, universally benefit the achiever? Despite the diversity of this study's sample, results may not generalize to the populations of different cultures. Cultural differences in individualism and collectivism moderate the

relationships of life satisfaction with personality and the balance of positive and negative affect (Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002); might the individualistic culture of this American sample strengthen the connection between goal attainment and life satisfaction or the various other cognitive kinds of well-being assessed herein? One might particularly expect the relationships of these well-being constructs with the interactions of goal attainment and autonomous versus controlled motivation to favor autonomy more strongly in an individualistic culture such as this. Likewise, the impact of extrinsic demand might differ considerably in a more egalitarian or “horizontal” culture (e.g., Swedish) or a more hierarchical or “vertical” culture (e.g., Chinese), in as much as these cultures’ norms inhibit or compel self-sacrifice (Triandis, 2001; Triandis & Suh, 2002). Some evidence exists to suggest relationships between specific sources of meaning and people’s overall amounts of meaning in life vary between the Canadian and Chinese populations (Lin, 2001).

Experimental intervention could address the issue of causal ambiguity in these results due to the quasi-experimental design. Theorists have often designated goals as a “source” of meaning or well-being and assumed that positive relations equate to benefits flowing from goals to well-being. However, almost all supportive evidence derives from studies lacking the random assignment methods necessary to qualify as true experiments, including the present study, and thus cannot establish causality empirically. In a rare exception, Sheldon and colleagues (2002) attempted an intervention to increase goal attainment for a randomly selected portion of their sample, though this met with limited success. Other experimental designs might employ goal-setting prompts that encourage

different kinds of goals (e.g., intrinsic vs. extrinsic goals) and track progress toward them over time to support causal claims about the effects of different goal contents and motives on well-being.

Nevertheless, experimental approaches carry their own risks. One should not assume that goals can be imposed or generated experimentally without sensitivity to individual life context and still be relevant to global well-being. Moreover, interventions that focus on encouraging goal attainment may act on or through other constructs such as self-efficacy and social support. As such, they may introduce their own ambiguities about the causality of observed relationships, or at least fail to resolve mediational issues to whatever degree such mechanisms operate without experimental control.

Last, the substantial number of separate significance tests conducted on these data inflate the probability of rejecting some null hypotheses due to “Type I” sampling error. While this possibility does not challenge the validity of results as they pertain to this sample, it threatens generalizability beyond it. The question of which results might generalize to whom seems well worth entertaining with further replicative research.

Conclusions

The relationship of goal attainment to subjective well-being change generalizes to meaning in life and psychological well-being, which share a higher-order general factor. This conclusion concords with theories that identify goals as important components of the personal meaning-making process. Further evidence demonstrates inequalities among goals based on their motives, characteristics, and contents, though these results disagree with prominent theories on the details. Extrinsic motivation for goal pursuit disconnects

goal outcomes from well-being outcomes, but no other dimensions of motivation moderate the general relationship as strongly as in other research on self-determination. Other goal characteristics weaken the connection of goal attainment to well-being change, including probability of success, environmental support, and goal facilitation (as opposed to goal conflict). Finally, results suggest the content of goals may moderate connections between their attainment and well-being outcomes, but to a lesser degree than others have suggested.

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Footnotes.

1. The Age-Universal I/E-R Scale exhibited exceptionally problematic invariance despite its inclusion of three reverse-scored items; 38 participants met the exclusion criterion.
2. The cited studies do not specify whether the components of the self-determination composite are unit-weighted or would theoretically require inclusion of the extrinsic reward rating as well, but all permutations of this analysis yield nearly identical results.
3. A direct relationship also emerged with identification ($\beta = .09$, $t_{(191)} = 2.08$, $p = .04$) when the multiple regression excluded attainment and its interaction term with identification. However, identification failed to achieve significance as a separate predictor ($\beta = .06$, $t_{(187)} = 1.37$, $p = .17$) when including attainment and the interaction of identification with attainment in the multiple regression, as well as when the sample included participants excluded by completion time, response invariance, and failure to list five goals ($\beta = .03$, $t_{(355)} = .90$, $p = .37$). Moreover, identification ratings averaged across all of each participant's goals formed a non-normal distribution (skewness = -1.32; kurtosis = 2.31; Shapiro-Wilk $W = .89$, $p < 1e^{-9}$), and a few participants appeared to have excessive leverage in determining the slope of the regression line. Tukey's fences identified four outliers below the lower bound. When the analysis excluded these outliers, the standardized regression coefficient for identification ratings reached significance ($\beta = .11$, $t_{(187)} = 2.54$, $p = .01$). However, Tukey's fences assume a normal distribution, so they may not apply properly to the non-normal distribution of identification ratings. Direct relationships with introjection ($\beta = .01$, $t_{(201)} = .23$, $p = .82$) and intrinsic motivation ($\beta = .03$, $t_{(232)} = .65$, $p = .52$) failed consistently to achieve significance. The interaction of attainment with intrinsic motivation related negatively to well-being change ($\beta = -.09$, $t_{(353)} = -2.91$, $p = .004$) when the analysis included participants cut for extreme completion time, response invariance, and listing fewer than five goals. The direction of this relationship contradicted previous studies that found a positive relationship (Sheldon & Kasser, 1998; Sheldon et al., 2004). However, the relationship failed to reach significance when the exclusion criteria applied to the analyzed sample ($\beta = -.04$, $t_{(232)} = -.99$, $p = .32$).
4. Though goal attainment did not relate significantly more to meaning in life than to the purpose subscale of PWB either, the slight dissimilarity of these results compelled a cursory comparison of the items from the MLQ-Presence subscale (Steger et al., 2006) against the PWB-Purpose subscale (Springer & Hauser, 2006). MLQ-Presence appears to represent the subjective sense of meaning and purpose in life as a global whole, whereas PWB-Purpose seems to represent the subjective sense of purpose in daily activity and personal lifestyle. The Presence subscale of the MLQ asks simple, straightforward questions about one's life at a level of complete abstraction, such that

participants who haven't already developed personal philosophies of life might base their answers on emotional reactions to the questions more than on careful consideration of personal sources of meaning in life as the measure's instructions request. The Purpose subscale of the PWB index asks somewhat more specific questions about personal life and activities that probably prompt consideration of slightly more concrete and recent experiences, grounding participants' thoughts more firmly in their own roles and activities and limiting evaluation of life as it exists apart from the self. This distinction concords with the proposal to define purpose as a personalized subcomponent of meaning in life that inherently compels action toward one's primary goals (Damon, Menon, & Bronk, 2003). However, the strength and similarity of correlations among these and other well-being measures (see Table 1) limit the empirical impact of any such contrasts.

5. The Psychological Well-Being index (Springer & Hauser, 2006) arguably possesses the most concrete items of all well-being indices employed herein. No participant's responses to this questionnaire met the exclusion criterion for extreme invariance, and overall PWB scores demonstrated the most stability across time of all well-being constructs. However, these properties may also result from the index's exceptional length and wealth of reverse-scored items.

Appendix A. Comprehensive list of measures administered.

Demographics questionnaire

Satisfaction with Life Scale (Diener et al., 1985)

Positive and Negative Affect Schedule (Watson et al., 1988)

Meaning in Life Questionnaire (Steger et al., 2006)

Psychological Well-Being scale (Springer & Hauser, 2006)

Operant goal listing task (Kaiser & Ozer, 1997)

Goal self-categorization task (see Appendix B)

Goal ratings (see Appendix C)

Personal Goal Questionnaire (Howell et al., 2001)

Values Q-set (Stauner et al., 2010)

Big Five Inventory (John et al., 1991)

Appendix B. Goal self-categorization task.

On this page we would like you to categorize your goals.

- 1) Reread the list of goals you provided on a previous page.
- 2) Find the goal category from the eight listed below that best matches each goal.
- 3) Click on the goal text, and drag and drop it into the category that matches best.
- 4) Repeat for all 10 of your goals.

Categories

Academic:

Includes academic studies and the academic portion of career preparation, as well as personal characteristics that clearly affect academic performance.

Social Relationships:

Includes all explicitly interpersonal aspects of life. Relationships with friends, family and romantic partners belong in the “social” category.

Material Wealth:

Includes aspects of life related to the acquisition, retention and maintenance of material wealth (including money and objects; also current or future employment).

Health:

Includes aspects of life related to management and/or improvement of physical health (including weight control or dietary concerns; also prevention of illness)

Organization:

Includes aspects of life related to the management of time, cleanliness and coordination of activities.

Affect Control:

Includes aspects of life directly related to the experience of enjoyment (the pursuit of happiness and amusement) or avoidance of stress.

Independence:

Includes aspects of life related to the development of self-reliance.

Moral and Religious:

Includes aspects of life related to religious or spiritual beliefs and ethical principles.

Appendix C. Goal ratings.

Early-quarter survey

Want vs. Ought: Is this goal something you personally want to attain, or something that you feel you ought to accomplish?

Meaning: How meaningful do you feel this goal is?

Extrinsic: Do you pursue this goal because someone else wants you to, or because the situation demands it?

Introjection: Do you pursue this goal because you would feel ashamed, guilty, or anxious if you didn't?

Identification: Do you pursue this goal because you really believe it's an important goal to have?

Intrinsic: Do you pursue this goal for the fun and enjoyment that it provides you?

Probability of Success: What are your chances of succeeding in this goal?

Difficulty: How difficult do you feel it will be to pursue this goal?

Investment: How willing are you to invest time, money, or effort to achieve this goal?

Purpose: Does this goal serve a greater purpose in your life that you identify with on a deep personal level?

Reward: Are you pursuing this goal because you hope to gain some material possession or reward (e.g., a car, money, a high-paying job, a better place to live, etc.), or to avoid losing a material possession?

Value congruence: Think of values (social, moral, religious, etc.) that are important to you personally. Is this goal consistent with the values that guide your life?

Time frame: What is your time frame for accomplishing this goal?

End-of-quarter survey

Enjoyment: How much have you enjoyed trying to achieve this goal?

Environmental support: Your environment (your living situation, other people, available money, etc.) can help you or hinder you in achieving your goals. How did your environment affect this goal?

Conflict: How has pursuing other goals affected your being successful in attaining this goal?

Success: How successful have you been in attaining this goal?

Progress: Over the past 8 weeks since you first gave us your goals, how much progress have you made toward completing this goal?

Effort: How much effort did you invest in pursuing this goal?

Meaning: How meaningful do you feel this goal was?

Appendix D. Current revision of goal content taxonomy.

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| <ul style="list-style-type: none"> 1.0 Academic / Occupational <ul style="list-style-type: none"> 1.1 Perform well at school or job <ul style="list-style-type: none"> 1.11 Improve work-related skills / knowledge 1.12 Study harder 1.13 Meet minimal performance standard 1.2 Complete specific (short-term) tasks (e.g., “finish paper”) 1.3 Make progress on long-term plans <ul style="list-style-type: none"> 1.31 Transfer to other campus 1.32 Pursue advanced degree 1.33 Graduate / complete education 1.4 Plan academic / occupational future 1.5 Achieve meaningful career goal 2.0 Social Relationships <ul style="list-style-type: none"> 2.1 Family of origin concerns <ul style="list-style-type: none"> 2.11 Maintain / improve relations with family or specific family members 2.12 Assist family member(s) 2.2. Peer relations <ul style="list-style-type: none"> 2.21 Make new friends 2.22 Maintain / improve friendships 2.23 Assist friend(s) 2.3 Romantic relations <ul style="list-style-type: none"> 2.31 Find a romantic partner 2.32 Maintain or improve romantic relationship 2.33 End a romantic relationship 2.34 Assist romantic partner 2.4 Family of destination concerns <ul style="list-style-type: none"> 2.41 Create family of destination <ul style="list-style-type: none"> 2.411 Get married 2.412 Have children 2.42 Maintain / improve relations with family and/or specific family members 2.43 Assist family member(s) 2.5 Participate in larger social community 2.6 Be respected or well known / leadership | <ul style="list-style-type: none"> 2.7 Alter a social personality trait to get along better with others <ul style="list-style-type: none"> 2.71 Be less shy, more talkative 2.72 Control temper / anger 3.0 Financial Concerns <ul style="list-style-type: none"> 3.1 Improve immediate financial situation <ul style="list-style-type: none"> 3.11 Budget better 3.12 Increase income 3.13 Find or improve job / short term employment 3.2 Improve longer-term financial situation <ul style="list-style-type: none"> 3.21 Save money 3.22 Pursue lucrative career 3.3 Financially assist family of origin 3.4 Financially assist family of destination <ul style="list-style-type: none"> 3.41 Be able to support future family 3.5 Financially assist friend, acquaintance, or community 3.6 Afford to purchase a desired item for self 4.0 Health <ul style="list-style-type: none"> 4.1 Maintain / improve health, appearance or hygiene <ul style="list-style-type: none"> 4.11 Lose weight 4.12 Get in shape / exercise 4.13 Better diet 4.14 Improve sleep schedule 4.2 Reduce consumption of drugs / alcohol / tobacco 4.3 Manage specific or chronic health problem 5.0 Organization <ul style="list-style-type: none"> 5.1 Activity control (start, stop, or complete an activity) <ul style="list-style-type: none"> 5.11 Clean-up / get organized 5.12 Be punctual 5.2 Use time more effectively (includes “stop procrastinating”) 5.3 Attain a performance standard in life task |
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Appendix D continued. Current revision of goal content taxonomy.

6.0 Affect Control

- 6.1 Increase positive affect (pursue pleasure, have fun)
 - 6.11 Participation or improvement in recreation, fine arts, hobbies
 - 6.12 Play a sport or improve sports ability
 - 6.13 Travel
 - 6.14 Thrill-seeking
 - 6.15 Learn new skill / gain knowledge for personal satisfaction
- 6.2 Decrease negative affect
 - 6.21 Reduce stress
 - 6.22 Relax
 - 6.23 Not worry so much
- 6.3 Feel better about self

7.0 Independence

- 7.1 Be self-sufficient
 - 7.11 Live independently from parents
 - 7.12 Do things for oneself
 - 7.13 Improve / maintain an independence related skill
 - 7.14 Obtain material goods / wealth needed for independence
- 7.2 Minimize influence of others
 - 7.21 Be more assertive, self-confident
- 7.3 Find direction in life

8.0 Moral or Religious

- 8.1 Moral
 - 8.11 Attain a virtue: courage, honesty, dutifulness, not be selfish, dedication to ideals, better “character”
 - 8.12 Do good for the community
 - 8.13 Attain a minimal moral standard
- 8.2 Religious
 - 8.21 Observe tenets of an organized religion
 - 8.22 Maintain or strengthen religious beliefs or faith
 - 8.23 Experience spiritual growth

9.0 Other

- 9.1 Meta-goals (goals to set or achieve goals, content-free achievement goals)
- 9.2 Acculturation / language