

PERSONAL GROWTH INITIATIVE, NEED SATISFACTION,
AND SUBJECTIVE WELL-BEING:
TESTING A PROCESS MODEL

BY

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TABLE OF CONTENTS

Acknowledgments.....	ii
List of Tables and Figures.....	v
Abstract.....	vi
Introduction.....	1
Personal Growth Initiative	2
Related Constructs	3
Summary of Related Constructs	21
Measures of Personal Growth Initiative	21
Self-Determination Theory	24
Personal Growth Initiative and Need Satisfaction	27
Proposed Process Model.....	31
The Current Study.....	32
Hypotheses	32
Methods.....	34
Participants.....	3
Procedure	35
Measures	35
Personal Growth Initiative Scale-II (Robitschek et al., 2012).....	35
Balanced Measure of Psychology Needs Scale (Sheldon & Hilpert, 2012).....	36
Temporal Satisfaction with Life Scale (Pavot et al., 1998)	36
Analysis.....	38
Results.....	39
Data Cleaning.....	39
Descriptive	39
Hypothesis Testing.....	45
Correlations.....	45

Exploratory Analyses.....	49
Mediational Path Analysis	49
Is Morality Comparable to Autonomy, Relatedness, and Competence	53
as a Basic Need?	
Discussion.....	66
Personal Growth Initiative and Present Life Satisfaction.....	67
Implications for Personal Growth Initiative as a Mediator of Need Satisfaction	70
Implications for Morality as a Basic Psychological Need	71
Limitations	71
Future Directions	72
Conclusion	73
References.....	75
Appendix A Questionnaires.....	90
Personal Growth Initiative Scale II (PGIS-II; Robitschek et al., 2012).....	90
Balanced Measure of Psychological Needs Scale (Sheldon & Hilpert, 2012)	92
Additional Items—Balanced Measure of Psychological Needs Scale	94
(Prentice et al., 2019)	
Demographic Questions.....	95
Covid-19 Questions	97
Appendix B.....	98
Curriculum Vitae	113

LIST OF TABLES AND FIGURES

Table 1	Related Constructs to Personal Growth Initiative.....	4
Table 2	Additional Morality items.....	36
Table 3	Descriptive Statistics.....	39
Table 4	Correlations.....	47
Table 5	Comparison of Path Analysis Models.....	50
Table 6	T1 Morality Satisfaction Multiple Linear Regression	54
Table 7	T1 Morality Dissatisfaction Multiple Linear Regression	56
Table 8	T2 Morality Satisfaction Multiple Linear Regression	49
Table 9	T2 Morality Dissatisfaction Multiple Linear Regression	63
Table 10	Correlation Table with Subcomponents.....	98
Figure 1	Proposed Process Model.....	31
Figure 2	Mediation Model 1.....	52
Figure 3	Mediation Model 2.....	52
Figure 4	Respondents' Degree of Anxiety about Covid-19.....	68

ABSTRACT

Personal growth initiative (PGI)—an individual’s internal motivation to grow toward self-actualization (Robitschek, 1998)—is associated with increased subjective well-being (Robitschek et al., 2019). Yet, how it promotes subjective well-being is unknown. I test the hypothesis that PGI increases individuals’ need satisfaction, which leads to increased present life-satisfaction. 143 undergraduate students reported their PGI, current need satisfaction, and life satisfaction at two timepoints, along with demographic information (age, gender, household income, race/ethnicity) and questions about their Covid-19 experiences. Contrary to expectations, PGI and present life satisfaction were unrelated. I tested 2 exploratory models: Model 1) PGI is associated with increases in need satisfaction, which leads to increased future life-satisfaction and Model 2) need satisfaction is associated with increases in PGI, which leads to increased future life-satisfaction. Differences in scores between two timepoints were analyzed via a modified simple partly-mediated model to determine proposed model fit. Model 2—need satisfaction’s effect on future life satisfaction partly mediated by PGI—is the best-fitting model. I also replicated past research of the independent effect of moral need satisfaction via exploratory multiple linear regression. Morality was comparable to other psychological needs, and accounted for additional variance in Past, Present, and Future life satisfaction. Finally, I tested the confirmatory hypothesis that Covid-19 anxiety affects participants’ need satisfaction. I consider the potential impacts of this study’s findings to future research, as well as the impact of Covid-19 on this study.

INTRODUCTION

The purpose of this paper is to explore whether *personal growth initiative*—the skillset and internal motivation to grow as an individual toward self-actualization (Robitschek, 1998)—leads to increased subjective well-being by increasing psychological need satisfaction. Subjective well-being and personal growth are highly interrelated (Compton et al., 1996), with personal growth associated with higher subjective well-being (Jayawickreme et al., 2012; Robitschek et al., 2019). Nonetheless, exactly how personal growth leads to increased subjective well-being is unclear. Self-determination Theory posits that satisfying innate basic psychological need leads to increased well-being (Ryan & Deci, 2000). Personal growth initiative has been shown to be associated with increased subjective well-being in a number of samples (e.g., Robitschek & Keyes, 2009) and has been studied alongside psychological need satisfaction in a number of empirical studies (e.g., Legault et al., 2017; Negovan & Tomša, 2018; Ryan et al., 1997). Sheldon and colleagues (2001) hypothesize positive effects from satisfying psychological need leads to higher motivation for individuals to satisfy these needs. One source of this motivation may be personal growth initiative. Personal growth initiative provides an opportunity to investigate the connections between individuals' growth, psychological need satisfaction, subjective well-being, and subsequent mental health. My study aims to test these connections by monitoring individuals' personal growth initiative, need satisfaction, and subjective well-being at two time points.

This thesis has three components: the primary component is the proposed process model; the second is confirming the independent effect of morality as a basic

psychological need; the third is considering the potential impact of the Covid-19 pandemic on these results. I will a) discuss the theoretical background of each element within this study; b) propose a process model where personal growth initiative's effect on present life satisfaction is partly mediated by need satisfaction; c) propose 2 hypotheses—that the proposed process model will fit the sample of 143 students, and that respondents' levels of Covid-19 anxiety would affect their relatedness satisfaction, relatedness dissatisfaction, and autonomy satisfaction; and d) outline methods and results of my primary analyses, including exploratory analyses. After conducting these exploratory analyses, I will e) consider the study's secondary and tertiary elements; and f) outline the results of all these analyses. Finally, I will g) discuss study limitations and future directions for research. Thus, the first sections will focus on the primary hypothesis (Hypothesis 1), and subsequent sections will consider the second and third components.

Personal Growth Initiative

Personal growth initiative is an individual's motivation and skillset to grow as an individual in ways that are important to them (Robitschek, 1998), often toward self-actualization (Luyckx & Robitschek, 2014; Robitschek et al., 2012). Personal growth initiative is comprised of four subcomponents: Readiness, Planfulness, Using Resources, and Intentional Behavior (Robitschek et al., 2012). Drawing from theories of intentional growth and change in counseling (e.g., Prochaska & DiClemente, 1986), personal growth initiative focuses on *intentional* growth (rather than environmentally-dictated or nonconscious growth; Robitschek, 1998). This focus builds from the intentional assumption of individuals' capacities for self-knowledge of their own needs, individuals'

capabilities to develop said knowledge, and individuals' capabilities to further develop skills for personal growth and change. Individuals with PGI identify areas they wish to grow, plan strategies to grow, utilize resources toward personal growth, and enact their plans to grow. For instance, an individual may wish to improve themselves by being healthier, so they set the goal of exercising five times a week, sign up with a friend for a class at their local fitness center, and regularly attend fitness classes.

Related Constructs

A number of constructs are theoretically or empirically related to personal growth initiative, including *hope*, the *stages of change model*, *optimism*, *growth mindset*, *self-efficacy*, *ego-resiliency*, *mental toughness*, *growth need strength*, and Ryff's (1989a) *personal growth*. The construct of hope is theoretically distinct, but empirically similar from personal growth initiative, particularly compared to the PGIS (Robitschek, 1998; Shorey et al., 2007). The stages of change model, growth mindset, ego-resiliency, mental toughness, growth need strength, and Ryff's (1989a) personal growth originate from different empirical traditions and thus ask different questions and describe related constructs. Optimism, growth mindset, and self-efficacy are related constructs that focus on broader constructs, often components of (e.g., growth mindset) or foundations for (e.g., self-efficacy) personal growth initiative. Table 1 compares these constructs and measures.

Hope. Hope is “a cognitive set that is based on a reciprocally derived sense of successful (a) *agency* (goal-directed determination) and (b) *pathways* (planning of ways to meet goals)” (Snyder et al., 1991, p. 571; italics added). A hopeful individual believes that they have the ability to succeed in their goals and generates potential pathways to

Table 1
Related Constructs to Personal Growth Initiative

Construct	Definition	Dimensionality	Theoretical Perspectives	Sample Question(s)
Personal Growth Initiative	An individual's motivation and skills to grow as an individual in ways that are important to them (Robitschek, 1998), often toward self-actualization (Luyckz & Robitschek, 2014; Robitschek et al, 2012).	4 dimensions; Readiness, Planfulness, Utilizing Resources, Behavior	Clinical theories of personal growth (e.g., Maslow, 1968; Rogers, 1961)	"I know how to set realistic goals to make changes in myself." (Robitschek et al., 2012) "I know how to change specific things that I want to change in my life." (Robitschek, 1998)
Hope	"[A] cognitive set that is based on a reciprocally derived sense of successful (a) <i>agency</i> (goal-directed determination) and (b) <i>pathways</i> (planning of ways to meet goals)" (Snyder et al., 1991, p. 571).	Unidimensional	Positive psychology; Philosophy (Snyder et al., 1991)	"I can think of many ways to reach my current goals" (Snyder et al., 1996)
Stages of Change Model	The pattern of cognitive and behavioral processes an individual experiences when deliberating upon and purposefully enacting habit and behavioral changes (Prochaska et al., 1988; Prochaska & DiClemente, 1983, 1986)	4 dimensions; Contemplation, Planning, Action, Maintenance	Counseling Psychology; Addiction research (Prochaska et al., 1988; Prochaska & DiClemente, 1983, 1986)	"I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem." (McConaughy et al., 1983) "I have made some changes in my drinking, and I want some help to keep from going back to the way I used to drink." (Miller & Tonigan, 1996)

Table 1, cont.

Construct	Definition	Dimensionality	Theoretical Perspectives	Sample Question(s)
Optimism	An individual's general expectancy of positive outcomes (Scheier & Carver, 1985)	Unidimensional	Positive Psychology (Scheier & Carver, 1985)	"In uncertain times, I usually expect the best." (Scheier et al., 1994)
Growth Mindset	An individual's belief that their abilities, particularly intelligence, are mutable and can be developed (Diener & Dweck, 1978, 1980).	Unidimensional	Intelligence research (Dweck, 1999; education (<i>Result List: "Growth Mindset"; EBSCOhost, 2020</i>))	"You have a certain amount of intelligence, and you can't really do much to change it." (Dweck, 1999)
Self-Efficacy	An individual's belief in their ability to perform a particular task (Bandura, 1986).	Unidimensional, within life domains (e.g., social self-efficacy; general self-efficacy)	Social Cognitive (Bandura, 1997)	"How confident would you feel in engaging in physical activity for at least 20 minutes? (Sweet et al., 2012)
Ego-Resiliency	How an individual expresses their personality within the demands of their circumstances (J. H. Block & Block, 1980).	Subdimension	Lewin's (1935) theories of motivation; Fenichel's psychoanalytic theories	"I quickly get over and recover from being startled. (Alessandri et al., 2007)
Mental Toughness	An individual's ability to maintain a high performance while under minor or significant potential mental stressors (Gucciardi et al., 2015).	Unidimensional	Empirical task performance research (Gucciardi et al., 2015)	"I am able to execute appropriate skills or knowledge when challenged." (Gucciardi et al., 2015)

Table 1, cont.

Construct	Definition	Dimensionality	Theoretical Perspectives	Sample Question(s)
Growth Need Strength	An individual's "need for personal growth and accomplishment at work," (Tiegs et al., 1992, p. 577).	Unidimensional	Motivation-Hygiene Theory (Herzberg et al., 1959); Activation Theory (Scott, 1966); Socio-technical Systems Theory (Trist, 1987); Jobs and Individual Differences: An Interactive Approach (Turner & Lawrence, 1965)	"I would like opportunities for personal growth and development in my job"; Indicate your relative preference for "A job where you are often required to make important decisions" vs. "A job with many pleasant people to work with." (Hackman & Oldham, 1975)
Personal Growth	An individual's orientation towards continued growth and development (Ryff, 1989a).	Unidimensional	Clinical theories of personal growth (e.g., Maslow, 1968; Rogers, 1961); Life-span development theories (e.g., Erikson's psycho-social change model; 1959)	"I am not interested in activities that will expand my horizons." (Ryff & Keyes, 1995)

goal success. Like personal growth initiative, hope's goals are self-directed. The *pathways* component of hope parallels the Planfulness and Utilization of Resources subcomponents of personal growth initiative and the *planning* stage of the Stages of Change model (Hettema et al., 2005). However, personal growth initiative and hope focus on different kinds of goals. Shorey and colleagues (2007) note that personal growth initiative focuses more specifically on self-improvement (e.g., "I know how to change specific things that I want in my life"; "I have a good sense of where I am headed in my life" (Robitschek, 1999) early in the Personal Growth Initiative Scale (PGIS; Robitschek, 1998). Individuals with high personal growth initiative may use personal growth initiative in more discrete, transitory periods over their lifetimes, while individuals high in hope may use hope more frequently to add to already-present skills. Shorey and colleagues (2007) posit personal growth initiative might be a subset of hope due to their similar aims and personal growth initiative's sharper focus. The Personal Growth Initiative Scale-II (PGIS-II; (Robitschek et al., 2012) further theoretically distinguishes personal growth initiative from hope by explicitly measuring individuals' intentional behaviors. While a highly hopeful individual may be agentic, ready, and plan to achieve success in their chosen goals, they do not necessarily habitually perform intentional behaviors to achieve these goals. Therefore, personal growth initiative is theoretically distinct from hope because it encompasses actions toward goal achievement and focuses specifically on improving the self.

Researchers have compared Snyder and colleagues' (1991) Hope Scale with the original PGIS (Shorey et al., 2007) and PGIS-II (Yang & Chang, 2016). Magyar-Moe and colleagues (2003; c.f. Shorey et al., 2007) observed a $r = 0.51-0.64$ correlation

between the Hope Scale and the original PGIS, while Dordi and Purandare (2018) observed a $r = 0.875$ ($df = 48, p \leq .05$) in alcoholic participants. Shorey and colleagues (2007) compared 378 undergraduate students' scores from the Hope Scale with the PGIS via structural equation modeling (SEM). Participants' PGIS and Hope scores covaried significantly (latent $r = 0.84$; zero order $r = 0.65$). Hope was uniquely predictive of Optimism ($r = .59$), psychological distress ($r = -.38$), and psychological well-being ($r = .59$) scores ($\chi^2 = 234.77, df = 98, p < 0.01, RMSEA = 0.063$ (CI = 0.053; 0.073), NNFI = 0.98, CFI = 0.98). Therefore, individuals' scores on the original PGIS were subsumed by their hope scores. Yang and Chang (2016) compared 227 undergraduate students' scores from the Hope Scale with students' scores on the PGIS-II via confirmatory factor analysis (CFA) and hierarchical regression. Researchers' found the best-fitting factor structure to be a first-order 6 factor (4 subcomponents of personal growth initiative and 2 subcomponents of hope) model where all subcomponents were allowed to co-vary ($df = 237, \chi^2 = 539.61, CFI = .98, NNFI = .98, RMSEA = .056$ (CI = .046–.065), SRMR = .077). The next-best-fitting model was a two-factor second-order model where each subcomponent loaded onto one of two co-varying factors (personal growth initiative or hope; $df = 245, \chi^2 = 569.27, CFI = .98, NNFI = .97, RMSEA = .057$ [CI = .048–.066], SRMR = .081) Students' scores on the PGIS-II Planfulness subscale explained “an additional 3–5% of variance [above hope] in life satisfaction, optimism, depression, and anxiety” (Yang & Chang, 2016, p. 124). Thus, while the measures of the original PGIS and Adult Hope Scale seem synonymous, the PGIS-II predicts unique variance in life satisfaction and related psychological constructs above the Adult Hope Scale.

Stages of change model. The *stages of change model* (Prochaska et al., 1988; Prochaska & DiClemente, 1983, 1986) describes the pattern of cognitive and behavioral processes an individual experiences when deliberating upon and purposefully enacting habit and behavioral changes. Like personal growth initiative, the stages of change model focuses on an individual enacting purposeful, deliberate changes, often towards growth. The subcomponents of personal growth initiative correspond to different stages in the stages of change model; the “readiness” subcomponent of personal growth initiative corresponds to an individual being in the *contemplation* stage of motivational interviewing, “planfulness” and “utilizing resources” subcomponents correspond to the *planning* stage (Robitschek, 1998), and “intentional behavior” corresponds to *action* and *maintenance* stages (Hettema et al., 2005). The stages of change model describes discrete instances of self-improvement with the aim of helping an individual navigate their current stage with their current skillset (Prochaska et al., 1988). In contrast, personal growth initiative describes an individual’s existing skillset, regardless of an individual’s current active efforts to change their behaviors (Robitschek, 1998). Thus, individual change in the stages of change model comes from an individual utilizing their pre-existing skills; change in personal growth initiative comes from an individual expanding these aforementioned skills. Personal growth initiative also emphasizes growth within an individual’s life course, rather than discrete habits or behaviors (such as smoking; cf. Prochaska & DiClemente, 1983; Robitschek, 1998). Personal growth initiative is a personality variable of the skills utilized during the stages of change.

Researchers have developed a number of scales measuring respondents’ stages of change for potential habits, including the Stages of Change Readiness and Treatment

Eagerness Scale (Miller & Tonigan, 1996) and University of Rhode Island Change Assessment (URICA; McConaughy et al., 1983). The Stages of Change Readiness and Treatment Eagerness Scale (19 drinking items; 19 drug use items; Miller & Tonigan, 1996) asks respondents the degree they agree or disagree with statements about their drinking and drug habits (sample item: "I want help to keep from going back to the drug problems that I had before."). Respondents' answers are scored on three subscales: Recognition ("I am a problem drinker."), Ambivalence ("Sometimes I wonder if I am an alcoholic."), and Taking Steps ("I'm not just thinking about changing my drug use, I'm already doing something about it.") for each habit; the Ambivalence subscale is interpreted based upon the Recognition subscale. Guidelines for interpreting the scores recommend comparing the respondent's scores to an accompanying table of scores of respondents who sought treatment for alcoholism or substance abuse problems. These guidelines establish the scale's aim is to treat deficit, rather than assess pathways to further individuals' growth. There are also a number of scales measuring individuals' stages of change for particular habits and behaviors (e.g., exercise (Dannecker et al., 2003); self-management of chronic pain (Kerns et al., 1997); bulimia nervosa (Martinez et al., 2007)).

The stages of change model describes how an individual uses skills impacted by personal growth initiative to change a discrete habit. Accordingly, there are multiple scales that measure respondents' degree of change at each stage for particular habits and behaviors (e.g., exercise (Dannecker et al., 2003); self-management of chronic pain (Kerns et al., 1997) or ask for respondents to specify the particular habit prior to scale completion (e.g., URICA; McConaughy et al., 1983). As this study focuses on global

effects of individuals' habits on multiple basic psychological needs and life satisfaction, a focus on personal growth initiative is both parsimonious and most appropriate.

Optimism. *Optimism* is defined as an individual's general expectancy of positive outcomes (Scheier & Carver, 1985). While researchers often focus on an individual's expectancies of the future, an optimistic individual also tends to have a positive perception of the past and present (see Busseri et al., 2009, 2013; Busseri & Choma, 2016). Both optimism (Bailey et al., 2007; Busseri & Choma, 2016) and personal growth initiative (Demaske et al., 2019; Freitas et al., 2016; Robitschek & Keyes, 2009) are positively associated with individuals' life satisfaction and well-being. Personal growth initiative is reliably related to optimism (e.g., Casellas-Grau et al., 2017; Freitas et al., 2018; Shorey et al., 2007; Yang & Chang, 2016). Despite these similarities, optimism and personal growth initiative are reliably considered distinct constructs (see Freitas et al., 2018; Yang & Chang, 2016).

Researchers have measured optimism using the Life Orientation Test-Revised (10 items; (Scheier et al., 1994) and the Optimism-Pessimism Scale (56 items; Dember et al., 1989; Dember & Brooks, 1989). The Life Orientation Test-Revised seems to measure trait optimism, while the Optimism-Pessimism Scale seems to measure state optimism (Burke et al., 2000). Compared to respondents' scores on the Hope Scale (1991), respondents' scores from the Life Orientation Test-Revised are less-strongly associated with life satisfaction (Bailey et al., 2007). Hope's additional explanatory power (and by extension, personal growth initiative; see above) indicates hope and personal growth initiative is a distinct construct from optimism.

Optimism, an individual's general expectancy of positive outcomes, is positively associated with life satisfaction, well-being, and personal growth initiative. Both constructs originate from positive psychological literature (Scheier & Carver, 1985), and optimism is oft used by researchers as construct validation of personal growth initiative (e.g., Freitas et al., 2018). Despite their similarities, personal growth initiative explains additional variance in life satisfaction.

Growth mindset. *Growth mindset* is an individual's belief that their abilities, particularly intelligence, are mutable and can be developed (Diener & Dweck, 1978, 1980). Individuals that possess a growth mindset focus on mastery and overcoming—rather than identifying—obstacles. Personal growth initiative is positively associated with related constructs, such as *internal locus of control* and *problem-focused coping* (Robitschek & Cook, 1999), and with related outcomes (Burnette et al., 2020), such as resilience (Yang & Chang, 2014). Researchers have hypothesized that personal growth initiative is a form of growth mindset (Jayawickreme & Blackie, 2016), for an individual with high personal growth initiative views their lives and themselves as mutable and focused on growth (Robitschek, 1998).

Despite the broad construct, most studies of growth mindset are focused around students, academic performance, and achievement; of 376 returned results for an EBSCOhost search of “growth mindset,” 207 studies (55%) include subjects 6-17, and another 41 (10%) include young adults. Researchers have measured individuals' growth mindset primarily via the Implicit Theories of Intelligence Scale (also called the “Growth Mindset Scale”; Dweck, 1999). Other school-based achievement studies use similar, short intelligence-based questionnaires (see Blackwell et al., 2007; McCabe et al., 2020;

Paunesku et al., 2015), or subject-specific questionnaires (e.g., Implicit Theories of Anxiety Scale; Schroder et al., 2015); a scale about poster design ability (Cutumisu, 2019). These scale questions ask respondents their agreement or disagreement about the adaptability of their abilities (e.g., “You can learn new things, but you can’t really change your basic intelligence.”; Dweck, 1999; “You can get better at designing posters with practice.”; Cutumisu, 2019). By contrast, the PGIS-II focuses on respondents’ perceptions of their own self-knowledge (e.g., “I am constantly trying to grow as a person.”; Robitschek et al., 2012), regardless of their efforts’ potential of success. While an individual’s growth-mindset of whether they are able to grow as a person could certainly contribute to their degree of personal growth initiative, the PGIS-II does not directly assess these beliefs.

Growth mindset is a mastery-oriented mindset frequently studied in classroom settings using a variety of measures. While personal growth initiative itself may be a form of growth mindset (Jayawickreme & Blackie, 2016), the PGIS-II focuses on respondents’ knowledge of their intentions and does not directly assess respondents’ beliefs about intelligence.

Self-efficacy. *Self-efficacy* is an individual’s belief in their ability to perform a particular task (Bandura, 1986). As self-efficacy is task-specific, an individual could potentially assess their self-efficacy for personal growth initiative or skills related to personal growth. Researchers have consistently found personal growth initiative and multiple forms of self-efficacy to be positively related, and self-efficacy positively influences personal growth initiative. Çelik (2015) found Turkish students’ academic self-efficacy positively influenced their personal growth initiative ($r^2 = .39, p < .001$).

Emotional self-efficacy was positively related to personal growth initiative for Punjab students, $F(2, 1431) = 2.37, p < .05$ (Beri & Jain, 2016) and counseling and clinical psychology graduate students (Stewart, 2015). Social self-efficacy positively influenced international students' personal growth initiative (Çankaya et al., 2017). Woerkom and Meyers (2019) found a strengths-based intervention directly increased participants' general self-efficacy 1 month after the intervention ($p < .05$), which in turn increased participants' Readiness for Change ($B = .23, p < .05$), Planfulness ($B = .36, p < .01$), and Intentional Behavior ($B = .24, p < .05$). Thus, multiple domains of self-efficacy seem to be a pre-requisite of personal growth initiative.

There are a number of similarities of question structure between measures of specific self-efficacy domains and the PGIS-II. Self-efficacy is often measured in distinct domains (e.g., social self-efficacy; Çankaya et al., 2017), each domain is unidimensional. Bandura (1997) recommended measuring self-efficacy by asking respondents how confident they would feel to engage in a specific task (e.g., confidence in engaging in physical activity for at least 20 minutes; Sweet et al., 2012). Many items in the PGIS-II assess an individuals' self-efficacy for personal growth (e.g., "I can tell when I am ready to make specific changes in myself."; "I figure out what I need to change about myself" (Robitschek et al., 2012). The PGIS-II also asks respondents about their habits (e.g., "When I try to change myself, I make a realistic plan for my personal growth") and meta-cognition (e.g., "I know when I need to make a specific change in myself") in addition to their confidence.

Self-efficacy is a broad construct with an important influence upon personal growth initiative. Self-efficacy focuses only on an individual's performance confidence,

rather than their desire or frequency of exercising their capabilities. Thus, while the two constructs address similar domains, personal growth initiative measures additional elements for growth.

Ego-resiliency. *Ego-resiliency*, as conceived by Block and Block (1980) describes how an individual expresses their personality within the demands of their circumstances. It is derived from Fenichel's (1945) psychoanalytic theories and Lewin's (1935) theories of motivation. Along with *ego control* (s.c. self-control), it is one of two modes of ego functioning. An individual with high ego-resiliency brings to bear their existing skills to novel circumstances and continues to operate as an integrated individual throughout their circumstances. Like an individual with high personal growth initiative, the ego-resilient individual would seem to exhibit resilience and high performance. Unlike an individual with personal growth initiative, the ego-resilient individual may not necessarily improve their skills or change their personality. In fact, a low ego-resilient individual's conformation to circumstances might appear to mimic an individual with high personal growth initiative's growth—though their impetus for change would be external, rather than internal. Ego-resiliency is a relatively stable trait that tends to decrease from childhood to early adulthood; individuals with high ego-resiliency had .21 rank-order stability from ages 2-33, and .69 from 29-33 (Syed et al., 2020). Individuals with high ego-resiliency are higher in well-being, but this effect can be explained by the Big 5 (sc. Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism; (Syed et al., 2020). Both constructs focus on the individual manifesting the self, but an individual with high personal growth initiative may manifest personality changes, while an individual with high ego-resiliency will not.

The Ego-Resiliency Scale (ER89; 14 items; Block & Kremen, 1996) asks respondents about their behavioral patterns and preferences in everyday life (“I quickly get over and recover from being startled”; “I like to take different paths to familiar places”). In contrast to the PGIS-II, questions in the ER89 ask the respondent about their internal (“I enjoy dealing with new and unusual situations”), social (“I am generous with my friends”), and others’ perceptions of the respondent (“I am regarded as a very energetic person”). Questions in the ER89 also describe behavioral patterns already encompassed by the Big 5 (e.g., “I am regarded as a very energetic person”; extraversion). Consequently, Alessandri and colleagues (2007) proposed ego-resiliency may be the higher-order factor of Extraversion and Openness (*Beta* by Digman, 1997) and *Plasticity* by De Young and colleagues; 2002). The Ego-Resiliency Scale is a unidimensional scale that measures a broader construct than the PGIS-II (Robitschek et al., 2012).

Though ego-resiliency describes individuals who may flourish under adversity, ego-resiliency places the causes of individuals’ change and adaptation outward, while personal growth initiative’s origins are autonomous and internal. Ego-resiliency is a broader construct than personal growth initiative; its primary measure encompasses elements of the Big 5 and the Big 5 can explain its positive association with well-being (Syed et al., 2020). Finally, ego-resiliency focuses on stability, rather than eudemonia.

Mental toughness. *Mental toughness* describes an individual’s ability to maintain a high performance while under minor or significant potential mental stressors (Gucciardi et al., 2015). Originating from descriptions of athletic performance, mental toughness focuses on the results of an individual’s actions, rather than their intentions, motivations,

or skills that contribute to the ultimate result. For example, a softball pitcher with high mental toughness would be able to consistently strike out the opposing team's batters, even if the opposing team hit a home run the previous batter and the two teams' scores are tied. Gucciardi and colleagues (2015) found mental toughness to be a unidimensional construct. While personal growth initiative and mental toughness engender resilient performance, mental toughness focuses on an individual's success or failure, rather than their improvement.

The Mental Toughness Inventory (8 items; Gucciardi et al., 2015) primarily includes items that focus on individual performance (e.g., item 1. "I believe in my ability to achieve my goals"; items 2., 3., 7. begin with "I am able to..."; cf. PGIS-II, "I know how to set realistic goals to make changes in myself"; Robitschek et al., 2012). The inventory also includes one item focusing on optimism ("I can find a positive in most situations") and one item focusing on personal growth, "I strive for continued success" (cf. "I actively work to improve myself"; Robitschek et al., 2012). The items of the Mental Toughness Inventory reflect the construct's focus on performance, while the PGIS-II asks respondents about their abilities to plan growth (e.g., I know how to make a realistic plan in order to change myself"; Robitschek et al., 2012). Per the unidimensional nature of the construct, the Mental Toughness Inventory is summed to a single score. Like the PGIS-II, the Mental Toughness Inventory asks individuals about their own interests and goals; unlike the PGIS-II, the Mental Toughness Inventory is a performance-focused unidimensional measure.

Mental toughness and personal growth initiative improve individual performance in a variety of situations. However, mental toughness is a unidimensional construct that

focuses upon resilience and performance rather than an individual's process and orientation towards growth.

Growth need strength. *Growth need strength* (Hackman, 1980; Spreitzer & Porath, 2014; Tiegs et al., 1992) is an individual's "need for personal growth and accomplishment at work" (Tiegs et al., 1992, p. 577). Growth need strength is a personality variable that is posited to positively affect an individual's workplace motivation. An individual with high growth need strength desires challenging work and opportunities for advancement in their workplace. Thus, an individual might be highly affectively committed to the success of their company (Lin et al., 2018; Zargar et al., 2014), but also less likely to seek creative solutions (Chae & Choi, 2018) and likely to seek opportunities outside of the company if they cannot see a path for workplace advancement (Zargar et al., 2014). In a Chinese sample, growth need strength was positively associated with job performance and affective commitment via hope (Lin et al., 2018). In a Canadian sample, growth need strength was positively associated with affective commitment and employee turnover within 15 months (Zargar et al., 2014). There is preliminary evidence growth need strength is negatively associated with workplace creativity in complex jobs (Chae & Choi, 2018). Like personal growth initiative, growth need strength focuses on self-improvement in an area the individual values (sc. the workplace), yet individual success is based less on eudemonia than external signals of accomplishment.

The Job Diagnostic Survey (89 items; (Hackman & Oldham, 1975) measures 16 variables potentially related to workplace performance including job dimensions (e.g., Task Significance; Autonomy), interpersonal factors (e.g., Dealing with Others),

psychological and affective factors (e.g., Experienced Meaningfulness of the Work), specific satisfactions (e.g., job security), and growth need strength (6 items). The growth need strength subsection of the Job Diagnostic Survey asks respondents if they would prefer their workplace to have certain characteristics (sample item: “I would like opportunities for personal growth and development in my job”). While the PGIS-II focuses on an individual’s current skills and habits (e.g., “I actively work to improve myself.”), the growth need strength subsection of the Job Diagnostic Survey focuses on respondents’ preferences—the latter questions ask respondents to choose their preference of two scenarios (sample item: “A job where you are often required to make important decisions” vs. “A job with many pleasant people to work with”; Hackman & Oldham, 1975). Thus, the growth need strength subsection of the Job Diagnostic Survey questions does not address the respondents’ skills or daily workplace experiences.

Growth need strength could conceptually be categorized as an individual’s achievement motivation and personal growth initiative in a workplace context (Hackman, 1980; Spreitzer & Porath, 2014; Tiegls et al., 1992). Like personal growth initiative, growth need strength is a personality variable focusing upon an individual’s capacity for personal growth that could be predicted to increase an individual’s motivation. However, growth need strength addresses an individual’s desire for personal growth rather than their skills, focuses upon the individual’s workplace rather than life course, and the items of the Job Diagnostic Survey (Hackman & Oldham, 1975) ask respondents about workplace preferences rather than personal growth desires.

Personal growth (Ryff, 1989a). *Personal growth* describes an individual's orientation towards continued growth and development (Ryff, 1989a). Personal growth is one of 6 criteria of well-being, along with *self-acceptance*, *positive relations with others*, *autonomy*, *environmental mastery*, and *purpose in life* (Ryff, 1989a). Influences for the development of the 6 criteria include clinical theories of personal growth (e.g., Maslow, 1968; Rogers, 1961), which also influenced personal growth initiative, and life-span development theories (e.g., Erikson's psycho-social change model; 1959). An individual with high personal growth is engaged in their lives, views themselves as continuously developing, is open to new experiences and developing new skills, and recognizes both their potential and previous successes (Ryff, 1989b). Personal growth describes an individual's general orientation towards self-actualization and the self as a "changing self"; by contrast, topics under personal growth initiative's domain are those of personal import, which leads to self-actualization (Robitschek, 1998). Thus, personal growth is framed as focusing more on the individual's approach to current tasks rather than particular self-directed topics.

Personal growth is measured in the Psychological Well-Being Scale (42 items; Ryff, 1989a). I will focus my commentary on the 7 personal growth items of the 42-item version; the Psychological Well-Being scale has been adapted into briefer measures as well, including an 18-item version (Ryff & Keyes, 1995). The personal growth items focus on openness (e.g., "I am not interested in activities that will expand my horizons," reverse-scored; "...new experiences..."), performance ("...I haven't really improved much as a person..." reverse-scored; "...I have developed a lot as a person..."), and self-actualization ("...life has been a continuous process of learning, changing, and growth").

Despite these different focuses, Ryff's Psychological Well-Being Scale is scored unidimensional.

Ryff's (1989a) unidimensional criteria of personal growth includes an individual's openness and eschews addressing an individual's task-specific motivations or goals. The construct of personal growth is a synthesis of clinical theories of personal growth—a foundation of personal growth initiative—and life-span development theories. Thus, Ryff's (1989a) personal growth describes a general orientation towards development, while personal growth initiative takes a more mechanistic, skills-focused approach.

Summary of Related Constructs

There are a number of constructs that contribute (sc. hope, optimism, growth mindset, self-efficacy), exhibit similar outcomes (sc. ego-resiliency, mental toughness, growth need strength, personal growth), or assess personal growth in a different frame (sc. stages of change model). These related constructs emerge from different theoretical traditions, and consequently exhibit different dimensionality (see Table 1). This study focuses on personal growth initiative because my research question focuses on the effects of a personality-level, skill-specific process of personal growth.

Measures of Personal Growth Initiative

Researchers have measured PGI using two different iterations of the Personal Growth Initiative Scale (PGIS & PGIS-II).

PGIS (Robitschek, 1998). The original scale (PGIS; 9 items; Robitschek, 1998) is a single-factor scale adapted from a scale developed during a vocational retreat (Robitschek, 1997). The PGIS focuses on personal growth initiative's first two

components, readiness and planfulness (Robitschek et al., 2012). Grounded in Prochaska & DiClemente's stages of change model (Prochaska et al., 1988; Prochaska & DiClemente, 1983, 1986), the PGIS conceptually distinguishes between personal growth initiative's cognitive and behavioral components, though the measure does not do so psychometrically. This single-factor structure masks respondents' distinct levels of Readiness, Planfulness, Using Resources, and Intentional Behavior; this masking makes it more difficult for counselors and researchers to understand respondents' strengths and weaknesses in subcomponents of personal growth (Robitschek et al., 2012).

Individuals' scores on the original PGIS are associated with higher emotional, social, and psychological well-being ($f^2 = 0.22-1.22$; Robitschek & Keyes, 2009). Individuals who had higher PGIS scores had more adaptive coping skills, engaged more in reflective coping (vs. reactive or suppressive), and coped better with developmental tasks, such as career development (Robitschek & Cook, 1999). Higher PGIS scores are associated with lower negative outcomes, including lower depression, anxiety, and reduced distress for parental alcoholism (Robitschek & Kashubeck, 1999). There is mixed evidence that higher PGIS scores are associated with protecting against psychological distress and inhibited functioning (cf. Blackie et al., 2015; Demaske et al., 2019; Robitschek & Kashubeck, 1999). Higher PGIS scores mediate depressive symptoms and positive affect for racial discrimination in African American men (Hoggard et al., 2019). Higher PGIS scores are also associated with higher degrees of related psychological factors, including self-acceptance (Robitschek & Keyes, 2009) and hope (Shorey et al., 2007).

PGIS-II (Robitschek et al., 2012). The revised version of the scale, PGIS-II (13 items; Robitschek et al., 2012), is a 4-factor scale modified to be more congruent with personal growth initiative theory. The PGIS-II develops personal growth initiative's two initial theoretical components of cognitive and behavioral growth into four—the cognitive component subdivided into Readiness and Planfulness, and the behavioral component subdivided into Using Resources and Intentional Behavior. The Using Resources and Intentional Behavior subscales enable researchers to identify and isolate behavioral components of personal growth initiative. The scale's multi-factor scale enables researchers to distinguish between subcomponents of personal growth initiative and identify individuals' strengths and weaknesses of growth skills.

Higher scores on the PGIS-II in college samples are associated with higher college GPAs (Robitschek & Thoen, 2015) and higher emotional and subjective well-being (Freitas et al., 2016) in college students. Higher scores on the PGIS-II have also been associated with greater acculturation for international students (Yakunina et al., 2013), increased perceived post-traumatic growth for veterans (Borowa et al., 2016), and is negatively predictive of psychological distress in clinical samples (Robitschek et al., 2019; Weigold et al., 2018). Education professionals who participated in a strengths-based training to increase PGI increased their self-efficacy and maintained that increase one month later (Woerkom & Meyers, 2019). Students who participated in another personal growth initiative-focused strengths-based intervention—Intentional Growth Training—had higher personal growth initiative and subjective well-being over the next week (Thoen & Robitschek, 2013). Thus, there is experimental evidence that personal

growth initiative is an individual motivational mindset that can be strengthened to decrease distress and improve well-being across populations.

Self-Determination Theory

Self-determination theory (SDT) is a framework that posits each individual has a drive to fulfill basic psychological needs, which have evolved to drive organisms to flourish within their environment (Ryan & Deci, 2000). Individuals seek these needs through cognitive control and performing a wide range of behaviors for non-immediate outcomes, working toward their psychological needs as terminal ends. These psychological needs are pervasive, create affective consequences, and the individual degenerates when their psychological needs are unfulfilled (Baumeister & Leary, 1995). Fulfillment of these needs mediates and explains the effects of supportive/detrimental conditions and the pursuit of eudemonic activities (e.g., personal growth; Sheldon, 2018) on individuals' subjective well-being (Ryan & Deci, 2017). These needs are not fulfilled in terms of objective or external reports, but with regard to the individual's own perception of need fulfillment (i.e., *feeling* fulfilled; Prentice et al., 2019). Three psychological constructs that meet these qualifications are the needs for autonomy, relatedness (Baumeister & Leary, 1995), and competence (Deci & Ryan, 2000). Recent work has provided initial evidence that morality may also function as a basic need (Prentice et al., 2019).

Prentice and colleagues (2019) have argued that morality—defined as an individual's experience of being moral—is a psychological need. Prentice and colleagues summarized previous research suggestive of morality's role as a psychological need and presented preliminary evidence, in-line with Baumeister and Leary's (1995) proposal for

the basic need of relatedness, that demonstrated high morality satisfaction was associated with highly satisfying events, and morality dissatisfaction was associated with highly dissatisfying events. In their review of recent self-determination theory, Vansteenkiste and colleagues (2020) assert future research must continue to gather evidence concerning morality's function as a basic psychological need. Thus, researchers who study basic psychological needs should compare morality to codified psychological needs (sc. Autonomy, Competence, and Relatedness) in their research (as this present study does).

If psychological needs are discoverable and demonstrable (e.g., Baumeister & Leary, 1995; Deci & Ryan, 2000; Prentice et al., 2019), their importance becomes self-evident—by definition, psychological needs are prolific; affect cognitive, affective, and behavioral processes; cause degeneration when stymied; and apply to all individuals (Baumeister & Leary, 1995). Being uniquely impactful, each basic psychological need (autonomy, relatedness, competence, and morality) accounts for distinct variance in individuals' well-being (Sheldon et al., 2001). When asked to write about deeply satisfying events, individuals' recollections consistently include autonomy, relatedness, competence (Sheldon et al., 2001), and morality among their most frequent experiences (Prentice et al., 2019). Autonomy, competence, and relatedness predicted unique event-related variance in affect, even when accounting for other potential psychological needs (Sheldon et al., 2001).

The effects of autonomy, relatedness, competence, and morality upon individuals' well-being are appropriately uniquely impactful, far-reaching, and demonstrable. Every known society has close social bonds (Mann, 1980). Married individuals have lower risks of fatal heart attacks (Lynch, 1977) and lower 5-year mortality rates for lung, colorectal

(Wang et al., 2018), breast, pancreatic, prostate, liver/intrahepatic bile duct, non-Hodgkin lymphoma, head/neck, ovarian, and esophageal cancers compared to never-married or widowed peers, even when controlling for age, sex, race, SES, type of cancer, and stage of progression (Aizer et al., 2013). Individuals in nursing homes who report higher relatedness need satisfaction (Custers et al., 2010) and higher perceived autonomy (Kasser & Ryan, 1999) reported lower depression, higher life satisfaction, and higher vitality; individuals who reported higher perceived autonomy and supported autonomy also had lower mortality rates in a one-year follow-up (Kasser & Ryan, 1999). Students who reported high autonomous motivation and low controlled motivation had better academic outcomes compared to their equally-motivated peers with the opposite motivational profile and their peers who reported similar amounts of autonomous and controlled motivation (Kusurkar et al., 2013; Vansteenkiste et al., 2009).

Along with promoting higher well-being, sufficient need satisfaction prevents degeneration; less-related divorced, single, and widowed individuals have higher mortality rate for all causes of death in the United States (Lynch, 1977, p. 38), and loneliness is associated with chronic mental health complications (Lynch, 2000). Accordingly, people who were divorced or recently separated were 3-20x more likely to be admitted into a mental hospital compared to their married peers (while rates of mental hospital admittance for never-married individuals were in between; Bloom et al., 1979). When presented with external rewards, individuals experience a decrease in autonomy via decreased internal locus of causality, which leads to less intrinsic motivation (Deci et al., 1999) and creativity (Amabile, 1982).

Personal Growth Initiative and Need Satisfaction

Conceptualizations of the relationship between personal growth initiative and need satisfaction are varied; while many researchers treat the concepts as related (Luyckx & Robitschek, 2014; Negovan & Bogdan, 2013), their exact theoretical relationships vary between studies—when considered at all. Researchers have theoretically and empirically conceptualized personal growth initiative and need satisfaction as simply related to one another (e.g., Luyckx & Robitschek, 2014; Negovan & Tomşa, 2018), as personal growth initiative being associated with increases in need satisfaction (e.g., Negovan & Bogdan, 2013; Reeve et al., 2018; Woerkom et al., 2016), as an outcome of need satisfaction (e.g., Boyd, 2007; Spreitzer & Porath, 2014), and as being “filtered” by individuals’ degree of need satisfaction (Ryan et al., 1997). Personal growth initiative is most often connected to autonomy (Negovan & Tomşa, 2018; Woerkom et al., 2016), sometimes connected to relatedness (Negovan & Tomşa, 2018), and sometimes to competence via self-efficacy (e.g., Luyckx & Robitschek, 2014; Woerkom & Meyers, 2019).

In their review of psychological elements associated with thriving young adults, Luyckx and Robitschek (2014) conceptually connected higher levels of personal growth initiative with higher self-efficacy (sc. competence; Deci & Ryan, 2000), need satisfaction, and well-being (Robitschek & Kashubeck, 1999; Robitschek & Keyes, 2009); for adolescents, personal growth initiative serves as a form of identity exploration, which increases agency and competence. One example of the connection between autonomy and PGI in young adults is that student volunteers from the University of Bucharest ($n = 289$) showed higher PGI ($t = 12.33, p < .01$), autonomy ($t = 4.23, p < .01$)

and relatedness ($t = 3.41, p < .01$)—though not competence ($t = 1.69, p > .05$)—need satisfaction than their non-volunteering peers ($n = 311$; Negovan & Tomša, 2018).

Beyond this conceptual connection, there is some evidence that higher personal growth initiative can increase need satisfaction. Training individuals to recognize strengths and build personal growth initiative leads to increased self-efficacy (Woerkom & Meyers, 2019), and personal growth itself via training strengths or weaknesses can lead to higher perceived competence and internal motivation (Woerkom et al., 2016). A cross-sectional sample of college students ($N = 400$) demonstrated students' levels of personal growth initiative was significantly related to their levels of autonomy ($B = .230, t = 5.708, p < .001$), though not competence (Negovan & Bogdan, 2013). There is preliminary evidence that higher personal growth initiative could help individuals better apply need-satisfaction supportive behaviors; teachers' higher personal growth initiative predicted higher increases in grade school teachers' autonomy-supportive motivating style after they completed an autonomy-supportive intervention program (Reeve et al., 2018).

At the same time, some researchers conceptualize need satisfaction leading to higher personal growth initiative. Spreitzer and Porath (2014) conceptualize *thriving* (vitality and individuals' sense of personal growth) as an outcome of need satisfaction; within their conceptualization, needs are satisfied by environmental workplace factors (e.g., climate of trust/respect and performance feedback). In a cross-sectional study investigating acculturation of international students ($n = 221$), structural equation modeling showed personal growth initiative was indirectly affected by individuals' autonomy via curiosity (Cankaya et al., 2018). While Cankaya and colleagues failed to

find a direct connection between personal growth initiative and autonomy ($p = .164$), this could be due to the direct effect being masked by error and the study's relatively low sample size, or the primary role of curiosity in students' acclimation. In another cross-sectional study, personal growth initiative was also indirectly associated to *asserted autonomy* (sc. internally-supported autonomy) via curiosity and exploration, while indirectly associated to *assisted autonomy* (sc. environmentally-supported autonomy) via interpersonal connectedness (Legault et al., 2017). In a cross-sectional study of postpartum women ($N = 229$), Boyd (2007) found autonomy ($B = 1.16, t = 3.68, p < .001$) and competence ($B = .911, t = 2.44, p = .02$) need satisfaction predicted higher PGI. However, like other studies that conceptualize need satisfaction as causal, these results were cross-sectional, and therefore causality cannot be established.

Martela and Sheldon (2019) theorized psychological need satisfaction mediates *eudemonic motives and activities*—“[w]ell-being conducive values, motivations, and practices” (2019, p. 464)—for subjective well-being outcomes. Martela and Sheldon (2019) separate “feeling well” into subjective well-being and need satisfaction (considered a component of eudemonic well-being). Drawing from theories that eudemonic behavior leads to subjective well-being (e.g., Sheldon, 2016), they view psychological need satisfaction as an outcome of doing well and a cause of feeling well. Need satisfaction should mediate specific outcomes of motives/activities as well as outcomes of supportive/detrimental conditions and subjective well-being (Ryan & Deci, 2017). As an individual's motivation and skills for pursuing personal growth and self-actualization, personal growth initiative rests firmly in the tradition of eudemonic well-being (Robitschek, 1998). Thus, within Martela and Sheldon's (2019) framework, the

effects of personal growth initiative on subjective well-being would be mediated by need satisfaction.

Organismic theory regarding psychological need satisfaction can provide some insights into how personal growth initiative and need satisfaction affect one another. Ryan and colleagues (1997) describe an innate internal drive toward self-actualization, conceptually similar to personal growth initiative, as this internal drive is described as an internal motivation towards self-actualization; this internal drive is mediated (i.e., limited) by individuals' degree of need satisfaction. Thus, while need satisfaction might not increase personal growth initiative, it could be "filtered" by the degree an individual fulfills their basic need satisfaction. In this conceptualization, an individual's expression of personal growth initiative is a consequence of fulfilled need, and an individual's personal growth initiative could only be lowered by needs being unsatisfied. A cross-sectional study of Nigerian students demonstrated a students' personal growth initiative to have a significant positive effect in their likelihood of seeking out mental health treatment ($\beta = .15, t = 3.52, p < .001$), while their internal locus of health control (i.e., autonomy in a health sphere) had a negative effect ($\beta = -.29, t = -7.05, p < .001$; Oluyinka, 2011). Thus, while personal growth initiative had a positive effect on health behavior, a lack of satisfied autonomy masked this effect.

Thus, there is a preponderance of empirical evidence connecting personal growth initiative, components of need satisfaction, and well-being to one another. These empirical and theoretical works connect two components of mental health and well-being—subjective well-being and personal growth—to one another via need satisfaction. At the same time, the connections between each component, particularly temporal

connections, are unclear. A parsimonious process model of these pieces can provide a framework to test these connections.

Proposed Process Model

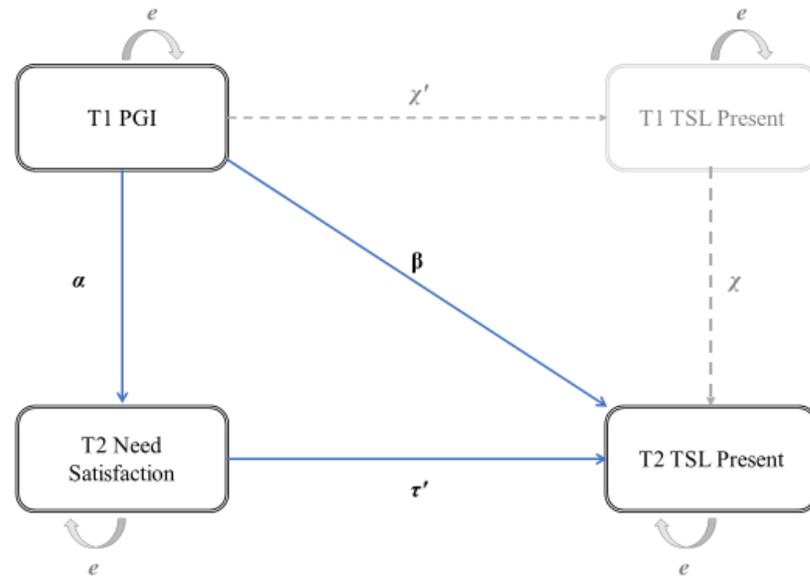


Figure 1 — Proposed Process Model

In line with recent calls to develop and test process models of well-being (Jayawickreme, Forgeard, & Seligman, 2012; Martela & Sheldon, 2019), the proposed mediation model (Fig. 1) proposes the effects of initial personal growth initiative (T1 PGI) are partly mediated ($\alpha + \tau' = \beta$) by subsequent need satisfaction (T2 Need Satisfaction; $\alpha + \tau'$) to increase present life satisfaction (T2 TSL Present), when controlling for initial present life satisfaction (T1 TSL Present; χ). The links between higher personal growth initiative (β ; e.g., Robitschek et al., 2019; Robitschek & Thoen, 2015) and higher psychological need satisfaction (τ' ; e.g. Aizer et al., 2013; Baumeister & Leary, 1995; Robitschek et al., 2019; Ryan & Deci, 2000) with subjective well-being

are well-established. Thus, the model hinges upon the causal pathway of personal growth initiative and need satisfaction (α).

Theoretical work by Ryan and colleagues (1997) and Martela and Sheldon (2019) indicates that PGI is not merely connected to psychological need satisfaction and well-being (e.g., Luyckx & Robitschek, 2014), but mediated by psychological need satisfaction (see Fig. 1 for a model). Robitschek (1998) hypothesized, based off DeCarvalho's (1990) work, that higher self-efficacy via PGI would lead to increased motivation and subsequent goal-oriented action, which would increase well-being. Building on work by Luyckx and Robitschek (2014; Robitschek, 1998) and Ryan and colleagues (1997), I propose that personal growth initiative acts as an autonomous controlled motivation, partly mediated by the individual's current levels of psychological need satisfaction, resulting in an increase of individuals' subjective well-being.

The Current Study

The purpose of the current study is to examine whether personal growth initiative improves life satisfaction by improving basic need satisfaction.

Hypotheses

My hypotheses are as follows:

1. Personal growth initiative (PGI) uniquely predicts present life satisfaction (LS) at a subsequent time, when controlling for initial life satisfaction (χ), with individuals' need satisfaction (NS) as a mediator ($\alpha + \tau'$; Martela & Sheldon, 2019; Ryan et al., 1997). (see Fig. 1)
2. I also test whether participants' anxiety about Covid-19 impacted the results of this study. Due to school closures (*COVID-19 Update*, 2020) and state-

mandated stay-at-home orders (Lee, 2020), Covid-19 anxiety is associated with significantly lower Relatedness and Autonomy satisfaction and higher Relatedness dissatisfaction.

METHODS

Participants

Two hundred Wake Forest University undergraduate students were recruited for this study through the Introduction to Psychology participant pool. Participants were compensated with 2 credit hours (0.5 hours for part 1; 1.5 hours for part 2) for their participation. After removing duplicates, survey responses that were completed in under 60 seconds in total, and unfinished responses, 143 participants (72 female) were used for the final analyses. Of participants who reported their race or ethnicity, 78% were Caucasian ($n = 112$), 9% were African-American ($n = 14$), 8% were Hispanic or Latino ($n = 12$),¹ 7% were Asian ($n = 10$), and 0.07% were Native American or Alaskan Native.

Participants were also asked to report a range of their estimated household income. 58.7% reported a household income of \$150,000 or more ($n = 84$), 16% a household income of \$100,000-\$149,999 ($n = 23$), 3.5% a household income of \$90,000-\$99,999 ($n = 5$), 6.3% a household income of \$80,000-\$89,999 ($n = 9$), 2.8% a household income of \$70,000-\$79,999 ($n = 4$), 2.1% a household income of \$60,000-\$69,999 ($n = 3$), 2.1% a household income of \$50,000-\$59,999 ($n = 3$), 1.4% a household income of \$40,000-\$49,999 ($n = 2$), 2.1% a household income of \$30,000-\$39,999 ($n = 3$), 1.4% a household income of \$20,000-\$29,999 ($n = 2$), 1.4% a household income of \$10,000-\$19,999 ($n = 2$), 2.1% a household income of \$10,000 ($n = 3$).

¹ Respondents could identify separately as Hispanic/Latino from race.

Procedure

Participants completed the survey packets in two waves, the first wave (T1) April 6-16 and the second wave (T2) April 27-30, 2020. Participants completed the measures below in both waves. Participants completed an additional demographic questionnaire at the end of wave one reporting their age, gender, household income, and race/ethnicity. Participants answered two additional questions at the end of wave two on their experiences with SARS Covid-19.

Measures

All measures are included in Appendix A.

Personal Growth Initiative Scale-II (Robitschek et al., 2012)

The Personal Growth Initiative Scale-II (PGIS-II; 16 items) asks participants the degree they agree with statements about four factors: readiness for change (4 items), planfulness (4 items), using resources (4 items), and intentional behavior (4 items) on a 6-point Likert scale ranging from 0 (“disagree strongly”) to 5 (“agree strongly”; Robitschek et al., 2012). I averaged items for each factor to create four subscale scores, and then sum the four subscale factors to create an overall PGIS-II score. The PGIS-II has been shown to have very good internal reliability ($\alpha = .73-.91$ subscale scores; $\alpha = .90-.94$ overall score) and good test-retest reliability (1-week, $r = .82$; 2-week, $r = .67$; 4-week, $r = .70$; 6-week, $r = .62$; Robitschek et al., 2012). The PGIS-II has demonstrated measurement invariance between European American, African American, and Hispanic samples ($\chi^2(342) = 690.39, p < .001, CFI = .952, SRMR = .080, RMSEA = .057$; Shigemoto et al., 2015). The reliability of the PGIS-II in this sample was extremely good (T1 $\alpha = 0.91$, T2 $\alpha = 0.91$).

Balanced Measure of Psychological Needs Scale (Sheldon & Hilpert, 2012)

The Balanced Measure for Psychological Needs Scale (18 items) asks participants the degree to which they agree with statements about their autonomy (6 items; 3 positively-worded, 3 negatively-worded), competence (6 items; 3 positively-worded, 3 negatively-worded), and relatedness (6 items; 3 positively-worded, 3 negatively-worded) on a 5-point Likert scale ranging from 1 (“no agreement”) to 5 (“much agreement”; Sheldon & Hilpert, 2012). I averaged each positively-worded and negatively-worded subscale to create 6 total subscales. Some items on the original General Need Satisfaction Scale / Basic Psychological Needs Scale (Gagne, 2003) weigh onto more than one factor, and the scale’s items are unbalanced, resulting in a muddled factorial structure (Johnston & Finney, 2010). The revised Balanced Measure for Psychological Needs Scale has strong 3-factor validity and internal reliability (Sheldon & Hilpert, 2012). I measured both need satisfaction and thwarting because need satisfaction and thwarting lead to different unique outcomes (Sheldon & Hilpert, 2012). The reliability of the satisfaction and dissatisfaction subscales in this sample were $\alpha = 0.77$ and $\alpha = .73$ at T1 and $\alpha = 0.79$ and $\alpha = 0.75$ at T2, respectively.

Additional items asking about Morality were added to the Balanced Measure for Psychological Needs Scale (8 items; 4 positively-worded, 4 negatively-worded), adapted from Prentice and colleagues (2019, p. 451). We administered the first four items measuring moral need “(a) a strong sense of moral fulfillment, b) that I was being a good person, c) that I embodied my moral values, d) that I did the right thing,” 2019, p. 451) along with four negatively-worded items I adapted from Prentice and colleagues’ original items. Question 5 (“that I put others ahead of myself,” 2019, p. 451) was not adapted due

to its lower factor loading. The additional morality items can be found in Table 2. The reliability of the Morality satisfaction and dissatisfaction subscales in this sample were $\alpha = 0.69$ and $\alpha = .77$ at T1 and $\alpha = 0.77$ and $\alpha = 0.78$ at T2, respectively.

Table 2
Additional Morality Items

-
1. I felt a strong sense of moral fulfillment.
 2. I felt a strong lack of moral fulfillment.[†]
 3. I felt that I am a good person.
 4. I felt that I am a bad person.[†]
 5. I felt that I embody my moral values.
-

Note. [†] Item adapted for this study.

Temporal Satisfaction with Life Scale (Pavot et al., 1998)

The Temporal Satisfaction with Life Scale (15 items) asks participants the degree they agree with statements about their past (items 1-5), present (items 6-10), and future (items 11-15) life satisfaction on a 7-point Likert scale ranging from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”) (Pavot et al., 1998). Items 6-10 were averaged to create a present life satisfaction score. A participant’s present life satisfaction score enables us to differentiate individuals with high present life satisfaction from individuals who simply anticipate their future well-being to be high and individuals whose lower past life satisfaction lead them to PGI and subsequent higher life satisfaction. The Temporal

Satisfaction with Life Scale has been shown to have good reliability ($n = 223$, $\alpha = .76$ present; McIntosh, 2001), convergent and divergent validity (McIntosh, 2001; Pavot et al., 1998). Previous confirmatory factor analysis supports the scale's 3-factor model in an American sample ($\chi^2(80, N = 223) = 236.08$, $p < .001$, CFI = .93, RMSEA = .09; McIntosh, 2001); $\chi^2(78, n = 646) = 341.64$, TLI = 0.95, CFI = 0.96, RMSEA = 0.072; Ye, 2007). The scale has been found to have a three-factor structure and excellent reliability ($\alpha = .87-.91$ overall, $\alpha = .81-.88$ present) in Chinese (Ye, 2007), German (Trautwein, 2004), Turkish (Akyurek et al., 2019), and elderly Spanish (Tomás et al., 2016) samples. The reliability of the TSL in this sample was Past $\alpha = .82$, Present $\alpha = .85$, Future $\alpha = .81$ at T1 and Past $\alpha = .87$, Present $\alpha = .87$, Future $\alpha = .81$ at T2.

Analysis

To test Hypothesis 1, a modified longitudinal single mediator path analysis model (Baron & Kenny, 1986) was conducted. To test Hypothesis 2, a series of multiple linear regressions were conducted. All analyses were conducted via R Version-4.0.2 (2020-06-22) -- "Taking Off Again"; R Core Team, 2020).

RESULTS

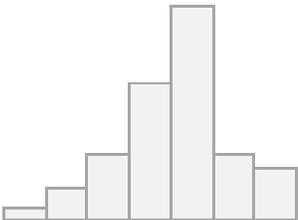
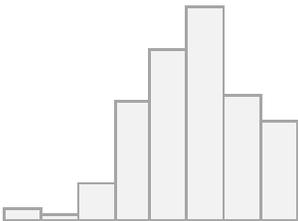
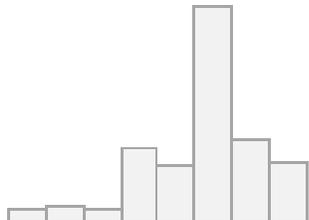
Data Cleaning

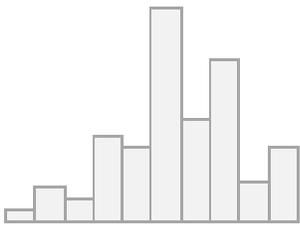
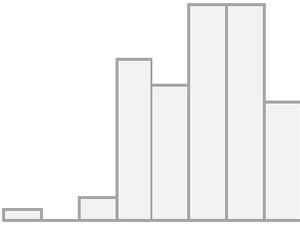
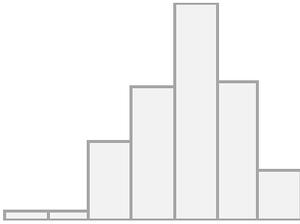
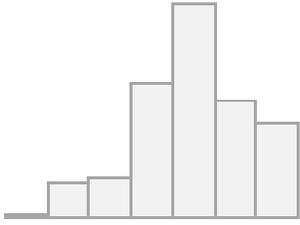
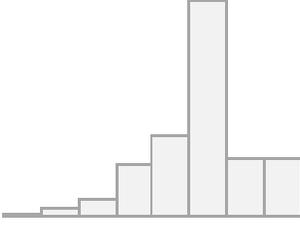
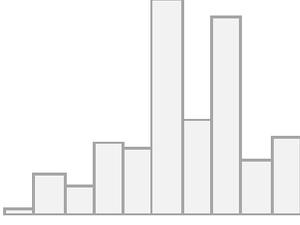
I removed responses with duplicate IP addresses, incomplete surveys, or responses where respondents took less than 60 seconds in total, I merged wave 1 and 2 data. This resulted in a total sample size of 143 entries.

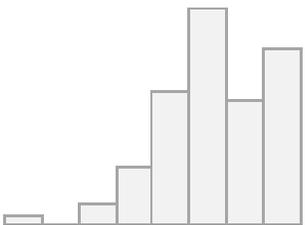
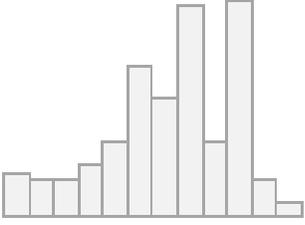
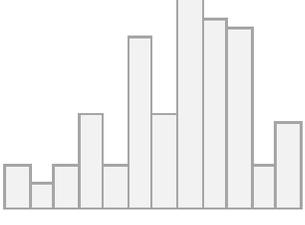
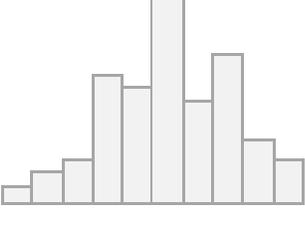
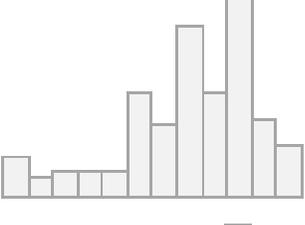
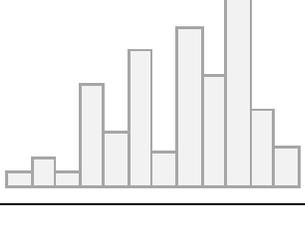
Descriptives

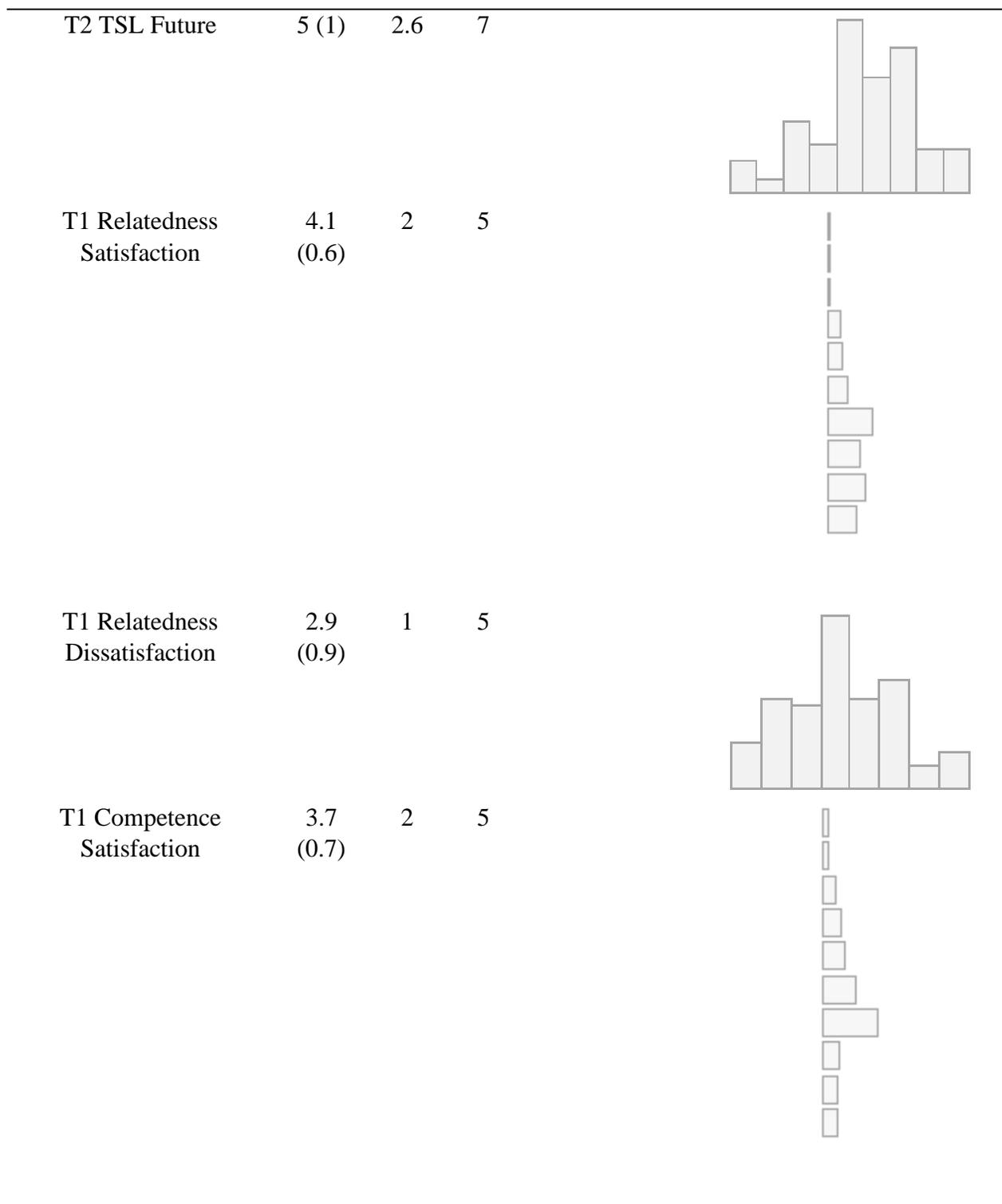
Descriptive statistics for all tested variables can be found in Table 3.

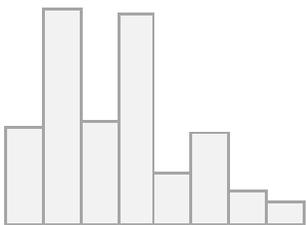
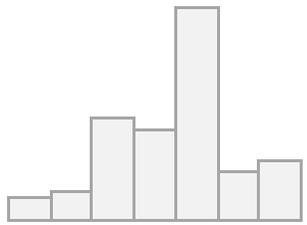
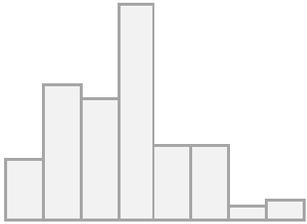
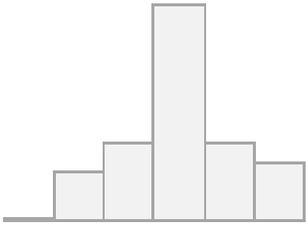
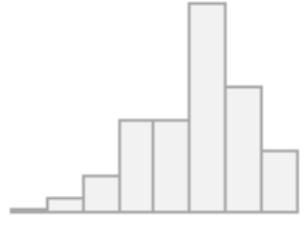
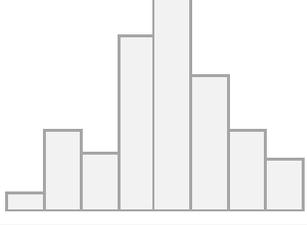
Table 3
Descriptive Statistics

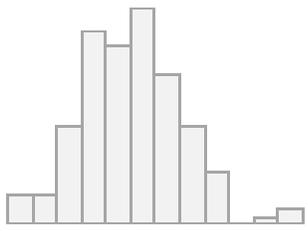
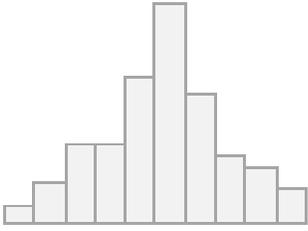
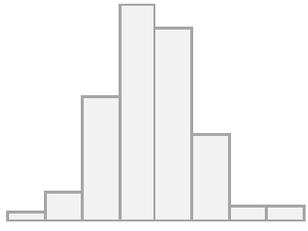
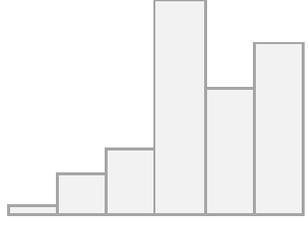
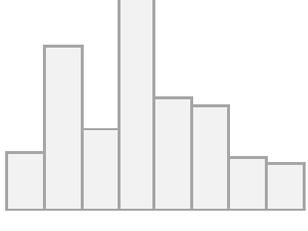
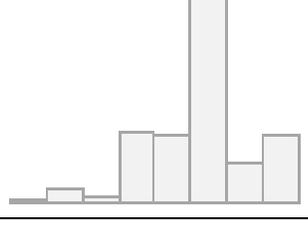
Variable	<i>M</i> (<i>SD</i>)	Min	Max	α	Distribution
T1 Total PGI	4.6 (0.7)	2.6	6	0.91	
T1 Readiness	4.7 (0.8)	2	6		
T1 Planfulness	4.6 (0.8)	2	6		

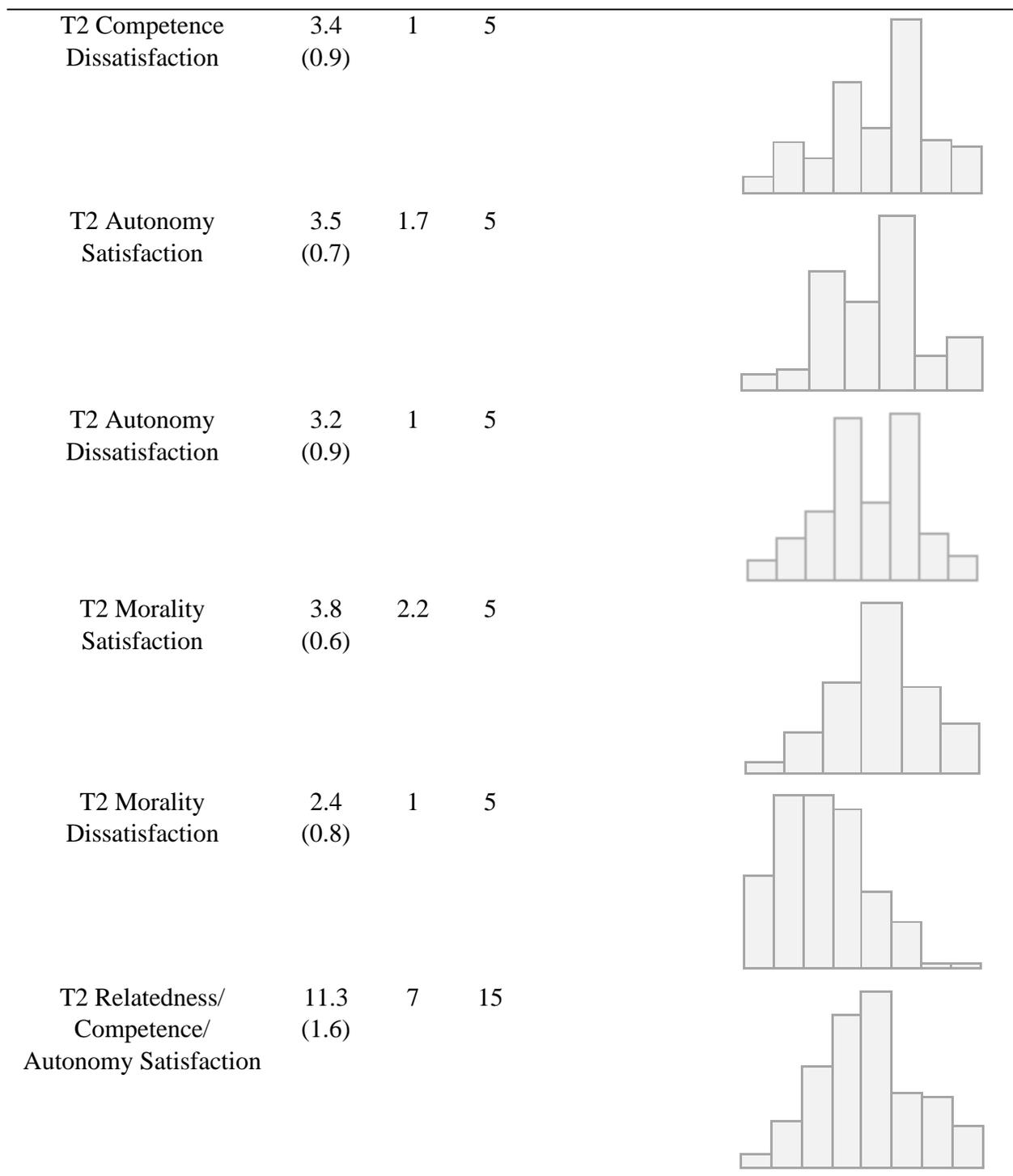
T1 Resources	4.1 (1.1)	1.3	6	
T1 Behavior	4.8 (0.8)	2.2	6	
T2 Total PGI	4.7 (0.6)	2.6	6	
T2 Readiness	4.9 (0.7)	2.8	6	
T2 Planfulness	4.7 (0.7)	2.4	6	
T2 Resources	4.1 (1.1)	1.3	6	

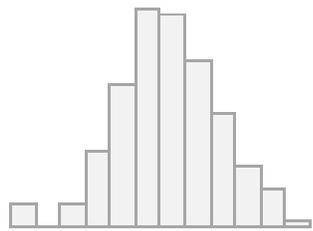
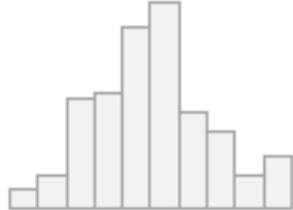
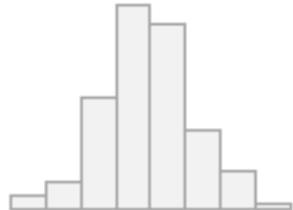
T2 Behavior	5 (0.7)	2.2	6	
T1 TSL Past	4.4 (1.3)	1	7	
T1 TSL Present	4.5 (1.4)	1	7	
T1 TSL Future	4.8 (1)	2	7	
T2 TSL Past	4.8 (1.4)	1	7	
T2 TSL Present	4.7 (1.4)	1	7	



T1 Competence Dissatisfaction	2.6 (0.9)	1	5	
T1 Autonomy Satisfaction	3.6 (0.8)	1.7	5	
T1 Autonomy Dissatisfaction	2.7 (0.8)	1	5	
T1 Morality Satisfaction	3.8 (0.6)	2.2	5	
T1 Morality Dissatisfaction†	3.6 (0.8)	1	5	
T1 Relatedness/ Competence/ Autonomy Satisfaction	11.5 (1.7)	7	15	

T1 Relatedness/ Competence/ Autonomy Dissatisfaction	8.2 (2.1)	3	15	
T1 Relatedness/ Competence/ Autonomy/Morality Satisfaction	15.3 (2)	10.2	20	
T1 Relatedness/ Competence/ Autonomy/Morality Dissatisfaction	11.8 (2.5)	4.3	20	
T2 Relatedness Satisfaction	4.1 (0.6)	2	5	
T2 Relatedness Dissatisfaction	2.9 (1)	1	5	
T2 Competence Satisfaction	3.7 (0.7)	1	5	



T2 Relatedness/ Competence/ Autonomy Dissatisfaction	9.4 (2.1)	3	15	
T2 Relatedness/ Competence/ Autonomy/Morality Satisfaction	15.1 (2.1)	10	20	
T2 Relatedness/ Competence/ Autonomy/Morality Dissatisfaction	11.8 (2.6)	4	18.7	
Covid-19 Anxiety	2.8 (1.1)	1	5	

Note. † Morality dissatisfaction items adapted from Prentice and colleagues' (2019) morality satisfaction items.

Hypothesis Testing

Correlations

Contrary to Hypothesis 1, personal growth initiative at time 1 and present life satisfaction at time 2 were not significantly correlated ($r = 0.13$, $p = 0.12$). Table 4 displays the correlation table of all tested variables; a correlation table including subscales is included in Appendix B.

Table 4
Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. T1 Total PGI	—															
2. T2 Total PGI	.69**	—														
3. T1 TSL Past	.28** [.12, .42]	.18* [.02, .34]	—													
4. T1 TSL Present	.18* [.02, .34]	.21* [.05, .36]	.58* [.47, .68]	—												
5. T1 TSL Future	.21* [.05, .36]	.20* [.04, .35]	.22** [.06, .37]	.35** [.20, .48]	—											
6. T2 TSL Past	.25** [.08, .39]	.26** [.10, .41]	.80** [.73, .85]	.49** [.35, .61]	.12 [-.04, .28]	—										
7. T2 TSL Present	.13 [-.03, .29]	.22** [.06, .37]	.46** [.32, .58]	.59** [.47, .69]	.25** [.09, .40]	.54** [.41, .65]	—									
8. T2 TSL Future	.34** [.19, .48]	.44** [.30, .57]	.31** [.15, .45]	.30** [.14, .44]	.66** [.55, .74]	.32** [.16, .46]	.41** [.26, .53]	—								
9. T1 Morality Satisfaction	.40** [.25, .53]	.44* [.31, .56]	.33** [.17, .47]	.33** [.18, .47]	.31** [.15, .45]	.38** [.23, .51]	.35** [.20, .49]	.51** [.38, .52]	—							

Table 4, cont.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
10. T1 Morality Dissatisfaction	.08 [-.08, .24]	.18* [.02, .33]	.34** [.18, .47]	.30** [.15, .44]	.14 [-.03, .29]	.39** [.24, .52]	.27** [.11, .41]	.28** [.12, .42]	.46** [.32, .58]	—							
11. T1 Relatedness/ Competence/ Autonomy/ Satisfaction	.47** [.33, .59]	.49** [.35, .60]	.31** [.16, .45]	.30** [.15, .44]	.37** [.22, .50]	.28** [.12, .43]	.30** [.14, .44]	.50** [.37, .62]	.71** [.62, .79]	.28** [.12, .42]	—						
12. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	-.08 [-.24, .08]	.02 [-.14, .19]	.43** [.29, .55]	.40** [.25, .52]	.23** [.07, .38]	.45** [.30, .57]	.33** [.17, .47]	.26** [.10, .41]	.20* [.04, .35]	.68** [.58, .76]	.15 [-.02, .30]	—					
13. T2 Morality Satisfaction	.27** [.11, .41]	.41** [.27, .54]	.21* [.05, .36]	.27** [.11, .41]	.34** [.19, .48]	.23** [.07, .38]	.35** [.20, .49]	.52** [.39, .63]	.71** [.62, .79]	.39** [.24, .52]	.59** [.48, .69]	.17* [.01, .33]	—				
14. T2 Morality Dissatisfaction	-.12 [-.28, .05]	-.19* [-.35, -.03]	-.30** [-.44, -.14]	-.32** [-.46, -.16]	-.20* [-.36, -.04]	-.28** [-.42, -.12]	-.19* [-.35, -.03]	-.25** [-.40, -.09]	-.38** [-.51, -.23]	-.69** [-.77, -.59]	-.25** [-.40, -.09]	-.54** [-.64, -.41]	-.52** [-.63, -.39]	—			
15. T2 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	.31** [.15, .45]	.46** [.32, .58]	.18* [.02, .34]	.23** [.07, .38]	.41** [.26, .54]	.25** [.09, .40]	.36** [.21, .49]	.54** [.41, .65]	.61** [.50, .71]	.33** [.18, .47]	.67** [.57, .75]	.17* [.01, .33]	.79** [.71, .84]	-.38** [-.52, -.24]	—		
16. T2 Relatedness/ Competence/ Autonomy/ Morality Dissatisfaction	.05 [-.11, .21]	-.04 [-.20, .13]	-.26** [-.41, -.10]	-.27** [-.42, -.11]	-.21* [-.36, -.05]	-.30** [-.44, -.15]	-.23** [-.38, -.07]	-.17* [-.33, -.01]	-.25** [-.40, -.09]	-.56** [-.66, -.44]	-.15 [-.31, .01]	-.63** [-.72, -.52]	-.31** [-.45, -.15]	-.72** [-.63, .79]	-.28** [-.42, -.12]	—	
17. Covid-19 Anxiety	.06 [-.10, .22]	.10 [-.06, .26]	-.03 [-.19, .14]	-.12 [-.28, .04]	-.07 [-.23, .10]	-.04 [-.21, .12]	-.19* [-.35, -.03]	0.00 [-.16, .17]	.09 [-.07, .25]	-.10 [-.26, .07]	-.04 [-.20, .12]	-.20* [-.35, -.04]	-.07 [-.10, .23]	.21* [.04, .36]	-.05 [-.21, .12]	.28** [.12, .43]	

Exploratory Analyses

Mediational Path Analysis

The purpose of these analyses is to evaluate the validity of personal growth initiative as a predictor of need satisfaction. The alternative hypothesis would be that the closer-fitting model is need satisfaction as a predictor of personal growth initiative. Separate confirmatory factor analysis was carried out to evaluate the adequacy of each exploratory model. Path analyses and confirmatory factor analyses were conducted via the “lavaan” package (Rosseel, 2012), and AIC measures were conducted via the “nonnest2” package (Merkle & You, 2020). Table 5 presents the goodness of fit indices for these 4 models.

As shown in Table 5, the fit indices of the two models indicates Model 2 better fits the sample in comparison to Model 1. As shown in Fig. 2 and Fig. 3, the standardized direct effect from T1 personal growth initiative to T2 need satisfaction was 0.31 (unstandardized effect = 0.95, SE = 0.24, $p < .001$) for Model 1. The standardized direct effect from T1 psychological need satisfaction and T2 personal growth initiative was 0.49 (unstandardized effect = 0.15, SE = 0.02, $p < .001$) for Model 2. The standardized direct effect from T2 need satisfaction to T2 future life satisfaction was 0.31 (unstandardized effect = 0.13, SE = 0.03, $p < .001$) for Model 1. The standardized direct effect from T2 personal growth initiative and T2 future life satisfaction was 0.24 (unstandardized effect = 0.37, SE = 0.10, $p < .001$) for Model 2. The standardized direct effect from T1 personal growth initiative to T2 future life satisfaction was 0.14 (unstandardized effect = 0.19, SE = 0.09, $p = .025$) for Model 1. The standardized direct effect from T1 psychological need

Table 5
Comparison of Path Analysis Models

Model	χ^2	<i>df</i>	<i>p</i>	TLI	CFI	SRMR	RMSEA	AIC
Model 1: T1 PGI								
Predicts T2 Need Satisfaction & T2 TSL Future	20.28	1.00	0.00	0.32	0.86	0.13	0.37	891.05
Model 2: T1 Need Satisfaction Predicts T2 PGI & T2 TSL Future								
	0.14	1.00	0.71	1.03	1.00	0.01	0.00	519.21
Model 3: T1 PGI Predicts T2 Need Satisfaction & T2 TSL Present								
	4.93	1.00	0.03	0.78	0.96	0.07	0.16	
Model 4: T1 Need Satisfaction Predicts T2 PGI & T2 TSL Present								
	0.87	1.00	0.35	1.01	1.00	0.02	0.00	

satisfaction and T2 future life satisfaction was 0.19 (unstandardized effect = 0.09, SE = 0.03, $p < .001$) for Model 2. The standardized direct effect from T1 future life satisfaction and T2 future life satisfaction was 0.54 (unstandardized effect = 0.47, SE = 0.05, $p <$

.001) for Model 1 and was 0.19 (unstandardized effect = 0.50, SE = 0.05, $p < .001$) for Model 2. The above findings indicate that personal growth initiative partly mediated the relations between psychological need satisfaction and future life satisfaction.

Results from the analyses indicated the goodness-of-fit for the two models. First, it is evident from Table 5 that, of the first two models, Model 2 (Time 1 need satisfaction predictive of Time 2 personal growth initiative) offers the best fit relative to Model 1. The overall chi-square for Model 2 was non-significant (vs. Model 1, $p = 0.705$), and Model 2 alone generated incremental fit indices that were above 0.90 (TLI = 1.028, CFI = 1.000), a SRMR at the recommended value of 0.00-0.08 (Hu & Bentler, 1999; SRMR = 0.010), and a RMSEA lower than the recommended value of 0.08 (Meyers et al., 2017); RMSEA = 0.000). Second, model comparisons indicated that Model 2 fit the data significantly better than Model 1 (cf. Table 4). The Akaike information criterion (AIC) measure (1998) considers both model parsimony and fit (thus, a simple model that fits well would receive a relatively low score). Third, Model 2's AIC measure is significantly better than Model 1 (AIC = 519.205 (CI = 314.740–428.940), $w-2 = 1.484$, $p < 2.2e-16$). Taken together, these fit indices indicated that Model 2 provided the best fit to the data set (relative to Model 1), and does not support our hypotheses that personal growth initiative positively influences future life satisfaction by increasing an individual's need satisfaction. Rather, the best-fitting model (Model 2) supports need satisfaction positively influences future life satisfaction by increasing an individual's personal growth initiative.

Fig. 2 and Fig. 3 illustrate the full hypothesized mediational models, Model 1 and Model 2 respectively, using the standardized coefficients for all paths in the model.

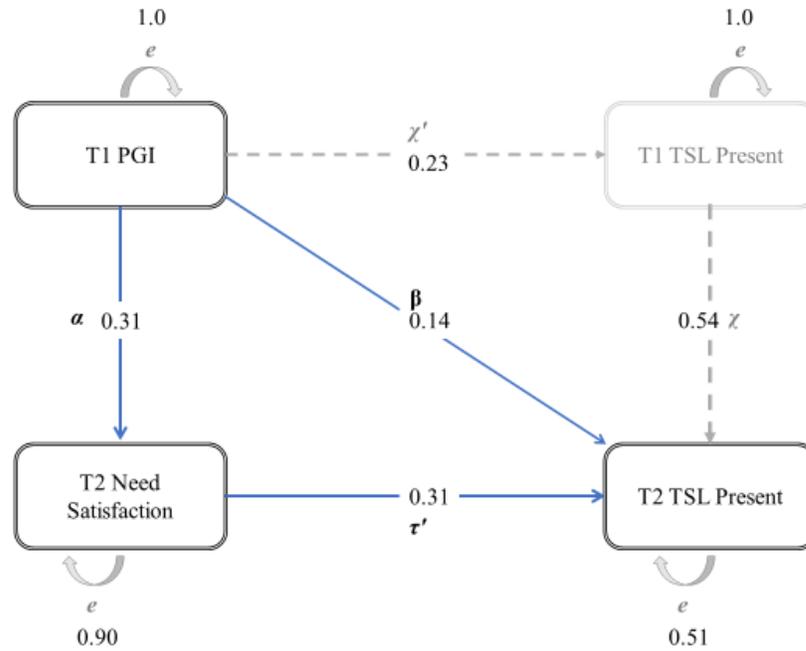


Figure 2 — Proposed Mediation Model 1

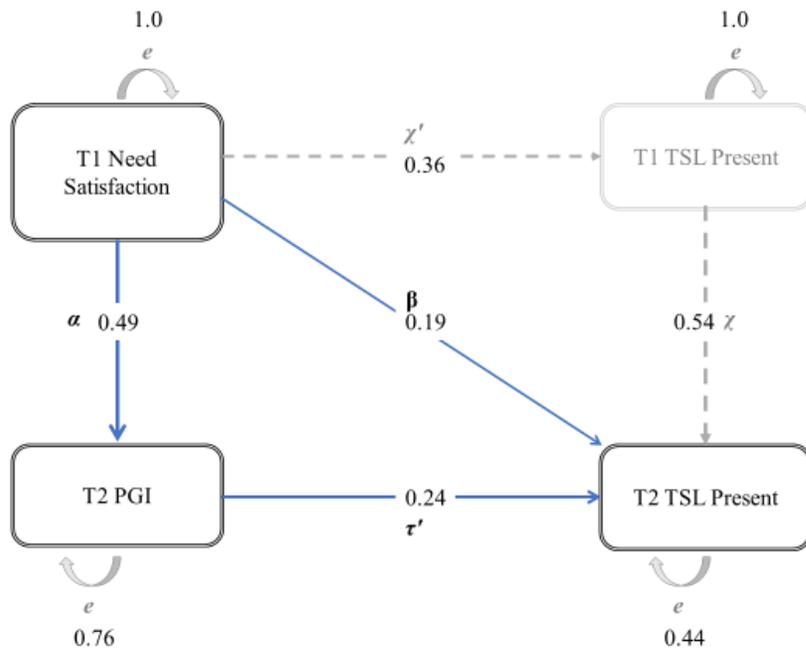


Figure 3 — Proposed Mediation Model 2

Is morality comparable to autonomy, relatedness, and competence as a basic need? In line with previous research (Prentice et al., 2019), I compared Morality to other established psychological needs (Autonomy, Relatedness, Competence) in exploratory analyses via multiple linear regression (Tables 6-9) and a comparison of distributions. When controlling for other psychological needs and personal growth initiative, Morality satisfaction explained a significant additional variance in Past (T1, $F(1, 137) = 8.82, p = .004, R^2 = .145, p < .01$), Present (T1, $F(1, 137) = 9.13, p = 0.003, R^2 = .124, p < .01$), and Future (T2, $F(1,137) = 3.69, p = .057, R^2 = .360, p < .01$) life satisfaction. When controlling for other psychological needs and personal growth initiative, Morality dissatisfaction explained a significant amount of additional variance in Past (T1, $F(1, 137) = 6.37, p = .01, R^2 = .308, p < .01$). Thus, Morality seems to have comparable explanatory power to other established needs, and Morality satisfaction explains additional variance in Life Satisfaction beyond other psychological needs. These results are in-line with Morality being a potential basic psychological need.

Table 6

T1 Morality Satisfaction Multiple Linear Regression

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T1	(Intercept)	1.18	[-0.50, 2.86]					
TSL Past	T1 Autonomy Satisfaction	0.40*	[0.08, 0.72]	[0.04, 0.41]	.04	[0.02, .09]	.30*	
	T1 Relatedness Satisfaction	-0.10	[-0.47, 0.27]	[-0.23, -0.13]	.00	[-0.01, .01]	.13	
	T1 Competence Satisfaction	-0.08	[-0.43, 0.27]	[-0.23, 0.15]	.00	[-0.01, 0.01]	.17*	
	T1 Morality Satisfaction	0.65*	[0.21, 1.09]	[0.09, 0.46]	.05	[-0.01, 0.12]	.33**	
	T1 PGI Total	0.34	[-0.02, 0.69]	[-0.01, 0.35]	.02	[-0.02, 0.07]	.28**	
								$R^2 = 0.145^{**}$

Table 6, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T1	(Intercept)	0.82	[-1.11, 2.75]					
TSL	T1 Autonomy Satisfaction	0.20	[-0.14, 0.54]	[-0.08, 0.30]	01	[-0.02, 0.04]	.23**	
Present	T1 Relatedness Satisfaction	0.06	[-0.33, 0.46]	[-0.15, 0.21]	00	[-0.01, 0.01]	.18*	
	T1 Competence Satisfaction	-0.09	[-0.47, 0.29]	[-0.24, 0.15]	00	[-0.01, 0.01]	.17*	
	T1 Morality Satisfaction	0.68*	[0.21, 1.15]	[0.08, 0.47]	05	[-0.02, 0.12]	.33**	
	T1 PGI Total	0.12	[-0.26, 0.49]	[-0.12, 0.24]	00	[-0.01, 0.02]	.19*	
								$R^2 = 0.124^{**}$

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights, *s*², represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates *p* < .05. ** indicates *p* < .01.

Table 7

T1 Morality Satisfaction Multiple Linear Regression

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T1	(Intercept)	-1.46	[-3.09, 0.18]					
TSL Past	T1 Autonomy Dissatisfaction	0.06	[-0.20, 0.31]	[-0.12, 0.20]	00	[-0.01, 0.01]	23**	
	T1 Relatedness Dissatisfaction	0.46**	[0.22, 0.70]	[0.15, 0.48]	07	[-0.00, 0.14]	40**	
	T1 Competence Dissatisfaction	0.17	[-0.06, 0.40]	[-0.04, 0.28]	01	[-0.02, 0.04]	27**	
	T1 Morality Dissatisfaction	0.27	[-0.02, 0.55]	[-0.01, 0.32]	02	[-0.02, 0.05]	34**	
	T1 PGI Total	0.64**	[0.36, 0.93]	[0.18, 0.47]	10	[0.02, 0.18]	28**	

 $R^2 = 0.308^{**}$

Table 7, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T1	(Intercept)	-0.37	[-2.11, 1.37]					
TSL Present	T1 Autonomy Dissatisfaction	0.13	[-0.14, 0.39]	[-0.09, 0.39]	00	[-0.01, 0.02]	24**	
	T1 Relatedness Dissatisfaction	0.62**	[0.36, 0.88]	[0.24, 0.58]	12	[0.03, 0.21]	43**	
	T1 Competence Dissatisfaction	-0.09	[-0.33, 0.15]	[-0.23, 0.10]	00	[-0.01, 0.02]	15	
	T1 Morality Dissatisfaction	0.23	[-0.07, 0.54]	[-0.04, 0.29]	01	[-0.02, 0.04]	31**	
	T1PGI Total	0.47**	[0.17, 0.77]	[0.08, 0.38]	05	[-0.01, 0.11]	19*	

$R^2 = 0.272^{**}$

Table 7, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T1	(Intercept)	1.91**	[0.48, 3.34]					
TSL Future	T1 Autonomy Dissatisfaction	0.24*	[0.02, 0.46]	[0.01, 0.37]	03	[-0.02, 0.08]	23**	
	T1 Relatedness Dissatisfaction	0.09	[-0.12, 0.30]	[-0.10, 0.27]	00	[-0.02, 0.03]	15	
	T1 Competence Dissatisfaction	0.07	[-0.13, 0.27]	[-0.12, 0.24]	00	[-0.01, 0.02]	13	
	T1 Morality Dissatisfaction	0.01	[-0.24, 0.26]	[-0.17, 0.19]	00	[-0.00, 0.00]	16	
	T1 PGI Total	0.39**	[0.14, 0.64]	[0.09, 0.42]	06	[-0.01, 0.14]	23**	

$R^2 = 0.126^{**}$

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. *sr*² represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
 * indicates $p < .05$. ** indicates $p < .01$.

Table 8

T2 Morality Satisfaction Multiple Linear Regression

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	0.60	[-1.33, 2.53]					
TSL Past	T2 Autonomy Satisfaction	0.07	[-0.32, 0.46]	[-0.17, 0.24]	00	[-0.01, 0.01]	17*	
	T2 Relatedness Satisfaction	0.61**	[0.22, 1.00]	[0.10, 0.45]	06	[-0.01, 0.13]	34**	
	T2 Competence Satisfaction	-0.31	[-0.67, 0.06]	[-0.35, 0.03]	02	[-0.02, 0.05]	05	
	T2 Morality Satisfaction	0.22	[-0.25, 0.68]	[-0.11, 0.30]	01	[-0.02, 0.03]	23**	
	T2 PGI Total	0.38	[-0.01, 0.76]	[-0.00, 0.35]	02	[-0.02, 0.07]	26**	

 $R^2 = 0.159^{**}$

Table 8, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	0.60	[-1.33, 2.53]					
TSL Past	T2 Autonomy Satisfaction	0.07	[-0.32, 0.46]	[-0.17, 0.24]	00	[-0.01, 0.01]	17*	
	T2 Relatedness Satisfaction	0.61**	[0.22, 1.00]	[0.10, 0.45]	06	[-0.01, 0.13]	34**	
	T2 Competence Satisfaction	-0.31	[-0.67, 0.06]	[-0.35, 0.03]	02	[-0.02, 0.05]	05	
	T2 Morality Satisfaction	0.22	[-0.25, 0.68]	[-0.11, 0.30]	01	[-0.02, 0.03]	23**	
	T2 PGI Total	0.38	[-0.01, 0.76]	[-0.00, 0.35]	02	[-0.02, 0.07]	26**	
								$R^2 = 0.159^{**}$

Table 8, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	0.11	[-1.76, 1.98]					
TSL Present	T2 Autonomy Satisfaction	0.04	[-0.34, 0.41]	[-0.18, 0.22]	00	[-0.00, 0.00]	24**	
	T2 Relatedness Satisfaction	0.53**	[0.15, 0.91]	[0.07, 0.42]	05	[-0.01, 0.11]	36**	
	T2 Competence Satisfaction	-0.07	[-0.42, 0.29]	[-0.23, 0.16]	00	[-0.01, 0.01]	18*	
	T2 Morality Satisfaction	0.50*	[0.05, 0.96]	[0.02, 0.43]	03	[-0.02, 0.08]	35**	
	T2 PGI Total	0.12	[-0.25, 0.49]	[-0.12, 0.23]	00	[-0.01, 0.02]	22**	

$R^2 = 0.180^{**}$

Table 8, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	0.30	[-0.87, 1.46]					
TSL Future	T2 Autonomy Satisfaction	0.10	[-0.14, 0.33]	[-0.11, 0.25]	00	[-0.01, 0.02]	42**	
	T2 Relatedness Satisfaction	0.07	[-0.17, 0.30]	[-0.11, 0.20]	00	[-0.01, 0.01]	32	
	T2 Competence Satisfaction	0.19	[-0.03, 0.41]	[-0.03, 0.31]	01	[-0.02, 0.04]	41**	
	T2 Morality Satisfaction	0.47**	[-0.19, 0.75]	[0.12, 0.47]	05	[-0.01, 0.11]	52**	
	T2 PGI Total	0.35**	[0.12, 0.59]	[0.08, 0.39]	04	[-0.01, 0.10]	44**	
								$R^2 = 0.360^{**}$

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. *sr*² represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
 * indicates $p < .05$. ** indicates $p < .01$.

Table 9

T2 Morality Dissatisfaction Multiple Linear Regression

Predictor		<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i>	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> ² 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	3.73**	[1.83, 5.62]						
TSL Past	T2 Autonomy Dissatisfaction	0.11	[-0.17, 0.39]	0.07	[-0.11, 0.24]	.00	[-0.01, 0.02]		-.13
	T2 Relatedness Dissatisfaction	-0.51**	[-0.76, -0.26]	-0.36	[-0.54, -0.19]	.09	[0.01, 0.18]		-.37**
	T2 Competence Dissatisfaction	0.01	[-0.24, 0.26]	0.01	[-0.16, 0.17]	.00	[-0.00, 0.00]		-.10
	T2 Morality Dissatisfaction	-0.18	[-0.50, 0.14]	-0.10	[-0.28, 0.08]	.01	[-0.02, 0.03]		-.28**
	T2 PGI Total	0.55**	[-0.21, 0.89]	0.25	[0.10, 0.41]	.06	[-0.01, 0.13]		.26**

 $R^2 = 0.218^{**}$

Table 9, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i>	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> ² 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	3.36**	[1.47, 5.26]						
TSL Present	T2 Autonomy Dissatisfaction	0.04	[-0.23, 0.32]	0.03	[-0.15, 0.21]	.00	[-0.01, 0.01]		-.11
	T2 Relatedness Dissatisfaction	-0.54**	[-0.79, -.030]	-0.39	[-0.57, -0.21]	.11	[0.02, 0.20]		-.35**
	T2 Competence Dissatisfaction	0.16	[-0.09, 0.41]	0.11	[-0.06, 0.27]	.01	[-0.02, 0.04]		-.00
	T2 Morality Dissatisfaction	-0.04	[-0.36, 0.28]	-0.02	[-0.21, 0.16]	.00	[-0.01, 0.01]		-.19*
	T2 PGI Total	0.48**	[0.15, 0.82]	0.23	[0.07, 0.38]	.05	[-0.02, 0.11]		.22**

$R^2 = 0.188^{**}$

Table 9, cont.

	Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i>	<i>beta</i> 95% CI [LL, UL]	<i>r</i> ²	<i>r</i> ² 95% CI [LL, UL]	<i>r</i> ²	Fit
T2	(Intercept)	2.51**	[1.24, 3.78]						
TSL Future	T2 Autonomy Dissatisfaction	0.15	[-0.04, 0.34]	0.14	[-0.03, 0.31]	.01	[-0.02, 0.05]		-.02
	T2 Relatedness Dissatisfaction	-0.22*	[-0.38, -0.05]	-0.22	[-0.39, -0.05]	.04	[-0.02, 0.09]		-.21*
	T2 Competence Dissatisfaction	0.02	[-0.15, 0.19]	0.02	[-0.14, 0.18]	.00	[-0.00, 0.01]		-.02
	T2 Morality Dissatisfaction	-0.17	[-0.39, 0.04]	-0.14	[-0.32, 0.04]	.01	[-0.02, 0.05]		-.25**
	T2 PGI Total	0.65**	[0.42, 0.87]	0.42	[0.28, 0.57]	.17	[0.06, 0.28]		.44**
									$R^2 = 0.268^{**}$

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. *sr*² represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

DISCUSSION

The *a priori* Hypothesis 1 is not supported, as T1 personal growth initiative was unrelated to T2 present life satisfaction. Model 1, which tested the exploratory revised hypothesis 1 (T1 personal growth initiative is partly mediated by T2 need satisfaction and positively related to T2 future life satisfaction) poorly fit the existing data ($\chi^2 = 20.28$, $df = 1.00$, $p = 0.00$, TLI = 0.32, CFI = 0.86, SRMR = 0.13). Model 2 which tested the exploratory revised hypothesis 2 (T1 need satisfaction is partly mediated by T2 personal growth initiative and positively related to T2 future life satisfaction) fit the data significantly better than Model 1 ($\chi^2 = 0.14$, $df = 1.00$, $p = 0.71$, TLI = 1.03, CFI = 1.00, SRMR = 0.01, RMSEA = 0.00, AIC = 519.21). An exploratory series of linear regressions examined morality as a psychological need. Morality satisfaction similarly explained variance compared to other established psychological needs (Autonomy, Relatedness, Competence) in life satisfaction, and explained additional variance in present and future life satisfaction. Morality dissatisfaction similarly explained variance compared to other established psychological needs (Autonomy, Relatedness, Competence) in life satisfaction, and explained additional variance in past life satisfaction. An exploratory series of linear regressions examined whether Covid-19 anxiety affected respondents' scores by decreasing Relatedness satisfaction, increasing Relatedness dissatisfaction, and decreasing Autonomy satisfaction (Hypothesis 2). Covid-19 anxiety significantly decreased Relatedness satisfaction, increased Relatedness dissatisfaction, and decreased Autonomy satisfaction. Future research should continue to explore the effects of crises like Covid-19 on personal growth initiative, need satisfaction,

and life satisfaction. Thus, Hypothesis 1 was rejected, Hypothesis 2 was not rejected, and my exploratory analyses provides support for Morality as a psychological need.

Personal Growth Initiative and Present Life Satisfaction

There are a number of potential factors that may contribute to the *a priori* hypothesis of personal growth initiative increasing present life satisfaction by increasing individuals' psychological need satisfaction not being supported. These factors include sample size; power; population; circumstances of measurement; and personal growth initiative impacting present eudemonic well-being, rather than life satisfaction. Power analyses of path analyses and mediational models have demonstrated samples of less than 300 addressing medium or smaller effects have less than 80% power (Fritz & MacKinnon, 2007; Pan et al., 2018), and longitudinal samples with larger within-subject correlation require larger samples (Pan et al., 2018). Given this study's sample of less than 150, this study may not have had enough power to detect an effect. The population in this study also has limited racial and socio-economic diversity; participants in this study are primarily white and with annual household incomes above \$150,000.

All research is affected by its environment and circumstances in which it is conducted, and the unique crisis of circumstance during Spring 2020 of Covid-19 is unprecedented for this population. Respondents' open-ended responses of how they were affected by Covid-19 were analyzed via inductive qualitative Grounded Theory methods (Holstein & Gubrium, 2008). These students experienced sudden relocation, isolation, and increase in coursework. When asked how Covid-19 has impacted them, one student simply wrote "quarantine". Another student from Connecticut encompassed many other

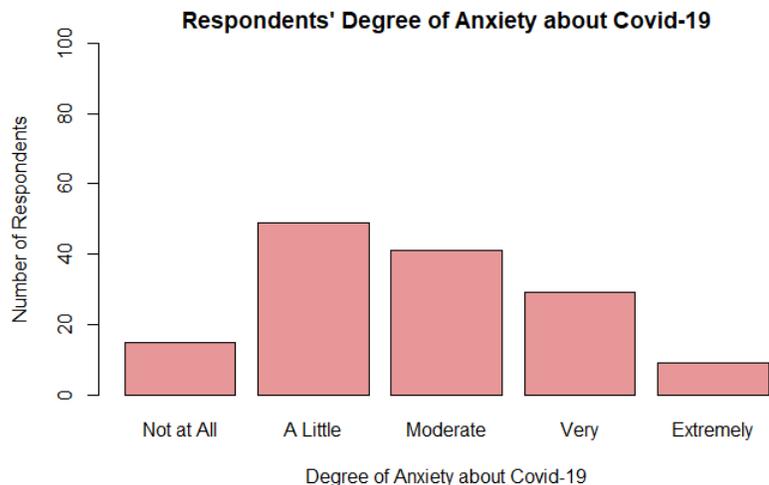


Figure 4 — Respondents' Degree of Anxiety about Covid-19

respondents' answers, writing "I have been isolated from most of my friends at home...[Covid-19] has presented an interesting challenge to my personal education...change of my perspective...[I] am using this time as a time to better myself, psychologically and physically." Their multifaceted experience of loneliness, of being overwhelmed by change, and an ultimate orientation towards self-contemplation is emblematic of many students' responses ("...I've managed to channel this nervousness into my school work and physical activity, in addition to working on myself."). Most students were living with their immediate family, and a number wrote "myself and my family are healthy and safe which is what's most important" and similar sentiments. Even respondents who were in otherwise stable situations expressed increased stress from school, either from increased work or reduced learning ("...turning to a remote learning style has taken a toll on my learning..."). Another student wrote "...in the last few weeks I have become more and more anxious about it...I am more lonely lately." Other respondents had been personally affected by Covid-19 ("I actually contracted

COVID...”), had people who they are close to contract Covid-19 (“I know a number of people who have gotten the Coronavirus...”; “Several family friends have been admitted to the hospital and that's worrying me”), or were grieving loved ones who died due to Covid-19 (“My best friend's father contracted it...He passed away a week later”). By contrast, one student wrote “I have not been tremendously impacted by COVID. I live in Atlanta where some things are closed, but I don't feel as though I, or anybody in my family is threatened by COVID. We are still able to live out our lives rather normally and it is nice to be back with my family. I have confidence that the world will quickly get over COVID and be better from it.” Students have simultaneously experienced loneliness and increased closeness to their families, increased educational burdens and reduced learning, extreme uncertainty and lethargy from unformed routine. Given the extent and diversity of these responses, it would be unsurprising if individuals’ responses to this crisis affected their personal growth initiative, psychological need satisfaction, or life satisfaction. There is also some empirical evidence that the circumstances of Covid-19 impacted participants’ responses; self-reported anxiety around Covid-19 (Fig. 4) was related to individuals’ present life satisfaction when controlling for need satisfaction (T2, $F(4,133) = 3.70, p = .007$). In order to broadly understand the relationships between personal growth initiative, psychological need satisfaction, and life satisfaction, future research must replicate this study during different circumstances and with more populations.

Finally, personal growth initiative simply may not influence present life satisfaction.

Implications for Personal Growth Initiative as a Mediator of Need Satisfaction

While the study's best-fitting model contradicts the exploratory hypothesis, the study's results align with and further support self-determination theory. Self-determination theory originates as a motivational theory (Deci & Ryan, 2000; Vansteenkiste et al., 2020), where an organism's development towards growth and autonomy does not simply occur (Ryan et al., 1997). Rather, specific psychological need fulfilment ("nutrients") are a necessary pre-requisite for optimal task performance, lest development be delayed or disrupted (Ryan et al., 1997). These psychological needs (Cicchetti & Tucker, 1994) and individuals' abilities to fulfill them (Mullainathan & Shafir, 2013) can themselves be impeded by environmental stressors. The basic criterion of *universality* (5) of a psychological need contends an individual's well-being is affected regardless of personality (Baumeister & Leary, 1995; Ryan & Deci, 2017), and should be consequently *pervasive* (6); personal growth initiative functions as a personality variable (Fleeson & Jayawickreme, 2015), thus should consequently be affected by need satisfaction. The associated criterion of *directional* (8) predicts that need satisfaction will direct and incite growth-focused behaviors (see Sheldon, 2011; Weinstein et al., 2016), and dissatisfaction will elicit corrective behavior (rather than need satisfaction being independently elicited by striving or growth-related behavior; Roth et al., 2019); personal growth initiative could be one avenue for these behaviors. Finally, need frustration can lead to compensatory behaviors that distort individuals' goals, and thus their capacity to satisfy their need and improve life satisfaction (Sheldon, 2011), even if the individual exhibits personal growth initiative. It follows, then, that personal growth initiative would

be a downstream effect of an individual's current psychological need satisfaction and dissatisfaction.

Implications for Morality as a Basic Psychological Need

The study's results align with morality being a basic psychological need that contributes unique variance to life satisfaction. Morality both acted similarly to the other codified basic psychological need of Autonomy, Relatedness, and Competence; Morality satisfaction marginally significantly explained additional variance in T1 Past, T1 Present, and T2 Future life satisfaction; and Morality dissatisfaction marginally significantly explained additional variance in T1 Past life satisfaction. Of note, both Morality satisfaction and dissatisfaction were impactful, satisfying criterion #4 to be a basic psychological need, *distinction* (Ryan & Deci, 2017). Future research will continue to clarify Morality's position as a potential psychological need.

Limitations

There are several limitations to consider when interpreting this study, and which should be considered in future research, including external validity, methodological limitations, and ambiguity of personal growth initiative as a unique construct. The study's relatively small sample size is likely to be more affected by outliers than the true population, leading to skewed variance (Meyers et al., 2017). The study's sample of predominately white private college students with an annual household income of \$150,000 or more limits the generalizability of this study. Future studies should aim to test a larger and more racially, ethnically, and socioeconomically diverse sample of participants. This study relied entirely upon self-report measures, which are prone to a number of potential biases (see Vazire, 2005; Weatherby et al., 1994). Future research

should explore these relationships with behavioral and informant-report data, along with self-reports. I also caution against making definitive causal attributions; an exploratory model using two timepoints can merely indicate order of change, rather than its instigator (Geweke et al., 1983). Participants were only measured at two timepoints less than 1 month apart; these results cannot be extended to long-term interactions between personal growth initiative, need satisfaction, and life satisfaction (Roisman & Fraley, 2013). Future research should measure participants at three or more timepoints.

Future Directions

This study should be replicated in a different, more racially and socio-economically diverse population outside of the Covid-19 pandemic. Future studies should continue to search for mechanisms of personal growth initiative's influence on life satisfaction and other measures of well-being. Future studies should further parse the distinct influences of psychological need satisfaction and dissatisfaction on personal growth initiative.

Researchers should continue to investigate the impacts of crises like Covid-19 on personal growth initiative, need satisfaction, life satisfaction, and other markers well-being. Qualitative data of respondents' experiences of Covid-19 should be systematically analyzed to more comprehensively explore how respondents' experiences during Covid-19 impacted their personal growth initiative, need satisfaction, and life satisfaction. These studies should include a diversity of populations, including college students and minority populations. Along with investigating crises' impacts upon well-being markers, researchers should investigate how these elements contribute to fostering pathways of individual and systemic resilience in the wake of and to future crises.

Conclusion

This study investigated a possible pathway of how personal growth initiative (Robitschek, 1998)—an individuals' motivation and skills to self-actualize—influences life satisfaction, via fulfillment of basic psychological need. Personal growth initiative is related to—but theoretically and empirically distinct from—hope, the stages of change model, optimism, growth mindset, self-efficacy, ego-resiliency, mental toughness, growth need strength, and Ryff's (1989a) conception of personal growth. Personal growth initiative (Woerkom & Meyers, 2019) and basic psychological needs (Vansteenkiste et al., 2020) are also predictive of psychological well-being. A number of researchers have theorized different relationships between these two constructs, including the constructs simply being related (e.g., Luyckx & Robitschek, 2014; Negovan & Tomşa, 2018), personal growth initiative increasing basic psychological need satisfaction (e.g., Negovan & Bogdan, 2013; Reeve et al., 2018; Woerkom et al., 2016), basic psychological need satisfaction increasing personal growth initiative (e.g., Boyd, 2007; Spreitzer & Porath, 2014), and personal growth initiative being “filtered” by individuals' degree of basic psychological need satisfaction (Ryan et al., 1997). This study compared participants' levels of personal growth initiative, psychological need satisfaction, and life satisfaction at two timepoints via a modified longitudinal single mediator path analysis model (Baron & Kenny, 1986). Personal growth analysis was not related to present life satisfaction. Personal growth initiative mediated psychological need satisfaction's effect on future life satisfaction in the best-fitting exploratory analysis model (see Table 5, Model 2). Thus, there is preliminary evidence that personal growth initiative partly mediates psychological need satisfaction's effect on future life satisfaction.

This study also examined the status of morality as a basic psychological need. Analyses showed morality was comparable to the established psychological needs of Autonomy, Relatedness, and Competence, and accounted for additional variance in present life satisfaction, in line with past research (Prentice et al., 2019).

This study provides new insights into the functioning of psychological need satisfaction and personal growth initiative on life satisfaction, with distinctions between past, present, and future. Future research should aim to replicate these findings in diverse populations and continue to investigate mechanisms of personal growth initiative's influence on life satisfaction.

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Appendix A

Questionnaires

Personal Growth Initiative Scale II (PGIS-II; Robitschek et al., 2012)

Please mark how much you agree or disagree with that statement. Use the following scale:

0	1	2	3	4	5
Strongly Disagree	Disagree Somewhat	Disagree A Little	Agree A Little	Agree Somewhat	Strongly Agree

1. I set realistic goals for what I want to change about myself.
2. I can tell when I am ready to make specific changes in myself.
3. I know how to make a realistic plan in order to change myself.
4. I take every opportunity to grow as it comes up.
5. When I try to change myself, I make a realistic plan for my personal growth.
6. I ask for help when I try to change myself.
7. I actively work to improve myself.
8. I figure out what I need to change about myself.
9. I am constantly trying to grow as a person.
10. I know how to set realistic goals to make changes in myself.
11. I know when I need to make a specific change in myself.
12. I use resources when I try to grow.
13. I know steps I can take to make intentional changes in myself.

14. I actively seek out help when I try to change myself.
15. I look for opportunities to grow as a person.
16. I know when it's time to change specific things about myself

Balanced Measure of Psychological Needs Scale (Sheldon & Hilpert, 2012)

Read each of the following statements carefully and score how true it is for you

OVER THE PAST WEEK, using the following scale:

1	2	3	4	5
Strongly Disagree	Disagree Somewhat	Neither Agree or Disagree	Agree Somewhat	Strongly Agree

1. I felt a sense of contact with people who care for me, and whom I care for.
2. I was lonely.
3. I felt close and connected with other people who are important to me.
4. I felt unappreciated by one or more important people.
5. I felt a strong sense of intimacy with the people I spent time with.
6. I had disagreements or conflicts with people I usually get along with.
7. I was successfully completing difficult tasks and projects.
8. I experienced some kind of failure, or was unable to do well at something.
9. I took on and mastered hard challenges.
10. I did something stupid, that made me feel incompetent.
11. I did well even at the hard things.
12. I struggled doing something I should be good at.
13. I was free to do things my own way.
14. I had a lot of pressures I could do without.
15. My choices expressed my “true self.”

16. There were people telling me what I had to do.

17. I was really doing what interests me.

18. I had to do things against my will.

Additional Items—Balanced Measure of Psychological Needs Scale

(Prentice et al., 2019)

Read each of the following statements carefully and score how true it is for you

OVER THE PAST WEEK, using the following scale:

1	2	3	4	5
Strongly Disagree	Disagree Somewhat	Neither Agree or Disagree	Agree Somewhat	Strongly Agree

19. I felt a strong sense of moral fulfillment.
20. I felt a strong lack of moral fulfillment.
21. I felt that I am a good person.
22. I felt that I am a bad person.
23. I felt that I embody my moral values.
24. I felt that I am going against my moral values.
25. I felt that I am doing the right thing.
26. I felt that I am doing the wrong thing.
27. I felt that I put others ahead of myself.
28. I felt that I put myself ahead of others.

Demographic Questions

Gender: What is your gender?

Male Female Other Prefer not to answer

Age: How old are you in years? _____

Household Income: What is your total household income?

Less than \$10,000

\$10,000 to \$19,999

\$20,000 to \$29,999

\$30,000 to \$39,999

\$40,000 to \$49,999

\$50,000 to \$59,999

\$60,000 to \$69,999

\$70,000 to \$79,999

\$80,000 to \$89,999

\$90,000 to \$99,999

\$100,000 to \$149,999

\$150,000 or more

Please specify your ethnicity

Hispanic or Latino

Not Hispanic or Latino

Prefer not to answer

Please specify your race.

American Indian or Alaska Native

Asian

Black or African American

Native Hawaiian or Other Pacific Islander

White

Prefer not to answer

Covid-19 Questions

How do you currently feel about the current Covid-19 Pandemic?

1	2	3	4	5
Not at all anxious	A little anxious	Moderately anxious	Very anxious	Extremely anxious

In a couple of sentences, explain how you have been impacted by the current

Covid-19 Pandemic.

APPENDIX B

Table 10
Correlation Table with Subcomponents

Variable	1	2	3	4	5	6	7	8	9
1. T1 Total PGI	—								
2. T1 Readiness	0.82** [.76, .87]	—							
3. T1 Planfulness	0.83** [.78, .88]	0.59** [.47, .69]	—						
4. T1 Resources	0.73** [.65, .80]	0.45** [.31, .57]	0.44** [.30, .57]	—					
5. T1 Behavior	0.81** [.74, .86]	0.60** [.49, .70]	0.54** [.41, .64]	0.50** [.37, .61]	—				
6. T2 Total PGI	0.69** [.59, .77]	0.53** [.40, .64]	0.54** [.41, .65]	0.51** [.38, .62]	0.62** [.51, .71]	—			
7. T2 Readiness	0.55** [.42, .65]	0.60** [.48, .69]	0.38** [.23, .51]	0.32** [.16, .46]	0.49** [.36, .61]	0.80** [.73, .85]	—		
8. T2 Planfulness	0.59** [.47, .68]	0.44** [.30, .56]	0.57** [.45, .67]	0.37** [.22, .50]	0.46** [.32, .58]	0.86** [.81, .90]	0.63** [.52, .72]	—	
9. T2 Resources	0.44** [.30, .56]	0.22** [.05, .37]	0.29** [.13, .44]	0.56** [.44, .67]	0.34** [.18, .48]	0.71** [.62, .79]	0.35** [.20, .49]	0.46** [.32, .58]	—
10. T2 Behavior	0.65** [.55, .74]	0.50** [.36, .61]	0.49** [.35, .60]	0.40** [.25, .53]	0.73** [.64, .80]	0.85** [.80, .89]	0.66** [.55, .74]	0.64** [.54, .73]	0.46** [.32, .58]

Table 10, cont.

Variable	1	2	3	4	5	6	7	8	9
11. T1 TSL Past	0.28** [.12, .42]	0.15 [-.01, .30]	0.32** [.15, .46]	0.20* [.03, .35]	0.20* [.04, .35]	0.18* [.02, .34]	0.05 [-.11, .21]	0.25** [.09, .40]	0.12 [-.05, .28]
12. T1 TSL Present	0.18* [.02, .34]	0.09 [-.08, .25]	0.18* [.02, .33]	0.15 [-.01, .31]	0.16* [.00, .32]	0.21* [.05, .36]	0.11 [-.05, .27]	0.27** [.11, .41]	0.10 [-.07, .26]
13. T1 TSL Future	0.21* [.05, .36]	0.22** [.06, .37]	0.17* [.01, .33]	0.11 [-.06, .27]	0.17* [.00, .32]	0.20* [.04, .35]	0.14 [-.02, .35]	0.25** [.09, .40]	-0.06 [-.10, .22]
14. T2 TSL Past	0.25** [.08, .39]	0.14 [-.03, .29]	0.26** [.11, .41]	0.14 [-.03, .30]	0.22** [.06, .37]	0.26** [.10, .41]	0.15 [-.01, .31]	0.30** [.14, .44]	0.14 [-.03, .30]
15. T2 TSL Present	0.13 [-.03, .29]	0.10 [-.06, .26]	0.11 [-.05, .27]	0.12 [-.04, .28]	0.08 [-.09, .24]	0.22** [.06, .37]	0.16 [-.00, .32]	0.27** [.11, .41]	0.12 [-.05, .27]
16. T2 TSL Future0	0.34** [.18, .48]	0.29** [.13, .43]	0.24** [.08, .39]	0.22** [.06, .37]	0.37** [.22, .50]	0.44** [.30, .57]	0.29** [.13, .43]	0.42** [.27, .54]	0.27** [.11, .42]
17. T1 Relatedness Satisfaction	0.29** [.13, .43]	0.25** [.09, .40]	0.22** [.06, .37]	0.23** [.07, .38]	0.23** [.07, .38]	0.42** [.27, .54]	0.27** [.11, .42]	0.44** [.30, .56]	0.28** [.12, .42]
18. T1 Relatedness Dissatisfaction	-0.11 [-.27, .06]	-0.08 [-.24, .09]	-0.11 [-.27, .05]	-0.09 [.024, .08]	-0.07 [-.23, .10]	-0.04 [-.20, .13]	-0.13 [-.29, .04]	-0.04 [-.20, .13]	0.02 [-.15, .18]
19. T1 Competence Satisfaction	0.40** [.26, .53]	0.33** [.17, .46]	0.33** [.18, .47]	0.30** [.15, .44]	0.32** [.17, .46]	0.36** [.21, .50]	0.25** [.10, .41]	0.41** [.27, .54]	0.16 [-.00, .32]
20. T1 Competence Dissatisfaction	-0.12 [-.28, .04]	-0.16* [-.32, -.00]	-0.03 [-.19, .13]	-0.03 [-.19, .14]	-0.20* [-.35, -.03]	-0.06 [-.23, .10]	-0.18* [-.34, -.02]	0.01 [-.15, .17]	0.06 [-.10, .23]

Table 10, cont.

Variable	1	2	3	4	5	6	7	8	9
21. T1 Autonomy Satisfaction	0.32** [.17, .46]	0.27** [.11, .41]	0.21* [.05, .36]	0.29** [.14, .44]	0.28** [.12, .42]	0.27** [.11, .42]	0.18* [.02, .34]	0.26** [.10, .41]	0.12 [-.04, .28]
22. T1 Autonomy Dissatisfaction	-0.05 [-.22, .11]	-0.10 [-.26, .07]	0.05 [-.12, .21]	-0.04 [-.20, .12]	-0.12 [-.28, .04]	0.02 [-.15, .18]	0.02 [-.14, .19]	0.07 [-.09, .24]	-0.09 [-.25, .08]
23. T1 Morality Satisfaction	0.40** [.25, .53]	0.32** [.17, .46]	0.26** [.10, .41]	0.31** [.16, .45]	0.40** [.26, .53]	0.44** [.30, .56]	0.32** [.17, .46]	0.42** [.287, .55]	0.25** [.09, .39]
24. T1 Morality Dissatisfaction	0.08 [-.08, .24]	-0.01 [-.17, .15]	0.11 [-.05, .27]	-0.02 [-.18, .15]	0.16* [.00, .32]	-.18* [.02, .33]	-.10 [-.07, .25]	-.22** [.05, .37]	-0.01 [-.17, .16]
25. T1 Relatedness/ Competence/ Autonomy Satisfaction	0.43** [.29, .56]	0.36** [.21, .49]	0.32** [.17, .46]	.35** [.20, .49]	0.36** [.21, .49]	0.44** [.30, .57]	0.30** [.14, .44]	0.47** [.33, .59]	0.24** [.07, .39]
26. T1 Relatedness/ Competence/ Autonomy/ Dissatisfied	-0.13 [-.28, .04]	-0.15 [-.30, .01]	-0.05 [-.21, .12]	-0.07 [-.23, .10]	-0.17* [-.32, -.01]	-0.04 [-.20, .13]	-0.13 [0.29, .03]	0.02 [-.15, .18]	0.00 [-.16, .17]
27. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.47** [.33, .59]	0.39** [.24, .52]	0.34** [.19, .48]	0.38** [.23, .51]	0.41** [.26, .53]	0.49** [.35, .60]	0.34* [.18, .48]	0.50** [.37, .62]	0.26** [.10, .41]
28. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	-0.08 [-.24, .08]	-0.13 [-.28, .04]	0.00 [-.17, .16]	-0.06 [-.22, .10]	-0.09 [0.25, .07]	0.02 [-.14, .19]	-0.09 [-.24, .09]	-0.08 [-.08, .24]	0.00 [-.17, .16]

Table 10, cont.

Variable	1	2	3	4	5	6	7	8	9
29. T2 Relatedness Satisfaction	0.17* [.01, .33]	0.05 [-.12, .21]	0.16 [-.00, .32]	0.15 [-.01, .31]	0.18* [.02, .33]	0.32** [.16, .46]	0.22** [.05, .37]	0.28** [.12, .42]	0.22** [.06, .37]
30. T2 Relatedness Dissatisfaction	0.09 [-.08, .25]	0.10 [-.06, .26]	0.03 [-.14, .19]	0.08 [-.08, .24]	0.09 [-.08, .25]	0.03 [-.14, .19]	0.08 [-.08, .24]	-0.03 [-.20, .13]	0.07 [-.10, .23]
31. T2 Competence Satisfaction	0.21* [.05, .36]	0.17* [.01, .33]	0.19* [.03, .35]	0.09 [-.08, .25]	0.21* [.05, .37]	0.33** [.18, .47]	0.24** [.08, .39]	0.34** [.19, .48]	0.15 [-.01, .31]
32. T2 Competence Dissatisfaction	0.12 [-.05, .28]	0.09 [-.07, .25]	0.03 [.014, .19]	0.16 [-.01, .31]	0.120.05 [-.05, .27]	0.09 [-.11, .21]	-0.08 [-.08, .25]	0.08 [-.24, .09]	0.11 [-.06, .26]
33. T2 Autonomy Satisfaction	0.30** [.14, .44]	0.18* [.02, .34]	0.28** [.12, .42]	0.23** [.07, .38]	0.26** [.10, .40]	0.36** [.21, .50]	0.23** [.07, .38]	0.36** [.21, .50]	-0.21* [.05, .36]
34. T2 Autonomy Dissatisfaction	0.03 [-.13, .20]	-0.01 [-.17, .16]	-0.07 [.23, .09]	0.11 [.05, .27]	0.11 [-.06, .27]	-0.02 [-.19, .14]	-0.01 [-.18, .15]	-0.10 [-.26, .06]	0.12 [-.05, .28]
35. T2 Morality Satisfaction	0.27** [.11, .41]	0.18* [.01, .33]	0.26** [.10, .41]	0.14 [-.02, .30]	0.26** [.10, .41]	0.41** [.27, .54]	0.24** [.08, .39]	0.48** [.34, .60]	0.19* [.03, .34]
36. T2 Morality Dissatisfaction	-0.12 [-.28, .05]	-0.06 [-.22, .11]	-0.18* [-.34, -.02]	-0.02 [-.14, .19]	-0.13 [-.29, .03]	-0.19* [-.35, -.03]	-0.10 [-.26, .06]	-0.29** [-.43, -.13]	0.05 [-.12, .21]
37. T2 Relatedness/ Competence/ Autonomy Satisfaction	0.29** [.14, .44]	0.18* [.01, .33]	0.27** [.11, .42]	0.20* [.04, .35]	0.28* [.12, .42]	0.43** [.29, .56]	0.29** [.13, .44]	0.42** [.28, .55]	0.24** [.08, .39]

Table 10, cont.

Variable	1	2	3	4	5	6	7	8	9
38. T2 Relatedness/ Competence/ Autonomy Dissatisfaction	0.11 [-.06, .27]	0.08 [-.08, .24]	0.00 [-.17, .16]	0.15 [-.01, .31]	0.14 [-.03, .29]	0.03 [-.14, .19]	0.07 [-.09, .23]	-0.09 [-.25, .07]	0.13 [-.04, .29]
39. T2 Relatedness Competence/ Autonomy. Morality Satisfaction	0.31** [.15, .45]	0.19* [.03, .34]	0.29** [.13, .43]	0.20* [.04, .35]	0.30** [.14, .44]	0.46** [.32, .58]	0.30** [.14, .44]	0.47** [.33, .59]	0.25** [.09, .40]
40. T2 Relatedness/ Competence/ Autonomy/ Morality Dissatisfaction	0.05 [-.11, .21]	0.05 [-.11, .21]	-0.06 [0.22, .11]	0.13 [-.03, .29]	0.07 [-.09, .23]	-0.04 [-.20, .13]	0.03 [-.14, .19]	-0.16 [-.32, .00]	0.12 [-.05, .28]
41. Corona	0.06 [-.10, .22]	0.05 [-.12, .21]	0.02 [-.14, .19]	0.13 [-.04, .29]	0.01 [-.16, .18]	0.10 [-.06, .26]	0.10 [-.06, .26]	0.08 [-.08, .24]	0.13 [0.04, .29]

Table 10, cont.

Variable	10	11	12	13	14	15	16
10. T2 Behavior	—						
11. T1 TSL Past	0.15 [-.02, .30]	—					
12. T1 TSL Present	0.18* [.01, .33]	0.58** [.47, .68]	—				
13. T1 TSL Future	0.18* [.01, .33]	0.22** [.06, .37]	0.35** [.20, .48]	—			
14. T2 TSL Past	0.23** [.07, .38]	0.80** [.73, .85]	0.49** [.35, .61]	0.12 [-.04, .28]	—		
15. T2 TSL Present	0.17* [.00, .32]	0.46** [.32, .58]	0.59** [.47, .69]	0.25** [.09, .40]	0.54** [.41, .65]	—	
16. T2 TSL Future	0.45** [.31, .57]	0.31** [.15, .45]	0.30** [.14, .44]	0.66** [.55, .74]	0.32** [.16, .46]	0.41** [.26, .53]	—
17. T1 Relatedness Satisfaction	0.33** [.18, .47]	0.14 [-.02, .30]	0.19* [.03, .35]	0.25** [.09, .39]	0.09 [-.08, .25]	0.24** [.08, .39]	0.28** [.12, .42]
18. T1 Relatedness Dissatisfaction	0.02 [-.15, .18]	0.39** [.24, .52]	0.42** [.28, .54]	0.13 [-.04, .28]	0.39** [.24, .52]	0.33** [.18, .47]	0.20* [.03, .35]
19. T1 Competence Satisfaction	0.32** [.17, .46]	0.17* [.01, .32]	0.17* [.00, .32]	0.34** [.19, .478]	0.17* [.01, .33]	0-.20* [.03, .35]	0.40** [.25, .53]
20. T1 Competence Dissatisfaction	-0.12 [-.28, .04]	0.28** [.12, .42]	0.16 [-.00, .31]	0.15 [.06, .38]	0.23** [-.05, .27]	0.12 [0.07, .25]	0.09 [-.08, .25]

Table 10, cont.

Variable	10	11	12	13	14	15	16
21. T1 Autonomy Satisfaction	0.30** [.15, .45]	0.30** [.15, .44]	0.24** [.08, .39]	0.23** [.07, .38]	0.23** [.07, .38]	0.15 [-.02, .31]	0.34** [.19, .48]
22. T1 Autonomy Dissatisfaction	0.05 [-.12, .21]	0.23** [.07, .38]	0.25** [.09, .40]	0.25** [.13, .43]	0.29** [.08, .39]	0.24** [.04, .35]	0.20* [-.07, .25]
23. T1 Morality Satisfaction	0.42** [.27, .54]	0.33** [.17, .47]	0.33** [.18, .47]	0.31** [.15, .45]	0.38** [.23, .51]	0.35** [.20, .49]	0.51** [.23, .51]
24. T1 Morality Dissatisfaction	0.27** [.11, .41]	0.34** [.18, .47]	0.30** [.15, .44]	0.14 [-.03, .29]	0.39** [.24, .52]	0.27** [.11, .41]	0.28** [.12, .42]
25. T1 Relatedness/ Competence/ Autonomy Satisfaction	0.41** [.26, .53]	0.27** [.11, .41]	0.26** [.10, .40]	0.35** [.05, .36]	0.21* [.09, .39]	0.25** [.30, .56]	0.44* [.67, .81]
26. T1 Relatedness/ Competence/ Autonomy Dissatisfaction	-0.03 [-.19, .13]	0.40** [.25, .53]	0.37** [.22, .50]	0.23** [.07, .38]	0.40** [.25, .53]	0.30** [.14, .44]	0.21* [.05, .37]
27. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.45** [.31, .57]	0.31** [.16, .45]	0.30** [.15, .44]	0.37** [.22, .50]	0.28** [.12, .43]	0.30** [.14, .44]	0.50** [.37, .62]

Table 10, cont.

Variable	10	11	12	13	14	15	16
28. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.061 [-.11, .22]	0.43** [.29, .55]	0.40** [.25, .52]	0.23** [.07, .38]	0.45** [.30, .57]	0.33** [.17, .47]	0.26** [.10, .41]
29. T2 Relatedness Satisfaction	0.30** [.14, .44]	0.28** [.13, .43]	0.29** [.13, .44]	0.23** [.07, .38]	0.34** [.18, .48]	0.36** [.21, .50]	0.32** [.16, .46]
30. T2 Relatedness Dissatisfaction	-0.01 [-.17, .16]	-0.29** [-.43, -.13]	-0.30** [-.44, -.14]	-0.23** [-.38, -.06]	-0.37** [0.50, -.22]	-0.35** [-.49, -.20]	-0.21* [-.36, -.05]
31. T2 Competence Satisfaction	0.33** [.18, .47]	-0.05 [-.22, .11]	0.05 [-0.12, .21]	0.33** [.18, .47]	0.05 [-.12, .21]	0.18* [.01, .33]	0.41** [.27, .54]
32. T2 Competence Dissatisfaction	0.07 [-.10, .23]	-0.08 [-.24, .08]	-0.07 [0.23, .10]	-0.13 [-.29, .04]	-0.10 [-.26, .06]	0.00 [-.17, .16]	-0.02 [-.19, .14]
33. T2 Autonomy Satisfaction	0.36** [.21, .50]	0.15 [-.01, .31]	0.14 [0.03, .30]	0.34** [.19, .48]	0.17* [.00, .32]	0.24** [.08, .39]	0.42** [.27, .54]
34. T2 Autonomy Dissatisfaction	-0.08 [-.24, .09]	-0.09 [-.25, .07]	-0.10 [-.26, .06]	-0.06 [-.22, .10]	-0.13 [-.29, .04]	-0.11 [-.18, .15]	-0.02 [-.19, .13]
35. T2 Morality Satisfaction	0.39** [.25, .52]	0.21* [.05, .36]	0.27** [.11, .41]	0.34** [.19, .48]	0.23** [.07, .38]	0.35** [.20, .49]	0.52** [.39, .63]
36. T2 Morality Dissatisfaction	-0.27** [-.41, -.22]	-0.30** [-.44, -.14]	-0.32** [-.46, -.16]	-0.20* [-.36, -.04]	-0.28** [-.42, -.12]	-0.19* [-.35, -.03]	-0.25** [-.40, -.09]

Table 10, cont.

Variable	10	11	12	13	14	15	16
37. T2 Relatedness/ Competence/ Autonomy/ Satisfaction	0.42** [.28, .55]	0.15 [-.01, .31]	0.19* [.03, .35]	0.39** [.24, .52]	0.23** [.06, .38]	0.32** [.17, .46]	0.49** [.36, .61]
38. T2 Relatedness/ Competence Autonomy Dissatisfaction	-0.01 [-.17, .16]	-0.21* [-.36, -.05]	-0.21* [0.37, -.05]	-0.19* [-.34, -.02]	-0.27** [-.42, -.11]	-0.21* [-.36, -.05]	-0.12 [-.2, .05]
. T2 Relatedness Dissatisfaction	-0.01 [-.17, .16]	-0.29** [-.43, -.13]	-0.30** [-.44, -.14]	-0.23** [-.38, -.06]	-0.37** [0.50, -.22]	-0.35** [-.49, -.20]	-0.21* [-.36, -.05]
39. T2 Relatedness/ Competence Autonomy/ Morality Satisfaction	0.45** [.31, .57]	0.18* [.02, .34]	0.23** [.07, .38]	0.41** [.26, .54]	0.25** [.09, .40]	0.36** [.21, .49]	0.54** [.41, .65]
40. T2 Relatedness/ Competence/ Autonomy/ Morality Dissatisfaction	-0.09 [-.25, .08]	-0.26** [-.41, -.10]	-0.27** [-.42, -.11]	-0.21* [-.36, -.05]	-0.30** [-.44, -.15]	-0.23** [-.38, -.07]	-0.17* [-.33, -.01]
41. Corona	0.01 [-.15, .18]	-0.03 [-.19, .14]	-0.12 [-.28, .04]	-0.07 [-.23, .10]	-0.04 [.21, .12]	-0.19* [-.35, -.03]	0.00 [-.16, .17]

Table 10, cont.

Variable	17	18	19	20	21	22	23		
18. T1 Relatedness Dissatisfaction	0.10 [-.07, .25]	—							
19. T1 Competence Satisfaction	0.40** [.25, .53]	-0.04 [0.20, .13]	—						
20. T1 Competence Dissatisfaction	0.09 [-.08, .25]	-0.42* [.27, .54]	-0.08 [-.24, .09]	—					
21. T1 Autonomy Satisfaction	0.41** [.27, .54]	-0.02 [-.18, .15]	0.44* [.30, .56]	-0.07 [-.23, -.09]	—				
22. T1 Autonomy Dissatisfaction	0.09 [-.07, .25]	0.33** [.17, .46]	0.10 [-.06, .26]	0.32** [.16, .46]	0.20* [.04, .35]	—			
23. T1 Morality Satisfaction	0.38** [.23, .51]	0.14 [0.02, .30]	0.47** [.33, .59]	-0.03 [-.19, .14]	0.39** [.25, .52]	0.06 [-.10, .22]	—		
24. T1 Morality Dissatisfaction	0.14 [-.03, .29]	0.38** [.23, .51]	0.16 [-.00, .31]	0.26** [.10, .41]	0.14 [-.02, .30]	0.40** [.25, .53]	0.46** [.32, .58]	—	
25. T1 Relatedness/ Competence/ Autonomy Satisfaction	0.75* [.67, .81]	0.01 [-.15, .18]	0.79** [.71, .84]	-0.03 [-.19, .13]	0.81** [.74, .86]	0.17* [.01, .33]	0.53** [.40, .64]	0.19* [.02, .34]	—
26. T1 Relatedness/ Competence/ Autonomy Dissatisfaction	0.12 [-.04, .28]	-0.78** [.70, .83]	-0.01 [-.17, .15]	0.78** [.70, .84]	0.04 [-.12, .20]	0.71** [.62, .78]	0.08 [-.09, .24]	0.45** [.31, .57]	0.06 [-.10, .22]

Table 10, cont.

Variable	17	18	19	20	21	22	23
27. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.73** [.64, .80]	0.05 [-.11, .21]	0.78** [.70, .83]	-0.03 [-.20, .13]	0.78** [.70, .82]	0.16 [-.00, .2]	0.71** [.51, .79]
28. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.14 [.23, .51]	0.75** [-.05, .28]	0.04 [.14, .44]	0.72** [.63, .79]	0.08 [-.09, .24]	0.70** [.61, .78]	0.20* [.04, .35]
29. T2 Relatedness Satisfaction	0.38* [.23, .51]	0.12 [-.05, .28]	0.30** [.14, .44]	0.02 [-.15, .18]	0.33** [.18, .47]	0.19* [.03, .34]	0.49** [.35, .60]
30. T2 Relatedness Dissatisfaction	-0.09 [-.25, .08]	-0.56** [-.67, -.44]	-0.05 [-.21, .12]	-0.25** [-.40, -.09]	-0.04 [-.21, .12]	-0.38** [-.51, -.23]	-0.17* [-.32, -.00]
31. T2 Competence Satisfaction	0.28** [.12, .42]	-0.06 [-.22, .11]	0.50** [.36, .61]	-0.04 [-.20, .12]	0.22** [.06, .37]	0.18* [.02, .33]	0.35** [.20, .49]
32. T2 Competence Dissatisfaction	0.02 [-.15, .18]	-0.18* [0.33, -.01]	-0.02 [-.18, .15]	-0.45** [-.57, -.31]	0.09 [-.08, .25]	-0.21* [-.36, -.05]	-0.08 [-.24, .09]
33. T2 Autonomy Satisfaction	0.35** [.19, .48]	-0.05 [-.21, .11]	0.35** [.20, .49]	-0.10 [-.26, .07]	0.53** [.40, .64]	0.26** [.10, .41]	0.38** [.23, .51]
34. T2 Autonomy Dissatisfaction	-0.03 [-.19, .13]	-0.16 [-.31, .01]	-0.05 [-.21, .12]	-0.07 [-.23, .09]	-0.12 [0.28, .05]	-0.51** [-.62, -.38]	-0.14 [-.30, .03]
35. T2 Morality Satisfaction	0.42** [.28, .55]	0.09 [-.08, .25]	0.38** [.23, .51]	-0.07 [-.24, .09]	0.33** [.18, .47]	0.14 [-.03, .30]	0.71** [.62, .79]

Table 10, cont.

Variable	17	18	19	20	21	22	23
36. T2 Morality Dissatisfaction	-0.24** [-.39, -.08]	-0.34** [-.48, -.19]	-0.13 [-.29, .04]	-0.17* [-.33, -.01]	-0.06 [-.22, .10]	-0.40** [-.53, -.25]	-0.38** [-.51, -.23]
37. T2 Relatedness/ Competence/ Autonomy Satisfacion	0.42** [.28, .55]	0.00 [-.17, .16]	0.49** [.36, .61]	-0.06 [-.22, .11]	0.46** [.32, .58]	0.27** [.11, .42]	0.51** [.38, .62]
38. T2 Relatedness/ Competence/ Autonomy Dissatisfaction	-0.05 [-.21, .12]	-0.41* [-.53, -.26]	-0.05 [-.21, .12]	-0.35** [-.48, -.19]	-0.03 [-.19, .13]	-0.48** [-.60, -.35]	-0.17* [-.33, -.01]
39. T2 Relatedness/ Competence/ Autonomy/ Morality Dissatisfaction	0.46** [.32, .58]	0.02 [-.14, .19]	0.50** [.37, .61]	-0.07 [-.23, .10]	0.46** [.32, .58]	0.25** [.09, .40]	0.61** [.50, .81]
40. T2 Relatedness Competence/ Autonomy Morality Dissatisfaction	-0.11 [-.27, .05]	-0.43** [-.56, -.29]	-0.08 [-.24, .09]	-0.33** [-.47, -.18]	-0.04 [-.21, .12]	-0.51** [-.62, -.38]	-0.25** [-.40, -.09]
41. Corona	-0.14 [-.30, .03]	-0.21* [-.36, -.04]	-0.04 [-.20, .12]	-0.04 [-.20, .13]	-0.02 [-.18, .14]	-0.23** [-.38, .07]	-0.09 [-.07, .25]

Table 10, cont.

Variable	24	25	26	27	28	29	30	31	32
27. T1 Relatedness/ Dissatisfaction	0.28** [.12, .42]	0.97** [.96, .98]	0.07 [-.09, .23]	—					
28. T1 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.68** [.58, .76]	0.11 [-.06, .27]	0.96** [.95, .97]	0.15 [-.02, .30]	—				
29. T2 Relatedness Satisfaction	0.30** [.14, .44]	0.43** [.28, .55]	0.14 [-.02, .30]	0.49** [.04, .36]	0.21* [.04, .35]	—			
30. T2 Relatedness Dissatisfaction	-0.40** [.27, .54]	-0.07 [-.18, .15]	-0.53** [.30, .56]	-0.11 [-.23, -.09]	-0.56** [-.66, -.43]	-0.21* [-.36, -.05]	—		
31. T2 Competence Satisfaction	0.17* [-.07, .25]	0.42** [.17, .46]	0.03 [-.06, .26]	0.44** [.16, .46]	0.08 [.04, .35]	0.31** [.15, .45]	-0.50 [-.21, .12]	—	
32. T2 Competence Dissatisfaction	-0.29** [-.44, -.14]	0.04 [-.12, .20]	-0.37** [-.50, -.22]	0.01 [-.15, .17]	-0.39** [-.52, -.25]	0.02 [-.14, .19]	0.31** [.16, .45]	-0.07 [-.24, .09]	—
33. T2 Autonomy Satisfaction	0.19* [.03, .34]	0.53** [.40, .64]	0.04 [-.13, .20]	0.54** [.41, .65]	0.09 [-.07, .25]	0.38** [.23, .51]	-0.14 [-.30, .03]	0.56** [.43, .66]	-0.02 [-.18, .15]
34. T2 Autonomy Dissatisfaction	-0.29** [-.43, -.13]	-0.09 [-.25, .08]	-0.31** [-.45, -.16]	-0.11 [-.27, .05]	-0.35** [-.48, -.19]	-0.12 [-.28, .04]	0.41** [.25, .54]	-0.15 [-.30, .02]	0.35* [.20, .49]
35. T2 Morality Satisfaction	0.39** [.24, .52]	0.48** [.34, .60]	0.06 [-.10, .22]	0.59** [.48, .69]	0.17* [.01, .33]	0.44** [.30, .57]	-0.18* [-.33, -.02]	0.47** [.33, .59]	-0.05 [-.21, .11]

Table 10, cont.

Variable	24	25	26	27	28	29	30	31	32
36. T2 Morality Dissatisfaction	-0.69** [-77, -.59]	-0.18* [-.33, .01]	-0.40** [-.53, -.25]	-0.25** [0.40, -.09]	00.54** [0.64, -.4][-0.29** (-.43, -.13)	0.44** [.30, .56]	-0.19* [-.34, -.03]	0.31** [.15, .45]
37. T2 Relatedness/ Competence	0.27** [.11, .42]	0.59** [.47, .69]	0.08 [-.08, .25]	0.63** [.51, .72]	0.15 [=.01, .31]	0.69** .59, .77	-0.16* [-.32, -.22]	0.81** [.74, .86]	-0.03 [-.19, .13]
38. T2 Relatedness/ Competence/ Autonomy Dissatisfaction	-0.44** [-.56, -.29]	-0.05 [-.22, .11]	-0.54** [-.65, -.41]	-0.09 [-.25, .07]	-0.58** [-.68, -.46]	-0.14 [-.30, .03]	0.77* [.70, .83]	-0.12 [-.28, .05]	0.73** [.64, .80]
39. T2 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.33** [.18, .47]	0.61** [.49, .70]	0.09 [-.08, -.25]	0.67** [.57, .75]	0.17* [.01, .33]	0.68** [.58, .76]	-0.18* [-.34, -.02]	0.78** [.70, .84]	-0.04 [-.20, .13]
40. T2 Relatedness/ Competence/ Autonomy/ Morality Dissatisfaction	-0.56** [-.66, -.44]	-0.10 [-.26, .07]	-0.56** [-.66, -.43]	-0.15 [-.31, .01]	-0.63* [-.72, -.52]	-0.20* [-.35, -.04]	0.76** [.68, .82]	-0.15 [-.31, .01]	0.68** [.59, .76]
41. Corona	-0.10 [-.26, .07]	-0.08 [-.24, .08]	-0.20* [-.36, -.04]	-0.04 [-.20, .12]	-0.20* [-.35, -.04]	-0.11 [-.27, .05]	0.29** [.13, .44]	0.02 [-.14, .18]	0.07 [-.10, .23]

Table 10, cont.

Variable	33	34	35	36	37	38	39	40
34. T2 Autonomy Dissatisfaction	-0.28** [0.42, -.12]	—						
35. T2 Morality Satisfaction	0.55** [.43, .66]	-0.18* [-.34, -.02]	—					
36. T2 Morality Dissatisfaction	-0.22** [-.37, -.06]	0.43** [.29, .56]	-0.52** [-.63, -.39]	—				
37. T2 Relatedness/ Competence/ Autonomy Satisfaction	0.84** [.79, .88]	-0.24** [-.38, -.07]	0.62** [.51, .72]	-0.29** [-.44, -.14]	—			
38. T2 Relatedness/ Competence/ Autonomy Dissatisfaction	-0.19* [-.34, -.21]	0.76** [.68, .82]	-0.18* [-.34, -.02]	0.52** [.39, .63]	-0.19* [-.34, -.03]	—		
39. T2 Relatedness/ Competence/ Autonomy/ Morality Satisfaction	0.83** [.77, .87]	-0.24** [-0.39, -.08]	0.79** [.71, .84]	-0.38** [-.52, -.24]	0.97** [.96, .98]	-0.20* [-.36, -.04]	—	
40. T2 Relatedness/ Competence/ Autonomy/ Morality Dissatisfaction	-0.22* [-.37, -.06]	0.75** [.66, .81]	-0.31** [-.45, -.15]	0.72** [.63, .79]	-0.24** [0.39, -.08]	0.97** [.95, .98]	-0.28** [-.42, -.12]	—
41. Corona	-0.11 [-.27, .05]	0.25** [.09, .40]	0.07 [-.10, .23]	0.21* [.04, .36]	-0.09 [-.25, .08]	0.27** [.11, .42]	-0.05 [-.21, .12]	0.28** [.12, .43]

CURRICULUM VITAE

ALANA DEMASKE

Greene Room 220 | Wake Forest University • (704) 380-1699 | demaas18@wfu.edu

EDUCATION

Wake Forest University, Winston-Salem, NC

Master of Arts in Psychology

August 2020

Thesis: Personal Growth Initiative, Need Satisfaction, and Subjective Well Being:

Testing a Process Model

GPA: 3.58

Loyola University New Orleans, New Orleans, LA

Bachelor of Science in Psychology with Honors, *magna cum laude*

August 2014 –

December 2016

Honors Thesis: Self-Report versus Behavioral Procrastination – A Comparative Study

- Thesis included designing a novel study; collecting and analyzing data; presenting results orally and in writing.

Minor: English

Major GPA: 3.87

Cumulative GPA: 3.77

ETS Major Field Test for Psychology scored 99th Percentile Dean's List all Semesters

RESEARCH INTERESTS

Strengths-Based Interventions • Post-Traumatic Growth • Applied Character Education

• Person-Situation Interactions • Habit Development

HONORS, AWARDS, AND FELLOWSHIPS

Wake Forest University

Research Assistantship (\$50,052)

August 2019 – May 2020

Wake Forest University

Research Assistantship

January 2019 – May 2019

Wake Forest University

Research Assistantship and Teaching Assistantship (\$26,611)

September 2018 –

December 2018

The Caring Foundation

Grant for Lee County Literacy Coalition Services (\$2,000)

November 2017

Loyola University New Orleans

Student Summer Research Fellowship for

June 2016

“Emblazoning the Self: Symbolizing Psychological Traits in Contemporary Heraldry”

PUBLICATIONS

Koehler, Jessica, Pierrakos, Olga, Lamb, Michael, **Demaske, A.**, Santos, Carlos, Gross, Michael, Brown, Dylan F.. (2020). *What Can We Learn from Character Education? A Literature Review of Four Prominent Virtues in Engineering Education*. 2020 American Society for Engineering Education Annual Conference and Exposition, Montreal, Canada, June.

Pierrakos, Olga, Prentice, Mike, Silvergate, Cameron, Lamb, Michael, **Demaske, Alana**, Smout, Ryan. (2019) *Reimagining Engineering Ethics: From Ethics Education to Character Education*. IEEE Frontiers in Education Conference, Cincinnati, OH, October 17.

UPCOMING WORKS

Demaske, Alana,² Sims, Emma, Jayawickreme, Eranda. (accepted). *Post-Traumatic Growth*. In Ruch, Willibald, Bakker, Arnold B., Tay, Louis, & Gander, Fabian (Eds.), *Handbook of Positive Psychology Assessment*. Boston, MA: Hogrefe Publishing Corporation.

POSTERS AND PRESENTATIONS

Demaske, A., Jayawickreme, Eranda. (2019, October). *Examining the construct validity and functional utility of personal growth initiative in a war-affected Sri Lankan sample*. Southeastern Society of Social Psychologists. Johnson City, TN.

Pierrakos, Olga, Prentice, Mike, Silvergate, Cameron, Lamb, Michael, **Demaske, Alana**, Smout, Ryan. (2019) *Reimagining Engineering Ethics: From Ethics Education to Character Education*. IEEE Frontiers in Education Conference, Cincinnati, OH, October 17.

Demaske, A. (2019, May). *Examining the construct validity and functional utility of personal growth initiative in a war-affected Sri Lankan sample*. Wake Forest University Department of Psychology First Year Graduate Student Research Day, Winston-Salem, NC.

Lewis, Lawrence, **Demaske, A.** (2016, August). *Symbolic representation in contemporary heraldry*. Eleventh International Conference on Interdisciplinary Social Sciences, London, UK.

PAPERS UNDER REVIEW AND IN PREPARATION

² First two authors shared equal contribution.

Demaske, A., Blackie, Laura, Jayawickreme, N., Jayawickreme, E.. (under review). Examining the Functional Utility of Personal Growth Initiative in a War-Affected Sri Lankan Sample. Manuscript under review.

Lewis, L., **Demaske, A.** (in prep). Symbolizing the self in contemporary heraldic art.

RESEARCH EXPERIENCE

Wake Forest University

Graduate Student in Growth Initiative Lab – Dr. Eranda Jayawickreme Fall 2018

- Present

Projects:

Efficacy of strengths-based interventions for well-being of recently-retired individuals

- Generated intervention items
- Researched moral traits, interventions, and measures

Post-Traumatic Growth in Sri Lanka and Post traumatic Growth in Rwanda Studies

- Entered and checked participants' responses into database
- Monitored data entry and checking for team of 7 people
- Cleaned data

Longitudinal Assessment of Growth from Adversity in Winston-Salem, NC (10 month longitudinal study)

- Assisted in laboratory set-up
- Ran community member participants for longitudinal data collection
- Assisted in compensating participants

Research Assistant on Character Education Project – Dr. Olga Pierrakos and Dr. Michael Lamb Fall 2018 – July 2020

- Compiled a Virtues Handbook for Engineering Department faculty
- Generated classroom interventions
- Worked with professors to implement classroom interventions
- Performed literature review of character education and engineering education
- Conducted, transcribed, and qualitatively analyzed faculty interviews
- Hosted faculty character education workshop

Loyola University New Orleans

“Symbolizing the self in contemporary heraldic art” – Dr. Lawrence Lewis

January 2015 – September 2016

- Coded Heraldic symbols
- Composed and presented informative poster discussing research
- Composed Methods section for upcoming paper

PROFESSIONAL EXPERIENCE

Streamline LLC, General Contractor

Continuing Education Instructor June 2020 – Present
Create and present continuing education courses.

Freelance Projects

Writer, Editor, Tutor January 2018 – September 2019
Compose articles. Read and comment upon book chapters. Tutor SAT, ACT, and essay writing.

Rollant Concepts, Inc., Gulf Breeze, FL

Data Analyst June 2016 – September 2019
Compile and enter data. Run statistical tests. Present results in a comprehensive manner. On project basis.

Dr. Christopher Schaberg, Assoc. Professor of English, Loyola University New Orleans

Copyeditor for *Airportness* October 2016 – January 2017
Read and commented upon book chapters. Discussed recommended improvements with author.

Dr. Christopher Schaberg, Assoc. Professor of English, Loyola University New Orleans

Assistant Book Editor for *Object Lessons—a Bloomsbury series* January 2015 – September 2016
Read and commented upon book chapters. Discussed recommended improvements with author. Solicited permissions. Created bibliography.

Loyola University New Orleans, New Orleans, LA

Transcriber—History Department August 2014 – December 2014
Oral History Studio transcriber for interview tapes using InqScribe software.

TEACHING EXPERIENCE

Streamline LLC, General Contractor Continuing Education July 2020 - Present
Instructor—Constructing Ethics Workshop

Instructor—NCLBGC 101: What Licensed General Contractors Need to Know

Wake Forest University

Teaching Assistant—Personality Spring 2020

Workshop Co-leader—“From Ethics to Character Education” Spring 2019

Teaching Assistant—Methods in Psychological Research Fall 2018

Teaching Assistant—Cognitive Psychology Fall 2018

LABORATORY AND COMPUTER SKILLS

- R
- Microsoft Office 365 Suite

- SPSS
- Structured Interviewing
- G-Suite
- InqScribe
- Motivational Interviewing Certified
- Annotated Bibliography compilation
- Qualitative Data Synthesis

RELEVANT COURSEWORK

- Psychometrics and R
- Seminar in Personality Psychology
- Skills in Human Services
- Research Design and Analysis II
- Biological Psychology
- Seminar in Social Psychology
- Cognitive Psychology
- Seminar in Developmental Psychology
- Research Design and Analysis I