A Thesis

titled

Relationships amongst Gratitude, Well-Being and Depression

By

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Submitted to the Graduate Faculty as partial fulfillment of
the requirements for the Master of Arts Degree in Psychology

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An Abstract of

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Recent research provides evidence that the study of positive characteristics and
human strengths can increase clinical understanding and treatment of psychopathology.
Investigation of interventions based on positive functioning is concordant with the aims
of clinical psychology, and explores an implicit but understudied aspect of intervention
development. One promising strengths-based intervention is the gratitude list or diary.
Several studies have provided evidence that gratitude diary interventions are effective in
improving well-being, and experimental research suggests that gratitude diary
interventions may also have the ability to reduce depressive symptoms and other forms of
psychopathology. However, despite broad enthusiasm for gratitude interventions, many
theoretical and practical questions about gratitude itself remain unanswered. If a gratitude
intervention is efficacious in the treatment of psychopathology, what mediators and
mechanisms might explain its efficacy? Does gratitude possess unique characteristics that
warrant the addition of interventions based on gratitude to a field already inundated with
excessive variety in treatments? Methodologically stringent studies are required to
evaluate gratitude interventions on substantive clinical outcome measures before the
enthusiasm surrounding gratitude interventions can be considered warranted. However,
research on the efficacy of gratitude interventions can be supported by studies examining causal pathways by which the improvement of gratitude might decrease symptomatology. The present longitudinal study examines the relationships amongst trait gratitude, subjective and psychological well-being, and depression to determine if increased subjective well-being mediates the relationship between trait gratitude and depression. Results of linear regression analyses indicate that while controlling for other variables, gratitude has a moderately sized, unique effect on later depressive symptoms. A test of mediation indicates that the effect of gratitude on depression is partially mediated by the life satisfaction component of subjective well-being, but not by positive affect or negative affect. Furthermore, the direct effect of gratitude on depressive symptoms remains significant and moderately sized in the presence of the mediating effect. Implications and limitations of this study, as well as future directions, are discussed.
This thesis is dedicated to my mother, Janice Van Dusen, without whom I wouldn’t be where I am today. I hope that my work with gratitude can honor the memory of the most grateful, compassionate individual I’ve ever known. Thanks, Mom.
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Chapter One

Introduction

Over the past decade, research in positive psychology has grown exponentially. Researchers and clinicians have begun to test theories and constructs based around human strength and growth, rather than solely focusing on pathology and recovery. This wave of attention has resulted in the production of multitudinous research articles, as well as more mainstream titles such as Martin Seligman's "Flourish." Positive psychology has been subject to a bevy of enthusiastic attention, some of which has resulted in conclusions that may be premature, cf. Seligman, Steen, Park, and Peterson (2005). This has resulted in a backlash against positive psychology amongst both researchers and laypeople, who criticize what they perceive as a naïve attitude toward psychological health which focuses exclusively on positive traits and ignores negative traits. However, while such pie-in-the-sky rhetoric was characteristic of the early positive psychology movement, positive psychology as a discipline is not nearly so radical (Wood & Tarrier, 2010). At its core, positive psychology simply expands the scope of psychology to encompass the scientific investigation of positive traits and characteristics in addition to maladaptive or pathological traits (Wood & Tarrier, 2010). This has the potential to not only aid in the treatment of psychopathology, but also benefit individuals across the whole spectrum of human functioning.

The present longitudinal study examines the relationships amongst trait gratitude, subjective and psychological well-being, and depression to determine if increased subjective well-being mediates the relationship between trait gratitude and depression.
This study also investigates the incremental validity of psychological well-being over subjective well-being in predicting depressive symptoms, and explores the longitudinal relationship between subjective and psychological well-being. Results from this study increase empirical support for the basic science of gratitude, and provide further justification for the exploration of interventions based on increasing gratitude.

This project is presented in five chapters. This chapter provides a brief project overview and rationale for the significance of the research project. Chapter Two provides a literature review to introduce the reader to previous research on the constructs of well-being, depression, gratitude as well as interventions designed to increase gratitude. The project’s statement of the problem and hypotheses are also discussed in this chapter. Next, in Chapter Three, the project’s method is discussed in detail; this section describes the study design, participants, procedure, and measures used. Chapter Four presents a detailed description of the statistical analyses conducted and the results. Finally, Chapter Five describes the importance and the significance of the findings as well as limitations, implications, and future research directions.
Chapter Two

Literature Review

In this chapter, the current literature in areas relevant to this project will be reviewed. There are several areas in which, researchers have made substantial progress in empirically defining and investigating positive aspects of cognition, emotion and behavior. One such area is the study of gratitude. First, this review will operationally define well-being, mechanisms of change in therapy, and depression, all of which are central to the current investigation of gratitude. Then, the construct of gratitude will be defined and described. Interventions based on increasing gratitude will be elucidated and finally, future directions in gratitude research will be discussed.

Well-Being

**Subjective vs. Psychological Well-Being.** The concept of well-being is foundational to the formulation of many positive psychological constructs. At its most basic level, well-being is the study of wellness, happiness and a life worth living, as opposed to disorder, and is not a new idea within psychological research (Bradburn, 1969). However, as the study of well-being has evolved, many researchers have come to distinguish between two distinct conceptualizations of well-being.

Subjective well-being is defined as an individual’s internal experience of happiness, and is comprised of three dimensions including positive affect, negative affect and life satisfaction (Ryff & Keyes, 1995). These dimensions load on to a single latent factor (Linley, Maltby, Wood, Osborne, & Hurling, 2009; Ryff & Keyes, 1995), and possess strong discriminant validity with regard to each other (Lucas, Diener, & Suh,
Lucas et al. (1996) reported intercorrelations amongst these factors as the result of two studies; each study included self-report measures at two time points and informant report measures obtained during the interval between the two time points. They found that positive affect and negative affect correlated at $r = -0.14$ to $-0.23$ within a given time point, that positive affect and life satisfaction correlated at $r = 0.43$ to $0.56$ within a given time point, and that negative affect and life satisfaction correlated at $r = -0.30$ to $-0.36$ within a given time point (Lucas et al., 1996). Currently, the most comprehensive method of assessing subjective well-being involves the combination of two independently well-validated measures (Linley et al., 2009): positive and negative affect are assessed using the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988), and life satisfaction is assessed using the Satisfaction with Life Scale (SWLS) (Diener, 1984).

Psychological well-being reflects a more existential conception of well-being as a life of engagement and meaning; there are many perspectives on this type of well-being, as articulated by (Waterman, 2008). However, the most broadly accepted operational definition by Ryff and Keyes (1995) extends to a multifactorial model including six dimensions: autonomy, environmental mastery, positive relations with others, personal growth, purpose in life and self-acceptance as measured using the Scales of Psychological Well-Being (SPWB) (Ryff & Keyes, 1995). Some research shows that the six factors all load onto a single higher-order factor, but intercorrelate with each other only modestly (Chen, Jing, Hayes, & Lee, 2013; Keyes, Shmotkin, & Ryff, 2002; Linley et al., 2009; Ryff & Keyes, 1995). However, other studies have found that the autonomy and positive relations facets each load onto separate factors from a higher-order factor.
which unifies the other four facets (Burns & Machin, 2009, 2013). The factor structure of psychological well-being is therefore still under some debate.

Subjective and psychological well-being are often referred to as hedonic and eudemonic well-being, respectively, and the distinction has its roots in Aristotelian philosophy (Ryan & Deci, 2001). Some research suggests that the two types of well-being, including their subfactors, are highly correlated ($r = .76 - .84$) but are distinct latent constructs, and that the factor structure of these two related constructs generalizes across cultures (Keyes et al., 2002; Linley et al., 2009; Ryff & Keyes, 1995). Furthermore, in one study positive affect, which has traditionally occupied a central role in discussions of well-being, loaded lowest on the model out of all factors associated with well-being, suggesting that positive affect is not a basic requirement for well-being (Linley et al., 2009). The model best supported by the factor analysis of Linley et al. (2009) is displayed below (see Figure 1).

![Figure 1: The Factor Structure of Subjective and Psychological Well-Being](image)

*Fig. 1.* The two factor model. Note: All participants in Samples 3–5, standardized estimates, all significant at $p < .001$. 

*Figure 1: The Factor Structure of Subjective and Psychological Well-Being*
Other Perspectives on Well-Being. Although many researchers continue to distinguish between subjective and psychological well-being (Joseph & Wood, 2010), others call this distinction between well-being constructs into question (Kashdan, Biswas-Diener, & King, 2008). Kashdan et al. (2008) argue that the distinction between hedonic and eudaimonic well-being is philosophical in origin, and that the two types of well-being are actually much more closely related than most well-being theorists believe: variables described as eudaimonic in nature are simply powerful predictors of subjective happiness. They cite evidence that feeling autonomy, growth and relatedness, all eudaimonic variables, are all related to increases in subjective well-being (Sheldon & Niemiec, 2006), and evidence that positive affect predisposes individuals toward reporting more meaning in their lives (King, Hicks, Krull, & Del Gaiso, 2006) to support their argument that subjective and psychological well-being should not be treated as separate types of happiness (Kashdan et al., 2008).

Rather than demonstrating that eudaimonic pursuits are central to a qualitatively different kind of happiness, this work [well-being research] has demonstrated that variables thought to be eudaimonic lead to quantitatively higher levels of hedonic well-being …. Eudaimonic pursuits are associated not with a ‘better’ form of happiness but simply a higher level of happiness. (Kashdan et al., 2008).

On the other hand, researchers such as Waterman (2008) believe that hedonic and eudaimonic well-being are qualitatively different. Thus, despite agreement amongst many researchers on the distinction between subjective and psychological well-being, research on positive functioning has not converged on predominant models and measures of subjective and psychological well-being (Joseph & Wood, 2010). Further complicating the issue are newer, unitary measures of well-being that combine elements of subjective and psychological well-being into a unifactorial construct (Diener et al., 2010; Hervás &
Vázquez, 2013). If subjective and psychological well-being are meaningfully distinct, what should be made of measures that appear to integrate these constructs without any empirical evidence of heterogeneity?

One possible solution to the ambiguities surrounding subjective and psychological well-being can be found in a recent study by Chen et al. (2013). The authors used a bifactor model to assess subjective and psychological well-being both on a component level and with regard to an overarching "general well-being" factor. Chen et al. (2013) found that when studied at an overarching, construct level, subjective and psychological well-being shared in a common "general well-being" factor. However, when examined at the component level, subjective and psychological well-being showed distinction from one another, with individual components each explaining variance in a range of other constructs such as optimism and social support, beyond the impact of the general well-being factor. Chen et al. (2013) concluded that the distinctiveness of subjective and psychological well-being depends on the level of measurement the two are assessed at. This finding potentially explains the conflicting results observed in the literature, including both the distinctiveness observed when multifactorial models of each construct are examined (e.g. Linley et al., 2009) and the similarities observed when items measuring both constructs are integrated into unifactorial measures (e.g. Hervás & Vázquez, 2013). However, these findings are recent and not yet replicated, and many questions still remain, including whether these constructs become more or less distinct when examined longitudinally.

Despite recent advances in the science of well-being, the precise relationship between subjective and psychological well-being has still not been truly clarified
Compounding the situation, many researchers continue to operationally define well-being using very brief or idiosyncratic measures (e.g. Jensen et al., 2013), despite recommendations that the major components of subjective well-being be assessed separately in future research (Diener, Suh, Lucas, & Smith, 1999). Conceptualizations of well-being and its measurement tend to vary based on theoretical orientation and the researcher or practitioner’s general epistemological approach to psychology (Joseph & Wood, 2010). In particular, subjective well-being has a more broad and well-supported literature base, while some researchers continue to debate the nature of psychological well-being (Kashdan et al., 2008; Linley et al., 2009; Waterman, 2008). The conceptualization reviewed here represents the most thoroughly supported operational definition of well-being (Keyes et al., 2002; Linley et al., 2009; Ryff & Keyes, 1995). However, the study of well-being continues to evolve; it seems prudent for researchers investigating well-being to include measures of both subjective and psychological well-being.

A unique, theory-based account of well-being has recently been advanced that integrates positive psychological theory with third-wave cognitive-behavioral psychotherapies such as Acceptance and Commitment Therapy (Kashdan & Ciarrochi, 2013). However, this conceptualization of well-being presents a mechanistic account of the internal processes by which well-being is achieved in an individual, including seven components: functional beliefs, mindfulness and awareness, perspective taking, values, experiential acceptance, behavioral control, and cognitive skill (Kashdan & Ciarrochi, 2013). These components are viewed as skills or traits that contribute to the development of well-being (Kashdan & Ciarrochi, 2013). In contrast, the constructs of subjective and
psychological well-being take a descriptive approach to well-being, defining well-being by an individual’s perception of current emotional, cognitive and environmental states (Ryff & Keyes, 1995). Thus, rather than advancing a competing definition of well-being, Kashdan and Ciarrochi (2013) take well-being theory a step further and delve into possible mechanisms which support existing conceptions of well-being. Although Kashdan and Ciarrochi (2013) present evidence supporting the components of their theory of well-being integrated from positive psychology and third-wave cognitive-behavioral approaches, their model as a whole has not been explicitly tested and will likely be the subject of future investigation.

The first several decades of research on well-being focused on defining the construct of subjective well-being and describing its demographic correlates (Diener et al., 1999). However, research linking psychological well-being to depression exists (Ryff & Keyes, 1995). Unfortunately, Ryff and Keyes (1995) utilized an idiosyncratic method of operationalizing depression in lieu of standardized measures, damaging the generalizability of their findings. More recently, a large (n=5566) ten-year cohort study investigated the longitudinal relationship between psychological well-being, measured using Ryff’s Scales of Psychological Well-Being, and depression, measured with the CES-D (Wood & Joseph, 2010). The researchers conducted a logistic multiple regression and found that low psychological well-being is a strong, independent risk factor for clinical depression in aging adults (Wood & Joseph, 2010). Subjects with low psychological well-being were over seven times more likely (OR = 7.16) to be depressed a decade later, and were still more than twice as likely (OR = 2.23) to be depressed 10 years later even after controlling for personality factors, negative functioning, prior
depression, physical health and other variables (Wood & Joseph, 2010). This evidence provides a rationale for further investigation into psychological well-being as a possible target for interventions aiming to prevent the incidence or recurrence of major depressive episodes (Wood & Joseph, 2010). However, a major weakness of this study was its failure to include subjective well-being amongst its predictor variables, which does not help clarify the distinction between subjective and psychological well-being debated by Kashdan et al. (2008).

In summary, current research on well-being contains both well-supported (subjective well-being) and contentious (psychological or eudaimonic well-being) constructs (Kashdan et al., 2008). Cutting-edge research is investigating the relationships between different conceptions of well-being (Chen et al., 2013), but more research is needed. Current perspectives on well-being both illustrate the depth of well-being as a construct and highlight the need for further research and synthesis of these accounts (Joseph & Wood, 2010; Kashdan et al., 2008). Well-being attempts to describe a great deal of human experience and covers enormous conceptual ground, and efforts to further operationalize this essential construct will be vital to the understanding of disorder and wellness. Given the current state of well-being research, studies examining well-being will likely benefit from the inclusion of measures of both subjective and psychological well-being, as empirical distinctions between the two continue to be the subject of debate (Joseph & Wood, 2010; Kashdan et al., 2008; Linley et al., 2009).
Depression

**Major Depressive Disorder.** The DSM-IV-TR defines major depressive disorder as a mood disorder, characterized most prominently by depressed mood and/or loss of interest in previously enjoyed activities (*Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (Text Revision)*, 2000). To qualify for a diagnosis of major depressive disorder, an individual must present with at least five of the following nine symptoms: depressed mood, loss of interest in pleasurable activities, significant weight loss or gain, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or excessive guilt, trouble concentrating, and suicidal ideation (*Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (Text Revision)*, 2000). In addition, these symptoms must cause clinically significant distress or impairment (*Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (Text Revision)*, 2000). Major depressive disorder is one of the most common disorders treated by clinicians (Young, Rygh, Weinberger, & Beck, 2008), has a 12-month prevalence rate of 6.7% in American adults and is associated with high psychiatric comorbidity, financial costs and lost productivity (Kessler, Chiu, Demler, & Walters, 2005). In addition, substantial gender differences have been observed in the prevalence of depression: women are, on average, twice as likely as men to be diagnosed with major depression (Kuehner, 2003). A variety of genetic, hormonal, psychological and psychosocial risk factors have been implicated in this relationship (Kuehner, 2003). Altogether, depression is a highly prevalent disorder with steep costs to society, and is thus an important target for psychosocial and pharmacological interventions (Young et al., 2008).
Although traditional psychiatric conceptualizations have framed major depressive disorder as a discrete diagnostic category, evidence exists which supports depression as a dimensional disorder that differs quantitatively, not qualitatively, amongst individuals (Ruscio & Ruscio, 2000). Individuals differ in the quantity and severity of depressive symptoms they experience. Several common measures of depression capture this dimensionality by classifying individuals as mildly, moderately or severely depressed (Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995).

**Psychotherapy for Depression.** Multiple empirically supported psychosocial treatments have been developed for depression, most notably interpersonal psychotherapy and cognitive-behavioral therapy (Young et al., 2008). Cognitive therapy has demonstrated comparable success with pharmacological treatments in treating depression (Young et al., 2008), and proven superior to pharmacological treatments alone in preventing recurrent depressive episodes (Gloaguen, Cottraux, Cucherat, & Blackburn, 1998), but the odds of depression recurring after remission remain very high (Young et al., 2008). In addition, a related concern to relapse involves residual symptoms – depressed individuals who still exhibit residual symptoms are more likely to relapse (Young et al., 2008). In addition, existing treatments are less effective in treating chronic depression than acute depression, although emergent treatments such as schema therapy have shown greater success (Young et al., 2008). A need still exists for interventions aimed at preventing relapse in depression, and for studies exploring the mechanisms of change in existing empirically supported treatments.
Mechanisms of Change in Therapeutic Interventions

**Mediators vs. Mechanisms.** Over the past several decades, researchers have labored to provide empirical evidence to support the efficacy and effectiveness of psychosocial interventions. This research has culminated in several treatments that have received substantial empirical support (Kazdin, 2007). However, psychologists are still unable to provide evidence-based explanations for why their treatments work (Kazdin, 2007). In statistical terms, when a third variable accounts for or explains the relationship between a predictor and outcome variable, the third variable is known as a mediator of that relationship. A mediated relationship can be contrasted with a moderated relationship. In a moderated relationship, the effect of the predictor variable on the criterion variable changes based on the presence of the moderator – the moderator affects the relationship between the independent and dependent variables, but the independent variable does not act “through” the moderator as with mediation. In other words, the moderator does not account for the relationship between two variables, it changes that relationship. However, mediators of therapeutic change are of particular interest to psychologists, as they provide an explanation for how or why therapy works.

We know that certain variables, such as the therapeutic alliance, account for substantial variation in treatment outcome, but we have not elucidated the mechanisms by which these variables achieve their effect (Kazdin, 2007). Even Beck’s cognitive-behavioral therapy for depression, which currently enjoys more empirical support than any other psychosocial intervention, possesses only weak evidence supporting the specific therapeutic mechanisms by which it purports to achieve results (Persons, 2008;

> An intervening variable that may account (statistically) for the relationship between the independent and dependent variable. Something that mediates change may not necessarily explain the processes of how change came about. Also, the mediator could be a proxy for one or more other variables or be a general construct that is not necessarily intended to explain the mechanisms of change. A mediator may be a guide that points to possible mechanisms but is not necessarily a mechanism.

A mechanism, on the other hand, is “the basis for [an] effect, i.e., the processes or events that are responsible for the change; the reasons why change occurred or how it came about” (Kazdin, 2007). Thus, mediators are an important first step in the search for mechanisms of change. Present statistical methods include robust procedures for mediation analysis, and take advantage of advances in computerized processing. Preacher and Hayes (2008) outline contemporary methods for testing statistical mediation. Their method provides an update to the seminal work by Baron and Kenny (1986), which popularized Sobel’s test as the method of choice for determining mediation. Sobel’s test creates a 95% confidence interval around the coefficient of the path from the independent variable through the mediating variable to the dependent variable. It then uses this confidence interval to determine if the coefficient for the mediated path is significantly different from zero (e.g., whether the mediated relationship is statistically significant). However, this test is based on assumptions of normality for both the distribution and the sampling distribution; Preacher and Hayes (2008) built on previous recommendations (D. P. MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) to bootstrap the standard error of Sobel’s test. This makes the test robust to non-normal distributions.
Although mediators are a good first step in the pursuit of mechanisms, they may
not be mechanisms in themselves; unfortunately, most research on the process of
therapeutic change has been in the context of mediation (Kazdin, 2007). For example,
two studies found that amongst formerly depressed patients, those who had received
Beck’s CBT for depression demonstrated a greater reduction in dysfunctional schemas
(Segal, Gemar, & Williams, 1999) and a smaller increase in dysfunctional cognitions
following a sad mood induction (Segal et al., 2006) than did patients who had received
pharmacotherapy. The differences in dysfunctional schemas and cognitive reactivity to
depressed mood between CBT completers and pharmacotherapy completers, in turn,
predicted less frequent relapse of depression at follow-up several years later (Segal et al.,
1999; Segal et al., 2006). This study and others (e.g. Imber et al., 1990) provide evidence
for the mediating influence of cognitive change in the relationship between Beck’s
cognitive-behavioral therapy and relapse of depression, but do not address the questions
of why or how the therapy creates cognitive change (Persons, 2008).

**The Phase Model of Psychotherapy Outcome.** Continuing to develop
therapeutic interventions without basic knowledge of how those interventions work
hampers psychotherapy research and results in a lack of parsimony amongst treatments
(Kazdin, 2007); however, more empirical attention is shifting to the mechanisms by
which psychotherapies create change (e.g. Kazdin & Nock, 2003; Lynch, Chapman,
Rosenthal, Kuo, & Linehan, 2006). At the same time, outcome research is acknowledging
the importance of therapeutic outcomes beyond symptom reduction (M. J. Lambert,
2013). One empirically supported theory that describes the processes of change
throughout psychotherapy is the phase model of psychotherapy outcome (Howard,
Lueger, Maling, & Martinovich, 1993). The phase model postulates three distinct, consecutive phases within the psychotherapy process: remoralization, remediation and rehabilitation (Howard et al., 1993). The first phase, remoralization, occurs quickly after treatment is begun and involves a marked increase in subjective well-being as the patient’s hopes of finding relief are raised (Howard et al., 1993). The second phase, remediation, is when symptoms most prominently begin to reduce, and is preceded by remoralization (Howard et al., 1993). The third phase, rehabilitation, occurs when symptoms are reduced or abated, allowing improvements to life functioning and adjustment of maladaptive patterns of behavior (Howard et al., 1993).

The phase model of psychotherapy outcome has been expanded and supported since its introduction. Stulz and Lutz (2007) utilized growth mixture models to examine the patterns of change amongst a large sample of psychotherapy outpatients ($n = 1128$). They found that 63% of patients exhibited patterns of change consistent with the phase model, and identified two other classes of patients based on patterns of change: partial rapid responders, who evidenced quick symptom reduction but never improved on life functioning, and the ‘symptomatically highly impaired,’ who began treatment with more severe symptoms and also did not evidence clear improvements to life functioning (Stulz & Lutz, 2007). Another study tested whether the phase model could be applied in reverse to predict the sequence of changes in patients who deteriorate during treatment (Swift, Callahan, Heath, Herbert, & Levine, 2010). Swift et al. (2010) found that demediation, or worsening of symptoms, reliably preceded demoralization (reduction in subjective well-being) and dehabilitation (deterioration of life functioning), although the latter two stages did not reliably occur in a particular order.
Despite empirical support for the phase model of psychotherapy outcome, many questions remain unanswered. The phase model explores vital processes that predict outcome, but as Kazdin (2007) observes, mediation is not necessarily indicative of a mechanism of change. Future research into the phase model needs to shoulder the difficult task of determining what processes explain the differential effects observed over the course of psychotherapy. In addition, subjective well-being within the phase model remains poorly defined – in their initial test of the phase model, Howard et al. (1993) assessed subjective well-being using only two items. Does the increase in subjective well-being observed in the model result from improvements in positive affect, negative affect, life satisfaction or some combination of these three factors? One recent study (Swift et al., 2010) utilized four items to assess subjective well-being. These four items seemed to reflect all three dimensions of subjective well-being (Swift et al., 2010), and thus probably assessed the construct accurately as a whole, but a more detailed examination of subjective well-being within the phase model will likely require more comprehensive measures of subjective well-being (Diener et al., 1999; Linley et al., 2009). Further research on the role of subjective well-being in the context of the phase model could elucidate which components of well-being explain the subjective well-being increase observed during the remoralization phase. However, existing evidence supporting the phase model is still exceedingly relevant to both psychotherapy outcome research and research on well-being. If increased subjective well-being is the most immediate predictor of successful psychotherapy outcomes, as evidence supporting the phase model suggests, then further investigations of subjective well-being and methods of increasing it are vitally important to psychotherapy outcome research.
Gratitude

Gratitude as a Disposition or Trait. Gratitude is a phenomenon that has been reflected upon by philosophers and writers for thousands of years. However, despite this scholarly interest, gratitude has only recently begun to receive empirical attention (McCullough, Emmons, & Tsang, 2002). Originally, gratitude was conceptualized as a positive emotion occurring in response to the receipt of costly, valuable or altruistic aid (McCullough, Kilpatrick, Emmons, & Larson, 2001). However, it has since been noted that expressions of gratitude don’t seem to be limited to events involving the aid of another, and can extend to global states or situations (Emmons & McCullough, 2003). In addition, individuals vary in the amount of grateful affect they experience on a dispositional basis (Emmons & McCullough, 2003). In light of these observations, gratitude has been most recently described, broadly, as part of a “life orientation toward noticing and appreciating the positive in the world” (Wood, Froh, & Geraghty, 2010). This disposition or life orientation towards gratitude includes both cognitive and affective components (Wood et al., 2010). It also encompasses individual differences in frequency of grateful affect, intensity of gratefulness, and other factors associated with the experience of gratitude as an emotion (Wood et al., 2010). However, there has been some variation amongst researchers with regard to the precise nature of gratitude.

In their initial empirical investigation of gratitude, Emmons and McCullough (2003) conceptualized gratitude as an emotion. McCullough et al. (2002) conducted an exploratory factory analysis and four confirmatory factor analyses to determine the structure of gratitude. They developed the Gratitude Questionnaire-6 based on the results of their exploratory factor analysis, which assesses the dispositional experience of
grateful affect by measuring the frequency, intensity, span and density of grateful affect (McCullough et al., 2002). They then used confirmatory factor analyses to determine the discriminative validity of their gratitude measure against measures of four other positive constructs: life satisfaction, happiness, optimism and hope (McCullough et al., 2002). They found much better fit amongst the two-factor models than the single-factor models, indicating that gratitude is distinct from these previously developed constructs (McCullough et al., 2002). Watkins, Woodward, Stone, and Kolts (2003) conceptualized gratitude more broadly, and initial factor analysis of their Gratitude, Resentment and Appreciation Test extracted three latent factors. Based on their analysis, gratitude includes a sense of abundance, representing a feeling that one has not been deprived in life, appreciation for the simple, everyday things in life and appreciation for the contributions of others to one’s well-being (Watkins et al., 2003).

Some theorists believe that a related construct, appreciation, encompasses differences in trait gratitude. Adler and Fagley (2005) define appreciation as “acknowledging the value and meaning of something – an event, a person, a behavior, an object – and feeling a positive emotional connection to it.” Adler and Fagley (2005) describe eight aspects of appreciation: a “have” focus, awe, ritual, present moment, self/social comparison, gratitude, loss/adversity and interpersonal. A “have” focus entails focusing on what one has instead of what one lacks. Awe is a feeling of deep emotional connection to something, such as a moment of speechless appreciation for a beautiful natural wonder. Ritual represents habitual acts that serve to foster appreciation. Present moment is being appreciative in a here-and-now context. Self/social comparison is appreciating a situation in response to a downward self or social comparison. Gratitude in
this model refers to noticing, acknowledging and being thankful for a benefit one has received. Loss/adversity involves using a difficult circumstance to remind oneself of positive aspects of one’s life. Finally, the interpersonal aspect involves noticing and being appreciative of the people in one’s life (Adler & Fagley, 2005).

Despite distinctions made by some researchers between gratitude and appreciation (Fagley, 2012), an overarching construct encompasses all conceptualizations of gratitude and appreciation currently studied and measured by existing gratitude and appreciation scales (Wood, Maltby, Stewart, & Joseph, 2008). Wood, Maltby, Stewart, and Joseph (2008) conducted two studies, including an exploratory factor analysis (Study 1) and a confirmatory factor analysis (Study 2) to examine the convergent validity and factor structure of three self-report measures of gratitude and appreciation: the one-factor Gratitude Questionnaire-6 (GQ-6) (McCullough et al., 2002), the three-factor Gratitude, Resentment and Appreciation Test (GRAT) (Watkins et al., 2003) and the eight-factor Appreciation Scale (Adler & Fagley, 2005). The studies found a single higher order factor above the twelve factors measured by the gratitude and appreciation scales (Wood, Maltby, Stewart, & Joseph, 2008). This factor structure was invariant across genders, although the investigators did find that females demonstrated significantly higher mean levels of gratitude across all three scales (Wood, Maltby, Stewart, & Joseph, 2008). The presence of a higher order gratitude factor above all existing facets of gratitude, regardless of conceptualization, indicates a single personality trait or dimension that governs gratitude, much as a stable trait such as neuroticism influences the expression of emotions associated with that trait (Wood, Maltby, Stewart, & Joseph, 2008). Wood, Maltby, Stewart, and Joseph (2008) advocate the integration of the gratitude and
appreciation literatures based on their single-factor solution, and indeed enlarge the construct of gratitude to encompass all aspects of gratitude and appreciation in a later review (Wood et al., 2010). Fagley (2012) supports this integration, but argues that rather than expanding the term gratitude to encompass appreciation, gratitude should be constrained to the expression of grateful affect as defined by Adler and Fagley (2005); furthermore, the broader term appreciation more properly defines the construct as a whole (Fagley, 2012). Given that all researchers involved agree on the structure of the gratitude/appreciation construct itself (Fagley, 2012; Wood et al., 2010), the present review does not attempt to resolve this brewing taxonomic tussle and instead utilizes the term gratitude unilaterally, as gratitude seems to currently be the more widely accepted descriptor for the overall construct of gratitude/appreciation.

If gratitude is indeed a stable, multifaceted trait, might it be explained through existing systems of personality, such as by trait differences in positive affect and other subfactors of the Big Five personality system? Gratitude, in fact, explains unique variance in subjective well-being, psychological well-being, and physical health outcomes beyond the effects of all of the Big Five personality traits in several studies (Fagley, 2012; Hill, Allemand, & Roberts, 2013; McCullough et al., 2002; Wood, Joseph, & Maltby, 2008). Initially, McCullough et al. (2002) used multiple regression to examine the incremental validity of gratitude over the Big Five personality traits, finding that the Big Five personality traits explained 21% of the variance in GQ-6 scores.

Wood, Joseph, et al. (2008) expanded this work and conducted a hierarchical multiple regression to test the incremental validity of gratitude, measured with the GQ-6, over the Big Five personality traits with respect to life satisfaction, measured with
Diener’s Satisfaction with Life Scale (SWLS). They found that gratitude predicted 9% additional variance in life satisfaction when controlling for the Big Five domains, and an 8% additional variance in life satisfaction when controlling for all 30 sub-facets of the Big Five (Wood, Joseph, et al., 2008). Wood, Joseph, et al. (2008) utilized the effect size benchmarks for incremental validity outlined by Hunsley and Meyer (2003) to determine that the incremental effect of gratitude on life satisfaction was twice the size of what can be considered a significant contribution to a model in personality research. Finally, Fagley (2012) conducted a hierarchical multiple regression to determine the unique contribution of appreciation, measured by the Appreciation Scale, to subjective well-being beyond the effects of both the Big Five and gratitude (as measured by the GQ-6), and found that appreciation explained a unique 11% of the variance in subjective well-being. To reiterate for clarity, at this point Wood, Maltby, Stewart, and Joseph (2008) had already demonstrated that the constructs measured by the GQ-6 and Appreciation scale loaded onto a single latent factor; Fagley’s demonstration of “appreciation’s” incremental validity beyond “gratitude” is an expression of the aforementioned nomenclature debate.

One study has found that gratitude predicts unique variance in psychological well-being beyond the Big Five personality traits as well (Wood, Joseph, & Maltby, 2009). Following a similar procedure to their study involving satisfaction with life, Wood et al. (2009) used hierarchical multiple regression to demonstrate incremental validity over the Big Five traits; gratitude demonstrated incremental validity with respect to the dimensions of personal growth, positive relationships with others, purpose in life and self-acceptance, explaining 2% to 8% additional variance on these dimensions. These results, though apparently small, again meet benchmarks for reasonable incremental
contributions (Hunsley & Meyer, 2003). Gratitude did not display incremental validity over the Big Five with respect to the dimensions of autonomy or environmental mastery (Wood et al., 2009). So it seems that dispositional gratitude is a construct with incremental validity over existing personality traits, albeit strongly correlated ($r = .43 - .51$) with positive affect (Wood, Joseph, et al., 2008; Wood et al., 2009).

One study found that while positive affect strongly mediates the relationship between gratitude and well-being, the combination of positive affect and positive beliefs almost fully mediates the same relationship (Toussaint & Friedman, 2009). However, the study by Toussaint and Friedman (2009) contains methodological limitations which make the authors’ claim of mediation difficult to interpret. These flaws include ambiguous definition of “positive beliefs,” use of idiosyncratic measures and most importantly, assessment at only one time point using outdated tests for mediation, which makes inferences of directionality impossible to support (Kazdin, 2007; Toussaint & Friedman, 2009).

Finally, gratitude has been uniquely linked to physical health outcomes beyond the Big Five personality factors. Hill et al. (2013) found that gratitude correlated with self-reported physical health while controlling for the Big Five; they found that this link was mediated by broad-based psychological health, health activities and willingness to seek help for health concerns. Again, however, the authors assessed variables at only one time point, which threatens the validity of their mediation claims (Kazdin, 2007).

Altogether, these findings support gratitude as a unique dispositional construct with strong ties to subjective and psychological well-being. However, the evidence
presented by these studies begs the question: what affective and cognitive processes explain the relationship between gratitude and outcome variables such as well-being? These are important questions to answer, and research investigating the mediators between gratitude and well-being has identified several possible mechanisms by which gratitude affects well-being (Wood et al., 2010).

**Mechanisms Behind Gratitude.** Several mechanisms are hypothesized to underlie the relationship between gratitude and well-being (Wood et al., 2010). The schematic hypothesis, which has achieved preliminary support, states that grateful people have specific cognitive and perceptual biases that predispose them to see help as more beneficial, thereby prompting increased grateful affect (Wood, Maltby, Stewart, Linley, & Joseph, 2008). Wood, Maltby, Gillett, Linley, and Joseph (2008) conducted three studies using observational (Study 1 and 2) and experimental (Study 3) methods to examine the relationship between trait gratitude and the amount of grateful affect experienced in a particular situation (state gratitude). They found that the relationship between trait and state gratitude following a grateful event was fully mediated by perceptions of the cost, value and genuine helpfulness of the help received (Wood, Maltby, Stewart, Linley, et al., 2008). In other words, grateful people saw the aid of another person as more costly, valuable and altruistic than did people lower in trait gratitude, and these perceptions explained the subsequent experience of grateful affect (Wood, Maltby, Stewart, Linley, et al., 2008).

The coping hypothesis is another mechanism that might explain at least part of the relationship between gratitude and well-being, and posits that gratitude affects well-being through the mediating influence of coping style (Wood et al., 2010). In one study,
gratitude correlated positively with coping styles such as seeking emotional support, positive reinterpretation, active coping and planning, while correlating negatively with self-blame, substance use and denial (Wood, Joseph, & Linley, 2007). The relationship between these gratitude and these coping styles mediated the relationship between gratitude and stress, but did not mediate the relationship between gratitude and well-being (Wood et al., 2007). As such, the authors speculate that mechanisms other than coping style relate gratitude to well-being (Wood et al., 2007). These findings make conceptual sense, but clearly indicate that mechanisms beyond coping style are at work in the relationship between gratitude and well-being.

The positive affect hypothesis is a third, more broad mechanism that may account for the impact of gratitude on well-being (Wood et al., 2010). As previously mentioned, gratitude is strongly correlated with positive affect, but has an impact on well-being independent of the Big Five trait of Agreeableness, which encompasses individual differences in positive affect (Wood, Joseph, et al., 2008; Wood et al., 2009). In addition, N. M. Lambert, Fincham, and Stillman (2012) found mediating effects for both positive affect and positive reappraisals when examining the relationship between gratitude and depression. Thus, the general benefits derived from the experience of positive emotions are associated with gratitude but do not fully explain its relation to well-being. Again, this seems to be consistent with research which indicates that gratitude includes a cognitive component (Toussaint & Friedman, 2009; Wood, Maltby, Stewart, Linley, et al., 2008).

The fourth possible explanatory mechanism behind the relationship between gratitude and well-being is the broaden-and-build theory of positive emotion (Fredrickson, 2001). Broaden-and-build theory goes beyond the positive affect.
hypothesis and states that each positive emotion fills an adaptive evolutionary function, broadening attention in the short term and building lasting personal resources in the long term (Fredrickson, 2001). Broaden-and-build theory has received a wide range of empirical support (Fredrickson & Branigan, 2005; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Rowe, Hirsh, & Anderson, 2007; Schmitz, De Rosa, & Anderson, 2009; Wadlinger & Isaacowitz, 2006). For example, Fredrickson and Branigan (2005) found that compared to anger, anxiety and a neutral-state control group, the positive emotions of amusement and contentment increased global attention bias and broadened thought-action repertoires. Gratitude has been theorized to relate to broaden-and-build theory (Fredrickson, 2004), and empirical evidence exists to support this link: Watkins, Scheer, Ovnicek, and Kolts (2006) found that gratitude prompted a larger array of prosocial thought-action tendencies than did simple indebtedness. Other recent studies have presented evidence that gratitude plays a role in the maintenance and strengthening of intimate relationships; Gordon, Impett, Kogan, Oveis, and Keltner (2012) found that romantic partners who are more grateful are more responsive to their partners' needs, and more likely to commit to relationships. These authors also observed that grateful partners are more likely to exhibit responsive interactional behavior with their partner in a laboratory setting (Gordon et al., 2012), and another study found that the experimentally induced expression of gratitude in a romantic partnership strengthened relationship satisfaction at a six-month follow-up, beyond disclosing positive events (Algoe, Fredrickson, & Gable, 2013), suggesting that gratitude plays a unique role in building and strengthening relationship bonds. Evidence for gratitude's unique role in relationship maintenance supports the hypothesis that the emotion fills an adaptive evolutionary function.
purpose. As a higher-level description of the processes by which positive emotions facilitate well-being, broaden-and-build theory could conceptually encompass both the schematic hypothesis and the coping hypothesis (Wood et al., 2010).

**Gratitude and Well-Being.** Gratitude has been robustly linked to both subjective and psychological well-being (Wood et al., 2010). As previously outlined, several studies have found links between gratitude and subjective well-being, after controlling for personality traits (e.g. Fagley, 2012; Wood, Joseph, et al., 2008). These studies answer the questions: are grateful people happier, and is the grateful disposition uniquely responsible for the increased happiness? Two studies have linked gratitude to psychological well-being: in addition to the study by Wood et al. (2009) which studied the incremental validity of gratitude with respect to psychological well-being, Kashdan, Uswatte, and Julian (2006) related gratitude to greater intrinsically motivated activity in veterans with PTSD. Curiously, one recent study of breast cancer patients found no relationships between gratitude and psychological well-being, even amongst basic bivariate correlations (Ruini & Vescovelli, 2013). However, given the possible protective effects of high psychological well-being against later depression (Wood & Joseph, 2010), the relationships between gratitude, subjective and psychological well-being, and depression are worthy of investigation.

**Gratitude and Psychopathology.** Although more clinicians are beginning to explore measures of well-being as outcomes for assessment, therapy and research (Joseph & Wood, 2010), the integration of positive functioning as a goal of clinical psychology is ultimately a debate tangential to the current discussion. The primary focus of clinical psychology rightfully remains on alleviating disorder. In this context, determining
whether gratitude interacts with psychopathology is a key step in assessing the potential impact of gratitude interventions in a clinical setting.

Several studies have demonstrated a directional relationship between gratitude and depression. One set of two longitudinal studies has found that trait gratitude protects against later depression, independent of personality (Wood, Maltby, Gillett, et al., 2008). Wood, Maltby, Gillett, et al. (2008) used structural equation modeling to examine the directionality of relationships between gratitude, stress, perceived social support and depression across time, testing several alternative models including all possible permutations of mediation between the four variables. In Study 1 \((n = 156)\), they found that the best fitting model showed a direct path from gratitude to decreased stress, increased social support and lower depressive symptoms over time, and that none of these relationships were mediated (Wood, Maltby, Gillett, et al., 2008). In Study 2 \((n = 87)\), they replicated the results of Study 1 in a second sample, again finding support for the direct model, and additionally found that the relationships remained after controlling for the Big Five personality traits (Wood, Maltby, Gillett, et al., 2008).

Another set of eight studies systematically approached the relationship between gratitude and depression, testing not only the causal relationship between gratitude and depression but also possible mediators including positive reframing and positive affect (N. M. Lambert et al., 2012). In Study 1, N. M. Lambert et al. (2012) found a direct path between gratitude and depressive symptoms across two time points. In Studies 2-5, they found that the path between gratitude and depressive symptoms was mediated by positive reframing, defined as the positive reappraisal of a negative life event (N. M. Lambert et al., 2012). In Studies 6-7, they tested the mediating effect of positive affect on the
relationship between gratitude and depressive symptoms, and in Study 8, they tested both mediators simultaneously. All studies were longitudinal in design, and Studies 3-7 contained an experimental manipulation designed to increase gratitude (N. M. Lambert et al., 2012). Of these manipulations Study 8, curiously, operationalized positive emotion using the Satisfaction with Life Scale (N. M. Lambert et al., 2012); life satisfaction, though correlated with positive affect as aspects of subjective well-being, is distinct from positive emotion (Diener et al., 1999). However, this misrepresentation of positive affect (N. M. Lambert et al., 2012) serendipitously provides additional basis for an investigation of subjective well-being as a mediator between gratitude and depression: if gratitude’s effect on depression is mediated by both positive affect and life satisfaction, then explicitly testing the mediating effect of subjective well-being on the relationship between gratitude and depression is a logical extension.

Other studies have linked gratitude to various disorders and risk factors. Kashdan et al. (2006) found that gratitude is much lower in veterans with PTSD than in veterans who do not meet criteria for the disorder. However, when present in veterans with PTSD, gratitude resulted in greater intrinsically motivated activity independently of symptomatology (Kashdan et al., 2006). Gratitude has also recently been linked to higher post-traumatic growth (PTG) in breast cancer patients (Ruini & Vescovelli, 2013). Kleiman, Adams, Kashdan, and Riskind (2013) determined that gratitude indirectly protects against suicidal ideation by increasing meaning in life. A large epidemiological study examining a construct of “thankfulness” from a religious perspective found that this related construct was associated with a lower risk for several forms of psychopathology, including major depression, generalized anxiety disorder, and substance use disorders.
Finally, two studies found that a gratitude intervention also improved clinically relevant outcomes in a community sample, including body image (Geraghty, Wood, & Hyland, 2010a) and worry (Geraghty, Wood, & Hyland, 2010b).

Research linking gratitude and psychopathology has much room to expand. However, a robust relationship between gratitude and depressive symptoms has been observed, and several possible mediators of this relationship have been identified. In addition, the longitudinal study by Wood and Joseph (2010) that linked psychological well-being prospectively with reduced depression later in life hints at another potential mediator. Given the robust links between gratitude and well-being in correlational and experimental settings, increased well-being may very well prove to mediate the relationship between gratitude and depression.

**The Importance of Gratitude.** Gratitude has demonstrated uniqueness as a construct and as a contributor to positive functioning (Wood et al., 2010). However, to be of clinical utility, the study of gratitude must produce actionable results for clinicians and for individuals suffering from distress as a result of psychopathology. A strong argument can be made for the relevance of gratitude and other positive psychological constructs to clinical psychology (Wood & Tarrier, 2010). Over the past several decades, treatment and efficacy research in clinical psychology has focused almost exclusively on the reduction of DSM-IV symptomatology, aligning itself with the medical model (but cf. M. J. Lambert (2013), for a review of current directions in outcome research). However, exclusive focus on the reduction of symptomatology may be insufficient to comprehensively treat and prevent disorder (Wood & Tarrier, 2010). Emerging evidence suggests that the absence of positive characteristics such as optimism (Brissette, Scheier,
and psychological well-being (Wood & Joseph, 2010) actually constitute independent risk factors for later depression. In the case of gratitude, the absence of gratitude predicts depression independently of the effects of characteristics such as the Big Five personality system (Wood, Maltby, Gillett, et al., 2008). In light of findings such as these, the decision to allocate empirical attention to positive characteristics may move beyond a purely epistemological debate and become an objectively relevant concern to clinical psychology (Wood & Tarrier, 2010). In other words, positive constructs may not only fall within the realm of clinical psychology, but in fact will probably prove necessary to fully understand disorder (Wood & Tarrier, 2010). At the same time, the study of positive characteristics should not be pursued as a separate or distinct offshoot of traditional clinical research, but as a logical extension of the existing spectrum of clinical phenomena (Wood & Tarrier, 2010). In fact, positive functioning is already an implicit component of many psychological assessments, treatments and outcome measures (Joseph & Wood, 2010). Contrary to many of the more grandiose claims of prominent supporters of the positive psychology movement such as Seligman et al. (2005), positive psychology itself is neither a novel nor radical approach to clinical psychology (Wood & Tarrier, 2010).

One exciting possibility for gratitude is its potential utility beyond clinical populations. Most therapeutic interventions are designed to correct pathological functioning, and thus have little relevance to non-disordered populations. However, interventions designed to bolster strengths may prove effective on clinical and non-clinical populations alike. For example, increased psychological well-being seems to strongly protect against later depression (Wood & Joseph, 2010). Investigating methods
of improving positive functioning may result in efficacious therapeutic and community-based interventions, and research has provided initial support for the efficacy of Internet-delivered positive psychology self-help interventions in reducing clinically relevant symptoms in self-selecting community populations (Geraghty et al., 2010a, 2010b; Seligman et al., 2005). As such, any comprehensive review of gratitude would be incomplete without examining interventions designed to increase gratitude.

Gratitude Interventions

Positive Psychology Interventions. Positive psychology interventions are broadly conceptualized as any therapeutic intervention that centers on building strengths instead of on ameliorating the effects of disorder (Sin & Lyubomirsky, 2009). A wide variety of positive psychology interventions have been tested in the past decade, with varying results (Sin & Lyubomirsky, 2009). A few examples of positive psychology interventions include gratitude lists, taking a survey to discover one’s “signature strengths,” and writing a story describing “you at your best” (Seligman et al., 2005). Based on a meta-analysis of 51 studies, positive psychology interventions increase well-being (mean $r = .29$) and decrease depressive symptoms (mean $r = .31$) (Sin & Lyubomirsky, 2009). However, due to widely varying interventions and sometimes undesirable methodologies, even strong proponents of positive psychology interventions advocate caution when interpreting these results (Wood & Tarrier, 2010). For example, the benchmark study by Seligman et al. (2005) was recently replicated, and positive psychology interventions were not found to be significantly superior to a more stringent placebo group (Mongrain & Anselmo-Matthews, 2012). However, out of existing positive psychology interventions, interventions aimed at increasing gratitude are
regarded as one of the positive psychology movement’s successes (Duckworth, Steen, & Seligman, 2005; Emmons & Stern, 2013).

**Gratitude Interventions.** Several interventions have been developed for the purpose of increasing grateful affect. Interventions involving gratitude include gratitude lists, grateful contemplation, and gratitude visits (Wood et al., 2010). Of these, gratitude lists have received the most focus and empirical support: grateful contemplation has been tested only in the context of a short experimental mood induction (Watkins et al., 2003) while “gratitude visits,” defined as writing a letter to a benefactor and reading it to the recipient in person, have been shown to produce a large but only temporary increase in well-being (Seligman et al., 2005).

In contrast, gratitude lists or diaries have been the target of more than ten studies, and have been touted as one of the more promising interventions developed during the course of the positive psychology movement (Emmons & Stern, 2013; Wood et al., 2010). A gratitude list intervention is described as an intervention lasting a specified amount of time (usually one or two weeks) where the participant or client is told to write daily about a number of people, events or circumstances that she or he is grateful towards (usually three to six items) (Wood et al., 2010). The intervention may ask the participant to consider instances of gratitude which occurred that day, or may be nonspecific (Wood et al., 2010). The intervention usually also requires participants to make a “causal attribution” for the event (Seligman et al., 2005). Despite enthusiasm surrounding gratitude interventions, interpreting the evidence supporting gratitude interventions is difficult given the wide range of delivery formats, effect sizes and particularly outcome measures used across studies (Wood et al., 2010). For example, several studies have
compared the gratitude list intervention to a condition involving listing hassles, which is not a psychologically inert control condition and may instead be a negative mood induction (Wood et al., 2010). Studies have compared gratitude to control conditions on measures of happiness, life satisfaction, positive affect and negative affect, as well as less relevant outcome measures such as decreases in headaches and expected life satisfaction in the upcoming week (Wood et al., 2010).

One study has examined a gratitude list intervention, referring to it as a “three good things exercise,” in comparison to a control group listing early memories, using depressive symptomatology as an outcome variable (Seligman et al., 2005). This study used a large (n = 577), self-selected sample and examined the gratitude list intervention and four other positive psychological interventions in comparison to their “early memories” control group (Seligman et al., 2005). Seligman et al. (2005) adapted this Internet-delivered exercise from the exercise used in the first experimental attempt to increase trait gratitude (Emmons & McCullough, 2003). Seligman et al. (2005) found impressive results for the “three good things” exercise, with benefits of increased happiness (\( \lambda^2 = .50 \)) and decreased depressive symptoms (\( \lambda^2 = .28 \)) at a 6-month follow-up. They suggested that this and other positive exercises may contain unique active ingredients that account for their effect.

Some studies have successfully replicated the results of Seligman et al. (2005). Compared to a control group, Senf and Liau (2013) found that a package of gratitude interventions including both gratitude lists and a gratitude visit significantly increased happiness and reduced depressive symptoms. The authors also notably found that the effect of the interventions was moderated by the Big Five trait of Extraversion, but this
moderation might simply be due to the interpersonal nature of the gratitude visit (Senf & Liau, 2013). Senf and Liau (2013) also only collected data up to 1 month post-treatment, despite the fact that Seligman et al. (2005) found that the gains from a gratitude visit intervention dropped off after 1 month.

The Seligman et al. study has also been replicated with inconclusive results (Mongrain & Anselmo-Matthews, 2012). This replication study used a control group that more stringently controlled for expectancy by creating a rationale for the early memory exercise with higher face validity (Mongrain & Anselmo-Matthews, 2012). In addition, the replication included a second, “positive placebo” control group where participants listed positive early memories (Mongrain & Anselmo-Matthews, 2012). Two positive psychology interventions, including the gratitude list, did not lower depression significantly more than either control group, and neither intervention increased well-being significantly more than the “positive placebo” group (Mongrain & Anselmo-Matthews, 2012). Mongrain and Anselmo-Matthews (2012) noted that Seligman et al. (2005)’s sample was recruited through Dr. Seligman’s self-help book Authentic Happiness, and increased motivation or belief in the interventions associated with that particular population may have biased the results. Evidence from another study suggests that trait curiosity and depressive symptoms influence participant self-selection for gratitude interventions (Kaczmarek et al., 2013), and these confounding variables may have resulted in selection bias for Seligman et al. (2005). (Mongrain & Anselmo-Matthews, 2012) concluded that the positive psychology exercises tested by Seligman et al. (2005) may increase well-being through mechanisms common to all therapies, rather than through mechanisms specific to the particular exercises.
There are, however, several recent studies that appear to have evaluated gratitude lists using methodologically stringent designs. A study targeting body dissatisfaction with an Internet-administered intervention in a community sample ($n = 479$) found that gratitude was comparable to an automatic thought record intervention in decreasing body dissatisfaction (differences were not significant) and much superior to a waitlisted control condition (Cohen’s $d = .96$) (Geraghty et al., 2010a). A similar study ($n = 247$) targeting worry in a community sample via the Internet also found that a gratitude intervention was comparable to an automatic thought record intervention (differences were not significant), and superior to waitlist controls (Cohen’s $d = 1.5$) (Geraghty et al., 2010b). In both studies, although the gratitude intervention and automatic thought record intervention achieved similar effects, participants in the gratitude intervention evinced much less attrition than participants in the automatic thought record condition (Geraghty et al., 2010a, 2010b). These studies suggest that even if gratitude interventions do not improve upon the ability of existing interventions to reduce psychopathology, they may deliver an equivalent effect to a significantly larger proportion of completers, granting them clinical utility in a profession already inundated with a wide variety of comparable interventions (Wood et al., 2010). Potential influences on treatment completion could include trait curiosity and depressive symptoms, which were identified as moderators of self-selection for gratitude interventions in a different study (Kaczmarek et al., 2013). In addition to higher rates of completion, these studies demonstrate a substantial effect relative to waitlist control groups on clinically relevant criteria, providing support for the basic efficacy of gratitude interventions (Geraghty et al., 2010a, 2010b). Studies using
this type of comparison should be conducted using different populations and delivery formats to test the generalizability of the results (Wood et al., 2010).

Future Directions in Gratitude Research. While the literature on gratitude thus far can be seen as promising, research on gratitude interventions should be regarded as preliminary. Wood et al. (2010) argue that more methodologically stringent studies are needed to appropriately evaluate the effectiveness of gratitude interventions. In particular, studies comparing gratitude to appropriate control conditions are needed to determine the base effectiveness of the treatment, and more studies comparing gratitude interventions to existing empirically supported treatments are necessary to determine if gratitude interventions can substantively add to existing treatment options (Wood et al., 2010). These studies are particularly vital if proponents of gratitude interventions continue to overstate the evidence in support of these interventions (Emmons & Stern, 2013).

Furthermore, an interesting question emerges despite the novelty of gratitude interventions: why has no research on gratitude interventions examined the gratitude list or a similar intervention from within the framework of an existing theoretical orientation? The efficacy of existing empirically supported treatments could potentially inform a more theoretically grounded gratitude intervention. For example, traditional cognitive-behavior therapy for depression is already centered around identifying and restructuring maladaptive automatic thoughts and schemas (Beck, 2011). Gratitude’s schematic hypothesis, or the mediating effect of attributions of a grateful event on subsequent grateful affect (Wood, Maltby, Stewart, Linley, et al., 2008), suggests that an intervention specifically targeting grateful schemas within a cognitive-behavioral framework may prove more efficacious than the simple “three good things” intervention pioneered by
McCullough et al. (2003) and Seligman et al. (2005). Intervention components such as psychoeducation and cognitive restructuring have the potential to more efficiently mobilize the mechanisms by which gratitude may improve well-being, including the schematic hypothesis (Wood, Maltby, Stewart, Linley, et al., 2008) and broaden-and-build theory (Garland et al., 2010).

Wood et al. (2010) advocate more stringent methodological tests of gratitude interventions, but may not go far enough in their call for empirical rigor. The gratitude list intervention itself needs to evolve as knowledge of gratitude and its mechanisms increases. The simple exercise developed by Emmons & McCullough (2003) and popularized by Seligman et al. (2005) needs to be expanded and refined if gratitude as a construct is to become relevant to clinical psychology. There is no value in testing the efficacy of an intervention which is inadequate at tapping into the very construct it professes to target. At the same time, researchers are beginning to realize that investigation of mediators and mechanisms of therapeutic change is a vital step on the road to developing effective, parsimonious treatments (Kazdin, 2007). Developers of emergent interventions such as the gratitude list have the opportunity to explore the mechanisms of change within their interventions before committing to expensive, elaborate efficacy research. In addition, proponents of positive psychology can gain traction amongst more skeptical theorists by empirically supporting mechanisms by which positive psychological constructs could reduce psychopathology.
Statement of the Problem

Clinical psychology continues to focus on pathological functioning in isolation from well-being, despite mounting evidence that the two concepts form a continuum (Joseph & Wood, 2010). This focus results in an incomplete picture of disorder that neglects the etiological contributions of positive characteristics and their absence to the formation of pathology (Wood & Tarrier, 2010). In many ways, a shift toward positive clinical psychology is neither dramatic nor revolutionary, and represents a natural movement to more fully encompass the object of clinical psychology as a discipline (Wood & Tarrier, 2010). In this context, the study of gratitude is simply exploration of an understudied, generalized protective factor with potential benefits to both clinical and nonclinical populations. To this end, researchers seek to uncover the underlying mechanisms behind gratitude’s relation to positive and negative functioning. At the same time, clinical psychology as a field is beginning to focus more attention on mechanisms of change in therapy (Kazdin, 2007), and researchers investigating gratitude interventions have a responsibility to determine the mechanisms by which their interventions operate before adding to the current glut of psychotherapy treatments. The central question of the proposed study is: does the mediating influence of psychological well-being explain the relationship between gratitude and later depression? Empirical support for this relationship would provide guidance for researchers interested in testing gratitude interventions, and would pave the way for further studies examining possible mechanisms of gratitude interventions. Increased well-being would fit conceptually as a higher-level mediator through which other processes such as positive emotion and reappraisals (N. M. Lambert et al., 2012) operate. In addition, research has suggested the
possibility of psychological well-being as a protective factor against later depression (Wood & Joseph, 2010), Does this hold true when subjective well-being is taken into account? Finally, only a few studies have explicitly examined the relationship between gratitude and depression (N. M. Lambert et al., 2012; Wood, Maltby, Gillett, et al., 2008), and this study will provide valuable replication of these results.

**Research Questions and Hypotheses of the Present Study**

Primary Research Question: Does subjective well-being mediate the relationship between gratitude and depression?

**H1.** Participants’ trait gratitude at Time 1 will predict lower depressive symptoms at Time 2, controlling for other variables.

**H2.** Higher subjective well-being at Time 1 will predict lower depressive symptoms at Time 2, controlling for other variables.

**H3.** Subjective well-being at Time 1 will mediate the relationship between trait gratitude at Time 1 and depressive symptoms at Time 2.

Exploratory Research Question 1: Does the relationship between gratitude and depression differ amongst groups of individuals?

**H4.** Gratitude will negatively predict depressive symptoms at Time 2 more strongly amongst participants who have more depressive symptoms at Time 1.

**H5.** The effect of gratitude on depression differs as a function of demographic characteristics, including gender and ethnicity.
Exploratory Research Question 2: How do subjective and psychological well-being relate over time? Does psychological well-being account for depressive symptoms beyond subjective well-being?

H6. Higher psychological well-being at Time 1 will predict higher subjective well-being at Time 2, controlling for subjective well-being at Time 1.

H7. Higher psychological well-being at Time 1 will significantly increase the variance explained by a model where gratitude and subjective well-being at Time 1 predict depression at Time 2.

A Proposed Clinical Model of Gratitude and Depression

Figure 2: A Proposed Clinical Model of Gratitude and Depression

Figure 2, above, outlines the proposed relationships between gratitude, subjective well-being and depressive symptoms. It is hypothesized that gratitude inversely predicts later depressive symptoms through the mediating influence of subjective well-being.
Chapter Three

Method

In this chapter, the method of the present study is discussed in detail. Study design, participants, procedure, measures used, and data analysis will all be described.

Study Design

This longitudinal study examined the relationship between gratitude and depressive symptoms, and explored subjective well-being as a mediator of this relationship. All variables were assessed at two separate time points, to allow for directional inferences during tests of mediation. Demographic variables, Time 1 depressive symptoms, Time 1 subjective well-being and Time 2 academic stress were controlled in the analyses. Time 1 gratitude and Time 2 subjective well-being were assessed as predictors of Time 2 depression independently of other predictors, and a test of mediation was applied.

Participants

Participants were 93 undergraduate students recruited from the University of Toledo psychology subject pool. Participants completed the study in return for course credit. In addition, participants who completed all measures at both time points were entered into a raffle to win one of two $25 Amazon gift cards. Prior to data collection, power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) indicated that 58 participants would be required to detect a large effect during the initial step of the hierarchical regression analysis with a power of .80. When adding one predictor into a
hierarchical multiple regression with either six or seven total predictors, a sample size of 42 would be required to detect a 2% (small effect) increase in $r^2$ with a power of .08. Based on this power analysis, subjects were recruited to exceed a minimum of 58 participants. Longitudinal relationships between gratitude (as measured by the GQ-6) and depressive symptoms (as measured by the CES-D) have been reported as correlations between $r = -.24$ and $r = -.48$ (Wood, Maltby, Gillett, et al., 2008), and the more conservative effect of $r = -.24$ was used in the power analysis.

**Procedure**

Participants completed online questionnaires via the PsychData survey system at two time points. Participants gave informed consent before completing each questionnaire. Each questionnaire consisted of all predictor and outcome measures. Participants who completed the first set of measures were emailed six weeks following their completion of the initial measures. Names, email addresses and other identifiers were kept separate from participant data. The order in which measures were presented to participants was counterbalanced.

**Measures**

**Demographics.** Participant demographics (e.g., gender, race, ethnicity, age and class standing) were collected by the University of Toledo psychology subject pool pre-screen, a prerequisite for research participation.

**Gratitude Questionnaire-6 (GQ-6).** The GQ-6 (Appendix A) is a six-item measure of trait gratitude that assesses respondents on a single latent gratitude factor measured by four dimensions: frequency of grateful affect, intensity of grateful affect,
density of grateful affect and span of grateful affect (McCullough et al., 2002). The GQ-6 demonstrates good internal validity ($\alpha = .82$) and loads onto a single latent factor with other gratitude and appreciation scales (Wood, Maltby, Stewart, & Joseph, 2008). However, the GQ-6 focuses entirely on the emotional experience of gratitude, and may not provide an accurate measure of the dispositional trait as a whole, with a factor loading of only .55 in one confirmatory factor analysis (Wood, Maltby, Stewart, & Joseph, 2008). As such, Wood, Maltby, Stewart, and Joseph (2008) recommend utilizing the GQ-6 in conjunction with other measures of gratitude.

**Gratitude, Resentment and Appreciation Test Short Form (GRAT).** The GRAT (Appendix B) is a 44-item measure of trait gratitude that assesses respondents on three latent factors: a sense of abundance, simple appreciation and appreciation for others (Watkins et al., 2003). This provides a more parsimonious assessment of dispositional gratitude than the 8-factor Appreciation Scale (Adler & Fagley, 2005), and assesses the same construct (Wood, Maltby, Stewart, & Joseph, 2008). Internal consistency amongst subscales of the 16-item short form have been reported as $\alpha = .80$ (sense of abundance), $\alpha = .87$ (simple appreciation) and $\alpha = .76$ (social appreciation) (Diessner & Lewis, 2007). In addition, the GRAT has demonstrated convergent validity with the GQ-6, correlating at $r = .77$ in one study (Watkins et al., 2006).

**Satisfaction with Life Scale (SWLS).** The SWLS (Appendix C) is a short, five-item measure designed to assess global perceived satisfaction with life (Diener, 1984). It represents a distinct dimension of subjective well-being, as it loads onto a single latent factor with positive and negative affect (Linley et al., 2009) and intercorrelates modestly with these measures (Lucas et al., 1996). The SWLS demonstrates good internal
consistency across studies, with alphas reported between $\alpha = .82 - .88$ in previous studies (Linley et al., 2009; Lucas et al., 1996).

**Positive and Negative Affect Scale (PANAS) Short Form.** The PANAS (Appendix D) is a 20-item measure of positive and negative affect (Watson et al., 1988). It consists of two ten-item subscales, which assess separately for positive and negative affect (Watson et al., 1988). A 10-item short form has been developed based on the highest loading items of the original scale, and this short form displays consistency with the original (A. Mackinnon et al., 1999). The PANAS has been rigorously validated, and internal consistency estimates in a recent study of well-being were reported as $\alpha = .81$ for positive affect and $\alpha = .85$ for negative affect (Linley et al., 2009).

**Scales of Psychological Well-Being Short Form (SPWB).** This measure (Appendix E) assesses psychological well-being on six dimensions: self-acceptance, personal growth, purpose in life, positive relationships, environmental mastery and autonomy (Ryff & Keyes, 1995). These six dimensions load onto a single higher-order latent factor (Keyes et al., 2002; Linley et al., 2009; Ryff & Keyes, 1995). The 18-item short form is utilized here; it contains 3 items for each dimension of well-being and demonstrates acceptable consistency with the 84-item long form (Ryff & Keyes, 1995). Items on the short form were chosen to represent the conceptual breadth of each dimension of well-being; thus, each 3-item subscale shows low ($\alpha = .33$ to .56) internal consistency within itself, but the short form maps well onto the factor structure established by previous tests of the measure (Ryff, 1989; Ryff & Keyes, 1995). In addition, subsequent studies have reported internal consistencies among subscales of the
short form that range from comparable ($\alpha = .37 – .59$) (Keyes et al., 2002) to substantially larger ($\alpha = .69 - .81$) (Linley et al., 2009).

**Center for Epidemiological Studies Depression Scale (CES-D).** This measure (Appendix F) assesses symptoms of depression (Radloff, 1977). It has achieved wide-ranging support and is one of the most frequently used scales of depression (Barlow, 2008). The CES-D demonstrates higher discriminability than the BDI in both college student and outpatient samples, but lower specificity in its prediction of clinical depression in college students using the standard cutoff score of 16 (Santor et al., 1995). These authors found that a cutoff score of 34 resulted in discriminability equivalent to the BDI-II in a college sample. As specificity of diagnosis was not of primary importance in this study, the increased discriminability of the CES-D made this measure more suitable. In addition, the CES-D contains positively worded items and is thus sensitive to positive functioning, allowing for measurement of a broader range of functioning than the BDI-II (Joseph & Wood, 2010).

**Perceived Academic Stress.** Because Time 2 data was to be collected at varying time points throughout a semester, it was believed that current academic stress might play a confounding role in students’ severity of depressive symptoms. As such, a brief measure of perceived academic stress was developed (Appendix G) so that this possible confound can be held constant throughout analyses. Items were adapted from the two-factor Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983). In a recent examination of the 10-item version of the Perceived Stress Scale, items 1 and 3 loaded most highly on the perceived helplessness factor, and items 4 and 5 loaded most highly on the perceived self-efficacy factor (Roberti, Harrington, & Storch, 2006). As such,
these four items were utilized and reworded to specifically target only academic concerns.

Data Analyses

Data Screening Procedure. Raw data consisted of 154 subjects at Time 1 and 106 subjects at Time 2. Data screening took place in three steps. First, data were screened for duplicate cases and accidental repeat administrations, including cases with 80% or more missing data. This reduced the datasets to 130 subjects at Time 1 and 97 subjects at Time 2. At this point, missing data analysis was performed on the data at each time point as indicated below. Next, data were matched across time points by Subject ID number and nonmatching cases were deleted, reducing both datasets to 93 subjects. At this point, scale reliabilities were assessed for each scale at each time point, demographic characteristics were examined, and summary scores were calculated for each scale. Finally, subject data was combined for Time 1 and Time 2, at which point descriptive statistics were acquired for each summary score and all analyses were conducted. All statistical tests performed were two-tailed, when applicable.

Missing Data Analysis. After data were screened for duplicate cases, but before subject data was matched across time points, both datasets were screened for missing data. At each time point, Little’s Missing Completely at Random (MCAR) test was performed to determine whether missing data could be assumed to occur at random. At Time 1, Little’s MCAR test was significant, \( \lambda^2(2018) = 2151, p = .019 \), indicating that the data were not missing completely at random (MCAR). There is currently no statistical method available to determine whether data are missing at random (MAR) or missing not
at random (MNAR). Since the data were not MCAR, and no variable had more than 5% missing values, a Maximum Likelihood algorithm called Expectation Maximization was used to impute missing values. At Time 2, Little’s MCAR test was not significant, $\lambda^2 (1474) = 1507, p = .268$, indicating that the data could be assumed to be MCAR. Because the data was MCAR, a Multiple Imputation algorithm was used to impute missing values at this time point.

**Reliability Analysis.** Once the dataset was finalized to 93 cases, Cronbach’s alpha was obtained for each scale at each time point. Results are listed in Table 1 (p.79). Reliability was excellent (> .75) for every scale with the exception of the Academic Stress scale, which exhibited weaker internal consistency and lower item-total correlations at both time points. However, internal consistency for this scale was still within acceptable ranges, and the scale was retained in further analyses. Between the two measures of gratitude included in this study, the GRAT displayed stronger reliability than the GQ-6. Reliability for the SPWB was high, despite the fact that the scale measures six distinct aspects of psychological well-being.

**Descriptive Statistics.** Descriptive statistics were acquired for each summary score at each time point, using the final $n$ of 93. Means and standard deviations for each variable are reported in Table 2 (p.80). Particular attention was paid to Time 2 Depression, the primary criterion variable in this study. On this variable, subjects were slightly less depressed, and displayed slightly less variability ($M = 15, SD = 9.54$) than a prior sample of female college students ($N = 76, M = 18, SD = 12.3$) (Santor et al., 1995). Using the standard cutoff score of 16, 40% of the sample was depressed. Using the cutoff of 34 determined by Santor et al. (1995), 5.3% of the sample was clinically depressed.
However, this sample appeared to be reasonably representative of college student populations in general with respect to depression scores.

**Correlations.** Pearson correlation coefficients were acquired, comparing each summary score to every other summary score (refer to Tables 3.1 and 3.2, p.82-83). All variables exhibited relationships in line with expected results based on previous theory and research: each scale correlated with itself across time points, academic stress correlated with depression, positive variables correlated positively with each other and negatively with depression, and positive and negative affect were uncorrelated. All variables were assessed for potential multicollinearity concerns, and only one set of relationships exhibited a potentially problematic degree of correlation ($r > .70$): psychological well-being was very highly correlated with both gratitude measures ($r = .69 - .80$) within each time point.
Chapter Four

Results

This chapter describes the preliminary and primary results of statistical analyses \((n=93)\) which address the hypotheses and research questions of the study. First, the primary hypotheses of the study were tested to determine if subjective well-being mediates the relationship between gratitude and later depression. Next, exploratory questions involving potential moderators of the relationship between gratitude and depression were investigated. Finally, exploratory questions involving the relative impact of subjective and psychological well-being on depression were tested. Hypotheses are tested in the same order they are described in Chapter Two.

Preliminary Results

Participants in the sample were 79.6% female and 18.3% male. Participants were primarily freshmen (59.1%), but also included sophomores (26.9%), juniors (7.5%), seniors (3.2%) and pre-college (1.1%). In terms of race, participants in the sample were primarily white (88.2%), with 5.4% African-American/black, 1.1% Asian, 1.1% Native American or Alaskan Native, 1.1% Hawaiian Native or Pacific Islander, and 1.1% of unknown race. Participants were primarily not of Hispanic origin (91.4%) with a minority of participants of Hispanic origin (5.4%). Two participants (2.2%) declined to submit any demographic information. Mean participant age was 19 years old \((M = 19.13, SD = 3.00)\). Based on descriptive statistics, assessing group differences based on race, ethnicity, and class rank was ruled out due to severe inequality among group sizes. Group differences were explored for all study variables based on gender with one-way ANOVAs, and no
significant differences between genders or classes were found on any variables of interest. One ANOVA result approached significance: women trended toward reporting higher levels of trait gratitude on the GRAT ($F(1, 89) = 3.02, p = .086$), which aligns with previous research (Wood, Maltby, Stewart, & Joseph, 2008).

**Primary Results**

**Primary Research Question (H1 and H2).** A hierarchical linear regression was performed to test two of the study’s three primary hypotheses. H1 states that gratitude will predict later depressive symptoms, while controlling for earlier depressive symptoms, subjective well-being and for later academic stress. H2 states that Time 2 subjective well-being will predict later depressive symptoms while controlling for earlier depressive symptoms, subjective well-being and later depressive symptoms. Both of these hypotheses were tested with a single hierarchical regression, where gratitude and the facets of subjective well-being (positive affect, negative affect and life satisfaction) were sequentially added over the covariates. The criterion variable in this analysis was Time 2 Depressive Symptoms. To protect against multicollinearity, all variables in this analysis were mean-centered by conversion to z-scores. Between the two measures of gratitude obtained, the GRAT displayed higher internal validity and more normally distributed responses, and was therefore utilized as the measure of trait gratitude in all analyses.

In the first step of the regression model, all covariates were entered, including Time 1 Depression, Time 1 Satisfaction with Life, Time 1 Positive Affect, Time 1 Negative Affect and Time 2 Academic Stress. The model at this step was statistically
significant, $F(5,87) = 13.14, p < .001, r^2_{adj} = .398$. In the second step, Time 1 GRAT was entered, resulting in a statistically significant increase in variance predicted by the model, $F_{change}(1,86) = 11.28, p = .001, r^2_{adj} increase = .063$. In the third step, Time 2 Satisfaction with Life, Time 2 Positive Affect and Time 2 Negative Affect were entered, resulting in a statistically significant increase in variance predicted by the model, $F_{change}(3,83) = 10.54, p < .001, r^2_{adj} increase = .135$. Thus, the model explained significantly greater variance in Time 2 Depressive Symptoms at each step of the analysis. Standardized regression coefficients, along with their standard errors and associated significance levels, are reported in Table 4 (p.83) for the full model at the final step, although variables are divided by the step in which they were initially entered.

Post hoc power analysis using G*Power indicated that power at Step 1 was 0.99, dropped to 0.72 at Step 2 and then rose to 0.90 at Step 3. Although the power for Step 2 was below the .80 benchmark for adequate power, results at this step were significant so the study was not deemed to be underpowered. Collinearity diagnostics indicated that the data did not suffer from multicollinearity: the lowest tolerance value of .369 did not exceed the benchmark for minimum tolerance (<.20), and the highest Variance Inflation Factor (VIF) of 2.713 did not approach the benchmark for maximum VIF (>5).

Results of this regression analysis allow for rejection of the null hypothesis and support both hypotheses associated with this analysis. In the final model, both Time 1 gratitude and Time 2 subjective well-being were both related to Time 2 Depressive Symptoms after controlling for other variables. These results also support the unique roles of subjective well-being and gratitude on depressive symptoms by demonstrating a significant effect for subjective well-being as a whole on depressive symptoms, beyond
the effect of gratitude. However, the results also do not provide a clear hint towards the role of subjective well-being as a mediator in the relationship between gratitude and depression. Visual examination of the GRAT regression coefficients at Step 2 (β = -.314, SE = .094, p = .001) and Step 3 (β = -.244, SE = .084, p = .005) of the analysis indicated that the contribution of gratitude was reduced in the presence of subjective well-being, but remained a strong, significant predictor.

**Primary Research Question (H3).** A mediation analysis was performed to test the third primary hypothesis (H3), that subjective well-being mediates the relationship between gratitude and depression. This analysis utilized the PROCESS macro for SPSS developed by Preacher and Hayes (2008), which allows for multiple mediation models and moderated mediation models. In this case, subjective well-being is composed of three distinct components, so a multiple mediation model was utilized. Time 1 GRAT was entered as the independent variable and Time 2 Depressive Symptoms was entered as the dependent variable. Time 2 Satisfaction with Life, Time 2 Positive Affect and Time 2 Negative Affect were entered as mediators. Time 1 Depressive Symptoms, Time 1 Satisfaction with Life, Time 1 Positive Affect, Time 1 Negative Affect, and Time 2 Academic Stress were entered as covariates (the same covariates which were used in the previous hierarchical regression). In mediation analysis, a mediating relationship is present if a 95% confidence interval drawn around the indirect effect of the predictor through the mediator does not include 0. Results supported a statistically significant mediating effect for Time 2 Satisfaction with Life on Time 2 Depressive Symptoms (r = -.052, 95% CI = -.159 - -.003), but not for Time 2 Positive Affect or Negative Affect, nor for the overall effect of all three facets, which represents subjective well-being as a
whole. Furthermore, the direct effect of gratitude on depressive symptoms remained significant ($r = -.24, p = .005, 95\% CI = -.412 - -.077$) in the presence of the mediators, indicating that mediation was only partial when present. Table 5 (p.84) summarizes these results. The results of this mediation analysis support the null hypothesis that subjective well-being does not mediate the relationship between gratitude and depressive symptoms; however, results provide support for the mediating influence of life satisfaction, a single component of subjective well-being.

Post hoc, the mediation analysis was repeated, removing academic stress as a covariate. In this exploratory context, the overall mediating effect of subjective well-being was significant, due primarily to an increase in the effect of negative affect (which makes sense; academic stress would likely be correlated with students' negative affect). Positive affect still did not display a significant effect on depressive symptoms.

**Exploratory Research Question 1 (H4 and H5).** In additional regression analyses, two variables were assessed as moderators of the relationship between gratitude and depressive symptoms. The first analysis addressed H4, which predicted that an interaction between gratitude and depressive symptoms would result in a greater effect of gratitude on later depressive symptoms among participants who were more depressed at Time 1. This moderation analysis had three steps: first, Time 1 Depressive Symptoms, Time 1 Satisfaction with Life, Time 1 Positive Affect, Time 1 Negative Affect, and Time 2 Academic Stress (the same covariates as the initial regression analysis) were entered into the model with Time 2 Depressive Symptoms as the criterion variable. Time 1 GRAT scores were entered as normal in the second step. Finally, an interaction term (Time 1 GRAT x Time 1 Depressive Symptoms) was added in the third step. In this
analysis, the interaction between gratitude and severity of depressive symptoms was not significant, $\beta = -.105, SE = .081, p = .19$. These results support the null hypothesis that the relationship between gratitude and later depressive symptoms does not change based on severity of prior depressive symptoms.

The second moderation analysis assessed H5, which stated that the relationship between gratitude and depression would differ as a function of both gender and ethnicity. Ethnicity was not assessed as a predictor because the sample did not possess sufficient variation in ethnicity. The effect of gender on the relationship between gratitude and depressive symptoms was assessed in a similar fashion to the previous analyses: Time 1 Depressive Symptoms, Time 1 Satisfaction with Life, Time 1 Positive Affect, Time 1 Negative Affect, Time 2 Academic Stress and gender (the same covariates, plus gender) were added in the first step of the regression equation. Time 1 GRAT scores were entered in the second step, and an interaction term (Time 1 GRAT x gender) was added in the third step. Gender did not have a significant effect on depressive symptoms, $\beta = -.040, SE = .213, p = .63$, while controlling for other variables, nor did the interaction of gratitude and gender have a significant effect, $\beta = .224, SE = .205, p = .40$. These results support the null hypothesis that the effect of gratitude on depressive symptoms does not vary between genders. However, this finding should be interpreted with caution because gender was not normally distributed (> 4:1 ratio of women: men).

**Exploratory Research Question 2 (H6).** Several analyses were performed to investigate H6, the hypothesis that psychological well-being leads to subsequent higher subjective well-being. Hierarchical regression only allows for a single dependent variable, so each facet of subjective well-being had to be analyzed separately: three
separate hierarchical regression analyses tested the ability of Time 1 Psychological Well-Being to independently predict Time 2 Satisfaction with Life, Positive Affect and Negative Affect respectively. Each analysis had two steps: all three facets of Time 1 Subjective Well-Being were controlled in the first step of the model, before adding Time 1 Psychological Well-Being in the second step.

A Bonferroni correction was applied to the alpha level for these tests, setting $\alpha = .017$, because these analyses were not fully independent of one another (each used the same predictors to test a different aspect of Time 2 Subjective Well-Being). However, none of the tests were statistically significant, even at an $\alpha = .05$ level. In each of the three regression equations, Time 1 Psychological Well-Being failed to significantly predict additional variance in later (Time 2) facets of subjective well-being, after controlling for previous (Time 1) subjective well-being. Only the result for psychological well-being's prediction of life satisfaction approached marginal significance. Furthermore, based on visual inspection the presence of psychological well-being did not appear to significantly impact regression coefficients for any of the Time 1 facets on their respective Time 2 criterion variables. However, post hoc power analyses indicated that power for detecting significant effects of the size reported was .18 - .23, indicating a possibility that these analyses failed to detect significant but very small effects. Results for all three analyses are detailed in Table 6 (p.85). These results support the null hypothesis that psychological well-being does not independently lead to higher subjective well-being. Subsequent mediation analyses to test whether psychological well-being mediates increases in subjective well-being were not performed because psychological
well-being did not demonstrate a significant relationship with facets of later subjective well-being after controlling for prior subjective well-being.

**Exploratory Research Question 2 (H7).** H7 predicted that psychological well-being significantly predicts depressive symptoms, after controlling for subjective well-being. To test the incremental validity of psychological well-being in predicting depressive symptoms, the initial hierarchical regression model used to test the primary hypotheses was repeated, adding psychological well-being to the model in a fourth step. The structure of this analysis was the same, with the addition of Time 1 Psychological Well-Being as a covariate in the first step, and Time 2 Psychological Well-Being as an additional fourth step in the model. With Time 1 Psychological Well-Being added as a covariate, the first step of the model was statistically significant, $F(6,86) = 12.46, p < .001, r^2_{adj} = .428$. Adding Time 1 GRAT scores in the second step again produced a statistically significant increase in the predictive ability of the model, $F$ change(1,85) = 5.84, $p = .018, r^2_{adj}$ increase = .030. The addition of Time 2 Satisfaction with Life, Time 2 Positive Affect and Time 2 Negative Affect in the third step also remained statistically significant, $F$ change(3,82) = 10.22, $p < .001, r^2_{adj}$ increase = .133. Finally, in the fourth step, Time 2 Psychological Well-Being significantly increased the predictive power of the model, $F$ change(1,81) = 12.94, $p = .001, r^2_{adj}$ increase = .052. Post hoc power analysis for the fourth step indicated a power of .61. Coefficients for the final step of the regression equation are reported in Table 7 (p.86). In the final model, psychological well-being scores displayed the lowest tolerance statistics (.328 for Time 1, .314 for Time 2), but these statistics did not exceed benchmarks for minimum tolerance (<.20). Similarly, VIFs were higher than other variables (3.053 for Time 1, 3.185 for Time 2) but did not
exceed the benchmark for maximum VIF (>5). These collinearity diagnostics indicate that the effects of psychological well-being in this analysis are interpretable, but caution should be exercised.

Based on these results, the null hypothesis can be rejected, and the hypothesis that psychological well-being predicts depressive symptoms independently of prior depressive symptoms, gratitude, and subjective well-being is supported. The presence of psychological well-being appeared to suppress the effects of life satisfaction and positive affect on depressive symptoms, reducing both regression coefficients to nonsignificance in the final step of the model. The values were previously significant and marginally significant, respectively (the effect of negative affect on depressive symptoms was not reduced to nonsignificance by the presence of psychological well-being). Although collinearity statistics are not low enough to indicate a problem with multicollinearity, it must be noted that psychological well-being appears to overlap somewhat with these two aspects of subjective well-being, and that results must therefore be interpreted with caution. This finding was particularly surprising considering the results of the previous analysis, where psychological well-being did not significantly predict later subjective well-being beyond previous subjective well-being.
Chapter Five

Discussion

The present longitudinal study sought to examine the relationships amongst trait gratitude, well-being, and depression to determine if increased subjective well-being mediates the relationship between trait gratitude and depression. In this chapter, the findings of this study are discussed, and limitations of the study are acknowledged. The chapter concludes with a discussion of the implications of this research and future directions for the field.

Discussion of the Results. Results indicate mixed support for the hypotheses of the present study. The study's primary hypothesis, that subjective well-being mediates the relationship between gratitude and later depression, was not supported, and a partial mediating role was only observed for the life satisfaction component of subjective well-being. Furthermore, the direct correlation between gratitude and depression remained significant and of moderate strength, even in the presence of the indirect effect of the hypothesized mediators. These results partially duplicate the results of N. M. Lambert et al. (2012), who found that life satisfaction partially mediated the relationship between gratitude and later depression. However, N. M. Lambert et al. (2012) also found that positive affect mediated the relationship between gratitude and later depression, and no such relationship was observed here. While there are many possible explanations for the discrepancy in this finding, one difference between this study and N. M. Lambert et al. (2012) is that the present study provided a more stringent test of mediation by controlling for initial positive affect, as well as other potentially relevant variables such as academic
stress. Alternatively, the study lacked sufficient power to detect a significant but very small mediation effect.

Although the study's primary hypothesis of mediation was not supported, the results still provide interesting information about the nature of the relationships between gratitude, well-being and depression. Gratitude's unique contribution to directly predicting depressive symptoms beyond subjective well-being affirms its status as a distinct construct worthy of further study. Furthermore, the mediating role of life satisfaction suggests that cognitive mechanisms such as positive reframing (N. M. Lambert et al., 2012) may play a role in the relationship between gratitude and lower psychopathology. This link also makes conceptual sense; by helping individuals appreciate the good things in life, gratitude would logically improve those individuals' satisfaction with life, and this overall sense of satisfaction could protect against depressive symptoms. However, the effect of gratitude through life satisfaction on depressive symptoms accounted for less than 0.5% of the overall variance in depressive symptoms, so this mediating effect should be interpreted conservatively despite its statistical significance. The lack of mediation observed for positive affect is also somewhat puzzling; as gratitude in large part concerns the experience of positive grateful affect, one might naturally expect positive affect to mediate relationships between gratitude and depressive symptoms, as it has in previous research (N. M. Lambert et al., 2012). Researchers should investigate alternative models for how gratitude impacts depressive symptoms. As always, additional studies are necessary to resolve discrepant findings in the literature.
This study's exploratory questions also met with results that provided mixed support for their related hypotheses. The first exploratory question dealt with potential moderators of the relationship between gratitude and later depression, and this relationship was not found to be moderated by either severity of depressive symptoms or gender. With regard to the second exploratory question, psychological well-being did predict depressive symptoms beyond subjective well-being, but it did not significantly predict later subjective well-being beyond the impact of prior subjective well-being. Both of these results provide evidence for the distinctiveness of psychological well-being. This supports the position of eudaimonic theorists such as Waterman (2008) that psychological well-being is qualitatively different from subjective well-being, and does not support the perspective of Kashdan et al. (2008) that psychological well-being merely leads to higher subjective well-being. If such a unidirectional relationship between subjective and psychological well-being is present, perhaps it requires a larger sample, longer measurement period, or a more diverse population to manifest.

Recent research suggests that another possible explanation for this finding is due to level of measurement: Chen et al. (2013) found that subjective and psychological well-being were distinct when examined at a component level, but did not diverge when examined at a higher-order construct level. The present study did not have a sample size large enough to examine these constructs on a latent level through factor analysis, and the constructs might behave differently when analyzed in this way. As such, nonsignificant findings in the present study do not necessarily refute their associated hypotheses, and future studies should endeavor to answer this question more properly through factor analysis. The most methodologically rigorous factor analyses of subjective and
psychological well-being together (Burns & Machin, 2013; Chen et al., 2013; Linley et al., 2009) do not examine the longitudinal relationship between subjective and psychological well-being, and this constitutes a gap in the literature that needs to be filled.

Limitations

This study does possess limitations which provide a caveat to the conclusions drawn. The sample obtained in this study was relatively homogenous in terms of gender and race (i.e., primarily white females). This homogeneity reduces generalizability, as does the use of a college sample. Given that women have also been observed as having a higher mean level of gratitude than men (Wood, Maltby, Stewart, & Joseph, 2008), the high ratio of women to men may represent a selection bias, as participants were able to choose this study from among a number of different studies to fulfill their course requirements. Other limitations include the time period of six weeks between measurements. A period this brief was necessary to facilitate data collection, but may not be enough time for clear mediation effects to emerge. Finally, the study’s design did not involve an experimental manipulation of gratitude which prevents causal conclusions from being drawn, although the longitudinal design allows for directional inferences in this regard.

Implications and Future Directions

Despite its limitations, the present study provides a reasonable contribution to the burgeoning literature on gratitude. The present study again supports the assertion that trait gratitude possesses a unique relationship with depressive symptoms, and shows that
this effect is not reducible to gratitude’s relationship with subjective well-being. Research on gratitude and gratitude interventions continue to expand rapidly. Researchers need to determine how gratitude impacts psychopathology, and how to effectively increase gratitude in a therapeutic context. Beyond developing new interventions, researchers should also determine whether such effects are already present in existing therapeutic interventions. Mindfulness and other third-wave behavioral therapies have much in common with positive psychology; mindfulness meditation is purported to increase compassion, kindness and gratitude, a series of claims which are just beginning to receive research support (Kashdan & Ciarrochi, 2013). In addition to their current, tentatively efficacious array of targeted gratitude interventions (Wood et al., 2010), researchers in positive psychology should investigate the impact of mindfulness and acceptance-based therapies on gratitude before adding to the already bloated therapeutic arsenal with targeted gratitude interventions.

Ultimately the results of this study, though mixed, support the further investigation of gratitude as a construct as well as interventions aimed at increasing gratitude. Throughout regression and mediation analyses, gratitude evidenced a moderately sized, direct relationship with depressive symptoms that remained significant in the presence of other strong positive and negative predictors of depression. The impact of gratitude on symptoms of depression is more than can be accounted for by the mere presence of general positive affect, life satisfaction, or the absence of negative affect. Developing a basic scientific knowledge of gratitude and other positive characteristics has the potential to explain more variance in models of disorder than more traditional, purely symptom-focused conceptualizations. For example, gratitude's effect on
depressive symptoms could be due to unique schematic biases (Wood, Maltby, Stewart, Linley, et al., 2008), or the result of increased relationship quality (Algoe et al., 2013; Gordon et al., 2012). Regardless, interventions that improve or specifically target gratitude could increase the potency of treatments which are already quite efficacious in the reduction of symptoms of depression and other disorders. A fast-growing literature base demonstrates that gratitude is an underappreciated trait with powerful potential for the alleviation of suffering and the treatment of disorder. This study provides support for this position by demonstrating the unique protective effects of gratitude on depressive symptoms in a general college student sample.


66


68


## Appendix A

### Data Analysis Tables

Table 1. Internal Validity Coefficients (\(N = 93\))

<table>
<thead>
<tr>
<th>Scale</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GQ-6</td>
<td>(\alpha = .79)</td>
<td>(\alpha = .86)</td>
</tr>
<tr>
<td>GRAT</td>
<td>(\alpha = .89)</td>
<td>(\alpha = .87)</td>
</tr>
<tr>
<td>SWLS</td>
<td>(\alpha = .86)</td>
<td>(\alpha = .91)</td>
</tr>
<tr>
<td>PANAS-Positive</td>
<td>(\alpha = .84)</td>
<td>(\alpha = .84)</td>
</tr>
<tr>
<td>PANAS-Negative</td>
<td>(\alpha = .84)</td>
<td>(\alpha = .83)</td>
</tr>
<tr>
<td>SPWB</td>
<td>(\alpha = .88)</td>
<td>(\alpha = .88)</td>
</tr>
<tr>
<td>CES-D</td>
<td>(\alpha = .90)</td>
<td>(\alpha = .89)</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>(\alpha = .66)</td>
<td>(\alpha = .67)</td>
</tr>
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</table>
Table 2. Descriptive Statistics ($N = 93$)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1</th>
<th></th>
<th>Measure</th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>GQ-6</td>
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<td>4.97</td>
<td>GQ-6</td>
<td>35.37</td>
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<tr>
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<td>12.28</td>
<td>GRAT</td>
<td>87.59</td>
<td>14.10</td>
</tr>
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<td>SWLS</td>
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<td>5.29</td>
<td>SWLS</td>
<td>24.73</td>
<td>6.04</td>
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<tr>
<td>PANAS-P</td>
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<td>4.04</td>
<td>PANAS-P</td>
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<td>4.30</td>
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<tr>
<td>PANAS-N</td>
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<td>4.48</td>
<td>PANAS-N</td>
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<td>4.18</td>
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<tr>
<td>SPWB</td>
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<td>13.43</td>
<td>SPWB</td>
<td>94.08</td>
<td>14.22</td>
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<tr>
<td>CES-D</td>
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<td>10.06</td>
<td>CES-D</td>
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<td>9.54</td>
</tr>
<tr>
<td>Academic Stress</td>
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<td>2.58</td>
<td>Academic Stress</td>
<td>11.44</td>
<td>2.64</td>
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</tbody>
</table>
Table 3.1 Correlation Matrix, Time 1 Variables with all other variables ($N = 93$)

<table>
<thead>
<tr>
<th></th>
<th>T1 GQ-6</th>
<th>T1 GRAT</th>
<th>T1 SWLS</th>
<th>T1 PANAS_P</th>
<th>T1 PANAS_N</th>
<th>T1 SPWB</th>
<th>T1 CES-D</th>
<th>T1 Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 GQ-6</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 GRAT</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 SWLS</td>
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<td>.51**</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 PANAS_P</td>
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<td>.35**</td>
<td>.57**</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1 PANAS_N</td>
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<td>-.23*</td>
<td>-.32**</td>
<td>-.16</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>.69**</td>
<td>.57**</td>
<td>.41**</td>
<td>-.43**</td>
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<td></td>
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<tr>
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<td>-.48**</td>
<td>-.43**</td>
<td>.68**</td>
<td>-.51**</td>
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<td>-.31**</td>
<td>-.39**</td>
<td>-.32**</td>
<td>.41**</td>
<td>-.40**</td>
<td>.50**</td>
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</tr>
<tr>
<td>T2 GQ-6</td>
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<td>.53**</td>
<td>.48**</td>
<td>.36**</td>
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<td>.51**</td>
<td>-.28**</td>
<td>-.18</td>
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<tr>
<td>T2 GRAT</td>
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<td>.70**</td>
<td>.52**</td>
<td>.32**</td>
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<td>.55**</td>
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<td>-.25*</td>
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<td>T2 SWLS</td>
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<td>.53**</td>
<td>.66**</td>
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<td>-.34**</td>
<td>.53**</td>
<td>-.41**</td>
<td>-.25*</td>
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<tr>
<td>T2 PANAS_P</td>
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<td>.28**</td>
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<td>.52**</td>
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<td>.38**</td>
<td>-.30**</td>
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<td>.59**</td>
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<td>.33</td>
<td>.30**</td>
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<td>T2 SPWB</td>
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<td>.52**</td>
<td>.49**</td>
<td>.37**</td>
<td>-.30**</td>
<td>.65**</td>
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<td>-.32**</td>
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<td>T2 CES-D</td>
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<td>-.51**</td>
<td>.47**</td>
<td>.44**</td>
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<td>-.31**</td>
<td>-.12</td>
<td>-.08</td>
<td>.23*</td>
<td>-.35**</td>
<td>.28**</td>
<td>.48**</td>
</tr>
</tbody>
</table>

** = $p < .01$, * = $p < .05$
Table 3.2 Correlation Matrix, Time 2 Variables with other Time 2 Variables (N = 93)

<table>
<thead>
<tr>
<th></th>
<th>T2 GQ-6</th>
<th>T2 GRAT</th>
<th>T2 SWLS</th>
<th>T2 PANAS_P</th>
<th>T2 PANAS_N</th>
<th>T2 SPWB</th>
<th>T2 CES-D</th>
<th>T2 Stress</th>
</tr>
</thead>
<tbody>
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<td>T2 GQ-6</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>T2 GRAT</td>
<td>.83**</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2 SWLS</td>
<td>.65**</td>
<td>.74**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2 PANAS_P</td>
<td>.47**</td>
<td>.49**</td>
<td>.51**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2 PANAS_N</td>
<td>-.07</td>
<td>-.21*</td>
<td>-.30**</td>
<td>-.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2 SPWB</td>
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<td>.80**</td>
<td>.70**</td>
<td>.59**</td>
<td>-.29**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2 CES-D</td>
<td>-</td>
<td>-</td>
<td>-.56**</td>
<td>-.55**</td>
<td>-.36**</td>
<td>.58**</td>
<td>-.68*</td>
<td>1</td>
</tr>
<tr>
<td>T2 Stress</td>
<td>-.27*</td>
<td>-.37**</td>
<td>-.30**</td>
<td>-.36**</td>
<td>-.38**</td>
<td>-.50**</td>
<td>.53**</td>
<td>1</td>
</tr>
</tbody>
</table>

** = p < .01, * = p < .05
Table 4. Standardized regression coefficients for prediction of Time 2 Depressive Symptoms after entry of all predictors ($N = 93$)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Beta weight</th>
<th>Standard error</th>
<th>t-score</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Time 1 CES-D</td>
<td>$\beta = .297$</td>
<td>SE = .106</td>
<td>$t = 2.81$</td>
<td>$p = .006$</td>
</tr>
<tr>
<td></td>
<td>Time 1 SWLS</td>
<td>$\beta = .144$</td>
<td>SE = .105</td>
<td>$t = 1.38$</td>
<td>$p = .172$</td>
</tr>
<tr>
<td></td>
<td>Time 1 PANAS-P</td>
<td>$\beta = .173$</td>
<td>SE = .094</td>
<td>$t = 1.85$</td>
<td>$p = .068$</td>
</tr>
<tr>
<td></td>
<td>Time 1 PANAS-N</td>
<td>$\beta = -.082$</td>
<td>SE = .109</td>
<td>$t = .75$</td>
<td>$p = .457$</td>
</tr>
<tr>
<td></td>
<td>Time 2 Academic Stress</td>
<td>$\beta = .153$</td>
<td>SE = .082</td>
<td>$t = 1.87$</td>
<td>$p = .065$</td>
</tr>
<tr>
<td>2</td>
<td>Time 1 GRAT</td>
<td>$\beta = -.244$</td>
<td>SE = .084</td>
<td>$t = -2.91$</td>
<td>$p = .005$</td>
</tr>
<tr>
<td>3</td>
<td>Time 2 SWLS</td>
<td>$\beta = -.253$</td>
<td>SE = .103</td>
<td>$t = -2.46$</td>
<td>$p = .016$</td>
</tr>
<tr>
<td></td>
<td>Time 2 PANAS-P</td>
<td>$\beta = -.166$</td>
<td>SE = .090</td>
<td>$t = -1.84$</td>
<td>$p = .070$</td>
</tr>
<tr>
<td></td>
<td>Time 2 PANAS-N</td>
<td>$\beta = .351$</td>
<td>SE = .091</td>
<td>$t = 3.86$</td>
<td>$p &lt; .001$</td>
</tr>
</tbody>
</table>
Table 5. Results of Mediation Analysis, with Confidence Intervals (N = 93)

<table>
<thead>
<tr>
<th>Direct Effect of Time 1 Gratitude on Time 2 Depressive Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Effect</td>
</tr>
<tr>
<td>$r = -.244^{**}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indirect Effect of Time 1 Gratitude on Time 2 Depressive Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect</td>
</tr>
<tr>
<td>Time 2 Subjective Well-Being</td>
</tr>
<tr>
<td>Time 2 Satisfaction with Life**</td>
</tr>
<tr>
<td>Time 2 Positive Affect</td>
</tr>
<tr>
<td>Time 2 Negative Affect</td>
</tr>
</tbody>
</table>

* Indicates this statistic was bootstrapped with 1000 samples.
** indicates the confidence interval for this effect does not pass through zero, and is therefore statistically significant.
Table 6. Standardized regression coefficients for the prediction of individual components of Time 2 Subjective Well-Being, after entry of all predictors (N = 93)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Beta weight</th>
<th>Standard error</th>
<th>t-score</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
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<td><strong>DV: Time 2 Satisfaction with Life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>T1 SWL</td>
<td>β = .512</td>
<td>SE = .106</td>
<td>t = 4.81</td>
<td>p &lt; .001</td>
</tr>
<tr>
<td></td>
<td>T1 Positive Affect</td>
<td>β = .013</td>
<td>SE = .095</td>
<td>t = .14</td>
<td>p = .889</td>
</tr>
<tr>
<td></td>
<td>T1 Negative Affect</td>
<td>β = -.093</td>
<td>SE = .087</td>
<td>t = -1.08</td>
<td>p = .283</td>
</tr>
<tr>
<td>2</td>
<td>T2 Psychological WB</td>
<td>β = .188</td>
<td>SE = .100</td>
<td>t = 1.88</td>
<td>p = .064</td>
</tr>
<tr>
<td></td>
<td><strong>DV: Time 2 Positive Affect</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>T1 SWL</td>
<td>β = .060</td>
<td>SE = .122</td>
<td>t = .50</td>
<td>p = .62</td>
</tr>
<tr>
<td></td>
<td>T1 Positive Affect</td>
<td>β = .408</td>
<td>SE = .109</td>
<td>t = 3.74</td>
<td>p &lt; .001</td>
</tr>
<tr>
<td></td>
<td>T1 Negative Affect</td>
<td>β = .013</td>
<td>SE = .099</td>
<td>t = .13</td>
<td>p = .89</td>
</tr>
<tr>
<td>2</td>
<td>T2 Psychological WB</td>
<td>β = .189</td>
<td>SE = .115</td>
<td>t = 1.65</td>
<td>p = .10</td>
</tr>
<tr>
<td></td>
<td><strong>DV: Time 2 Negative Affect</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>T1 SWL</td>
<td>β = .091</td>
<td>SE = .115</td>
<td>t = .79</td>
<td>p = .43</td>
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<tr>
<td></td>
<td>T1 Positive Affect</td>
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<td>p &lt; .001</td>
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<td>SE = .108</td>
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Table 7. Standardized regression coefficients for prediction of Time 2 Depressive Symptoms after entry of all predictors, including Psychological Well-Being \((N = ?)\)

<table>
<thead>
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<th>Variable</th>
<th>Beta weight</th>
<th>Standard error</th>
<th>t-score</th>
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Appendix B

GQ-6: The Gratitude Questionnaire-Six Item Form

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = neutral 5 = slightly agree 6 = agree 7 = strongly agree

____1. I have so much in life to be thankful for.

____2. If I had to list everything that I felt grateful for, it would be a very long list.

____3. When I look at the world, I don’t see much to be grateful for.*

____4. I am grateful to a wide variety of people.

____5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history.

____6. Long amounts of time can go by before I feel grateful to something or someone.*

* Items 3 and 6 are reverse-scored.
Appendix C

GRAT: The Gratitude, Resentment and Appreciation Test Short-Form

OPINION QUESTIONNAIRE

Please provide your honest feelings and beliefs about the following statements which relate to you. There are no right or wrong answers to these statements. We would like to know how much you feel these statements are true or not true of you. Please try to indicate your true feelings and beliefs, as opposed to what you would like to believe. Respond to the following statements by circling the number that best represents your real feelings. Please use the scale provided below, and please choose one number for each statement (i.e. don't circle the space between two numbers), and record your choice in the blank preceding each statement.

1 2 3 4 5 6 7 8 9
I strongly agree I disagree I feel neutral I agree I strongly agree
somewhat about the statement somewhat agree

_____ 1. I couldn't have gotten where I am today without the help of many people.
_____ 2. Life has been good to me.
_____ 3. * There never seems to be enough to go around and I never seem to get my share.
_____ 4. Oftentimes I have been overwhelmed at the beauty of nature.
_____ 5. Although I think it's important to feel good about your accomplishments, I think that it's also important to remember how others have contributed to my accomplishments.
_____ 6. * I really don't think that I've gotten all the good things that I deserve in life.
_____ 7. Every fall I really enjoy watching the leaves change colors.
Although I'm basically in control of my life, I can't help but think about all those who have supported me and helped me along the way.

I think that it's important to "Stop and smell the roses."

* More bad things have happened to me in my life than I deserve.

* Because of what I've gone through in my life, I really feel like the world owes me something.

I think that it's important to pause often to "count my blessings."

I think it's important to enjoy the simple things in life.

I feel deeply appreciative for the things others have done for me in my life

* For some reason I don’t seem to get the advantages that others get.

I think it's important to appreciate each day that you are alive.

* These items are reverse scored.
Appendix D

SWLS: The Satisfaction with Life Scale

DIRECTIONS: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree or Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

______1. In most ways my life is close to my ideal.

______2. The conditions of my life are excellent.

______3. I am satisfied with life.

______4. So far I have gotten the important things I want in life.

______5. If I could live my life over, I would change almost nothing.
Appendix E

PANAS: The Positive and Negative Affect Schedule Short-Form

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past week. Use the following scale to record your answers.

1 = very slightly or not at all
2 = a little
3 = moderately
4 = quite a bit
5 = extremely

___ inspired       ___ afraid
___ upset         ___ alert
___ excited       ___ nervous
___ scared        ___ enthusiastic
___ determined    ___ distressed
Appendix F

SPWB: Scales of Psychological Well-Being

1  2  3  4  5  6
strongly moderately slightly slightly moderately strongly
disagree  disagree  disagree agree  agree  agree

1.* I tend to be influenced by people with strong opinions.
2. In general, I feel I am in charge of the situation in which I live.
3. I think it is important to have new experiences that challenge how you think about yourself and the world.
4.* Maintaining close relationships has been difficult and frustrating for me.
5.* I live life one day at a time and don’t really think about the future.
6. When I look at the story of my life, I am pleased with how things have turned out.
7. I have confidence in my opinions, even if they are contrary to the general consensus.
8.* The demands of everyday life often get me down.
9. For me, life has been a continuous process of learning, changing and growth.
10. People would describe me as a giving person, willing to share my time with others.
11. Some people wander aimlessly through life, but I am not one of them.
12. I like most aspects of my personality.
13. I judge myself by what I think is important, not by the values of what others think is important.
14. I am quite good at managing the many responsibilities of my daily life.
15.* I gave up trying to make big improvements or changes in my life a long time ago.
16.* I have not experienced many warm and trusting relationships with others.
17.* I sometimes feel as if I’ve done all there is to do in life.
18. *In many ways, I feel disappointed about my achievements in life.

*These items are reverse-scored so that higher scores correspond to greater psychological well-being.
Appendix G

CES-D: Center for Epidemiological Studies Depression Scale

1. I was bothered by things that usually don’t bother me. 0 1 2 3
2. I did not feel like eating; my appetite was poor. 0 1 2 3
3. I felt that I could not shake off the blues even with help from my family or friends. 0 1 2 3
4. * I felt that I was just as good as other people. 0 1 2 3
5. I had trouble keeping my mind on what I was doing. 0 1 2 3
6. I felt depressed. 0 1 2 3
7. I felt that everything I did was an effort. 0 1 2 3
8. * I felt hopeful about the future. 0 1 2 3
9. I thought my life had been a failure. 0 1 2 3
10. I felt fearful. 0 1 2 3
11. My sleep was restless. 0 1 2 3
12. * I was happy. 0 1 2 3
13. I talked less than usual. 0 1 2 3
14. I felt lonely. 0 1 2 3
15. People were unfriendly. 0 1 2 3
16. * I enjoyed life. 0 1 2 3
17. I had crying spells. 0 1 2 3
18. I felt sad. 0 1 2 3
19. I felt that people dislike me. 0 1 2 3
20. I could not get “going.” 0 1 2 3

* These items are reverse scored.
Appendix H

Academic Stress Measure

0 = never

1 = almost never

2 = sometimes

3 = fairly often

4 = very often

1. In the last week, how often have you felt upset because of something that happened unexpectedly with your schoolwork?

2. In the last week, how often have you felt nervous and stressed as a result of school?

3. * In the last week, how often have you confident about your ability to handle your schoolwork?

4. * In the last week, how often have you felt that things at school were going your way?

* These items are reverse scored.