Gratitude and Well-being: Replication and Extension of the Benefits of a Gratitude Exercise and Investigation of Potential Moderators and Mediators

DISSERTATION

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By

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Abstract

BACKGROUND: The link between trait gratitude and adaptive functioning has led to an interest in the development and investigation of interventions for therapeutically enhancing gratitude. The most commonly studied gratitude exercises include writing letters of gratitude, grateful contemplation, and gratitude lists. Research has shown that these exercises are at least somewhat effective for enhancing well-being. However, much about these exercises remains unknown. For example, more research is needed to establish for whom and under what conditions gratitude exercises are most effective as well as the mechanisms by which they have their effects. To address these gaps in the current literature, the present study investigated two potential moderators of a gratitude list exercise, trait gratitude and depressive symptoms; the role of conscious knowledge of the purpose of the exercise (i.e., a rationale); and several personal resources and maladaptive cognitive behavioral patterns as potential mediators of the effect of the gratitude list exercise on indices of well-being.

METHODS: Participants were 164 undergraduates (mean age 19.53, 69.6% female, 81.6% Caucasian) selected based on a prescreening measure of depressive symptoms to ensure adequate representation of participants from across the full range of depressive symptoms. Participants were randomly assigned to one of three conditions, each of which completed 14 days of list making. Specifically, the control condition involved making a list each evening of events that occurred during the day; the Gratitude
without Rationale and Gratitude + Rationale conditions both involved making daily lists of things for which they felt grateful, but participants in the Gratitude + Rationale condition received an explanation of the purpose of the exercise whereas those in the Gratitude without Rationale condition did not. Baseline and follow up self-report measures were collected before and after the 14 days of list making, respectively.

RESULTS: Compared to the control condition, the gratitude exercise was associated with increased happiness and decreased depressive symptoms among participants who were low in baseline trait gratitude. Similarly, the gratitude exercise was associated with decreased depressive symptoms amongst participants who had very high baseline symptoms. Further examination of these results revealed that the gratitude exercise eliminated the relation between baseline trait gratitude and later happiness. Similarly, the gratitude exercise eliminated the relation between baseline trait gratitude and later depressive symptoms and attenuated the relation between baseline depressive symptoms and later symptoms, though the effect of the exercise on happiness appeared to be more robust than its effect on depressive symptoms. There was some evidence that including the rationale may have boosted the effect of the exercise on happiness for individuals low in trait gratitude, but this difference achieved only a trend level of significance. Contrary to expectation, the gratitude exercise did not impact experience of positive or negative emotions and none of the personal resources or maladaptive cognitive and behavioral patterns significantly mediated the relation between the gratitude exercise and happiness or depressive symptoms regardless of baseline level of trait gratitude or depressive symptoms.
CONCLUSIONS: This study provides evidence that gratitude exercises may be most effective for individuals who are low in trait gratitude or high in depressive symptoms. In addition to highlighting the need to consider moderators of the effects of gratitude exercises, these findings help to explain previous inconsistencies in the literature. The present study also supports the hypothesis that gratitude exercises may be useful for reducing depressive symptoms, though more research is needed before firm conclusions can be drawn. Similarly, there was some suggestive evidence that including a rationale may enhance the effect of gratitude exercises on happiness, but more research in samples where more robust effects are found is needed. Given that the exercise did not impact positive or negative emotions and that there was no evidence of mediation, the mechanisms by which the gratitude exercise had its effect remain unclear. Other future directions for research are discussed.
Dedication

This project is dedicated to my parents, Neal and Kandee Lipke, and to my
husband, Brent Harbaugh. To my father: You taught me how to persevere in continuing
towards my goals even when I do not feel like it. I am deeply thankful for this ability,
especially while working on this project. Your unconditional acceptance of me just as I
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viii
## Table of Contents

Abstract .................................................................................................................. ii

Dedication ............................................................................................................... v

Acknowledgements ............................................................................................... vi

Vita ........................................................................................................................ vii

List of Tables ........................................................................................................ xi

List of Figures ....................................................................................................... xii

Chapter 1: Introduction ......................................................................................... 1
  Gratitude and Well-Being ................................................................................... 3
  Gratitude Interventions ...................................................................................... 5
  Who Benefits Most From Gratitude Interventions? ........................................... 13
  Mediators of Gratitude List Exercises .............................................................. 20

Chapter 2: The Present Study ............................................................................. 32
  Hypotheses .......................................................................................................... 32
  Method .................................................................................................................. 33
  Participants .......................................................................................................... 33
  Measures .............................................................................................................. 34
  Procedure ............................................................................................................ 38
  Data Analytic Strategy ....................................................................................... 40

Chapter 3: Results .............................................................................................. 44
Preliminary Analyses..........................................................................................44
Did the conditions differ on happiness or depressive symptoms, or change in positive and negative emotions? .................................................................46
Did trait gratitude or baseline depressive symptoms moderate the effect of the gratitude exercise on happiness, depressive symptoms, or change in positive and negative emotions? ...............................................................47
Was the effect of the gratitude exercise mediated by changes in personal resources and/or maladaptive cognitive and behavioral patterns?..............................51
Chapter 4: Discussion........................................................................................54
Effect of the Gratitude Exercise on Happiness.................................................55
Effect of the Gratitude Exercise on Depressive Symptoms..............................58
Mechanism of Action.......................................................................................64
Strengths and Limitations...............................................................................67
Future Directions..............................................................................................69
Summary and Conclusions...............................................................................72
References.......................................................................................................74
Appendix A: Tables..........................................................................................87
Appendix B: Figures..........................................................................................92
List of Tables

Table 1. Descriptive statistics by condition for T1 and T2………………………..88
Table 2. Correlations for all measures…………………………………………………89
Table 3. Descriptive statistics by condition for slopes of positive and negative emotions………………………………………………………………………………..90
Table 4. T1 GQ-6 and Condition regression model predicting T2 CESD…………….90
Table 5. T1 GQ-6 and Condition regression model predicting T2 SHS………………91
Table 6. T1 CESD and Condition regression model predicting T2 CESD………………91
List of Figures

Figure 1. Daily average emotion ratings on the ADES across the 14 days of list making:
A negative emotions, B positive emotions.................................................................93

Figure 2. Condition by T1GQ-6 interaction predicting T2 CESD scores...............94

Figure 3. Condition by T1GQ-6 interaction predicting T2 SHS scores....................95

Figure 4. Condition by T1CESD interaction predicting T2 CESD scores...............96

Figure 5. Schematic representation of PROCESS Model 8 (i.e., moderated mediation
model).........................................................................................................................97
Chapter 1: Introduction

Most research aimed at improving people’s lives deals with reducing that which is maladaptive or problematic (e.g., research that aims to understand and fix disorder). However, recent work highlights the critical role of adaptive functioning in understanding most, if not all, aspects of human psychological and social functioning (e.g., see Seligman, Steen, Park, & Peterson, 2005; Wood, Froh, & Geraghty, 2010). Indeed, as the positive psychology movement (e.g., see Seligman & Csikszentmihalyi, 2000) has gained momentum, a growing number of researchers are coming to realize the value of balancing research on maladaptive constructs (e.g., neuroticism) and disorder with research on adaptive constructs (e.g., optimism) and positive functioning (e.g., see Seligman et al., 2005). One such adaptive construct that has received recent empirical and theoretical attention is gratitude.

Gratitude has been conceptualized in a number of ways. For example, it has been described as an emotion, an attitude, a moral virtue, a habit, a personality trait, and a coping response (Emmons & McCullough, 2003). As an emotion, gratitude is described as moderately pleasant and activating (Emmons & McCullough, 2003) and is rated as highly similar to joy and contentment and highly dissimilar to contempt, hate, and jealousy (Schimmack & Reisenzein, 1997). Perhaps most commonly, gratitude is thought of specifically within the context of receiving aid from another person or organization which is perceived as costly, valuable, and altruistic (Wood, Maltby, Stewart, Linley, &
Joseph, 2008). That is, one can feel gratitude towards someone for help that is given. However, as pointed out in a recent review of the literature on gratitude (Wood et al., 2010), this strictly interpersonal conceptualization seems quite narrow when considering all of the things for which people report feeling grateful. For example, when participants in a study by Emmons and McCullough (2003) kept daily gratitude lists, many participants reported feeling grateful for non-aid related things such as “waking up in the morning” and “the Rolling Stones.” Thus, gratitude is likely something more than appreciation of aid. Consistent with this, Wood et al. (2010) discuss gratitude as part of a wider life orientation involving the tendency to notice and appreciate the positive in the world. These authors distinguish gratitude from optimism, which is an orientation towards expecting positive future outcomes (Carver, Scheier, & Segerstrom, 2010) and hope, which is a tendency to see the pathways through which such positive future outcomes may come to fruition (Geraghty, Wood, & Hyland, 2010a). Based on these comparisons, gratitude seems to involve present moment appreciation of the positive aspects of events, states of being, and characteristics of the self and one’s physical and social world.

As reviewed by Wood et al. (2010), this broader life orientation conceptualization of gratitude is supported by factor analytic work on several measures of diverse aspects of gratitude (i.e., individual differences in experience of grateful affect, behaviors to express gratitude, appreciation rising from understanding that life is short, positive social comparisons, appreciation of other people, focus on what a person has, focus on the positive in the present moment, feelings of awe when encountering beauty), which shows that these diverse aspects are indicators of a single higher order gratitude factor (Wood,
Maltby, Stewart, & Joseph, 2008). It is gratitude in this broader sense that is thought of as a personality trait. That is, individual differences in dispositional gratitude reflect differences in the frequency and intensity with which people experience these indicators of the higher order gratitude factor and also differences in the range of events that elicit these indicators (Wood, Maltby, Gillett, Linley, & Joseph, 2008).

**Gratitude and Well-being**

Wood et al. (2010) point out that in addition to accounting for the diversity of things for which people feel grateful (e.g., feeling grateful toward non-social sources such as feeling grateful for nice weather; Emmons & McCullough, 2003), the life orientation conceptualization of gratitude also facilitates understanding of the link between gratitude and other psychological variables, specifically, well-being. That is, gratitude is positively related to well-being and if gratitude were merely a feeling of thankfulness towards others, this relation would not make logical sense. Specifically, depression-related psychopathology (which can be conceptualized as low well-being) tends to be characterized by attribution of personal success and positive life circumstances to outside sources (i.e., external attributions, Abramson, Seligman, & Teasdale, 1978). Thus, if gratitude were only about focusing on what others do for you, it would seem that gratitude should be negatively correlated with well-being. McCullough, Emmons, and Tsang (2002) also point out this logical inconsistency and Wood et al.’s (2010) life orientation conceptualization of gratitude nicely resolves it.

It is easy to imagine how having a life orientation towards noticing and appreciating the positives in the world would be positively related to well-being as well as other indices of adaptive functioning and an extensive body of research provides
empirical support for this intuitive link (see Wood et al., 2010). For example, research on
the relation between gratitude and Big Five personality traits, which provide an
integrative map of personality functioning (Watson, Clark, & Harkness, 1994), shows
that individuals who score higher on measures of gratitude also tend to score higher on
measures of extraversion (e.g., positive emotionality, gregariousness), agreeableness
(e.g., empathetic, considerate), openness to experience (e.g., imaginative, curious), and
conscientiousness (e.g., carefulness, organization) and lower on measures of neuroticism
(e.g., negative emotionality, emotional instability; McCullough et al., 2002). Further,
gratitude relates to indices of positive emotional functioning (e.g., higher emotional
warmth, trust, altruism, tender-mindedness), lower dysfunction (e.g., lower anger and
depression, higher openness to feelings and ideas), and positive social relationships
(Wood, Joseph, & Maltby, 2008; 2009). Wood et al. (2010) review twenty studies that
demonstrate relations between gratitude and a myriad of indices of well-being such as life
satisfaction, environmental mastery, purpose in life (Wood et al., 2009), positive affect
(e.g., Froh, Kashdan, Ozminkowski, & Miller, 2009; Emmons & McCullough, 2003),
depression (negatively related to gratitude; e.g., Fredrickson, Tugade, Waugh, & Larkin,
2003; McCullough, Tsang, & Emmons, 2004), and negative affect (negatively related to
graditude; e.g., Emmons & McCullough, 2003; Sheldon & Lyubomirsky, 2006).

Cross-sectional findings on the relations between gratitude and indices of well-
being are bolstered by longitudinal studies showing that gratitude indeed precedes well-
being. For example, in two longitudinal studies Wood, Maltby, Gillett, et al. (2008)
followed first year undergraduate university students across their first semester of college
and results from both studies showed that, controlling for baseline measures, gratitude at
the beginning of the semester predicted enhanced well-being (i.e., reduced stress and depressive symptoms and increased perceived social support) 3 months later.

**Gratitude Interventions**

The clear and consistent relation between gratitude and positive psychological functioning has led researchers to design and investigate methods for therapeutically enhancing gratitude. As pointed out by Wood et al. (2010) gratitude based interventions have been pointed to as a key success of the positive psychology movement (e.g., Seligman et al., 2005). Indeed, experimental research on gratitude enhancing exercises further supports the notion that gratitude causes well-being and mounting evidence suggests that gratitude exercises may be beneficial in a range of ways (see Wood et al., 2010 for review). The most commonly used exercises are the gratitude list exercise, which involves having participants make lists of things for which they are grateful on a regular basis, and the gratitude letter exercise, which involves having participants write a letter of thanks to someone who had not been properly thanked in the past. Some studies have also used grateful contemplation, which involves thinking about things for which one feels grateful at regular intervals or making a single gratitude list and observing immediate effects.

At present, seven studies examining the effects of gratitude letter exercises have been published. In general, four of these studies yielded positive results (e.g., increased happiness/life satisfaction compared to control conditions; Seligman et al., 2005; Froh et al., 2009, Watkins, Woodward, Stone, & Kolts, 2003; Toepfer, Cichy, & Peters, 2012; Boehm, Lyubomirksy, & Sheldon, 2011), one yielded null results (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011), and one yielded negative results (i.e., decreased
well-being compared to baseline and compared to a control condition; Sin, Della Porta, & Lyubomirsky, 2011). There may be several possible explanations for these inconsistencies, one of which hinges on the fact that gratitude letter exercises can have either one or two parts. That is, some gratitude letter conditions have participants write the letter, but not deliver it whereas others have participants both write and deliver the letter. The gratitude letter conditions in Seligman et al. (2005) and Froh et al. (2009) involved the participants actually delivering the letters, the letters were mailed to the recipients by the researchers in Toepfer et al.’s (2012) study, and participants in Watkins et al.’s (2003) study expected to have their letters mailed to the recipient by the researchers. In contrast, participants in the studies with null and negative results (Lyubomirsky et al. 2011; Sin et al., 2011) did not deliver the letters themselves nor did they expect the researchers to mail the letters. The Boehm et al. (2011) study is the exception in that it did not involve delivery of the letters and yet found positive results. Thus, perhaps delivering the letter, or least expecting it to be delivered, is important for enhancing well-being with gratitude letter conditions.

There are three published studies to date that examine grateful contemplation exercises. Watkins et al. (2003) randomly assigned undergraduates to spend 5 minutes thinking about things they did over the summer for which they felt grateful or 5 minutes thinking about things that they wanted to do over summer, but did not do. Results showed that participants in the grateful thinking condition experienced more positive affect both compared to baseline and compared to participants in the other condition. Sheldon and Lyubomirksy (2006) conducted a 4-week study in which undergraduates were randomly assigned to write about the details of their life or about all of the things for which they
had to be grateful. Participants in both groups were then instructed to mentally repeat these exercises (i.e., think about the things for which you are grateful) over the next 4 weeks. At the end of the 4 weeks, participants reported that they had repeated the exercise an average of 3 times. Results indicated that participants in the gratitude condition experienced non-significant decreases in negative affect and non-significant increases in positive affect across the 4 weeks compared to participants in the details of life condition. However, participants in the gratitude condition did report significantly increased positive affect immediately after completing the initial writing exercise compared to baseline.

Rash, Matsuba, and Prkachin (2011) examined the effect of a grateful contemplation exercise compared to contemplating memorable life events over 4-weeks in a sample of community participants. Participants in the grateful contemplation condition were instructed to think about things in the past week for which they felt grateful and to try to experience and sustain the feelings of gratitude associated with those things for 5 minutes. Participants in the memorable life events condition were instructed to think about events that happened in the past week and to try to experience and sustain the feelings associated with those events. Participants in both conditions were asked to repeat the exercise 2 times per week for 4 weeks (i.e., 8 times) and to record in a logbook the things about which they thought immediately following each repetition of the exercise. Examination of the logbooks indicated that 93.6% of participants completed the exercise 8 times during the 4 weeks. Results revealed that participants in the gratitude condition reported greater improvements in life-satisfaction and self-esteem, but there were no group differences in change in positive or negative emotions. It is possible that
differences in the sample characteristics (i.e., college versus community), exercise instructions (i.e., whether or not the instructions included a prompt to dwell upon feelings of gratitude), or frequency with which the grateful contemplation exercise was completed (i.e., an average of 3 versus 8 times) could account for the discrepancy between these results and those of Sheldon and Luybomirksy’s (2006) study. Thus, it seems reasonable to conclude that grateful contemplation may be useful as an immediate positive emotion induction, but conclusions about its ability to enhance well-being over longer periods of time await future research.

Studies using gratitude list exercises have yielded somewhat more consistent results. The first studies involving a gratitude list exercise for enhancing well-being were conducted by Emmons and McCullough (2003). Notable findings include, first, that undergraduates randomly assigned to make weekly gratitude lists for 10 weeks reported increases in overall life satisfaction, hours spent exercising, and expected life satisfaction in the upcoming week compared to participants randomly assigned to make weekly 5-item hassles list (i.e., to list up to 5 things that irritated you during the week) or weekly 5-item lists of impactful life events (i.e., list up to 5 events that impacted you during the past week) for 10 weeks. Compared to both control conditions, results showed decreases in negative affect and increases in positive affect for participants in the gratitude list condition that approached, but did not achieve, statistical significance. In their second study, Emmons and McCullough increased the frequency of the lists hypothesizing that more frequent list making might have a larger impact on affect. Indeed, results showed that undergraduates who were randomly assigned to complete daily gratitude lists for 2 weeks reported experiencing more positive affect at the end of those 2 weeks compared
to undergraduates randomly assigned to make 5-item daily hassles lists. However, neither the hassles nor the gratitude condition differed from a downward social comparisons condition (i.e., list the ways that you are better off than others) on positive affect. There were no group differences in negative affect. In their third study, Emmons and McCullough demonstrated that, among adults with neuromuscular disorders, completing daily gratitude lists for 3 weeks was associated with higher well-being as indexed by higher positive affect, lower negative affect, higher life satisfaction, more optimism about the upcoming week, and feeling more connected with others compared to participating in an assessment-only control condition (i.e., participants in this condition only completed measures of well-being and affect each day). Further, at the end of the study, participants in the gratitude condition were rated by spouses or significant others as higher in positive affect and life satisfaction than were participants in the control condition.

Seligman et al. (2005) compared listing three good things that happened each day for one week (conceptualized by Wood et al. 2010 as a gratitude list) to writing about childhood memories each day for one week in a sample of middle-aged adults who volunteered for an online self-help study. Results showed that, compared to baseline and compared to the writing about early childhood memories condition, the three good things condition was associated with decreased depressive symptoms at the end of the 1 week of exercises and at 1 month follow up. The three good things conditions was also associated with increased happiness compared to baseline and compared to the control condition at 1 month follow up, though this difference was not seen immediately following the 1 week of exercises. Impressively, group differences on both depressive symptoms and happiness were maintained at 6-month follow up. Similarly, Sergeant and Mongrain (2011)
demonstrated that, compared to writing about childhood memories, a 1-week gratitude list exercise was associated with improvements in happiness measured over the course of 6 months in a sample of community adults, though the exercise did not impact depressive symptoms and only improved happiness in participants who reported being high in self-criticism.

Chan (2011) used a “good things” exercise similar to the one utilized by Seligman et al. (2005) with a sample of Chinese schoolteachers. Specifically, at the end of each week for 8 consecutive weeks, participants were instructed to list three good things that had happened during the week and to contemplate the meaning of those events and the feelings of gratitude that they inspired. No control or comparison group was used. Results indicated that, compared to baseline, participants experienced increases in life satisfaction and sense of accomplishment as well as decreases in emotional exhaustion.

Finally, similar results have been obtained in an adolescent sample. Specifically, Froh, Sefick, and Emmons (2008) found that, compared to making daily hassles lists, making daily gratitude lists for 2 weeks was associated with increased satisfaction with life in the passed few weeks, expected satisfaction with life in the upcoming few weeks, and overall satisfaction with school and decreased negative affect up to 3 weeks after the end of the gratitude list exercise. However, differences on all outcomes between the gratitude list condition and a no-treatment control condition failed to reach significance (but were in the expected directions) except for overall satisfaction with school (participants in the gratitude list condition reported higher satisfaction).

As a whole, these studies suggest that making daily gratitude lists is associated with a number of positive outcomes even when done for only relatively short periods of
time (e.g., 2 weeks). However, it is important to view the results of these studies in the
text context of the control conditions and samples that were used (Wood et al., 2010; Froh et
al., 2009). Specifically, one of these studies did not have a control or comparison group
(Chan, 2011), three used hassles lists as a control condition (Emmons & McCullough,
2002 Studies 1 and 2; Froh et al., 2008), and two used no treatment or assessment-only
control conditions (Emmons & McCullough, 2002 Study 3; Froh et al., 2008). These
types of control conditions have important disadvantages. First, none controls for
expectancy. Seligman et al. (2005) and Sergeant and Mongrain (2011) are the only
studies involving gratitude lists to date that may control for expectancy. Specifically,
these studies used writing about childhood memories as a control condition, which may
be a plausible method for enhancing happiness (i.e., one could believe that writing about
childhood memories could increase one’s happiness). This means that benefits garnered
by participating in the gratitude list condition in this study likely came from elements
specific to that condition rather than merely from expectancy of improvement. Second,
using hassles lists as a control condition may a) cause group differences by decreasing
well-being in the hassles list condition rather than by increasing well-being in the
gratitude list condition or b) inflate group differences by both decreasing well-being in
the hassles condition and increasing well-being in the gratitude list condition.
Unfortunately, none of the studies that used hassles control conditions reported pre and
post descriptive statistics or reported testing differences in well-being between baseline
and post-exercise. Thus, it is not possible to determine whether group differences in these
studies were due solely to increases in well-being caused by the gratitude list exercises.
Indeed, only 3 studies to date involving gratitude list exercises have used psychology
neutral, plausible control conditions (i.e., Emmons & McCullough, 2003 Study 1; Seligman et al., 2005; Sergeant & Mongrain, 2011). Thus, more work that utilizes these kinds of strong control conditions is needed.

It is also important to view the results of previous studies in the context of whether the participants were motivated to improve their well-being. In particular, some studies involving gratitude exercises have used undergraduate or adolescent samples who participated in exchange for college credit or as part of a course curriculum (e.g., Emmons & McCullough, 2002 Studies 1 and 2, Froh et al., 2008) whereas other studies were specifically advertised as testing interventions designed to increase happiness and were targeted at individuals seeking to improve their well-being (e.g., Seligman et al., 2005; Chan, 2011). These two types of samples may differ in several ways, one of which is whether or not participants have a clear rationale or reason for why the gratitude exercise is being completed. That is, in self-improvement seeking samples, the obvious reason for participants to complete the exercise is to achieve improved happiness or well-being. However, in non-self-improvement seeking samples, participants may not have such a clear understanding that the gratitude exercise may benefit them and this might impact the effectiveness of the exercise. For example, Lyubomirsky et al. (2011) found that the effect of a gratitude letter exercise on well-being was moderated by self-selection into a “happiness intervention” such that the exercise only improved well-being amongst participants who self-selected into the happiness condition, but not amongst participants who thought they were completing an intervention involving cognitive exercises designed to improve organization. This suggests that the benefits of gratitude exercises may depend, at least in part, on the participant having a clear reason or rationale for why the
gratitude exercise is being completed. Thus, in the future, research should directly test the impact of a rationale on the effectiveness of gratitude exercises.

**Who Benefits Most From Gratitude Interventions?**

Research is beginning to sort out the types of individuals who are most likely to benefit from gratitude exercises and doing so may help explain some of the inconsistencies in the literature (e.g., Froh et al., 2009; Segreant & Mongrain, 2011). For example, several researchers have suggested that gratitude exercises may be particularly useful in the context of some forms of psychopathology. Indeed, two studies by Geraghty et al. (2010a; 2010b) demonstrate that gratitude lists may be as effective as cognitive restructuring for improving poor body image and reducing worry when used in a web-based, self-help format. Specifically, Geraghty et al. conducted two studies using the same methodology in separate samples of adults: one sample with very poor body image and one sample with chronic worry. Both studies were advertised as testing self-help interventions, were conducted entirely online, and involved three 2-week conditions: daily 6-item gratitude lists, daily self-monitoring and cognitive restructuring worksheets, and a waiting list control condition. The self-monitoring and cognitive restructuring worksheets were modeled after a common, effective technique used in cognitive behavioral therapy and involved recording and challenging unhelpful and overly negative thoughts and generating alternative thoughts that are more balanced and neutral. The gratitude list and self-monitoring/cognitive restructuring conditions included equivalent, convincing rationales for how and why they should work to reduce the targeted symptom (i.e., body dissatisfaction; worry). Results showed that both the gratitude list and self-monitoring/cognitive restructuring conditions greatly reduced the targeted symptoms
compared to the waiting list control conditions. Further, in both studies, participants who completed the gratitude list conditions did not significantly differ on the targeted symptoms from participants who completed the monitoring/cognitive restructuring conditions. This is important given that gratitude lists are far simpler than cognitive restructuring and results in both studies showed that attrition was significantly lower in the gratitude list conditions (e.g., in the study of individuals with poor body image, participants in the gratitude condition were twice as likely to complete the study compared to those in the self-monitoring/cognitive restructuring condition). These two studies provide evidence that gratitude list exercises may be effective for reducing at least some types of psychopathology (Wood et al., 2010), which suggests that further research on the efficacy of gratitude list exercises in the context of psychopathology is warranted.

Several researchers (e.g., Emmons & McCullough, 2003; Sin & Lyubomirsky, 2009; Wood et al., 2010; Sin et al., 2011; Sergeant & Mongrain, 2011) have also suggested that exercises that increase positive emotional experiences, such as gratitude exercises, may be particularly helpful for individuals with depressive symptoms because such individuals tend to have specific deficits in positive affect (e.g., Clark & Watson, 1991). Indeed, as pointed out by Wood et al. (2010), the life orientation conceptualization of gratitude seems inconsistent with the negative beliefs about oneself, the world, and one’s future, which characterize depression (Beck, Rush, Shaw, & Emery, 1979).

To our knowledge, three published studies have examined gratitude exercises in samples of individuals with elevated depressive symptoms. Two of these studies used a gratitude list exercise. First, the study by Seligman et al. (2005) described above showed that in adults with some depressive symptoms (mean Center for Epidemiological Studies
Depression Scale score = 14), making lists of three good things that happened each day for one week was associated with increased happiness and decreased depressive symptoms compared to writing about early childhood memories. Also, in this study, going on a gratitude visit (i.e., writing a letter of thanks to someone who had never been properly thanked and reading it aloud to the recipient), was associated with large and significant, though temporary (group differences disappeared after 3 months), reductions in depressive symptoms and increases in happiness compared to writing about early childhood memories. Similarly, Sergeant and Mongrain (2011) demonstrated that a 1-week gratitude list exercise was associated with increased happiness compared to writing about childhood memories in a sample of community adults with moderate depressive symptoms (mean Center for Epidemiological Studies Depression Scale score = 20.54) and that this effect was strongest for individuals who reported being high in self-criticism. However, the gratitude list exercise did not impact depressive symptoms in this study, regardless of baseline level of symptoms or self-criticism. Finally, Sin et al. (2011) reported results from a study in which dysphoric undergraduates (mean Beck Depression Inventory – II score = 16.7 indicating mild depression) were randomly assigned to either write, but not deliver, gratitude letters (to one person or to several people) or to write about affectively neutral classical music. Participants completed these writing assignments once a week for 4 weeks. Unexpectedly, results showed that participants in the gratitude letter condition demonstrated decreased well-being over the 4 weeks. The authors speculated that because the participants in this study were dysphoric, they may have found writing a gratitude letter to be difficult and frustrating or perhaps that depressive thoughts and emotions may have interfered with the task and led to feelings of
“failure.” To these possibilities, we add the hypothesis that dysphoric individuals may experience instructions to write a letter to someone they have never properly thanked as a guilt induction.

To account for the differing results from Sin et al.’s (2011) study and those from the gratitude letter condition in Seligman et al.’s (2005) study, we hypothesize that the gratitude letter condition (Seligman et al., 2005) may have yielded beneficial effects because it involved delivering the letter, which likely provided potent social rewards and may have increased feelings of social connectedness. Thus, even if Seligman et al.’s (2005) participants felt some guilt or frustration when writing the letter, the positive effects of delivering the letter may have overpowered these negative feelings. In contrast, the fact that the gratitude letters in the Sin et al. (2011) study were not delivered may have intensified any guilt induced by having participants think about how they had failed to appropriately express gratitude. This is consistent with the hypothesis mentioned earlier that delivering the gratitude letter may be important for enhancing well-being.

Indeed, despite some conflicting results, we assert that some gratitude exercises may have beneficial effects for individuals with depressive symptoms. This hypothesis is also consistent with results from Geraghty et al.’s (2010a) study of chronic worriers. Specifically, 64% of participants in this study was classified as depressed based on a self-report measure of symptoms (i.e., the Patient Health Questionnaire – 9) and the average score (mean = 12.6) on this measure indicated mild depression yet results showed extremely large reductions in worry (Cohen’s d = 1.8) for participants in the gratitude list condition compared to those in a waiting list control condition. Further, participants in the gratitude list condition did not drop out of the study at higher than expected rates.
Specifically, the authors reported 44% attrition from the gratitude list condition, which compares favorably to other unguided self-help interventions. This suggests that participants, despite their depressive symptoms, did not experience the gratitude list exercise as unduly aversive. Thus, perhaps gratitude exercises that are not as challenging or potentially guilt-inducing as the thank-you letter, such as gratitude lists, may have benefits for individuals with depressive symptoms. To test this hypothesis, future research should examine the moderating effect of depressive symptoms on the relation between various gratitude exercises and relevant outcomes.

In addition to examining gratitude exercises in the context of psychopathology, it will be useful to understand how personality variables impact their effectiveness. For example, it has been suggested that implementation of gratitude and other strength building exercises in middle and high schools may serve to enhance well-being and coping during a developmental period when such strengths are critical for buffering the effects of stressors (Froh et al., 2008). If implementation of such exercises were to occur, it would be useful to know for whom gratitude versus other kinds of strength building exercises (e.g., expressing optimism) would be most beneficial so that students can be matched with particular types of exercises. In particular, it seems that gratitude exercises should be most helpful for individuals who are low in trait gratitude.

McCullough et al. (2004) first presented this possibility in the form of the resistance hypothesis, which states that high trait gratitude individuals are predisposed to feel grateful often and in response to wide variety of events such that their daily experience of gratitude is much more strongly determined by their personality than by specific events that occur throughout the day. One might think of these individuals as
people who regularly reap the benefits associated with a life orientation towards noticing and appreciating the positive aspects of events, states of being, and characteristics of the self and one’s world. In contrast, individuals who are low in trait gratitude do not feel grateful as often or in response to as many stimuli and so their daily experience of gratitude is determined in large part by whether or not specific gratitude inducing events occur, for example, being the recipient of an act of kindness. Thus, as discussed by Rash et al. (2011), for individuals high in trait gratitude, adding one more gratitude induction (i.e., a gratitude list) to their day is not likely to have a large impact. For these individuals, completing a gratitude list would be like turning on a flashlight while standing outside on a sunny day. On the other hand, for individuals who are low in trait gratitude, a daily gratitude induction is likely to have a much larger impact. For these individuals, making a gratitude list is like turning on a flashlight in a dark room.

McCullough et al. (2004) noted that the resistance hypothesis has been supported in research on other personality traits. For example, previous work shows that among patients with rheumatoid arthritis, daily negative affect is strongly linked to ratings of pain in individuals with low levels of neuroticism whereas individuals with high levels of neuroticism evidenced a weaker relation between their pain and daily negative mood (Affleck, Tennen, Urrows, & Higgins, 1992). Consistent with this, McCullough et al. (2004) found that the relation between daily gratitude-inducing events and the degree of gratitude experienced was much weaker for individuals high in trait gratitude compared to those low in trait gratitude.

It is also important to acknowledge the alternative hypothesis that because individuals high in trait gratitude are more sensitive to gratitude inducing experiences
(e.g., they are more likely to experience gratitude in response to a particular event and the feelings of gratitude that they experience are more intense), gratitude exercises may be more effective for such individuals. McCullough et al. (2004) call this the conductance hypothesis because they hypothesize that for individuals high in trait gratitude, their emotional reactions to gratitude-inducing events are conducted upward such that these emotions put them into a grateful mood that then colors their perception of other daily experiences. In contrast, they hypothesize that individuals low in trait gratitude may feel discrete grateful emotions in response to a specific gratitude-inducing event, but that these emotions tend to fade quickly rather than turning into a longer lasting grateful mood. In support of the conductance hypothesis, McCullough et al. (2004) cite research showing that for individuals high in extraversion, the effects of positive emotions inductions are stronger amongst individuals high in extraversion compared to those low in extraversion (Larsen & Ketelaar, 1991).

To our knowledge, only one study to date has tested trait gratitude as a moderator of the impact of gratitude exercises on well-being. This study, conducted by Rash et al. (2011), compared a 4-week grateful contemplation exercise to contemplation of memorable life events in a sample of undergraduates and found support for the resistance hypothesis. Specifically, they found that, compared to recalling memorable events, grateful contemplation was associated with increased life satisfaction over 4 weeks, but this effect was only significant amongst participants with low trait gratitude at baseline. While this study provides initial support for the resistance hypothesis as applied to gratitude exercises and suggests that trait gratitude may be an important determinant of the effectiveness of gratitude exercises, replication of this finding is, of course, necessary.
Mediators of Gratitude List Exercises

In addition to replicating the beneficial effects of gratitude list exercises compared to appropriate control conditions and investigating who is most likely to benefit from gratitude list exercises, future research is necessary to establish the mechanisms by which gratitude list exercises have their effects. Indeed, this is an important step in understanding how gratitude relates to adaptive psychological and social functioning (Wood et al., 2010; Layous & Lyubomirksy, 2013). However, mediators of the effect of gratitude exercises on well-being have not yet been widely studied (Wood et al., 2010). One hypothesis posed by several researchers (e.g., Fredrickson, 2004; Wood et al., 2010) is that gratitude exercises may be related to well-being by way of positive emotions. Consistent with this, habitual experience of positive emotions is central to well-being and happiness (Emmons & McCullough, 2003) and gratitude exercises have been shown to directly increase experience of positive emotions both immediately (Watkins, Grimm, & Kolts, 2004 Study 4; Sheldon & Lyubomirsky, 2006) and over time (e.g., Emmons & McCullough, 2003). Further, as mentioned above, individuals high in trait gratitude also tend to be higher in positive emotionality than their low trait gratitude counterparts (e.g., McCullough et al., 2002; Wood, Joseph et al., 2008). It is important to note, however, that studies that have controlled for agreeableness and extraversion (i.e., positive emotionality) indicate that trait gratitude may be related to well-being beyond its relation with positive emotions. For example, McCullough et al. (2002) found that whereas the magnitude of the relation between trait gratitude and well-being was reduced when controlling for extraversion and agreeableness the relation remained significant. Other studies that have controlled specifically for positive affect have found that the relations
between gratitude and well-being and gratitude and life satisfaction remain intact (Wood, Joseph et al., 2008; Wood et al., 2009). This suggests that even if trait gratitude functions in part by enhancing positive emotions, this is cannot be the only important mechanism. Additionally, as pointed out by Wood et al. (2010), trait gratitude and gratitude exercises may operate by distinct mechanisms.

Whereas the general hypothesis that positive emotions partially account for the effect of gratitude exercises is parsimonious, a more sophisticated understanding can be achieved by appeal to Fredrickson’s broaden-and-build hypothesis (Fredrickson, 1998; 2001). Indeed, several researchers (e.g., Fredrickson, 2004; Emmons & McCullough, 2003; Wood et al., 2010) have suggested that Fredrickson’s broaden-and-build hypothesis may be particularly useful for understanding the precise role that positive emotions play in the link between gratitude exercises and well-being. The broaden-and-build hypothesis as applied to the present discussion holds that gratitude exercises may have their effect on psychological functioning, at least in part, because they increase positive emotions, which, by broadening thought-action repertoires, build enduring personal resources that facilitate adaptive functioning (Fredrickson, 2004). More generally, the broaden and build hypothesis asserts that the experience of positive emotions facilitates adaptive functioning by building behavioral and psychological resources such as increased social and environmental engagement, psychological resilience, and broad minded coping.

Specifically, the broaden-and-build hypothesis holds that whereas negative emotions narrow individuals’ momentary thought-action repertoires by triggering specific action tendencies (e.g., attack, run away), positive emotions broaden individuals’ momentary thought-action repertoires (Ashby, Isen, & Turken, 1999; Fredrickson, 2001; Fredrickson
This cognitive broadening is posited to promote a wider range of thoughts and actions than is typical (e.g., explore, play, savor), thereby, over time, building enduring, trait-like resources (Burns et al., 2008; Fredrickson & Joiner, 2002). A number of studies lend support to the broaden-and-build hypothesis. In particular, Fredrickson et al. (2008) demonstrated that, compared to a waiting list control group, individuals randomly assigned to practice Loving Kindness Meditation experienced increases over time in daily positive emotions and these increases in turn predicted increases in a range of personal resources such as sense of purpose in life and social support. Increments in these resources then predicted increased life satisfaction and decreased depressive symptoms. Further, participants in the Loving Kindness Meditation condition maintained their gains in personal resources at 15-month follow up indicating that positive emotions may indeed lead to enduring personal growth (Cohen & Fredrickson, 2010).

To our knowledge, the broaden-and-build hypothesis has not been explicitly tested in the context of gratitude exercises making this an important future direction for research aimed at understanding the mechanisms by which gratitude exercises operate. A critical first step in this direction is to identify specific personal resources that are likely to mediate the link between gratitude exercises and well-being. For example, perceived social support, tendency to savor, flexible cognitive processing, and trait gratitude are good candidate mediators because evidence suggests that they are linked to well-being and are likely to be increased by gratitude exercises either directly or by way of positive emotions.
First, the relation between social support and depression (which is conceptualized here as an index of poor psychological functioning) has long been established and social support is a valuable personal resource in the sense that it is a protective factor against depression (see Ibarra-Rovillard & Kuiper, 2011). Indeed, social support has been shown to increase over time in association with both gratitude and positive emotions. Specifically, as discussed above, higher levels of trait gratitude predict increases in social support over time (Wood, Maltby, Gillett et al., 2008) and Fredrickson et al. (2008) demonstrated that increased positive emotions appear to result in increased social support and that such increments were associated with reduced depressive symptoms over time. One can imagine how positive emotions may foster both actual and perceived social support. For example, individuals who frequently experience positive emotions are rewarding to be around and may, thus, attract more social support. Further, one can imagine how the broadened perspective induced by positive emotions (Fredrickson & Branigan, 2005) may allow one to more frequently recognize or positively interpret others’ supportive behavior. One could also imagine how gratitude exercises could enhance perceived social support more directly (e.g., Wood, Maltby, Gillett et al., 2008). For example, frequently dwelling on feelings of gratefulness for the social support one has may serve as a form of priming making individuals more likely to recall their social support network and, thus, to feel supported.

Much research has been conducted exploring responses to and regulation of negative emotion whereas less attention has been paid to regulation of positive emotion and how people respond to positive events. However, there is good reason to believe that one’s responses to positive experiences and emotions can facilitate adaptive functioning
and well-being by serving to preserve and amplify the effects of those experiences and emotions (e.g., Quoidbach, Berry, Hansenne, & Mikolajczak, 2010; Tugade & Fredrickson, 2007). For example, Bryant (1989; 2003) and Feldman, Joormann, and Johnson (2008) discuss the construct of savoring, which involves the tendency to respond to positive emotional states with recurrent thoughts about positive self-qualities, positive emotional experiences, and one’s positive life circumstances. These responses are posited to preserve and amplify positive affective experiences (Quoidbach et al., 2010). Savoring is positively associated with indices of well-being (e.g., life satisfaction, happiness; Bryant, 2003) and negatively associated with depressive symptoms even controlling for responses to negative affect (e.g., brooding; Bryant, 2003; Feldman et al., 2008; Raes, Daems, Feldman, Johson, & Van Gucht, 2009).

It should be noted that an exercise designed to enhance positive emotions, such as a gratitude list exercise, may lead to increased savoring in part because it provides more positive emotions on which to focus. However, the broadened perspective induced by positive emotions may specifically allow individuals to recognize, and therefore pay attention to, positive aspects of situations that they may not have noticed given a narrower perspective. Further, because gratitude inherently involves revisiting past positive experiences (e.g., feeling thankful for help provided by a friend earlier in the day), one can easily imagine how a gratitude list exercise may directly foster a tendency to savor positive events and emotions in addition to enhancing the occurrence of such emotions.

Cognitive flexibility may also be an important mediator of the link between gratitude exercises and well-being. Cognitive flexibility is part of executive functioning
and involves the ability to shift a course of thought or action according to the changing demands of the situation (Genet & Siemer, 2011). Such ability is involved in positive psychological traits such as resilience (Fredrickson et al., 2003; Genet & Siemer, 2011) and emotion regulation (Ochsner & Gross, 2007). Unsurprisingly, deficits in cognitive flexibility predict psychological distress following trauma (Palm & Follette, 2011) as well as vulnerability to depression and depressive styles of responding to negative events or emotions (e.g., negative interpretation biases, elaborative processing of task irrelevant negative material; Joormann & Siemer, 2011). Based on these findings, flexible information processing (i.e., cognitive flexibility) is conceptualized as a personal resource, which may be protective against depressive symptoms and facilitate happiness.

Research shows that positive emotions enhance cognitive flexibility (e.g., see Isen, 2002). Indeed, Isen (2002) discusses how, as a body of work, her research demonstrates that positive affect enhances creativity, problem solving, and the ability to take multiple factors into account simultaneously. Also supporting the link between positive emotion and cognitive flexibility, studies have demonstrated that positive emotion can replenish depleted self-control (Tice, Baumeister, Shmeuli, & Muraven, 2007), decrease perseveration in a set-switching paradigm (Dreisbach & Goschke, 2004), and enhance cognitive control during a Stroop Task (Yuan, Xu, Yang, Liu, Chen, Zhu et al., 2011).

In addition to impacting cognitive flexibility via enhanced positive emotions, one could also imagine how gratitude exercises could impact cognitive flexibility more directly by prompting practice with viewing situations from different perspectives in much the same way that a cognitive restructuring exercise would do (see Lyubomirsky,
Sheldon, & Schkade, 2005). For example, engaging in a gratitude list making exercise at the end of a very bad day would challenge the individual to find positive elements of the negative events that occurred (e.g., “Even though my presentation wasn’t well received, I’m thankful that I was able to gracefully handle technical difficulties that arose during my talk.”) or to switch his or her attention to positive elements in his or her life that exist independent of a single bad day (e.g., “I’m thankful that after a horrible day, I have a wonderful family to come home to.”). Consistent with this, research has shown that one of the mechanisms mediating the relation between trait gratitude and future depressive symptoms is the tendency to positively re-frame challenges in one’s life (Lambert, Fincham, & Stillman, 2012).

Finally, perhaps the most obvious mechanism by which gratitude exercises may have their effect is gratitude itself. Indeed, it seems only logical to expect that regular practice of a gratitude list exercise would result in increased trait gratitude in the sense that such exercises inherently increase the frequency of taking a grateful perspective on one’s life and that this increase in trait gratitude would result in enhanced well-being. Indeed, this seems consistent with research that has found that gratitude exercises are most effective for individuals who are low in trait gratitude (Rash et al., 2011). However, there is currently very little evidence to support this assumption as only one study to date has examined whether increases in gratitude account for the benefits of a gratitude exercise. Specifically, Emmons and McCullough (2003) showed that increases in positive affect associated with making gratitude lists compared to hassles lists were mediated by increases in average daily gratitude in a sample of undergraduates. This effect was replicated when comparing a gratitude lists condition to a no treatment control condition.
in a sample of adults with neuromuscular diseases. Notably, however, changes in daily
gratitude did not account for decrease in negative affect associated with making gratitude
lists in either sample. Future research is needed to replicate this effect, especially
compared to more stringent control conditions, and to determine whether increases in
trait gratitude account for benefits other than enhanced positive affect.

In addition to adaptive personal resources as mediators, it will also be important
for future research to examine maladaptive cognitive and behavioral patterns as potential
mediators of the effect of gratitude exercises on outcomes. For example, Fredrickson and
colleagues describe how positive emotions may serve not only to enhance personal
resources, but also to interrupt downward negative emotional spirals characterized by
maladaptive cognitive and behavioral patterns. In this way, the positive emotions
afforded by gratitude exercises may buffer against depressive symptoms. Specifically,
Fredrickson and colleagues describe a model of emotional systems as self-perpetuating
spirals (Fredrickson & Joiner, 2002; Garland, Fredrickson, Kring, Johnson, Meyer, &
Penn, 2010). Negative emotions narrow attention and cognition resulting in restricted and
often stereotypic cognitive patterns and behaviors (e.g., brooding, social withdrawal).
These patterns and behaviors then engender further negative emotions, which serve to
continue the downward cycle whereby attention, cognition, and behavior become
progressively restricted. As mentioned above, positive emotions, on the other hand,
broaden attention and cognition and this results in a wider range of available cognitive
patterns, behaviors, and coping mechanisms (e.g. Fredrickson, 2001). Indeed, research
has demonstrated that introducing positive constructs can reduce attentional biases
toward negative information (Hughes & Kendall, 2008). Additionally, broadened
cognition seems incompatible with brooding, which is a negative self-referential thought process that involves repetitive, stereotypic thoughts about oneself, one’s mood symptoms, and the causes and implications of those symptoms (Nolen-Hoeksema, 1991). By broadening cognition, positive emotions may allow for other non-stereotypic thought processes such as problem solving or distraction (e.g., see Isen, 2002). Thus, the positive emotions induced by gratitude exercises may facilitate adaptive functioning by interrupting maladaptive cognitive and behavior patterns.

As is the case with adaptive personal resources, an important first step in investigating the broaden-and-build hypothesis as a potential explanation for how gratitude exercises work is to identify the specific maladaptive cognitive and behavior patterns that mediate the link between gratitude exercises and well-being. For example, brooding (i.e., maladaptive rumination characterized by passive comparison of current situation with some unachieved ideal), behavioral activation, and dampening are strong candidates. First, brooding has been consistently linked to increased risk for depression in a number of longitudinal studies (e.g., Just & Alloy, 1997; Wisco & Nolen-Hoeksema, 2008). Further, when induced to brood, individuals already experiencing depressive symptoms (i.e., both dysphoric and clinically depressed individuals) experience exacerbated and prolonged negative mood, impaired problem-solving, inhibition of instrumental behavior (i.e., not wanting to engage in active mood-repair behaviors), more negative thinking, and negative memory recall (see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Based on such results, one can see how brooding could be conceptualized as a process associated with narrowed attention and behavior that can lead to or exacerbate depressive symptoms. It is precisely this cognitive and behavioral
narrowing that Fredrickson and Joiner (2002) and Garland et al. (2010) propose may be interrupted by positive emotions. For example, perhaps the broadened thought-action repertoire induced by positive emotions counters inhibition of instrumental behavior and the broadened perspective counters impaired problem solving (e.g., the person is able to generate a greater number of and more creative solutions; Isen, Daubman, & Nowicki, 1987; Isen, 2002). It is easy to imagine how this might start a self-perpetuating upward emotional spiral. For instance, improved ability to engage in mood repair behavior and solve problems could lead to additional positive emotions and, therefore, presumably, fewer negative emotions and problems about which to brood.

Lack of behavioral activation (i.e., behavioral avoidance) is associated with depressive symptoms (Kanter, Mulick, Busch, Berlin, & Martell, 2007; Kanter, Rusch, Busch, & Sedivy, 2009) and is one aspect of the emotional spirals described by Fredrickson and colleagues. That is, to the extent that positive emotions broaden thought-action repertoires, positive emotions should be associated with increased behavioral activation (Fredrickson, 1998). For example, Fredrickson and Branigan (2005) found that individuals reported wanting to engage in more activities following a positive emotion induction compared to a neutral emotion condition. Further, increased behavioral activation should lead to decrease depressive symptoms, which is consistent with the theory underlying behavioral activation therapy for depression (e.g., Martell, Addis, & Jacobson, 2001). Thus, future research should examine the effect of gratitude list exercises on behavioral activation and investigate whether changes in behavioral activation partially mediate the relation between such exercises and outcomes.
Finally, dampening is also a maladaptive process that may be interrupted by gratitude list exercises and dampening may partially mediate the link between such exercises and outcomes like well-being and depressive symptoms. Like savoring, dampening occurs in response to positive emotions and events. Unlike savoring, however, dampening is characterized by responses that reduce the intensity or duration of positive emotions. For example, telling oneself that positive emotions will not last or that one does not deserve positive emotions would serve to dampen or short circuit positive mood. Unsurprisingly, dampening strategies are positively related to depressive symptoms (e.g., Quoidbach et al., 2010) and negative related to well-being (e.g., Gross & John, 2003). Indeed, high levels of dampening predicted depressive symptoms over a 3- to 5-month interval (Raes, Smets, Nelis, & Schoofs, 2012). To the extent that making a gratitude list encourages dwelling on pleasant events, situations, and feelings, it seems reasonable to expect that gratitude lists exercises would be in direct opposition to dampening. Further, the positive emotions afforded by gratitude list exercises may interrupt tendencies to dampen by broadening one’s perspective such that the individual is able to recognize, and therefore pay attention to, aspects of situations that s/he may not have noticed given a narrower perspective. For example, a broader perspective may allow an individual to realize that s/he does deserve to experience positive emotions or that enjoying positive emotions is valuable even if those emotions are short lived.

In sum, research on the relation between gratitude exercises and well-being is in the early stages. The research to date points towards gratitude exercises as effective for enhancing several indices of well-being, but further investigation into a number of issues surrounding gratitude exercises is necessary. Specifically, future research should replicate
the effect of gratitude list exercises using psychologically neutral control conditions, examine these exercises in the context of depressive symptoms and trait gratitude to determine for whom they are most effective, and investigate mediators of the link between gratitude exercises and well-being to determine the mechanisms by which these exercises impart their benefits.
Chapter 2: The Present Study

To these ends, the present study compared a 2-week daily gratitude list exercise to a 2-week control condition, which involved making lists of daily events. A gratitude list exercise was chosen because research using such exercises has yielded more consistent results than research using other types of gratitude exercises (e.g., gratitude letters or visits). To examine the importance of having a clear rationale for completing the exercises, two sets of instructions were used for the gratitude list exercise: one that included a rationale describing the expected benefits of the exercise and one that did not include a rationale. A list of daily events was chosen for the control condition because making such a list is likely to require a similar amount of time and cognitive load as making a gratitude list, but seems less likely than a hassles list to decrease well-being or induce rumination. This was an important consideration given that the present sample included individuals with depressive symptoms and research shows that rumination inductions serve as powerful negative mood inductions among individuals with depressive symptoms (see e.g., McLaughlin & Nolen-Hoeksema, 2011).

Hypotheses.

The present study tested five specific hypotheses which were as follows: 1) compared to baseline and compared to making lists of daily events, a 14-day gratitude list making exercise will be associated with benefits including increased happiness and daily experience of positive emotions as well as decreased depressive symptoms and daily
experience of negative emotions; 2) including a rationale with the gratitude list exercise instructions will enhance the benefits of the exercise compared to completing the same exercise without a rationale in the instructions; 3) the benefits of the gratitude list exercise will depend upon baseline level of depressive symptoms such that the exercise is more beneficial for individuals with some levels of depressive symptoms compared to others; 4) the benefits of the gratitude list exercise will depend upon baseline level of trait gratitude such that the exercise is more beneficial for individuals with lower levels of trait gratitude and 5) the benefits of the gratitude list exercise will be mediated by increases in personal resources (i.e., affective savoring, attentional flexibility and control, gratitude, and social support) and decreases in maladaptive cognitive and behavioral patterns (i.e., affective dampening, brooding, and behavioral avoidance). The reader is reminded that the majority of the mediators tested in the present study have never before been investigated in this context. Thus, hypothesis number 5 is relatively exploratory in nature.

**Methods**

**Participants.**

Participants were 164 undergraduate students at the Ohio State University ages 18-54 (mean age = 19.53 [SD = 3.52]; 69.6% female) who received partial course credit for their participation. The majority of the sample was Caucasian (81.6%), with the remainder of the sample self-identifying as African American (5.7%), Asian (5.7%), Hispanic (3.9%), or of mixed race (3.1%). Participants were recruited based on their scores on a screening measure of depressive symptoms to ensure that the sample included participants from across the full range of symptoms. This approach was taken to enhance power to find the hypothesized moderating effect of baseline depressive symptoms.
Specifically, an approximately equal number of participants who scored in each of the 4 quartiles on the Center for Epidemiologic Studies Depression Scale (CESD) at the time of screening were invited to participate. This sampling method was successful in that, at baseline, 23% of the sample scored in the lowest quartile (score of 0-7), 28% in the second quartile (score of 8-13), 20% in the third quartile (score of 14-21), and 29% (score of 22 or higher). Despite this distribution of scores, the mean and standard deviation (SD) of the CESD in this sample was comparable to other published studies of the CESD in non-clinical college samples (e.g., Shean & Baldwin, 2012; Jimenez, Niles, & Park, 2010).

Measures.

Centers for Epidemiologic Studies Depression Scale (CESD). The CESD (Radloff, 1977) is a 20-item self-report measure developed to assess depressive symptoms in community samples. Respondents are asked to rate each item on a scale from 0 to 3 on the basis of “How often you have felt this way during the past two weeks.” Radloff (1977) reported excellent reliability and validity for this widely used scale.

Subjective Happiness Scale (SHS). The SHS (Lyubomirsky & Lepper, 1999) is a 4-item self-report measure of global subjective happiness. One item asks participants to characterize their happiness using an absolute rating (i.e., 1 = not very happy to 7 = very happy) and one item asks for a happiness rating relative to peers (i.e., 1 = less happy to 7 = more happy). The other two items offer brief descriptions of happy and unhappy people and ask participants to rate the extent to which each describes them from 1 (not at all) to 7 (a great deal).
Responses to Positive Affect Questionnaire (RPA-Q). The RPA-Q (Feldman et al., 2008) is a 17-item self-report measure, which assesses the tendency to respond to positive moods with thoughts about positive self-qualities and positive affective experiences versus with responses that might dampen positive moods. These responses correspond to three factors: Self-focused savoring (e.g., Think “I am living up to my potential”), emotion-focused savoring (e.g., Think about how strong you feel), and dampening (e.g., Remind yourself these feelings won’t last). Participants rate their tendency to experience each item when in a good mood on a scale from 1 (Almost Never) to 4 (Almost Always).

Interpersonal Support Evaluation List – College Student Version (ISEL – College Version). Following the lead of Wood, Maltby, Gillett et al. (2008), the belonging, tangible, and appraisal subscales of the ISEL – College Version (Cohen & Hoberman, 1983) were used as an index of perceived social support. The belonging subscale measures shared social activities; the tangible subscale measures the potential for provision of practical assistance; and the appraisal subscale measures the perceived availability of people to give advice, listen to problems, and provide emotional support. Thus, these subscales measure perceived social support rather than actual social situations. The ISEL – College Version has strong predictive validity for constructs such as stress, depression, and physical health (Cohen, Mermelstein, Kamarck, & Hoberman, 1985), has very good psychometric properties (Cohen et al., 1985), and is used widely in research.

Stroop Task. The Stroop Task (Golden & Freshwater, 2002) is a very widely used measure of response inhibition and attentional control. In this task, participants must respond to one aspect of a list of words (i.e., the color of the ink), while ignoring another
prepotent aspect (i.e., what the word says). For example, if the word “green” is printed in red ink, the participant must say “red” while inhibiting the impulse to report the meaning of the word (i.e., to say “green”). When a participant makes a mistake (i.e., reports the meaning of the word rather than the color of the ink), s/he is asked to go back and correct the mistake. The Interference T-Score method of scoring was employed because it is the most widely used. Under this scoring method lower scores indicate poorer inhibition and control.

Gratitude Questionnaire – 6 (GQ-6). The GQ-6 (McCullough et al., 2002) is a 6-item self-report measure of the disposition to experience gratitude. Participants rate the extent to which they agree with items (e.g., “I have so much in life to be thankful for.”) on a 1 to 7 scale. The GQ-6 has been shown to have good psychometric properties (McCullough et al., 2002).

Ruminative Response Scale - Brooding Subscale (RRS – Brooding Scale). The RRS (Davis & Nolen-Hoeksema, 2000) is a 22-item self-report questionnaire meant to assess the tendency to respond to negative emotions with ruminative thoughts. Participants respond to items (e.g., “Think about why you always react this way.”) on a 4-point scale anchored by “almost never” and “almost always.” Davis and Nolen-Hoeksema (2000) report excellent psychometric properties for this scale. The RRS is comprised of a self-reflection subscale, which contains items that characterize adaptive self-analysis and problem solving; a depression subscale, which contains items that overlap with depressive symptoms; and a brooding subscale, which contains items that characterize maladaptive self-analysis and dwelling on negative aspects of the self or one’s own emotional or behavioral reactions to the world (Treynor, Gonzalez, & Nolen-
Hoeksema, 2003). The present study used only those 5 items on the brooding subscale as this is the subscale that has been shown to relate most strongly to depressive symptoms without overlapping with such symptoms (Treynor et al., 2003).

**Behavioral Activation for Depression Scale (BADS) – Activation Subscale.** The BADS (Kanter et al., 2007) is a 25-item self-report questionnaire developed to assess participants’ reported tendency to be active and engaged in their stance towards the environment. Responses are made using a 7-point scale. Kanter et al. (2007) report that the BADS has excellent psychometric properties. The BADS yields four subscales: Activation, Avoidance, Social Impairment, and School/Work Impairment. The Activation subscale was used in the present study as an index of behavioral activation. Example items from this subscale include, “I did something that was hard to do, but it was worth it,” “I engaged in a wide and diverse array of activities,” and “I structured my day’s activities.”

**Adapted Differential Emotions Scale (ADES).** Fredrickson et al. (2003) modified the Differential Emotions Scale, which was created by Izard (1977), so that it included a broader range of positive emotions. On this adapted scale, participants are asked to rate items on a 0 (never) to 4 (most of the time) scale to indicate the degree to which they have felt each of the 20 listed emotions in the specified range of time (e.g., past week, since X event). Positive emotions include: amusement, awe, compassion, gratitude, hope, love, pride, sexual desire, joy, interest, and contentment. Negative emotions include: anger, contempt, disgust, embarrassment, fear, guilt, sadness, and shame. Surprise was also included, but not classified as positive or negative. Fredrickson et al. (2003) used item analysis to determine that positive and negative subscales can be calculated by
summing the ratings for 10 of the positive emotions (all except awe and compassion) and 7 of the negative emotions (all except embarrassment). Since surprise was deemed to be neither positive nor negative, it was not included in the present study. In the present study participants completed the ADES daily and were asked to rate the degree to which they experienced each of the listed emotions over the past 24 hours.

*Single Item Mood Rating.* Participants were asked to rate their mood in the present moment on a 0-10 scale ranging from Extremely Negative to Extremely Positive both before and after completing the daily questionnaires and lists.

*Procedure.*

The present study involved 3 segments, which were as follows: 1) a Time 1 [T1] laboratory-based session during which baseline measures were collected, 2) 2 weeks of daily questionnaires and list making which were completed online each evening from the location of the participant’s choosing, and 3) a Time 2 [T2] laboratory-based session during which follow-up measures were collected. The daily questionnaires segment began on the evening of the day on which the T1 session occurred and continued for the next consecutive 13 days. The T2 session took place within one week of the last day of daily questionnaires. During the T1 session, participants filled out several baseline self-report measures, including measures unrelated to the present study, and completed the Stroop Task. The self-report measures were completed using a secure, web-based survey procedure. At the T2 session, participants completed the same measures administered during the T1 session.

For the daily questionnaires segment of the study, participants were randomly assigned to one of three conditions, which differed only in the list that was made each
evening. Participants in the Gratitude + Rationale condition made a 5-item gratitude list and received instructions for making the list that included a rationale. These instructions were as follows:

“It is human nature to not pay attention to the things in our lives for which we may be thankful or grateful. However, research is beginning to suggest that noticing and appreciating such things can have a positive effect on your well-being. This is because thinking about things for which we feel thankful can make us feel good and these good feelings may have lasting effects beyond the present moment. For example, thinking about the things for which you are grateful can open your eyes to positive aspects of life that you didn’t notice before. Thus, filling out the following questionnaire is expected to have a positive effect on your well-being.

In this questionnaire, you will think about and make a list of up to 5 things for which you feel grateful. These can be little things that happened during the day (e.g., feeling thankful that you got to eat your favorite food for lunch or that your friend helped you with your homework), things that you notice (e.g., feeling thankful for good weather or an interesting lecture), or more abstract things (e.g., feeling thankful for loving family or friends or for simply waking up each morning). It doesn’t matter what it is; as long as you feel thankful for it, you can add it to your list. For each thing that you list, please rate the how grateful you feel for that thing on the provided scale.”

The Gratitude without Rationale condition also made a 5-item gratitude list, but did not receive a rationale with the instructions. Specifically, participants in this group received only the second paragraph of the instructions for the Gratitude + Rationale condition shown above.
The third group was a control condition which involved making a list of events that occurred during the day. The instructions for this list were as follows:

“In this questionnaire, you will think about and make a list of up to 5 things that happened during your day. These can be things that happened to you (e.g., got called on in class, got invited to a party, got sick) or things that you did (e.g., went to class, worked out, called a friend). It doesn’t matter what it is; if it happened to you or you did it during the last 24 hours, you can add it to your list. For each thing that you list, please rate the how positive, negative, or neutral the event was for you on the scale provided.”

An approximately equal number of participants who scored in each quartile on the screening CESD were assigned to each condition. Participants filled out the following questionnaires and lists in the following order every evening: Single item mood rating, ADES, gratitude list with or without rationale or daily event lists (depending upon the group to which the participant was randomly assigned), single item mood rating. In addition to receiving a daily email reminder to fill out the questionnaires, compliance was encouraged by giving participants credit for the daily questionnaires segment of the study according to the number of days of questionnaires that they submitted.

Data Analytic Strategy.

Following preliminary analyses that included examination of descriptive statistics and correlations and checks of randomization and manipulation, hierarchical multiple linear regression (MLR) and mediation analyses were conducted to test the main hypotheses. First, four hierarchical MLR analyses with contrast coding were conducted to test the main effect of Condition on the dependent variables (DV$s), which were T2
CESD, T2 SHS, and the slopes of average daily positive and negative emotions. These slopes reflect the pattern of change in average daily positive and negative emotions for each participant across the 14 days of list making. Slopes were generated using mixed models analyses, the results of which are reported below in the preliminary analyses section. For each hierarchical MLR analysis, the effect of Condition was represented by two orthogonal contrast codes. The first code compared the Gratitude without Rationale condition to the Gratitude + Rationale condition and the second compared the Control condition to the Combined Gratitude condition (i.e., both gratitude conditions). The second contrast code collapsed across the two gratitude conditions and was of interest when these two conditions did not differ from each other (i.e., when the first contrast code was non-significant). For all hierarchical MLR analyses predicting T2 CESD and T2 SHS, the appropriate T1 variable (i.e., CESD or SHS) was entered on Step 1 to control for baseline and the contrast codes were entered on Step 2. It was not necessary to control for baseline in the analyses predicting the slopes of positive and negative emotions because slopes reflect the pattern of change over time. Following Aiken and West (1991), T1 variables were zero centered through standardization for ease of interpretation. Because hierarchical MLR analyses only compare the conditions on T2 CESD and T2 SHS controlling for baseline, it was necessary to perform follow-up paired samples t-tests to determine the significance and direction of change from T1 to T2 within each condition (e.g., Did the Combined Gratitude condition improve on happiness while the

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1 The mixed models analyses were performed in SAS because this statistical program easily saves slope predictions for individual participants. All other analyses were performed in SPSS.
Control condition stayed the same or did the Combined Gratitude condition stay the same and the Control condition got worse?). Such follow-up analyses were not necessary when predicting the slope of positive and negative emotions, however, because the slopes themselves reflect the pattern of change over time.

Hierarchical MLR analyses were also used to test the moderating effects of T1 CESD and T1 GQ-6 on the relation between Condition and the four DVs. The T1 CESD x Condition and T1 GQ-6 x Condition interaction terms were created by multiplying z-scored T1 CESD and T1 GQ-6 by the two contrast codes representing Condition. The hierarchical MLR analyses testing moderation were identical to the analyses testing main effects except that the contrast codes and moderator at T1 (i.e., T1 CESD or T1 GQ-6) was entered on Step 1 and the appropriate interaction terms were entered on Step 2. Significant interactions were interpreted using PROCESS (available at http://www.afhayes.com), which is an SPSS utility for conditional process modeling (see Hayes, 2013). Specifically, PROCESS generates regions of significance (i.e., the Johnson-Neyman technique), simple slopes, and predicted points for interaction effects. All analyses using PROCESS were based on 5000 bootstrapping samples.

For all hierarchical MLR analyses, regression diagnostics were examined to determine if extreme data points were present that might be exerting excessive influence on overall model fit or on individual beta weights. Specifically, DFFITS and DFBETA values were examined for each case, using ±1.0 as a cutoff (Cohen, Cohen, West, & Aiken, 2003). One high influence data point was detected that impacted the result of the
analysis testing the moderating effect of T1 CESD on the relation between Condition and T2 CESD (see below for details). Therefore, this point was dropped from all analyses.

Finally, mediation analyses using Preacher and Hayes’ (2004) bootstrapping approach were conducted to examine personal resources and maladaptive cognitive/behavioral patterns as potential mediators of the effect of Condition on the DVs. All continuous predictor variables and covariates were zero centered through standardization. For the analyses predicting T2 CESD and SHS, the appropriate T1 variable was entered as a covariate to control for baseline. All mediators were measured at T2.²

² Time constraints associated with the present study prevented measurement of mediators at an intermediate time point, which would have allowed a more appropriate test of mediation.
Chapter 3: Results

Preliminary Analyses.

Means and SDs for all measures are shown in Table 1 and correlations are shown in Table 2. All means, SDs, and correlations were as expected for a college sample.

Data from 3 of the 164 participants in the original sample was unusable. Specifically, one participant did not have complete T1 data, one participant did not have complete T2 data, and one participant completed lists from two conditions due to an error. Also due to errors, two participants did not have complete Stroop data. All Ns for significant results are reported in the note for the corresponding table.

Preliminary analyses revealed that six variables were skewed. Specifically, ISE and CESD at T1 and T2 and ECS at T2 were mildly to moderately skewed (skewness range = -1.06 to .97). Appropriate transformations for each of these variables were conducted to remedy the skew. However, results of analyses using transformed versus raw variables did not differ and, thus, the raw variables were retained for interpretability.

Compliance with the daily questionnaires portion of the study was very good, with no participant missing more than 4 days of questionnaires. Specifically, 85% of the sample completed 13 or 14 days, 9% completed 12 days, 5% completed 11 days, and 0.6% completed 10 days. A one-way ANOVA revealed that the three conditions did not significantly differ in number of days missed ($p = .66$) and Little’s MCAR test revealed
that missing data was missing completely at random with respect to all other variables in the dataset ($p = .54$).

A series of one-way ANOVAs testing differences between the conditions at T1 revealed that they did not differ significantly on CESD, SHS, or any mediator variable at baseline (all $ps > .21$) indicating that randomization was successful.

A manipulation check was performed to confirm that the gratitude lists functioned as a positive mood induction compared to the control condition lists. Results of a one-way ANOVA indicated that the conditions significantly differed from each other on average change in mood from pre- to post-list making ($F (2, 159) = 15.75, p = .00$). Post-hoc comparisons revealed that, as expected, participants in the Gratitude + Rationale condition reported a significantly larger increase in mood compared to participants in the Gratitude without Rationale condition (mean difference = .20, $p = .03$) and those in the Control condition (mean difference = .49, $p = .00$) and that participants in the Gratitude without Rationale condition reported a significantly larger increase in mood compared to those in the Control condition (mean difference = .29, $p = .00$). One sample t-tests comparing the average change in mood from pre- to post-list making to zero within each condition revealed that, also as expected, the increases reported by both the Gratitude + Rationale and Gratitude without Rationale conditions were significant (difference = .45, $t(51) = 6.45, p = 00$; difference = .25, $t(53) = 3.75, p = .00$, respectively) whereas the Control condition reported no change in mood from pre- to post-list making (difference = -.04, $t(53) = -.84, p = .40$).

Finally, to generate slope predictions for each participant for change in positive and negative emotions across the 14 days of list-making exercises, mixed models
analyses including fixed effects of Intercept, Time, Condition, the Time x Condition interaction and a random effect for slope were estimated for positive and negative emotions. Both of these analyses revealed that the fixed effects of Condition and the Time x Condition interaction were non-significant indicating that conditions did not differ on intercept or slope for positive or negative emotions ($ps > .31$). Thus, reduced models were estimated including no fixed effects and random effects for both Intercept and Slope. Unstructured covariance matrices were used for these analyses because this covariance matrix does not impose any restrictions on the relations between the variances and covariances (Crowder & Hand, 1990). These analyses revealed that the slopes of both positive and negative emotions were significantly negative meaning that both positive and negative emotions declined across the 14 days. However, it should be noted that the degree of decline across the 14 days for both types of emotions was very slight indicating only trivial change, as can be seen in Figures 1a and 1b. Specifically, the mean slope for positive emotions across all conditions was -.20 ($t(159) = -8.18, p = .00$) and the mean slope for negative emotions across all conditions was -.09 ($t(159) = -6.11, p = .00$). Individual slope predictions from the reduced models were saved for each participant and these served as the DVs for subsequent analyses predicting change in positive and negative emotions. Descriptive statistics for these slopes are shown in Table 3.

**Did the conditions differ on happiness or depressive symptoms, or change in positive and negative emotions?**

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3 Though the degree of decline in positive and negative emotions was very small, decline in both types of emotions was unexpected. Therefore, the means, SDs, and correlations for the average daily ratings across the 14 days were examined. This examination revealed only slight, non-systematic variability in means, SDs, and correlations across the 14 days, which suggests that participants were not responding randomly or losing focus across the list making period.
Results revealed that Condition did not significantly predict T2 SHS or T2 CESD controlling for baseline \((ps \geq .54)\).

Results of the mixed model analyses reported above indicated that the three conditions did not differ on slope of positive or negative emotions. Therefore, it was not necessary to re-test the differences in slopes between the two gratitude conditions using hierarchical MLR analyses. Thus, only the contrast code representing the comparison between the Combined Gratitude versus Control conditions was entered into these analyses (i.e., only the differences between the Combined Gratitude and Control conditions were tested). Results indicated that these conditions also did not differ on slope of positive or negative emotions \((ps \geq .49)\). As shown in Table 3, the slopes for both positive and negative emotions were significantly negative, though very small, for all conditions. Together these results indicate that both positive and negative emotions decreased very slightly across the 14 days of list making and that this decrease was similar across the conditions.

*Did trait gratitude or baseline depressive symptoms moderate the effect of the gratitude exercise on happiness, depressive symptoms, or change in positive and negative emotions?*

As shown in Tables 4 and 5, results revealed that T1 GQ-6 significantly moderated the effect of Condition (Combined Gratitude vs. Control) on both T2 CESD and T2 SHS. Further, the interaction between Condition (Gratitude without Rationale vs. Gratitude + Rationale) and T1 GQ-6 approached, but did not achieve, significance when predicting T2 SHS. However, T1 GQ-6 did not significantly moderate the effect of Condition on the slope of positive or negative emotions \((ps \geq .49)\).
The Condition (Combined Gratitude vs. Control) x T1 GQ-6 interaction predicting T2 CESD is depicted in Figure 2. This interaction was interpreted from two perspectives: first, by examining differences between the conditions on T2 CESD scores at varying levels of T1 GQ-6 and, second, by examining differences between the conditions on the relation between T1 GQ-6 and T2 CESD scores (i.e., examining the simple slope for each condition). With regard to differences between the conditions on T2 CESD scores, PROCESS revealed that the effect of Condition (Combined Gratitude vs. Control) on T2 CESD (controlling for T1 CESD) was significant only when T1 GQ-6 was very low (T1 GQ-6 scores ≤ -2.20 SDs, i.e., 2.20 SDs or more below the mean) with participants in the Combined Gratitude condition reporting significantly lower T2 CESD scores compared to those in the Control condition. It should be noted that the region of significance for this interaction included only a very small number of participants. Specifically, there were only 7 participants across all conditions with T1 GQ-6 scores ≤ -2.20 SDs. Therefore, follow-up paired samples t-tests to test change from T1 to T2 CESD when GQ-6 was low were not conducted to avoid interpreting results based only on a handful of data points.

Next, with regard to the relation between T1 GQ-6 and T2 CESD, PROCESS revealed that the simple slope of the line representing the association between T1 GQ-6 and T2 CESD scores for the Control condition was significantly negative (-.45, \( p = .02 \)). In contrast, the simple slope of the line representing this association for the Combined Gratitude condition was non-significant (.04, \( p = .80 \)). This indicates that, controlling for T1 CESD scores, there was a significant negative relation between T1 GQ-6 scores and T2 CESD scores among participants in the Control condition such that low gratitude at
T1 predicted increases in depressive symptoms at T2. In contrast, T1 GQ-6 was not related to T2 CESD among participants in the Combined Gratitude condition.

The Condition (Combined Gratitude vs. Control) x T1 GQ-6 interaction predicting T2 SHS is depicted in Figure 3. This interaction was also interpreted both by examination of condition differences on T2 SHS at varying levels of T1 GQ-6 and by examination of differences between the conditions on the relation between T1 GQ-6 and T2 SHS. First, PROCESS revealed that the effect of Condition (Combined Gratitude vs. Control) on T2 SHS (controlling for T1 SHS) was significant only when T1 GQ-6 was low (T1 GQ-6 ≤ -.34, i.e., .34 SDs below the mean) with participants in the Combined Gratitude condition reporting significantly higher T2 SHS scores compared to those in the Control condition. The region of significance for this interaction was large enough to allow follow-up paired samples t-tests, which revealed that for participants with low baseline gratitude, those in the Combined Gratitude condition reported significant increases in SHS from T1 to T2 (mean difference = -.35, t(33) = -2.87, p = .01) whereas those in the Control condition (n = 12) reported no change (p = .34).

PROCESS also revealed that the simple slope of the line representing the association between T1 GQ-6 and T2 CESD scores for the Control condition was significantly positive (.05, p = .01), whereas the simple slope of the line representing this association for the Combined Gratitude condition was non-significant (-.01, p = .70). This indicates that, controlling for T1 SHS, T1 GQ-6 was positively related to T2 SHS among participants in the Control condition such that low gratitude at T1 predicted lower happiness at T2. In contrast, T1 GQ-6 was not predictive of T2 SHS among participants in the Combined Gratitude condition.
Next, the moderating effect of T1 CESD on the relations between Condition and the 4 DVs was examined. Results revealed that the Condition x T1 CESD interaction did not significantly predict any of the DVs \( (p = .16) \). However, examination of regression diagnostics revealed one high influence data point in the analysis predicting T2 CESD that altered these results (Deleted Studentized Residuals = -4.22, DFFITS = -3.31). As shown in Table 6, when this point was deleted, T1 CESD significantly moderated the relation between Condition (Combined Gratitude vs. Control) and T2 CESD.

The Condition (Combined Gratitude vs. Control) x T1 CESD interaction predicting T2 CESD is depicted in Figure 4. As with the interactions involving T1 GQ-6, the Condition x T1 CESD interaction was interpreted both by examining condition differences on T2 CESD scores at varying levels of T1 CESD and by examining differences between the conditions on the relation between T1 and T2 CESD scores. First, PROCESS revealed that the effect of Condition was significantly negative when T1 CESD was very high (T1 CESD $> 2.40$ SDs above the mean) with participants in the Combined Gratitude condition reporting significantly lower T2 CESD scores compared to those in the Control condition. However, the effect of Condition reversed to become significantly positive when T1 CESD was low (T1 CESD $< -1.34$ SDs; i.e., 1.34 SDs or more below the mean) with participants in the Control condition reporting significantly lower T2 CESD scores compared to those in the Combined Gratitude condition. Again, however, the region of significance for this interaction included only a very small number of participants. Specifically, there were only 5 participants across all conditions with T1 CESD scores $> 2.40$ SDs above the mean and only 3 participants with T1 CESD scores $\leq
-1.34 SDs. Therefore, to avoid interpreting results based on only a handful of data points, follow-up paired samples t-tests were not conducted.

PROCESS also revealed that the simple slopes for the association between T1 CESD and T2 CESD scores for both conditions were significantly positive, though the slope was attenuated (i.e., shallower) in the Combined Gratitude condition. Specifically, the simple slope of the line representing the association between T1 and T2 CESD scores for the Control condition was .98 (p = .00) whereas the simple slope for the line representing this association for the Combined Gratitude condition was .74 (p = .00).

This indicates that while T1 CESD was strongly related to T2 CESD in both conditions, this relation was stronger in the Control condition compared to the Combined Gratitude condition. Thus, high depressive symptoms at T1 were less predictive of high symptoms at T2 in the Combined Gratitude condition than in the Control condition.

*Was the effect of the gratitude exercise mediated by changes in personal resources and/or maladaptive cognitive and behavioral patterns?*

Given that the effect of Condition on depressive symptoms was not consistent across level of T1 CESD or T1 GQ-6 and the effect of Condition on happiness was not consistent across level of T1 GQ-6, a moderated mediation approach was used to test the hypothesis that the effect of Condition was mediated by changes in personal resources and maladaptive cognitive and behavioral patterns. The conceptual model for these analyses is depicted in Figure 5. Further, since there were no significant differences between the Gratitude without Rationale and Gratitude + Rationale conditions in any previous analysis, mediation analyses only compared the Combined Gratitude condition...
to the Control condition. Specifically, three sets of 9 analyses were conducted using PROCESS Model 8. The first set of analyses estimated the indirect effects of Condition (Combined Gratitude vs. Control) on T2 CESD by way of each personal resource and maladaptive cognitive and behavioral pattern variable at varying levels of T1 CESD. The second and third sets estimated the indirect effects of Condition on T2 CESD and T2 SHS, respectively, by way of each personal resource and maladaptive cognitive and behavioral pattern variable at varying levels of T1 GQ-6. Personal resource variables included T2 RPA-Emotion, RPA-Self, ISE, Stroop, GQ-6, and ECS and maladaptive cognitive and behavioral pattern variables included T2 Brooding, BADS-Activation, and RPA-Dampening. Zero centered personal resource and maladaptive cognitive and behavioral pattern variables measured at T1 and the dependent variables at T1 were also included in their respective models as covariates to control for baseline. Thus, each model tested change in a specific personal resource or maladaptive cognitive/behavioral variable as a mediator of the link between Condition and T2 CESD or T2 SHS controlling for baseline and tested whether this indirect path varied by level of T1 CESD or T1 GQ-6. PROCESS Model 8 was chosen because it tests moderation of both the indirect and direct paths, which permits determination of whether the effect of the moderator is carried entirely by the mediator in the model or if other mediators of its impact may also exist.

PROCESS revealed that the Condition x T1 CESD interaction did not significantly predict change in any personal resource or maladaptive cognitive/behavioral

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4 Given the exploratory nature of these analyses, no steps were taken to constrain the Type 1 error rate (i.e., the conventional $p < .05$ cutoff was used to determine significance) even though a large number of analyses was conducted.
pattern variable (all $ps \geq .12$) and that confidence intervals for all conditional indirect effects in each model included zero. These results indicated that, contrary to expectation, changes in the personal resource or maladaptive cognitive/behavioral pattern variables did not mediate the effect of Condition on T2 CESD regardless of baseline depressive symptoms.

Similarly, PROCESS revealed that the T1 GQ-6 x Condition did not significantly predict change in any personal resource or maladaptive cognitive/behavioral pattern variable (all $ps \geq .22$) and that confidence intervals for all conditional indirect effects on T2 CESD and T2 SHS in each model included zero. These results were also contrary to expectation and indicated that changes in the personal resource and maladaptive cognitive/behavioral pattern variables did not mediate the effect of Condition on T2 CESD or T2 SHS controlling for baseline regardless of T1 GQ-6.
Chapter 4: Discussion

The present study investigated the impact of a 14-day gratitude list exercise on happiness, depressive symptoms, and daily emotional experience compared to a daily events list control condition. To examine whether the gratitude list exercise was more effective for some individuals compared to others, trait gratitude and baseline depressive symptoms were tested as moderators of the effect of the gratitude list exercise. The effect of conscious knowledge of the purpose of the exercise (i.e., a rationale) was also examined. To determine whether gratitude list exercises confer their benefits by increasing personal resources and reducing maladaptive cognitive and behavioral patterns, several indices of these constructs were tested as mediators of the effect of the exercise. Results indicated that the gratitude list exercise increased happiness both compared to baseline and compared to the control condition, but as expected, that was only true for individuals low in trait gratitude. Specifically, participants in the gratitude condition reported similar, high levels of happiness regardless of baseline gratitude whereas for participants in the control condition, happiness at T2 was dependent upon baseline trait gratitude. As one would expect, low trait gratitude participants in the control condition were significantly less happy at T2 than their counterparts in the gratitude condition. The gratitude exercise was also associated with decreased depressive symptoms compared to the control condition both for individuals with very low trait gratitude and those with very high depressive symptoms, though the effect of the exercise
on depressive symptoms was less robust compared to its effect on happiness. As with happiness, the gratitude exercise was associated with elimination of the relation between baseline gratitude and future depressive symptoms as well as a reduction in the relation between baseline and future symptoms. Among the two gratitude conditions, inclusion of a rationale with the exercise instructions was associated with a greater increase in happiness amongst individuals low in trait gratitude, though this difference achieved only approached statistical significance. Finally, contrary to expectation, the gratitude list exercise was not associated with improvements in positive or negative emotions regardless of baseline level of trait gratitude or depressive symptoms and the mediation analyses revealed that none of the indices of personal resources or maladaptive cognitive and behavioral patterns accounted for the relation between the gratitude list exercise and happiness or depressive symptoms.

**Effect of the Gratitude Exercise on Happiness.**

The strongest finding of the present study was that the gratitude list exercise was associated with increased happiness compared to a neutral control condition amongst individuals with low trait gratitude. This partially replicates Emmons and McCullough’s (2003; Study 1) findings that a gratitude list exercise enhanced well-being compared to a neutral control condition in an undergraduate sample, though Emmons and McCullough found an effect of the gratitude list exercise on average whereas the exercise was only effective for increasing happiness amongst individuals with low trait gratitude in the present study. Other previous studies in undergraduate samples have found that gratitude list exercises enhance well-being compared to assessment only or daily hassle lists control conditions (e.g., Emmons & McCullough, 2003 Study 2; Froh et al., 2008), but
comparisons with neutral conditions have been conducted less frequently and results have been somewhat inconsistent. Such inconsistencies suggest that one or more moderators may be at play and the present study provides evidence that trait gratitude is such a moderator. That is, samples may vary in trait gratitude by chance making it more or less likely that an effect of a gratitude exercise will be detected on average (e.g., perhaps Emmons & McCullough found an effect on average because their sample happened to be lower in trait gratitude). Thus, the present study increases confidence that the benefits of gratitude list exercises in undergraduate samples are due to the specific attributes of the exercise rather than to the effects of assessment or to decreases in well-being as a result of making hassles lists, but these benefits are strongest amongst individuals low in trait gratitude.

The moderating effect of trait gratitude in the present study provides the first replication of Rash et al.’s (2011) study, in which a 4-week grateful contemplation exercise was most effective for individuals low in trait gratitude at baseline. Our results offer further support for what McCullough et al. (2004) call the resistance hypothesis, which holds that individuals with high trait gratitude are less likely to benefit from specific gratitude inductions because their daily experience of gratitude is largely determined by their personalities whereas individuals with low trait gratitude are more likely to benefit because their daily experience of gratitude depends more on the particular events of that day than on their personality. A similar, and perhaps more parsimonious, explanation is that high trait gratitude individuals are not resistant to the effect of a gratitude exercise, but rather that there is a ceiling effect for such individuals. That is, individuals with high trait gratitude already experience the benefits associated
with gratitude whereas individuals with low trait gratitude can obtain these benefits specifically by practicing gratitude exercises. Froh et al. (2009) explain this in the context of momentary experience of grateful emotions. Specifically, they hypothesize that grateful emotions may lead to enhanced well-being, which in turn yields more grateful emotions and while this occurs naturally in individuals with a predisposition to experience frequent positive emotions, individuals low in such positive emotionality may need something like a gratitude exercise to “kick start” this process. This conceptualization is consistent with the finding that baseline trait gratitude was not associated with happiness at T2 amongst participants who completed the gratitude list exercises. That is, even though low trait gratitude typically predicts lower levels of happiness over time (Wood et al., 2010) as it did in the control condition in the present study, a gratitude exercise apparently can break that link. Indeed, engaging in the gratitude list exercise in the present study allowed low trait gratitude individuals to enjoy levels of happiness at T2 that were similar to their higher trait gratitude peers.

In addition to highlighting the specific importance of trait gratitude as a moderator of the effect of gratitude exercises, the present study joins a growing body of work that highlights the need to consider moderators of the effect of gratitude exercises in general. Indeed, had the present study not included moderators, we would have concluded that the gratitude list exercise was ineffective. Similarly, Froh et al. (2009) found that their gratitude letter exercise was only effective compared to a neutral control condition in adolescents with low baseline positive emotionality (though see Rash et al., 2011 for failure to replicate positive emotionality as a moderator) and Sergeant and Mongrain (2011) found that their gratitude list exercise was associated with improved self-esteem
only among individuals high in self-criticism. Together these studies suggest that failure to consider personality moderators could account for some of the inconsistency in the literature on gratitude exercises. Other individual difference factors may also play an important role in determining the effectiveness of such exercises. For example, Lyubomirsky et al. (2011) found that whereas an 8-week gratitude letter exercise was not associated with increased well-being on average compared to a daily events list, the exercise improved well-being amongst individuals who self-selected to participate in a gratitude exercise to increase their happiness and among those who put substantial effort into the exercises. Thus, there may be a variety of moderators of the effect of gratitude exercises and further exploration of these moderators will help clarify for whom and under conditions gratitude exercises are most useful.

**Effect of the Gratitude Exercise on Depressive Symptoms.**

In addition to increasing happiness among participants with low trait gratitude, the gratitude list exercise was associated with decreases in depressive symptoms compared to the control condition for individuals with very low trait gratitude and those with very high baseline depressive symptoms. Thus, the present study joins a small but growing body of work in demonstrating that gratitude exercises can be effective for reducing depressive symptoms (Seligman et al., 2005; Toepher et al., 2012). Further, the present sample included a large percentage of participants with elevated CESD scores (29% of the sample had scores of 22 or higher) and the gratitude list exercise was associated with reduced symptoms amongst such individuals, which suggests that such exercises may be useful even for individuals with substantial symptoms. This is important as there is some evidence that certain types of gratitude exercises, specifically gratitude letter writing
exercises that do not include delivery of the letter, may actually increase depressive symptoms in dysphoric individuals (Sin et al., 2011).

It must be noted, however, that the effect of the gratitude list exercise on depressive symptoms compared to the control condition was only significant amongst the handful of participants in the present study who had very high levels of depressive symptoms (CESD scores 2.4 SDs or more above the mean) or very low levels of trait gratitude (GQ-6 scores 2.2 SDs or more below the mean). Said another way, only a few participants fell within the region of significance for each of these interactions, meaning that these effects depended upon a small number of data points. Thus, these results do not permit firm conclusions regarding the effectiveness of gratitude list exercises for decreasing depressive symptoms. However, they suggest that had the sample included more participants with very low trait gratitude or very high depressive symptoms, more robust effects on symptoms would have been found. Therefore, future research should take care to over-sample individuals with very low trait gratitude and/or very high depressive symptoms to allow the best possible look at how gratitude list exercises impact depressive symptoms amongst such individuals.5

While firm conclusions regarding the effectiveness of gratitude list exercises for individuals with high depressive symptoms await future research, it is worth noting that the gratitude list exercise eliminated the association between trait gratitude and future

5 The effect of condition on depressive symptoms was also significant at very low levels of baseline depressive symptoms, but the direction of this effect was unexpected. Specifically, when baseline depressive symptoms were very low (i.e., T1 CESD ≤ -1.34 SDs), the gratitude list exercise was associated with higher depressive symptoms at T2 compared to the control condition. However, given that there was no a priori reason to expect such an effect and that there were only 3 participants in the present sample with T1 CESD scores in this range, we will withhold speculation about possible explanations until this effect is replicated.
depressive symptoms. That is, whereas low trait gratitude predicted higher depressive symptoms at T2 for participants in the control condition, that link was broken for participants in the gratitude exercise condition. This is impressive given that low trait gratitude has been shown to be related to higher depressive symptoms over time (Wood et al., 2010). These results indicate that by engaging in regular gratitude exercises, low trait gratitude individuals may be able to enjoy lower levels of depressive symptoms, similar to their higher trait gratitude peers. Results also showed that baseline depressive symptoms were less strongly predictive of future symptoms amongst individuals in the gratitude condition, though this effect was not as robust as for trait gratitude. This is perhaps not surprising given that the best predictor of future depressive symptoms is one’s current level of symptoms (e.g., Lewinsohn, Zeiss, & Duncan, 1989; Tram & Cole, 2006).

The patterns of results for both happiness and depressive symptoms were largely in line with expectation, but it is worth discussing the difference in impact of the gratitude exercise on happiness compared to its impact on depressive symptoms. It is possible that gratitude exercises may impact some aspects of well-being differently than others (e.g., happiness versus depressive symptoms). However, it could also be that failure to find more robust evidence of the effect of the exercise on depressive symptoms was due to an unmeasured moderator (e.g., self-criticism, Sergeant & Mongrain, 2011), the short duration of the exercises, or the use of a relatively mild gratitude exercise (i.e., a gratitude list exercise). Indeed, Toepher et al. (2012) found reductions in depressive symptoms after 4 weeks of gratitude letter writing exercises. However, Seligman et al. (2005) found significant decreases in depressive symptoms immediately following one
week of exercises for participants in both the gratitude list and gratitude visit conditions. This suggests that rapid change in depressive symptoms is possible even when using a brief gratitude list exercise.

The reader is reminded, however, that Seligman et al.’s (2005) study involved individuals specifically seeking to improve their well-being. Indeed, the sample was taken from among visitors to the website for Seligman’s (2002) book Authentic Happiness and the study information was available under a link titled “Happiness Exercises.” While the exact ways in which such a sample differs from the typical undergraduate sample have yet to be established (Parks, Della Porta, Pierce, Zilca, & Lyubomirksy, 2012), one can imagine several important differences, including both motivation and whether the participants have a clear understanding of the purpose of completing the exercises (i.e., a rationale). Unfortunately, though the present study was designed to test the effect of including a rationale on outcomes, the fact that the gratitude list exercise was associated with significantly reduced depressive symptoms for so few participants made it impossible to determine whether the rationale mattered in relation to such symptoms. However, inclusion of the rationale was associated with larger increases in mood from pre- to post-list making compared to making a gratitude list without a rationale and there was some evidence that the rationale enhanced the impact of the gratitude list exercise on happiness. Specifically, amongst individuals low in trait gratitude, the gratitude list plus rationale condition showed a larger increase in happiness compared to the gratitude list without rationale condition, though the difference between the two conditions did not achieve statistical significance. Clearly, more work in samples
that show stronger effects of gratitude exercises is needed to sort out the role played by consciousness knowledge of the exercise’s purpose.

We must also consider potential explanations for the failure in the present study to find an effect of the gratitude list exercise on outcome on average, given that other work has found gratitude exercises to be beneficial on average even when compared to a neutral control condition (Emmons & McCullough, 2003 Study 1; Seligman et al., 2005; Rash et al., 2011). As mentioned above, it is possible that other studies have found an effect on average simply because their samples happened to be lower in trait gratitude as a function of chance. Further, studies that find an effect of the gratitude exercise on average do not rule out the possibility that these exercises are most effective for individuals low in trait gratitude. For example, Rash et al. (2011) found a main effect of their gratitude exercises, but then upon exploring trait gratitude as a moderator, discovered that the effect of the exercise was only significant for those low in trait gratitude.

Another possibility, however, is that perhaps the benefits of the gratitude list exercise on happiness take more than 2 weeks of practice to emerge for most individuals whereas benefits can be seen more rapidly for individuals with low trait gratitude. This hypothesis is based on results from Seligman et al. (2005) who found that a 1-week gratitude list exercise was not associated with increased happiness compared to writing about childhood memories immediately following completion of the exercise, but that the expected difference between these groups emerged by 1 month follow up and was maintained at 6 month follow up. Further, they found that the effect of the gratitude list exercise was most pronounced for those individuals who continued to practice the
exercise on their own after the 1 week of prescribed exercises. Indeed, the two other studies in which gratitude exercises have been shown to be more effective on average compared to neutral control exercises were longer than 2 weeks: Emmons and McCullough (2003; Study 1) used a 10-week gratitude list exercise and Rash et al. (2011) used a 4-week grateful contemplation exercise. Thus, perhaps the benefits of gratitude list exercises take more time to accrue for individuals with average or higher trait gratitude compared to those with low trait gratitude.

Or perhaps a more intense gratitude exercise might be required for individuals higher in trait gratitude to experience rapid benefits. For example, Seligman et al. (2005) found that individuals who took part in a gratitude visit experienced improvements in happiness compared to the neutral control condition immediately at the end of the 1 week of exercises. It is easy to imagine that a gratitude visit, in which you write a gratitude letter to a specific individual and then deliver the letter in person, is likely to be experienced as more emotionally intense than simply writing a list of things for which you feel grateful. Thus, perhaps one’s level of trait gratitude determines the threshold at which one is able to benefit from gratitude exercises and higher thresholds can be reached slowly over time through repeated practice or more quickly by engaging in an intense gratitude exercise. This seems reminiscent of Weber’s Law in perception, which states

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6 Similarly, it could be argued that grateful contemplation exercises like the one used by Rash et al. (2011) may be more potent than gratitude lists. Specifically, Rash et al.’s manipulation included instructions to not only call to mind things for which you feel grateful, but also to try to “experience and maintain the sincere heart-felt feelings of gratitude associated with the thought” for 5 minutes. In contrast, the gratitude list exercise used in the present study required only that participants type 5 things for which they feel grateful and included no instructions to contemplate these things or to try to maintain the feelings associated with them. Thus, it could be argued that the contemplation portion of the exercise used by Rash et al. (2011) made it more emotionally intense than the exercise used in the present study.
that the degree of change in a stimulus required to reach the just noticeable difference threshold is proportional to the baseline level of the stimulus. While conclusions, of course, await future research, it seems that this future work would be wise to establish whether different types of gratitude exercises are in fact more emotionally intense than others and whether this intensity impacts how quickly individuals are able to benefit from the exercise given their baseline level of trait gratitude.

**Mechanisms of Action.**

It is intriguing that in the present study even though the gratitude list exercise served as a momentary positive mood induction and was associated with increased happiness and decreased depressive symptoms amongst individuals with low trait gratitude, it was not associated with enhanced positive emotions or decreased negative emotions over the course of the study regardless of level of trait gratitude or baseline depressive symptoms. Consistent with this, evidence in the literature supporting the effect of gratitude exercises on life satisfaction and happiness has been far more consistent than evidence supporting the effect of gratitude exercises on changes in positive and negative emotions. For example, in their first study, Emmons and McCullough (2003) found no group differences between their gratitude list condition and their control conditions on change in positive or negative affect, but found that participants in the gratitude condition experienced significantly improved life satisfaction compared to making lists of daily events. Similarly, Rash et al. (2011) found improvements in life satisfaction for their gratitude condition compared to the control condition, but no group differences in change in positive or negative affect across the study period. These studies demonstrate that increases in well-being as a result of gratitude exercises can occur independent of
increases in positive emotions and decreases in negative emotions. Thus, changes in emotional experience cannot be solely responsible for the effects of gratitude exercises. This is in line with research that has shown that trait gratitude is related to well-being even after controlling for positive emotionality (e.g., Wood, Joseph, et al., 2008; Wood et al., 2009). Indeed, as discussed earlier, studies have shown that gratitude is prospectively related to a number of constructs that support well-being such as social support (Wood, Maltby, Gillet et al., 2008) and positive re-framing (Lambert et al., 2012) and gratitude exercises may confer their benefits by directly impacting these constructs (i.e., the coping hypothesis discussed by Wood et al., 2010). Contrary to this notion, however, in the present study, the gratitude list exercise was not associated with change in any of the personal resources or maladaptive cognitive and behavioral patterns compared to the control condition, regardless of level of trait gratitude or baseline depressive symptoms. Thus, the mechanism by which the gratitude list exercise had its effect in the present study is unclear.

One possibility is that the exercise increased the amount of attention that participants gave to positive features of their lives, which impacted their subsequent judgments of happiness even though it did not impact their daily experience of emotions. This possibility is consistent with what some researchers have described as a bottom-up theory of well-being, which holds that individuals make judgments about their current level of well-being or happiness based on their present moment recollections of the quality of their experiences (e.g., fulfilling, disappointing; Diener, 1994; Lyubomirsky et al., 2005). Thus, perhaps one pathway by which gratitude list exercises can have their effect is by providing an opportunity to rehearse the positive features of one’s
experiences, making these features more accessible in memory later on. One could imagine that this might occur even if there is no change in the frequency with which an individual experiences positive or negative emotions on a day to day basis. Obviously, future research is necessary to sort out the mechanisms of gratitude exercises. It is clear, however, that these future studies should go beyond looking only at change in experience of emotions to consider a range of potential mediators including cognitive mechanisms such as accessibility of positive events in memory.

In addition to exploring a range of potential mechanisms of gratitude exercises, future researcher should take care to consider the length of time over which the gratitude exercise is practiced because it may take longer than 2 weeks for such an exercise to effect substantial change in mediators compared to a neutral control condition. Indeed, one explanation for the failure to find mediation effects in the present study, despite testing several potential mediators, is that these mediators may have been unlikely to be affected by a gratitude exercise in only 2 week’s time. For example, as reviewed by Rabipour and Raz (2012), programs specifically designed to enhance aspects of cognitive flexibility and executive function typically involve several weeks of practice. Further, Fredrickson et al. (2008) observed improvements in personal resource variables (e.g., savoring, positive relationships) over the course of 7-weeks of Loving Kindness Meditation training. With the exception of Emmons and McCullough’s (2003, Studies 2 and 3) investigations of trait gratitude as a mediator, we are aware of no previous studies to date that have tested the effect of a gratitude exercise on changes in the specific personal resources or maladaptive cognitive and behavioral patterns assessed in the present study. Thus, further research is necessary to explore whether gratitude exercises
performed for longer than 2 weeks may yield improvements on these variables and whether such improvements may account for the longer term effects of the gratitude exercise. Indeed, it will be important for researchers to bear in mind that different mechanisms may account for the effect of gratitude exercises over short versus long time frames.

**Strengths and Limitations.**

The present study contributes to the literature in several important ways. First, it adds to the growing body of work emphasizing the need to consider moderators of the impact of gratitude list exercises. In particular, this study provides evidence that gratitude list exercises may be most beneficial in terms of increasing happiness for individuals with low baseline trait gratitude. Second, the study utilized a psychologically neutral control condition, which is important for determining whether the specific attributes of gratitude lists exercises are responsible for their benefits. Finally, the present study provides a demonstration of the beneficial impact of a gratitude list exercise on depressive symptoms in individuals with elevated baseline symptoms.

However, it is important to consider the results of the present study in the context of several limitations. First, while daily events lists are preferable to hassles lists or assessment only control conditions, a daily events list may not adequately control for expectation or believability. That is, gratitude exercises have received attention in the popular media, for example, in Lyubomirksy’s (2007) popular book *The How of Happiness* and seem fairly face valid, which may make it easy for participants to guess that gratitude list exercises are intended to impact the list maker in a positive fashion. In contrast, it seems unlikely that a typical undergraduate would expect making a list of
things s/he did during the day to improve his/her well-being unless a convincing rationale was presented (such as the one used by Sheldon & Lyubimirsky, 2006). Thus, a critic may suggest that participants in the gratitude list exercise condition reported increases in happiness as a results of demand characteristics. While this is indeed possible, it is difficult to understand why participants low in trait gratitude would have fallen prey to this demand characteristic whereas those higher in trait gratitude did not. Regardless, future research should strive to use control conditions that are believable such as writing about childhood memories, which was used by Seligman et al. (2005) and Sergeant and Mongrain (2011).

Another limitation of the present study is the use of a convenience sample—undergraduate university students. Some may argue that undergraduate samples are inappropriate for testing the effects of gratitude interventions because they are not the target population for these interventions. Such critics might say that gratitude exercises should be studied in clinical populations or in samples of individuals specifically seeking self-improvement because these are the kinds of people for whom gratitude exercises are intended (Seligman et al., 2005). However, we suggest that to the extent that gratitude exercises improve well-being and coping ability, college students may actually be an important target population for these interventions. This is because transitioning to college is associated with dramatic increases in stress (e.g., Towbes & Cohen, 1996; Dyson & Renk, 2006) and many students find it difficult to cope (e.g., Gall, Evans, & Bellerose, 2000). Thus, in the same way that researchers have suggested that gratitude interventions may be useful as psychological strength building activities for adolescents (Froh et al., 2008, 2009), such exercises may help buffer the effects of stressors
associated with adjusting to college life. For example, gratitude exercises could easily be implemented as part of the curriculum in first year experience courses or as part of residence hall programming.

While we argue that it is indeed interesting and important to study gratitude exercises in college samples, it is worth noting that results found in such samples may have limited generalizability. In particular, our sample was primarily Caucasian and in the freshmen and sophomore classes (judging by age). In addition to examining the effect of gratitude exercises across the life span, future research should take cultural background into account. For example, Lyubomirsky and colleagues have suggested that self-focused happiness interventions may be less effective for individuals from collectivistic cultures than those from individualistic cultures (e.g., Boehm et al., 2011). Thus, perhaps gratitude exercises that focus on interpersonal expressions of gratitude (e.g., gratitude letter exercises) would be most useful for individuals from collectivistic cultures compared to more self-focused happiness interventions (Boehm et al., 2011).

**Future Directions.**

It is clear that, at present, the literature on gratitude exercises contains as many questions as it does answers. Indeed, there are several important directions for future research, some of which have been mentioned thus far. These include examining moderators of the effect of gratitude exercises – especially trait gratitude; comparing the intensity and effectiveness of different types of exercises (e.g., gratitude letters versus grateful contemplation versus gratitude lists); and examining the effect of gratitude exercises that are practiced for more than 2 weeks on a range of potential mediators.
including the accessibility of positive events in memory, personal resources, and maladaptive cognitive and behavioral patterns to determine the mechanisms of action. It is worth noting that researchers examining moderators of gratitude exercises, especially personality moderators such as trait gratitude, would be wise to utilize samples specifically selected to over-represent individuals at the extremes on the personality traits of interest (e.g., individuals low in trait gratitude). This is because interaction effects are notoriously difficult to detect in traditional field research due to unselected samples having low power to detect effects that “live” at the extremes of the distributions of the interacting variables (McClelland & Judd, 1993). For example, Rash et al. (2011) suggest that their failure to find moderation by positive affectivity could have been due to low power since their study included only 56 unselected participants. Indeed, it is impressive that they found moderation by trait gratitude in such a small sample.

A few additional directions for future research also warrant mention. First, the optimal frequency of making gratitude lists needs to be explored. Specifically, studies have found gratitude list exercises to be effective compared to neutral control conditions when practiced as little as once per week (e.g., Emmons & McCullough, 2003 Study 1) and as frequently as once per day (e.g., Seligman et al., 2005). However, an analysis of unpublished data discussed by Lyubomirsky et al. (2005) demonstrated that participants assigned to contemplate “the things for which they are grateful” once per week experienced increases in happiness/well-being (the exact measure used is unclear) compared to an assessment only control condition whereas participants assigned to engage in grateful contemplation three times per week did not differ from controls. Lyubomirksy et al. (2005) suggest that perhaps the gratitude exercise lost its freshness
when practiced more frequently and others have pointed out that some individuals may find making gratitude lists to be dull or even frustrating (e.g., Emmons, 2007). Indeed, following completion of the present study, several participants spontaneously reported that they found the gratitude lists to be engaging at first, but that making the lists quickly became an annoyance. In particular, they reported feeling pressure to come up with new things each day for their lists and that this was difficult to do. Thus, future research should explore whether reducing the frequency of list making or including specific instructions indicating that the daily lists need not be unique results in more robust findings.

It will also be important for future research to clarify the effect of gratitude exercises on different aspects of well-being. For example, in the present study, much stronger evidence was found for the effect of the gratitude list exercise on happiness compared to depressive symptoms and no evidence was found for an effect on positive or negative emotions. Other studies have similarly found that gratitude exercises are associated with improvements in some aspects of well-being but not others or affect different aspects of well-being differently (e.g., Emmons & McCullough, 2003; Sergeant & Mongrain, 2011; Rash et al., 2011). This seems to be a common, but largely unaddressed, pattern in the literature on gratitude exercises that would benefit from empirical attention.

Finally, future research is needed to examine the durability of benefits associated with gratitude exercises in general as well as with different types of exercises. Few studies have examined the longer term benefits of gratitude exercises, but those that have done so have demonstrated that benefits can be maintained up to 6 months after
completion of the exercise period (though, unsurprisingly, maintenance tends to be more robust amongst individuals who continue to practice the exercise after the end of the study; Seligman et al., 2005; Lyubomirksy et al., 2011). Determining the durability of benefits is particularly important when considering the use of gratitude exercises in the context of psychopathology. For example, Geraghty et al.’s (2010a, 2010b) studies demonstrated that gratitude list exercises were as effective as a traditional cognitive restructuring technique for reducing worry and body dissatisfaction, but these studies did not assess the maintenance of the effects beyond the 2-week study period. Indeed, it would be quite exciting if a technique as simple as a gratitude list exercise could be used instead of a more complicated cognitive restructuring technique, especially since Geraghty et al. found that attrition was much higher in the cognitive restructuring condition. However, if the benefits of the gratitude exercise are not enduring compared to the benefits of cognitive restructuring, then their utility is obviously limited.

Research on the durability of benefits should also consider potential differences between types of gratitude exercises. For example, in Seligman et al.’s (2005) study, the benefits associated with the gratitude list condition were maintained and even amplified at 3 and 6 month follow up for both happiness and depressive symptoms whereas participants in the gratitude visit condition did not maintain their gains beyond 1 month. It may be that gratitude list exercises lend themselves to continued practice over time (i.e., one can be thankful for even very small or mundane things like good weather or a delicious meal) whereas practical considerations might limit the number of gratitude visits a person is likely to go on (i.e., gratitude visits are higher cost in terms of time and energy and it may be awkward to repeat a visit to the same person).
Summary and Conclusions.

In sum, results of the present study demonstrate that a 2-week daily gratitude list exercise can be effective compared to baseline and compared to a neutral control condition for increasing happiness in individuals with low trait gratitude. Specifically, participants in the gratitude condition reported similar, high levels of happiness regardless of baseline gratitude whereas for participants in the control condition, happiness at T2 was dependent upon baseline trait gratitude. Further, the results suggest that such an exercise may reduce depressive symptoms in individuals with very high symptoms and in those with very low trait gratitude, though evidence for effects on depressive symptoms was not robust. As with happiness, the gratitude exercise was associated with a reduction in the relations between baseline trait gratitude and baseline depressive symptoms and later symptoms. These results are discussed in the context of previous work on trait gratitude and the growing evidence that gratitude exercises may impact different types of individuals differently. Further research is necessary, however, to determine the mechanisms by which gratitude list exercises confer their benefits. In sum, while this study contributes to a growing literature supporting the efficacy of gratitude exercises in general, much more work is needed to clarify for whom these exercises are most beneficial, which types of exercises work for different individuals, and the mechanisms by which these exercises confer their benefits.
References


Appendix A: Tables
Table 1. Descriptive statistics by condition for T1 and T2. Note: T1 = Time 1, T2 = Time 2; Combined Gratitude Condition = collapsed gratitude condition containing both rationale and no rationale groups; CESD = Center for Epidemiological Studies Depression Scale; SHS = Subjective Happiness Scale; ISE = Subjective, Belongingness, and Tangible subscales of the Interpersonal Support Evaluation – College Version; RPA-Self = Self subscale of the Responses to Positive Affect Scale; RPA-Emo = Emotion subscale of the Responses to Positive Affect Scale; ECS = Effortful Control Scale; Stroop = interference T score on the Stroop Task; GQ-6 = Gratitude Questionnaire-6; Brooding = Brooding subscale of the Ruminative Response Scale; BADS-Act = Activation Subscale of the Behavioral Activation for Depression Scale; RPA-Damp = Dampening subscale of the Responses to Positive Affect Scale.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Control Condition (n = 54)</th>
<th>Gratitude without Rationale Condition (n = 54)</th>
<th>Gratitude + Rationale Condition (n = 52)</th>
<th>Combined Gratitude Condition (n = 106)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1 Mean (SD)</td>
<td>T2 Mean (SD)</td>
<td>T1 Mean (SD)</td>
<td>T2 Mean (SD)</td>
</tr>
<tr>
<td>CESD</td>
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<td>15.63 (12.85)</td>
<td>15.04 (10.21)</td>
<td>15.43 (10.14)</td>
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<td>SHS</td>
<td>4.88 (1.33)</td>
<td>4.90 (1.41)</td>
<td>4.69 (1.42)</td>
<td>4.77 (1.44)</td>
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<td>ISE</td>
<td>29.18 (6.79)</td>
<td>29.57 (7.22)</td>
<td>26.83 (7.94)</td>
<td>28.07 (7.32)</td>
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<tr>
<td>RPA-Self</td>
<td>8.69 (2.72)</td>
<td>8.85 (2.94)</td>
<td>8.98 (3.02)</td>
<td>10.00 (3.23)</td>
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<tr>
<td>RPA-Emo</td>
<td>12.91 (3.44)</td>
<td>13.50 (3.74)</td>
<td>13.19 (3.10)</td>
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<tr>
<td>ECS</td>
<td>88.13 (10.69)</td>
<td>88.02 (11.21)</td>
<td>89.13 (11.61)</td>
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<td>Stroop</td>
<td>55.74 (5.54)</td>
<td>56.64 (7.17)</td>
<td>55.45 (6.06)</td>
<td>58.12 (8.32)</td>
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<td>GQ-6</td>
<td>36.63 (5.33)</td>
<td>36.48 (5.31)</td>
<td>36.17 (4.80)</td>
<td>36.43 (4.71)</td>
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<td>Brooding</td>
<td>10.82 (3.41)</td>
<td>10.07 (3.62)</td>
<td>10.63 (3.45)</td>
<td>9.76 (3.48)</td>
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<td>BADS-Act</td>
<td>27.64 (5.84)</td>
<td>27.86 (7.11)</td>
<td>28.32 (7.46)</td>
<td>28.46 (6.84)</td>
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<tr>
<td>RPA-Damp</td>
<td>16.06 (4.66)</td>
<td>15.72 (4.36)</td>
<td>15.46 (4.04)</td>
<td>15.50 (4.35)</td>
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<td>04</td>
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</table>

Table 2. Correlations for all measures. Note: N = 160; all unmarked correlations significant at p < .01, * = p < .05, ** = p ≥ .05. Cronbach’s alphas are shown on the diagonal. T1 = Time 1; T2 = Time 2; SHS = Subjective Happiness Scale; CESD = Center for Epidemiological Studies Depression Scale; ISE = Subjective, Belongingness, and Tangible subscales of the Interpersonal Support Evaluation – College Version; RPA-Self = Self subscale of the Reponses to Positive Affect Scale; RPA-Emo = Emotion subscale of the Responses to Positive Affect Scale; ECS = Effortful Control Scale; Stroop = interference T score on the Stroop Task; GQ-6 = Gratitude Questionnaire – 6; Brooding = Brooding subscale of the Ruminative Response Scale; BADS = Behavioral Activation for Depression Scale; RPA-Damp = Dampening subscale of the Responses to Positive Affect Scale; Sex = 0 (male) or 1 (female).
Table 3. Descriptive statistics by condition for slopes of positive and negative emotions. Note: All slopes significantly different from zero (all ps < .01); Combined Gratitude Condition = collapsed gratitude condition containing both rationale and no rationale groups.

<table>
<thead>
<tr>
<th>Step/variables added</th>
<th>R2</th>
<th>ΔR²</th>
<th>B (SE) a final step</th>
<th>sr at final step</th>
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<td><strong>Step 1:</strong></td>
<td></td>
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<tr>
<td>Constant</td>
<td>.62**</td>
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<td></td>
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<tr>
<td>T1 CESD</td>
<td></td>
<td></td>
<td>15.70** (.68)</td>
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</tr>
<tr>
<td>T1 GQ-6</td>
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<td>8.62** (.70)</td>
<td>.61**</td>
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<tr>
<td>X1</td>
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<td></td>
<td>-1.50† (.81)</td>
<td>-.09†</td>
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<tr>
<td>X2</td>
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<td></td>
<td>-.54 (1.37)</td>
<td>-.02</td>
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<tr>
<td><strong>Step 2:</strong></td>
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<td>.63†</td>
<td>.01†</td>
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</tr>
<tr>
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<td></td>
<td>-.99 (1.41)</td>
<td>-.04</td>
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<tr>
<td>T1GQ-6 x X2</td>
<td></td>
<td></td>
<td>2.72* (1.20)</td>
<td>.11*</td>
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Table 4. T1 GQ-6 and Condition regression model predicting T2 CESD. Note. N = 160; X1 = contrast code representing the Gratitude without Rationale vs. Gratitude + Rationale conditions; X2 = contrast code representing the Combined Gratitude vs. Control conditions; T1 SHS and T1 GQ-6 standardized; sr = semi-partial correlation; *p < .05; **p < .01 † = p < .10.
**Table 5.** T1 GQ-6 and Condition regression model predicting T2 SHS. Note. N = 160; X1 = contrast code representing the Gratitude without Rationale vs. Gratitude + Rationale conditions; X2 = contrast code representing the Combined Gratitude vs. Control conditions; T1 SHS and T1 GQ-6 standardized; sr = semi-partial correlation; *p < .05; **p < .01; †p < .10.

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<td>T1 SHS</td>
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<td>T1 GQ-6</td>
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<tr>
<td>X1</td>
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<td>.08 (.12)</td>
<td>.03</td>
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<td>X2</td>
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<td>.11 (.11)</td>
<td>.04</td>
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<tr>
<td>T1GQ-6 x X1</td>
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<td>-.23† (.13)</td>
<td>-.07†</td>
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<tr>
<td>T1GQ-6 x X2</td>
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<td>-.29** (.11)</td>
<td>-.10**</td>
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**Table 6.** T1 CESD and Condition regression model predicting T2 CESD. Note. N = 160; X1 = contrast code representing the Gratitude without Rationale vs. Gratitude + Rationale conditions; X2 = contrast code representing the Combined Gratitude vs. Control conditions; T1 CESD standardized; sr = semi-partial correlation; *p < .05; **p < .01.

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<tr>
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<td>.74**</td>
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<td>T1CESD x X2</td>
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<td>-2.54* (1.15)</td>
<td>-.11†</td>
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Appendix B: Figures
Figure 1. Daily average emotion ratings on the ADES across the 14 days of list making: A negative emotions, B positive emotions.
Figure 2. Condition by T1GQ-6 interaction predicting T2 CESD scores.
Figure 3. Condition by T1GQ-6 interaction predicting T2 SHS scores.
Figure 4. Condition by T1 CESD interaction predicting T2 CESD scores.
Figure 5. Schematic representation of PROCESS Model 8 (i.e., moderated mediation model); Condition = Combined Gratitude vs. Control condition, Pers. Res. or Mal. CB Pattern = Personal resource or maladaptive cognitive/behavioral pattern.