ABSTRACT

THE EFFECTS OF GRATITUDE ON HEALTH-RELATED QUALITY OF LIFE IN PARKINSON'S DISEASE

By Jenna M. McGwin

Research has consistently shown that individuals who take the time to focus on things for which they are grateful are likely to have increased well-being. However, individuals who have been diagnosed with a chronic health condition, such as Parkinson's disease, may not be as likely to experience gratitude. Although prior research has demonstrated the relationship between a grateful outlook and well-being, prior research has not examined the relationship between a grateful outlook and subjective health appraisals, namely health-related quality of life. Two studies were developed to evaluate the effects of trait gratitude, and experimentally induced state gratitude on health-related quality of life in individuals with Parkinson's disease.

The first study examined the relationship between trait gratitude and health-related quality of life in Parkinson's disease. Prior to analysis, the health-related quality of life variables on the Parkinson's Disease Questionnaire-39 were reduced to three component variables: Social, Psychological, and Physical. The three component variables served as the dependent variables, and trait gratitude served as the independent variable in the analyses. The results of a simple linear regression showed that higher levels of trait gratitude were associated with lower levels of social distress in individuals with PD ($p = 0.02$). However, the results of another simple linear regression showed that higher levels of trait gratitude were not associated with lower levels of psychological distress. Finally, the results of a simple linear regression analysis showed that higher levels of trait gratitude were not associated with lower levels of physical distress.

The second study examined the effects of conscious gratitude practice on health-related quality of life, positive affect, and negative affect in individuals with Parkinson's disease. Participants in this study were randomly assigned to either the gratitude condition or the positive thinking condition, and were then asked to think for one to two minutes per day, for seven days, about things in life they were grateful for or positive things in general. The results showed no difference from baseline to follow-up for health-related quality of life, positive affect, or negative affect for either condition. Although no differences were found, future research should continue to examine the effect of gratitude on health-related quality of life in individuals with Parkinson's disease. A longer study duration is recommended for future research.

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by

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A Thesis Submitted
In Partial Fulfillment of the Requirements
For the Degree of

Master of Science-Psychology

Experimental

at

The University of Wisconsin Oshkosh
Oshkosh WI 54901-8621

May 2011

COMMITTEE APPROVAL

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5-9-11 Date Approved

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Date Approved

FORMAT APPROVAL

5/6/11
Date Approved

For Nathan: My husband, my best friend, my love. I could not have done this without your constant support, encouragement, and patience. Thank you for always believing in me. I would also like to dedicate this to my family, especially my Grandma Etta. Your courage and strength throughout the challenges of Parkinson's disease taught me about perseverance. Thank you. I love you all.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to Dr. Susan McFadden, my thesis advisor. Your enthusiasm for my project encouraged me to continually push through barriers and see the light at the end of the tunnel. Your boundless knowledge, counsel, and patience helped me finish this extensive project. I would also express my appreciation to Dr. Anca Miron and Dr. Keilah Worth for their time and continued support throughout the past year.

I would like to acknowledge Dr. Thomas Fritsch and the Parkinson Research Institute, Aurora Sinai Medical Center, Milwaukee, WI. I am forever grateful for the amount of support and assistance I received from the staff at the Parkinson Research Institute. Without your enthusiasm and willingness to assist with participant recruitment, this project may never have left the ground.

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Introduction

The moment an individual is diagnosed with Parkinson's disease, life changes. Many people experience depression and a loss of health-related quality of life. How does someone cope with something as devastating as this? Research has shown that having a grateful outlook and focusing on things in life that one is grateful for can have an impact on various facets of well-being (Emmons & McCullough, 2003; Froh, Sefick, & Emmons, 2008; Watkins, Woodward, Stone, & Kolts, 2003). Because individuals with PD are likely to experience worsening HRQOL, which can impact their overall well-being, they may benefit from a gratitude intervention.

Although the relationship between gratitude and various facets of well-being has been substantiated, the relationship between gratitude and HRQOL has yet to be examined. Because HRQOL in individuals with PD serves as a measure of physical and psychological well-being, it is important to see whether there is a relationship between gratitude and HRQOL. In light of the previous theories and research, Study 1 was designed to examine the relationship between trait gratitude and HRQOL. Specifically, the study posits that higher levels of trait gratitude are associated with lower levels of distress as measured by the HRQOL measure. Study 2 was designed to examine the effects of a daily gratitude thinking intervention on HRQOL, as well as positive and negative affect. Specifically, Study 2 posits that the daily gratitude thinking intervention positively influences HRQOL, increases positive affect, and decrease negative affect.

Parkinson's Disease

Parkinson's disease (PD) is one of the most common neurological degenerative disorders, characterized by loss of dopaminergic neurons in the substantia nigra, a structure in the midbrain that controls voluntary movements. Individuals diagnosed with PD can have a multitude of symptoms, which range from mild to severely disabling, depending on the stage of the disease. The classic motor symptoms expressed in individuals with PD are tremors, stiffness and/or rigidity, slowness and/or absence of movement, and postural instability (Macht, Smith Pasqualini, & Taba, 2007). As the disease progresses, increasing disability is likely (Tolosa, Wenning, & Poewe, 2006).

PD affects one out of every 1,000 people over the age of 65 and one out of every 100 people over the age of 75 (Doherty & Lyle, 2004). Indications from epidemiological research show that PD occurs in all ethnic groups and affects both sexes equally (Macht, Smith Pasqualini, & Taba, 2007). There are a variety of treatments that address the symptoms of PD. Some of the most researched treatments in PD are those which deal with the biological side of the disease. For example, researchers know that PD is caused by a loss of dopaminergic neurons in the substantia nigra, so biological/pharmacological treatments are aimed at increasing the amount of dopamine in that region of the brain. Among the biological/pharmacological treatments are DOPA decarboxylase inhibitors, monoamine oxidase-B (MAO-B) inhibitors, catechol-*O*-methyltransferase (COMT) inhibitors, and synthetic dopamine agonists (Gallagher & Schrag, 2008).

A recent discovery in the treatment of PD is the effectiveness of deep brain stimulation (DBS). Tanei, Kajita, Kaneoke, Takebayashi, Nakatsubo, and Wakabayashi

state that "bilateral deep brain stimulation (DBS) of the subthalamic nucleus (STN) is considered to be the gold standard for surgical treatment of patients with medically intractable PD" (2009, p. 589). According to the National Institute of Neurological Disorders and Stroke, DBS "uses a surgically implanted, battery-operated medical device called a neurostimulator to deliver electrical stimulation to targeted areas in the brain that control movement, blocking the abnormal nerve signals that cause tremor and PD symptoms" (2010).

In addition to the biological/pharmacological treatment options for individuals with PD, there are also psychosocial treatments that have proven effective. Cognitive-behavioral therapy (CBT) is one form of psychosocial treatment that has been used to treat symptoms of PD. The National Association of Cognitive-Behavioral Therapists states that cognitive-behavioral therapy is a type of psychotherapy that stresses the important role of thinking in how we feel and what we do (2009). In a recent study, an 8-week group CBT program was shown to be effective in treating both anxiety and depression in individuals with PD (Feeney, Egan, & Gasson, 2005). Another form of psychosocial treatment is support groups. However, traveling can be difficult for some individuals with PD. Therefore, a pilot study was conducted on the effectiveness of professionally-led internet support groups. After completion of the 20-week pilot study, participants showed improved quality of life (Lieberman, Winzelberg, Golant, Wakahiro, DiMinno, Aminoff, & Christine, 2005).

Health-related quality of life in individuals with Parkinson's Disease.

The National Center for Chronic Disease Prevention and Health Promotion states that health-related quality of life (HRQOL) refers to individuals' self-perception of their mental and physical health over time. In addition, medical professionals often use HRQOL as a way to measure the effects of chronic illnesses on individuals. Kamphuis et al. (2002) state that HRQOL should be measured multidimensionally, including social relationships, psychological state, and physical health (2002). The most commonly used measure of HRQOL in PD is the Parkinson's Disease Questionnaire-39 (PDQ-39), which consists of 39 questions about problems, difficulties, and distressing feelings that span eight separate dimensions (mobility, activities of daily living, emotional well-being, stigma, social support, communication, cognitions, and bodily discomfort). The questions of the PDQ-39 are answered on a zero to four scale ranging from *never* to *always*; thus, lower scores indicate less distress, and higher scores indicate more distress. The PDQ-39 was used in the current studies to examine HRQOL.

A substantial amount of recent research on PD is concerned with the motor elements that characterize the disease, and the corresponding pharmacological treatments (Feeney, Egan, & Gasson, 2005). However, research on HRQOL has indicated that individuals with PD are likely to face issues of autonomic and cognitive dysfunction, sleep problems (Visser et al., 2008), fatigue (Herlofson & Larsen, 2003), anxiety, and problems with social functioning (Schrag, 2006). Research has also addressed variables that contribute to HRQOL in individuals with PD (Visser et al., 2008; Winter et al., 2010; Zhao, Tan, Lau, Au, Li, & Luo, 2008). These studies are important for several reasons.

First, HRQOL is measured by asking individuals to rate how they feel about the state of their own health and well-being. Hence, HRQOL is a self-perception and is not an opinion from a health care professional. Second, until recently, health care professionals did not seem as interested in the non-motor symptoms experienced by individuals with PD. The majority of research was concerned mainly with the neurological processes, with far less attention to non-motor and psychological issues. Finally, before these studies were completed, the variables that contribute to HRQOL were unknown. As a result of these studies, interventions can now be developed and empirically tested to improve HRQOL in individuals with PD.

The effects of the motor symptoms as well as the non-motor psychological symptoms that characterize PD have a significant impact on many facets, including psychosocial and physical well-being, objective health, and a decrease in HRQOL. Therefore, it is important that researchers begin to study contributors to HRQOL in individuals with PD.

One research team used multiple linear regression and structural equation modeling to determine the variables that significantly influence HRQOL in individuals with PD. The results showed that activities of daily living and psychosocial well-being were the largest contributors to HRQOL. Depressive symptoms and pain also contributed individually but on a smaller scale. In addition, 57% of the variance in activities of daily living was explained by motor symptoms, motor complications, autonomic dysfunctions, and daytime sleepiness. Furthermore, 58% of the variance in psychosocial well-being was explained by depressive symptoms, psychiatric complications, motor symptoms, and

autonomic dysfunction (Visser et al., 2008). These results suggest a conceptual model of HRQOL in individuals with PD that can be used to develop interventions that address these variables in order to create a more fulfilling life for individuals living with this debilitating neurological disease.

HRQOL has not only been studied in individuals with PD living in a Western culture, but has also been studied in individuals living in Eastern cultures. Two recently published articles addressed the factors affecting HRQOL in individuals with PD living in Asia, as well as in Russia. Because the factors affecting PD may vary depending on the individual's culture, it is important to consider research conducted around the world. A recent study found that HRQOL in Asian individuals with PD was significantly affected by bodily discomfort, mobility, communication, and social support (Zhao et al., 2008). In addition, HRQOL was significantly affected by stigma because Asian individuals have a "strong sense of self-dignity and a greater need for 'face-saving'" (Zhao et al., 2008, p. 740).

In another recently published article, the authors attempted to discern the social and clinical determinants of HRQOL in Russian individuals with PD. The results of this study indicate that the number of individuals living in the household was an independent social determinant of HRQOL. The authors reasoned that the number of individuals in the household significantly impacts HRQOL because it increases the quality and availability of care inside the home (Winter et al., 2010). In addition, the authors found that depression, motor complications, disease severity, and dementia were all independent clinical determinants of HRQOL.

When examining HRQOL in PD, one must also be aware that the motor and non-motor symptoms of the disease often interact with one another. Several studies have shown that the presence of stress, depression, and/or anxiety can have pronounced effects on motor symptoms in PD. An editorial in *Stress Medicine* stated that individuals with PD often experience a worsening tremor in the presence of emotional and social stress (Rosch, 1999). Many individuals with PD have agreed with this occurrence, and one example given in the article was the pressure of writing in front of other individuals. When the individual writes a check at home, the handwriting is completely legible. However, in the presence of others, the tremor worsens, and the handwriting becomes illegible.

A study by Kuhn et al. (1996) examined the influence of depression on motor performance. Depression was assessed using the Zung scale, and the Motor Performance Test Series (MPTS) was used to assess motor function. The results showed that individuals with depression performed significantly worse than individuals without depression on the aiming subtest of the MPTS. The researchers concluded that the intensity of depression may have an influence on motor performance (Kuhn et al., 1996).

Individuals with PD also experience anxiety, and research has found that anxiety can fluctuate with motor function. Erdal (2001) examined individuals with and without the "on-off" phenomenon. This phenomenon has been described as unpredictable motor fluctuations, which differs from end of dose fluctuations caused by medication. The "on-off" phenomenon has been linked to fluctuations in dopamine levels, which can render the individual immobile within minutes. Because this phenomenon can have pronounced

effects on the physical symptoms of PD, it is important to understand the role of anxiety in this phenomenon. Previous research has shown that both depression and anxiety increase when individuals are in the "off" or immobile state. The results of this study showed that the individuals with the "on-off" phenomenon had significantly higher levels of anxiety than the individuals without the phenomenon. There were no significant differences between the groups on depression; both groups were mildly depressed.

In conclusion, HRQOL is an important construct for individuals with PD. Measuring HRQOL allows researchers to better understand how individuals with PD subjectively evaluate their health. The current studies take the previous information and further examine HRQOL and its relationship with trait gratitude, as well as state gratitude.

Positive Psychology and Gratitude

Since the inception of positive psychology in 2000, considerable research has focused on identifying individual strengths, in addition to treating weaknesses (Seligman & Csikszentmihalyi, 2000). Seligman, Steen, Park, and Peterson (2005) state that in order for psychology to be a complete science, it should include an understanding not only of suffering, but happiness as well. In addition, they argue that psychology should examine the interaction of suffering and happiness, and implement validated interventions that both relieve suffering and increase happiness. A main goal of the positive psychology movement is to learn how to build and sustain qualities that not only allow individuals and communities to survive, but also to flourish. Proponents of positive psychology claim

that if psychology only focuses on the negative side of life, we will never fully understand what individuals are capable of. Studying positive psychology interventions may lead to a better understanding of human strengths, and how these strengths can be utilized to improve the lives of individuals with mental and physical challenges.

The concept of gratitude is one of the strengths addressed by the positive psychology movement. In order to offer perspective on how much the positive psychology movement has fostered research on gratitude, a recent PsycInfo search was conducted with the key word of "gratitude." In total, the search returned 248 articles with 73% of the articles being published after the launch of positive psychology in 2000.

What is gratitude?

As stated by Emmons and Crumpler (2000), gratitude is not easy to define as it has been conceptualized in many ways, including a moral affect, a trait, an emotion, a virtue, and a coping response. Gratitude is a complex construct, and researchers study it from many different perspectives. Regardless of the chosen perspective, researchers argue that gratitude is a social construct. For example, trait gratitude involves interpreting a social situation with a positive outlook (Wood, Maltby, Gillett, Linley, & Joseph, 2008). In addition, gratitude as an emotion occurs when an individual recognizes he or she has obtained a positive outcome, and realizes that an external source caused the positive outcome (Emmons & McCullough, 2003). Finally, as a moral affect, gratitude is likely to cause the individual to behave prosocially in the future. Thus, gratitude is socially constructed.

McCullough, Kilpatrick, Emmons, and Larson (2001) argue that gratitude is a moral affect, with three morally relevant functions. The first is that gratitude serves as a moral barometer, allowing individuals to accurately perceive that they have been at the receiving end of a benefit. The second function is a moral motive, motivating the individual to behave prosocially toward the original benefactor, as well as other third parties (i.e., a "pay it forward" type of motivation). Finally, gratitude is a moral reinforcer, meaning that the expression of gratitude encourages moral behavior in the future. The authors concluded that this evidence supports the conceptualization of gratitude as a moral affect.

In addition to being conceptualized as a moral affect, gratitude has also been conceptualized as a disposition, or a trait. Trait gratitude has been defined as a "generalized tendency to recognize and respond with grateful emotion to the roles of other people's benevolence in the positive experiences and outcomes that one obtains" (McCullough, Emmons, & Tsang, 2002, p. 112). McCullough et al. state that individuals with a trait of gratitude have a lower threshold for grateful experiences and emotions. This lowered threshold allows individuals to recognize and respond with gratitude after obtaining a positive outcome that was the result of the benevolence of another. The lower threshold could consist of several facets. In essence, McCullough, and colleagues suggest that intensity (more intense experiences of gratitude), frequency (greater frequency of experiences of gratitude), span (feeling grateful for many circumstances), and density (attributing positive outcomes to a number of people) are facets that work together to lower the threshold for trait gratitude.

In the first of four studies, McCullough et al. (2002) developed a questionnaire to measure trait gratitude, the Gratitude Questionnnaire-6 (GQ-6). The authors then examined the correlations of self-ratings and informant ratings of trait gratitude with measures of religiousness/spirituality, positive affect and well-being, prosociality, and the Big Five Personality Traits. The correlation between self-ratings and informant ratings was $r = 0.33$, $p < 0.01$. In addition, the GQ-6 was positively correlated with positive affect and well-being measures, prosociality, and religiousness. Finally, this study showed that the GQ-6 was positively correlated with Agreeableness and Extraversion, and negatively correlated with Neuroticism (McCullough et al., 2002). The results of the first study show the validity of the GQ-6. The second study provided additional support for validity and internal consistency of the GQ-6 measure; it also replicated the results of positive affect and well-being, as well as religiousness from the first study. The third study examined the relationship between trait gratitude and materialism and envy. As expected, the results showed a negative correlation between trait gratitude and materialism, as well as a negative correlation between trait gratitude and envy. McCullough et al. (2002) state that grateful individuals tend to worry less about materialistic possessions, and are less envious of others. In addition, McCullough et al. (2002) state that individuals who are more grateful are not as tied to their material possessions, and are less envious of the materials of others.

Finally, the fourth study examined the relationship between trait gratitude and positive emotions, well-being, prosocial traits, and spirituality, after controlling for Extraversion/Positive Affectivity, Neuroticism/Negative Affectivity, Agreeableness, and

Social Desirability. The results showed that after controlling for the above constructs, trait gratitude accounts for unique variance in nearly all of the measures. Therefore, the authors concluded that there is indeed a trait for gratitude and it can be reliably and validly measured using the GQ-6 questionnaire.

Two studies conducted by Wood, Maltby, Gillett, Linley, and Joseph (2008) researched the relationship between trait gratitude and the development of social support, stress, and depression over time. Although a number studies have examined the relationship between trait gratitude and a variety of psychological well-being variables, this study was different in that it examined the directionality of the variables in question. In both studies, the authors used structural equation modeling to test six models of how gratitude, stress, depression, and social support relate to each other over time.

The first model, a stability model, stated that there will not be a longitudinal relationship between trait gratitude, stress, depression, and social support. The direct model predicted that trait gratitude will lead to, or predict, stress, depression, and social support. The reverse model stated that stress, depression, and social support will lead to trait gratitude. The reciprocal model predicted that there will a positive feedback loop between trait gratitude, stress, depression, and social support. The fifth model tested involved a combination of mediational variables. The final model tested the possibility of a third variable, such as neuroticism or extraversion, accounting for the relationship between trait gratitude, stress, depression, and social support.

The authors tested the second (direct model), third (reverse model), and fourth model (reciprocal) against the first model (stability). The results showed that the second

model, where trait gratitude leads to less stress, less depression, and more social support, provided the best fit for the data. These results suggest that a trait of gratitude allows individuals to appreciate the social support they have in their lives, no matter how many support people they may have, and that trait gratitude also serves as a buffer against stress and depression. There was no support for the mediation models.

In the second study, the authors attempted to replicate the results of the first study and examine whether higher order personality traits could explain the results of the first study. The authors stated that the direct model was superior to both the reciprocal and stability models, and that the direct model is preferred over any other model (Wood et al, 2008). The authors also examined two possible mediation models where stress mediates the relationship between trait gratitude and social support, and depression mediates the relationship between trait gratitude and social support. The results did not support stress as a mediator, but depression could not be ruled out as a potential mediator as depression was negatively associated with both types of social support (appraisal and tangible) measured. Overall, the results show that trait gratitude, over time, is associated with more social support and lower levels of stress and depression.

In addition, gratitude can also be viewed as a mood, or a particular emotional state. Moods often wax and wane, and fluctuate across or throughout days (Rosenberg, 1998). McCullough, Tsang, and Emmons (2004) state that moods are important to study because they can have a different effect on consciousness than emotions, because emotions occur for relatively shorter durations than moods. Therefore, McCullough et al. (2004) concluded that by studying grateful moods in daily life, we can have a better

understanding of how gratitude exerts its presumed effects on individuals' psychological and social lives. McCullough et al. (2004) designed two studies to examine gratitude in people's daily moods.

In the first study, participants completed a series of questionnaires which included measures of well-being, life satisfaction, depressive symptoms, positive affect, optimism, spiritual transcendence, and the Big Five Personalities. Participants were asked to rate the intensity they felt a variety of emotions each day, for a total of 21 days. The amount of gratitude in participants' daily mood was measured by their mean score on three words related to gratitude (*thankful*, *grateful*, and *appreciative*). The results of the first study showed that individuals experienced higher levels of gratitude in their daily moods when they scored high on measures of well-being and positive emotion. Furthermore, individuals who scored high on measures of spiritual transcendence experienced higher levels of daily gratitude, when compared to their lower scoring counterparts (McCullough et al., 2004).

In the second study, participants completed the same measures as in the first study, as well as measures of trait gratitude, religiousness and spirituality, dispositional empathy, and envy. Participants were asked to rate the intensity of a variety of felt emotions each day, for a total of 14 days. Participants also recorded up to eight situations that they felt grateful for each day, and who they felt grateful for in the situation. Finally, participants rated the intensity of the gratitude they felt in each situation on a scale from 1 (*somewhat grateful*) to 3 (*extremely grateful*). The amount of gratitude in participants' daily mood was measured in the same way as the first study. The results of the second

study showed that individuals experienced more gratitude in their daily moods when they scored high on measures on empathic concern. It was also found that gratitude in individual's daily moods was strongly related to the number of discrete interpersonal events that elicited gratitude, as well as the amount of gratitude they experienced in response to those events. These two studies give the psychological community a better understanding of how gratitude-eliciting events and personality variables influence the amount of gratitude we feel each day.

In the current studies, gratitude was examined from two different perspectives. In Study 1, trait gratitude was examined by having participants complete the GQ-6. Specifically, this study examined the relationship between trait gratitude and several HRQOL dimensions. In Study 2, gratitude was examined as a state. Because this research induced a grateful state by asking participants to consciously focus on things for which they are grateful, for one to two minutes per day, gratitude was examined in Study 2 by aggregating the scores of the grateful adjectives on the daily rating form (*grateful, thankful,* and *appreciative*) to create a single measure of mean daily gratitude. The single measure of mean daily gratitude was then used to examine the intervention's effect on HRQOL. Furthermore, to make sure that individuals who score high on trait gratitude were evenly distributed in the gratitude thinking and positive thinking conditions, the GQ-6 was completed prior to the intervention.

The positive consequences of gratitude.

Research on gratitude has contributed to the study of human strengths. For example, gratitude has been found to be related to positive coping, which allows

individuals to approach situations instead of withdrawing from them (Wood, Joseph, & Linley, 2007). In other studies, gratitude has been linked with less need for materialistic possessions (Lambert, Fincham, Stillman, & Dean, 2009; Polak & McCullough, 2006), and a tendency to recall more positive than negative life events (Watkins, Grimm, & Kolts, 2004). Also, individuals who are happy can become more grateful after a counting kindness intervention (Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006).

Furthermore, gratitude has also been linked to prosocial behavior in three separate experimental studies (Grant & Gino, 2010; Tsang, 2006b; 2007). In addition, gratitude has been consistently correlated with aspects of the Big Five personality domains (Wood, Joseph, & Maltby, 2008). For instance, gratitude was positively correlated with extraversion, openness, agreeableness, and conscientiousness, and negatively correlated with neuroticism. In addition, Wood et al. (2008) showed that after controlling for the Big Five domains and facets of personality, gratitude explained additional variance in satisfaction with life. Finally, gratitude was also shown to predict psychological well-being after controlling for the Big Five personality domains (Wood, Joseph, & Maltby, 2009).

Gratitude and well-being.

The studies that are most relevant to Study 2 were conducted by Emmons and McCullough (2003). In the initial, groundbreaking study, the authors conducted three separate experiments to examine the effects of a grateful outlook on physical and psychological well-being. In the first study, Emmons and McCullough randomly assigned participants to one of three conditions: gratitude, hassles, and events. The participants

were provided with weekly reports and were instructed to list up to five things they experienced in the past week that they were grateful for (gratitude condition), things that annoyed or bothered them (hassles condition), or events that affected them (events condition). The results showed that participants in the gratitude condition were more optimistic about the upcoming week, felt better about their lives as a whole, spent more time exercising, and also reported fewer physical complaints than participants in either the hassles or the events condition (Emmons & McCullough, 2003). However, neither positive nor negative affect was significantly influenced by the manipulation.

In the second study, Emmons and McCullough randomly assigned participants to the gratitude, hassles, or downward social comparisons condition. The second study was different from the first in that it was a daily study that took place for two weeks, instead of a weekly study. The participants were provided with daily rating forms and were instructed to list things they were grateful for (gratitude condition), things that annoyed or bothered them (hassles condition), or ways in which their lives were better off than others (downward social comparisons condition). The results showed that participants in the gratitude condition had higher levels of positive affect during the study duration. However, the daily study did not show any significant changes in time spent exercising or physical complaints as a function of intervention type.

The third study was designed to extend the daily study from two weeks to three weeks, to use a participant population that has a chronic disease rather than using undergraduate college students, and finally, to try and replicate the findings from the previous studies. The participants in this study were all diagnosed with a neuromuscular

disease, such as Post-polio syndrome, Charcot-Marie-Tooth, or Fascioscapulohumeral disease. Participants were randomly assigned to either the gratitude or the control condition. The participants were provided with daily rating forms, and were instructed to list things they were grateful for, or only complete the daily rating forms, serving as the control. The results of this study showed that participants in the gratitude condition had a significant increase in their level of positive affect, and a significant decrease in their level of negative affect. In addition, participants in the gratitude condition reported getting more hours of sleep each night.

In a similar study conducted by Watkins et al. (2003), the researchers implemented a gratitude intervention to determine whether or not it would have an effect on positive and negative affect. In this study, participants were randomly assigned to one of four conditions: a gratitude thinking condition, a gratitude essay condition, a gratitude letter writing condition, or the control condition. The participants were given a total of five minutes to think about someone they were grateful for, write an essay about someone they were grateful for, write a letter to someone they were grateful for, or finally, write about the layout of their living room, which served as the control. The results of this study showed that participants in the gratitude conditions significantly increased their positive affect, and that participants in the gratitude thinking condition had the highest increase. Furthermore, participants in all gratitude conditions experienced a significant decrease in negative affect. Although this study only looked at the effect of gratitude on positive and negative affect after one, five-minute exercise, the researchers still found significant effects.

As these research studies show, individuals benefit in various ways when exposed to a gratitude intervention. Depending on how often the gratitude intervention takes place (i.e., daily or weekly), as well as the duration of the intervention, the gratitude intervention can impact well-being. Because gratitude interventions have been shown to improve well-being, Study 2 of the current research posits that a gratitude intervention will also improve HRQOL. Although gratitude has been shown to be an important construct in and of itself, as the next section shows, it is also important to discuss the role that religion plays in the development and maintenance of gratitude.

The Relation of Religion and Gratitude

The concept of gratitude and giving thanks is an important virtue in many religions. Emmons and Crumpler (2000) state that the roots of gratitude are present in many of the world's religions, and gratitude permeates the teachings, prayers, and texts. Emmons and Kneezel (2005) state that gratitude is at the heart of Christian faith. It has been noted throughout many Christian works that giving thanks, not only to God, but for life in general is an "understanding of what it means to be a human in a right relationship with God" (Emmons & Kneezel, 2005, p. 141). In Judaism, "gratitude is a vital component of worship, and permeates every aspect of the worshiper's daily life" (Emmons & Crumpler, 2000, p. 59). Furthermore, in Islam, thankfulness and gratitude to God can be seen throughout the chapters of the Koran (Emmons & Crumpler, 2000). Therefore, it can be concluded that gratitude is a central component to many, if not all, of the world's religions.

In a recent article, Krause (2006) examined the importance of gratitude toward God and how it can affect health and stress in late life. Although gratitude has been linked to greater well-being and certain aspects of health, Krause believes that it is important to understand who the individual is grateful to (i.e., other human beings, religious figures, etc.). Krause states that "it is still not entirely clear how feeling grateful to God in the face of adversity may lead to better health" (2006, p. 167). Krause designed a study to examine the relationship between gratitude toward God, and health and stress in late life. The results of this study showed that the effects of living in a rundown neighborhood on health were completely offset for older women with the highest gratitude scores. Therefore, it can be concluded that gratitude toward God in late life may have an effect on the body (Krause, 2006).

In another study, Krause (2009) examined the possible effects of religion on changes in depression over time. Krause conducted this study to see if gratitude offsets the effects of chronic financial strain on depressive symptoms in later life. The results of this study showed that financial problems have a substantial impact on depressive symptoms in older adults, but the effects are nonexistent for older individuals who are the most grateful (Krause, 2009).

These studies suggest that religion plays an integral role in the development and maintenance of gratitude. Because gratitude is such an important component of many religions, religiousness should be accounted for in any research on the topic of gratitude. If researchers fail to account for religion, it may be impossible to parse out the individual effects that gratitude alone contributes. Because religion plays an important role in the

development and maintenance of gratitude, Study 2 controls for religion by examining if religious individuals are evenly distributed across the two conditions.

Positive Thinking and Psychological Well-Being

Previous research has shown that thinking positively has direct benefits to psychological well-being. It is important to highlight some of this research because the current experimental study not only examines the effects of focusing on someone or something one is grateful for, but also examines the effects of general positive thinking on HRQOL, and positive and negative affect. In a study conducted by Lightsey (1994), positive thoughts were found to moderate, or "buffer", the impact of negative events. The results of this study also showed that individuals who are able to generate positive thoughts after experiencing a negative life event may be able to ward off negative emotions and moods (Lightsey, 1994). In addition, Lightsey (1994) also stated that if an individual is able to generate positive thoughts during stressful situations, he or she may be able to maintain a positive mood in the face of life stresses. Therefore, if individuals are able to think positively, they may be able to increase positive feelings and decrease negative feelings.

Study 2 posits that a general positive thinking intervention will have an effect on positive and negative affect, but will not have an effect on HRQOL. In order for positive thinking to affect physical well-being and HRQOL, it would need to be more narrowly defined (i.e., optimistic thinking). Study 2 tests the hypothesis that a general positive thinking intervention does not have an effect on HRQOL.

The Structure of Positive and Negative Affect

Previous research has shown that a conscious focus on gratitude reduces negative affect and increases positive affect. Because positive and negative affect are examined in Study 2 as independent constructs (by use of the I-PANAS-SF), it is important to discuss research providing support for this view.

The structure of positive and negative affect as independent constructs has been shown in several factor analysis studies (Thompson, 1997; Tellegen, Watson, & Clark, 1999; Watson, Clark, Tellegen, 1988; Watson & Tellegen, 1985). In addition, research has also shown the independence of positive and negative affect in experimental studies. For example, Schimmack (2001) conducted a study to examine the structure of positive and negative affect. In this study, participants viewed pleasant, neutral, and unpleasant pictures. Participants' affect prior to the manipulation showed that they had low levels of negative affect and moderate levels of positive affect. After the manipulation, participants reported an increase in negative affect, but still reported feeling positive affect. Schimmack concluded from this study that positive and negative affect can coexist. Schimmack claimed these results provide support for the independence of positive and negative affect.

Study 1 hypotheses

The purpose of Study 1 was to examine the relationship between trait gratitude and HRQOL in individuals with PD. Because Kamphuis et al. (2002) stated that HRQOL should incorporate social relationships, psychological state, and physical health, the

researcher grouped the eight dimensions of the HRQOL measure into three component variables. The dimensions were also grouped to increase power and decrease the possibility of a Type II error. The dimensions of mobility, activities of daily living, and bodily discomfort contributed to the Physical component variable. The dimensions of emotional well-being and cognitions were grouped into the Psychological component variable. Finally, the dimensions of social support, stigma, and communication formed the Social component variable. Due to small sample size, a factor analysis could not be run to determine whether the eight dimensions load on the three factors specified. However, this could be examined by future research.

Based on the Wood et al. (2008), Kuhn et al. (1996), and Erdal (2001) findings, the following hypotheses were developed to determine the relationship between trait gratitude and HRQOL in PD.

Hypothesis 1: Higher levels of trait gratitude are significantly associated with fewer experiences of social distress.

Hypothesis 2: Higher levels of trait gratitude are significantly associated with fewer experiences of psychological distress.

Hypothesis 3: Higher levels of trait gratitude are significantly associated with fewer experiences of physical distress.

Study 2 hypotheses

This study was designed to examine whether a daily gratitude intervention positively influences HRQOL in persons with PD, and whether it increases positive

affect, and decreases negative affect. Figure 1, shown below, is the conceptual model of Study 2. The figure shows that the manipulation will increase HRQOL, but the effects may be mediated by an increase in PA, or a decrease in NA. Specifically, the following hypotheses were examined:

Hypothesis 1: The aggregated level of mean daily gratitude will be higher in the gratitude thinking condition than in the positive thinking condition.

Hypothesis 2: Participants in the gratitude condition will show a greater increase in HRQOL than participants in the positive thinking condition.

Hypothesis 3: The manipulation will increase positive affect of participants in both the gratitude and positive thinking conditions.

Hypothesis 4: The manipulation will decrease negative affect of participants in both the gratitude and positive thinking conditions.

Hypothesis 5a: Positive affect will mediate the relationship between the manipulation and HRQOL.

Hypothesis 5b: Negative affect will mediate the relationship between the manipulation and HRQOL.

Figure 1. Conceptual Model

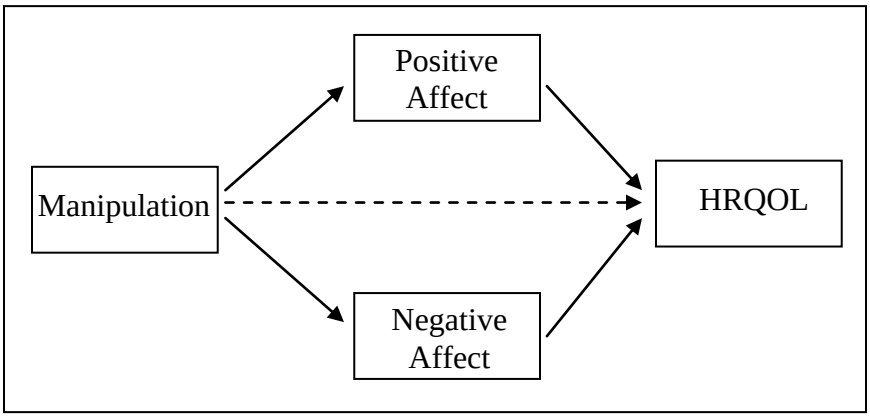

Figure 1. The manipulation will increase HRQOL, but the effects may be mediated by an increase in PA, or a decrease in NA.

Study 1

Method

Participants.

Participants were recruited by the researcher who attended local PD support group meetings. All participants met the requirement of a diagnosis of PD. A total of 29 individuals participated in the current study. Twelve of the 29 participants of Study 1 also participated in Study 2. For the twelve individuals who participated in both studies, the pre-manipulation data was used from Study 2 for the current study. The researcher read from the following script: "My name is Jenna McGwin and I am a graduate student at the University of Wisconsin Oshkosh. I am currently working on a research study that is looking at health-related quality of life in individuals with Parkinson's disease. I am here to ask if anyone would be interested in participating. This will require you to fill out two questionnaires, which should only take a few minutes. Thank you for your time." Additional questionnaires were sent with the script attached to the Parkinson Research Institute, Milwaukee, Wisconsin.

Measures.

HRQOL. Health-related quality of life was assessed using the Parkinson's Disease Questionnaire-39 (PDQ-39). The PDQ-39 measures eight dimensions of HRQOL: mobility, activities of daily living, emotional well-being, stigma, social support, cognitions, communication, and bodily discomfort. Validity of the PDQ-39 was assessed by correlating the questionnaire with clinical assessments of ill health, specifically, the

Columbia score and the Hoehn and Yahr staging score. In a previous study, the PDQ-39 summary index was significantly correlated with the Columbia score ($r = 0.43$, $p < 0.001$, $n = 122$) and the Hoehn and Yahr staging score ($r = 0.51$, $p < 0.001$, $n = 127$), indicating high construct validity (Jenkinson, Fitzpatrick, Peto, Greenhall, & Hyman, 1997, p. 356). For Study 1, the dimensions of HRQOL were grouped into three component variables: social distress, psychological distress, and physical distress. Reliability analysis for the PDQ scale showed high internal consistency, Cronbach's alpha = 0.89.

Trait Gratitude. Trait gratitude was assessed by the use of the Gratitude Questionnaire-6 (GQ-6). The GQ-6 includes six items rated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. The GQ-6 has been shown to have high internal consistency with Cronbach's alpha of 0.82 (McCullough, Emmons, & Tsang, 2002). Furthermore, the GQ-6 self-ratings correlate highly with informant ratings of gratitude ($r = 0.33$, $p < 0.01$), supporting validity of the measure (McCullough, Emmons, & Tsang, 2002). For Study 1, the GQ-6 scale showed adequate internal consistency, Cronbach's alpha = 0.64.

Procedure.

Participants who showed an interest in participating in the study were handed a packet containing the two questionnaires of interest. Participants were asked to follow the instructions printed on the questionnaires. The researcher collected the completed questionnaires after the support group meeting. Individuals who wished to take the questionnaires home to complete them were given a business reply envelope to send the questionnaires back to the researcher.

Results

All data were analyzed using PASW 18 (2010). The data of Study 1 were analyzed by conducting regression analyses. Prior to data analysis, all assumptions of regression were checked. The results showed that the multivariate outlier assumption was violated. Multivariate outliers occur when a participant's scores are found to be outliers on multiple independent variables. Two participants were found to be multivariate outliers (i.e., Cook's D value > 1.00) and were excluded from further analysis leaving a total sample of $N = 27$.

A simple linear regression was conducted to evaluate the relationship between trait gratitude and social distress. The regression indicated a significant negative correlation between trait gratitude and social distress ($r = -0.42$, $p = 0.02$), with trait gratitude being a significant predictor of social distress, $\beta = -0.42$, $t = -2.26$, $p = 0.02$. The results of the regression analysis indicated that trait gratitude explained 17.5% of the variance in social distress, and the overall model was significant, $F(1, 24) = 5.11$, $p = 0.03$. These results suggest that higher levels of trait gratitude are associated with fewer experiences of social distress in individuals with PD, providing support for hypothesis 1.

Another simple linear regression was conducted to evaluate the relationship of trait gratitude and psychological distress. The regression indicated a non-significant negative correlation between trait gratitude and psychological distress ($r = -0.12$, $p = 0.28$). Trait gratitude was not a significant predictor of psychological distress, $\beta = -0.12$, $t = -0.61$, $p = 0.55$, accounting for only 1.5% of the variance in psychological

distress. The overall regression model was not significant, $F(1, 24) = 0.37$, $p = 0.55$. These results suggest that higher levels of trait gratitude are not associated with fewer experiences of psychological distress in individuals with PD.

Finally, a simple regression was conducted to evaluate the relationship of trait gratitude and physical distress. The results of the regression indicated a non-significant correlation between trait gratitude and physical distress ($r = -0.13$, $p = 0.27$). Trait gratitude was not a significant predictor of physical distress, $\beta = -0.13$, $t = -0.63$, $p = 0.53$. These results suggest that higher levels of trait gratitude are not associated with fewer experiences of physical distress by the participants of the current study.

Discussion

Previous research has indicated that there is a trait for gratitude, and this trait is positively related to well-being, lower levels of stress and depression, and allows individuals to appreciate the social support they have, regardless of the number of people in their lives (McCullough et al., 2002; Wood et al., 2008). As predicted by hypothesis 1, higher levels of trait gratitude are associated with lower levels of social distress. This result provides additional support for the concept of gratitude as a social construct. Gratitude can be viewed from many perspectives, such as a trait, an emotion, and a mood, but all of the different perspectives involve a social component. Therefore, it can be concluded that, for the participants in this study, those with higher levels of trait gratitude experience less social distress.

Hypothesis 2 was not supported. This result suggests that higher levels of trait gratitude are not associated with lower levels of psychological distress. Although previous research has indicated a positive association between trait gratitude and various facets of well-being, this study does not provide support for that association (McCullough et al., 2002). It is possible that individuals with PD experience an overwhelming amount of psychological distress that cannot be completely offset with high levels of trait gratitude. Many individuals with PD experience depression, and previous studies have been unable to determine whether the depression has a purely psychological cause, a biological cause, or a combination of the two (Erdal, 2001; Schrag, 2006). Another possible explanation of why the hypothesis was not supported is that previous research examined the relationship between trait gratitude and well-being, not lower levels of psychological distress per se. Although lower levels of psychological distress could be associated with well-being, these constructs cannot be viewed as the same. It is possible that there is an association between higher levels of trait gratitude and lower levels of psychological distress, but the association may be too small to detect with a limited sample size.

The hypothesis that higher levels of trait gratitude would be associated with lower levels of physical distress was also not supported. Previous research has not shown an association between trait gratitude and physical symptoms, but because the HRQOL measure is subjective, it was thought that trait gratitude may have an effect on how phyisical symptoms were assessed. It is possible that an association exists between these constructs, but could not be detected in the current study due to small sample size.

Although mixed support was found for the hypotheses, the results of the current study should not deter future studies from examining the association between trait gratitude, psychological distress, and physical distress in individuals with PD.

Study 2

Method

Participants.

Participants were recruited by the use of a promotional research flyer. The flyer was distributed by local PD support groups throughout the state of Wisconsin, and the Parkinson Research Institute, Milwaukee, Wisconsin. All participants met the requirement of a diagnosis of PD. A total of 12 individuals (66.7% male), aged 53-91, participated in Study 2.

Conditions.

Participants were randomly assigned to either the gratitude thinking condition or the positive thinking condition. In the gratitude condition, participants were given the following instructions: "There are many things in life that we might be grateful for. Whether those things are big or small, take the next one to two minutes to think about things or people in your life that you are grateful for." Participants in the positive thinking condition were given the following instructions: "Take the next one to two minutes to think about positive things."

Measures.

In addition to the two measures used in the first study, the PDQ-39 and the GQ-6, the following measures were included in Study 2.

Positive and Negative affect. Positive and negative affect were assessed using the International Positive and Negative Affect Schedule-Short Form (I-PANAS-SF)

(Thompson, 2007). Thompson developed the I-PANAS-SF using items from the original PANAS (Watson, Clark, & Tellegen, 1988). The original PANAS assesses positive and negative affect as two separate dimensions, and has been shown to be both reliable and valid (Watson et al., 1998). Because the I-PANAS-SF was created from the PANAS, it too assesses positive and negative affect as two separate dimensions. This scale contains five items on positive affect and five items on negative affect, answered on a scale ranging from 1 (*never*) to 5 (*always*). Convergent validity of the scale was determined previously by correlating the I-PANAS-SF with a subjective well-being and happiness measure. The results showed that the PA subscale correlated positively with both SWB ($r = .33$, $p < .01$) and happiness ($r = .39$, $p < .01$), and also that the NA subscale negatively correlated with both SWB ($r = –.33$, $p < .01$) and happiness ($r = –.51$, $p < .01$), thus showing convergent validity (Thompson, 2007). For Study 2, the PA and NA scales had Cronbach's alphas of 0.71 and 0.82, showing good internal consistency reliability.

Religiousness. Religiousness was assessed with three items. Two items assessed organizational religiousness ("How often do you go to religious services?" and "Besides religious services, how often do you take part in other activities at a place of worship?"), which were rated on a scale from 1 (*never*) to 6 (*more than once a week*). The third item was an overall self-ranking of religiousness ("To what extent do you consider yourself a religious person?"), which was rated on a scale from 1 (*not at all*) to 4 (*very religious*). These items were selected from the Brief Multidimensional Measure of Religiousness/Spirituality (Fetzer Institute, 1999). For Study 2, the religiousness scale had Cronbach's alpha of 0.87, showing good internal consistency of the measure.

Manipulation check. To determine the effectiveness of the experimental manipulation, a follow-up measure was developed that asked participants to rate the extent they thought about positive things, the extent they thought negative things, and the extent they thought about people or things they were grateful for during the past week. All questions were rated on a 1 (*never*) to 5 (*always*) scale. The measure also asked participants to write one or two sentences regarding what they thought about the past week.

In addition to the measures of HRQOL, trait gratitude, positive and negative affect, and religiousness, participants were asked to fill out a daily rating form, which included nine affect terms. The nine affect terms on the daily form were: *excited, bitter, grateful, happy, sad, thankful, inspired, afraid,* and *appreciative.* Selection of the affect items came from the study by Emmons and McCullough (2003). The affect items that loaded highest on positive and negative were selected, as well as the three affect items that relate specifically to gratitude (*grateful, thankful,* and *appreciative*). The positive and negative affect items were selected only as distracter items, and were not included in statistical analysis. Participants were asked to rate the extent to which they experienced each of the feelings during the present day on a scale from 1 (*did not experience*) to 3 (*experienced many times*). The affect items were randomly ordered on each of the seven daily scales. Finally, participants were asked to complete a demographic questionnaire, at the beginning of the study, which included questions on gender, marital status, employment status, education level, ethnicity, as well as the age at which the participant was diagnosed with PD, and how long the participant has been diagnosed with PD.

Procedure.

The promotional research flyers were mailed to the PD support groups and the Parkinson Research Institute. The consent form and an envelope were also attached to the flyer. Any individual diagnosed with PD who was interested in participating completed the consent form and mailed the form back to the researcher. Once the researcher received the completed consent form, along with an address of where to send the remaining forms, the packet was mailed to the individual. As soon as the packet was received by the participant, the study began.

The packet included a cover letter outlining the instructions of the study, the demographic questionnaire, the religiousness questionnaire, two baseline measures (PDQ-39 and I-PANAS-SF), seven daily rating forms, as well as three follow-up measures (PDQ-39, I-PANAS-SF, and a manipulation check). Participants were instructed to complete the baselines measures on the first day of the study. On each day after, they were to complete the daily rating forms (i.e. days 2-8). Participants were instructed to complete the follow-up measures on the day following the end of the seven days of daily ratings (i.e., day 9). Participants were provided with three stamped envelopes for mailing the forms back to the researcher. Participants were instructed to mail the demographic questionnaire, the religiousness questionnaire, the I-PANAS-SF baseline, and the PDQ-39 baseline in one envelope on the first day of the study. Participants were instructed to mail the seven daily forms in another envelope after the eighth day. Finally, participants were instructed to mail the I-PANAS-SF follow-up, the

PDQ-39 follow-up, and the manipulation check follow-up in the last envelope on the ninth day of the study.

The participants were instructed to fill out the daily rating forms as close to the end of the day as possible, but before becoming too tired. It was stressed that if the participant had difficulty completing the forms, it would be appropriate for a caregiver or spouse to assist them. The daily forms were to be filled out *before* the participants thought about things or people in life they were grateful for, or thought about positive things. In the condition specific directions, it was suggested that the participant have a watch or clock with a second hand so they could time the one to two minutes of thought about grateful or positive things. The daily rating form took approximately two minutes to complete each day. It was stressed that if they forgot to fill out a form, it is better to omit the form than to go back and try to fill it out from memory.

Results

A t-test was conducted to ensure that there were no significant differences between participants in the gratitude condition and participants in the positive thinking condition on religiousness or trait gratitude. The t-test examining the difference of religiousness between the gratitude (M = 9.17, SD = 3.43) and positive thinking (M = 9.67, SD = 4.46) conditions was not significant, $t(10) = -0.22$, $p = 0.83$, suggesting that religious individuals were evenly distributed between the two conditions. The t-test examining the difference of trait gratitude between the gratitude (M = 41.00, SD = 1.10) and positive thinking (M = 37.50, SD = 3.99) conditions was also not significant,

$t(5.75) = 2.07$, $p = 0.09$, suggesting that individuals who are high in trait gratitude were evenly distributed between the two conditions.

Demographic variables.

The participants in the gratitude condition were younger ($M = 64.17$, $SD = 4.48$) than participants in the positive thinking condition ($M = 75.33$, $SD = 3.90$). However, the age of participants was not significantly different between the two conditions, $t(10) = -1.88$, $p = 0.09$. The participants in the gratitude condition have had PD for fewer years ($M = 6.67$, $SD = 2.17$) than participants in the positive thinking condition ($M = 9.50$, $SD = 2.59$). However, the mean length of PD was not significantly different between the two conditions, $t(10) = -0.84$, $p = 0.42$. The participants in the gratitude condition also completed fewer years of education than participants in the positive thinking condition. More detailed information regarding the demographics of the participants in each condition can be seen in Table 1.

Table 1
Comparison of Demographic Information by Condition

	Condition	
	Gratitude (N = 6)	Positive Thinking (N = 6)
Mean Age	64.17 (4.48)	75.33 (3.90)
Gender		
Male	66.7%	66.7%
Female	33.3%	33.3%
Highest Education		
Grammar School	16.7%	0%
Vocational/Technical School (2 yr degree)	16.7%	0%
Some College	33.3%	16.7%
Bachelor's Degree	16.7%	0%
Master's Degree	16.7%	50.0%
Doctoral Degree	0%	16.7%
Professional Degree (MD, JD, etc.)	0%	16.7%
Employment Status		
Employed	33.3%	16.7%
Unemployed	16.7%	0%
Retired	50.0%	83.3%
Ethnicity		
Caucasian	100%	100%
Marital Status		
Married	66.7%	83.3%
Living with Another	16.7%	0%
Single	16.7%	0%
Widowed	0%	16.7%
Mean Age Diagnosed with PD	56.67 (4.61)	65.50 (3.37)
Mean Length of PD	6.67 (2.17)	9.50 (2.59)
GQ-6		
Total Gratitude Score	41.00 (1.09)	37.50 (3.99)
Religiousness		
Total Religiousness Score	9.17 (3.43)	9.67 (4.46)

Note. The numbers in parentheses indicate the standard deviations for each variable.

Data reduction.

Prior to conducting a one-way ANOVA to check the experimental manipulation, the scores on the affect items related to gratitude (*grateful, thankful,* and *appreciative*) on the daily rating scales were aggregated to derive a single measure of mean daily

gratitude. The single measures of mean daily gratitude from days 1-7 were then aggregated to form a single composite score across the seven days.

The questions of the PDQ-39 measure were reduced to create a single summary score for each of the eight dimensions. The eight summary scores were then aggregated to derive a total summary index (PDQ-SI), which encompasses all eight dimensions of HRQOL. There were a total of nine 2 x 2 mixed ANOVAs computed to evaluate any significant differences on HRQOL between the gratitude and the positive thinking conditions. See Table 2 for means and standard deviations for each dimension of HRQOL, as well as means and standard deviations for positive and negative affect.

For comparative purposes between Study 1 and Study 2, the PDQ-39 variables were also grouped into three component variables: physical distress, psychological distress, and social distress. A series of three, 2 x 2 mixed ANOVAs were conducted to examine significant differences. Results can be found in Appendix M.

The I-PANAS-SF items on the Positive Affect (PA) scale were summed to create a total PA score. The items on the Negative Affect (NA) scale were summed to create a total NA score. Because the I-PANAS-SF was completed at baseline and again at follow-up, there were two scores for each subscale, one baseline total score and one follow-up total score each for PA and NA.

Table 2
Comparison of Outcome Measures by Condition

	Condition			
	Gratitude (N = 6)		Positive Thinking (N = 6)	
	Baseline	Follow-up	Baseline	Follow-up
PDQ-39				
PDQ-SI	31.98 (8.62)	31.73 (7.14)	15.56 (5.92)	22.13 (6.80)
Mobility	47.08 (15.71)	45.83 (14.11)	28.33 (12.58)	39.50 (13.54)
ADL	26.67 (13.41)	34.72 (14.26)	22.92 (6.61)	31.25 (6.61)
EWB	32.64 (8.77)	30.56 (9.11)	4.86 (2.73)	11.11 (3.83)
Stigma	28.13 (14.94)	27.08 (12.98)	2.08 (5.10)	4.17 (3.09)
SS	10.42 (3.98)	8.33 (6.80)	1.39 (1.39)	2.78 (1.76)
Cognitions	44.79 (8.29)	36.46 (9.33)	17.70 (9.19)	21.88 (9.51)
Comm	26.67 (19.44)	22.22 (5.56)	13.89 (9.29)	22.22 (12.11)
BD	55.56 (11.52)	48.61 (13.16)	33.33 (9.62)	33.33 (6.80)
I-PANAS-SF				
PA	19.33 (0.61)	19.17 (1.08)	19.33 (0.84)	18.17 (1.30)
NA	10.00 (1.44)	10.50 (2.05)	8.17 (0.87)	8.68 (0.80)

Note. PDQ-SI = Parkinson's Disease Questionnaire-Summary Index.
ADL = Activities of Daily Living. EWB = Emotional Well-being.
SS = Social Support. Comm = Communication. BD = Bodily Discomfort.
PA = Positive Affect. NA = Negative Affect.

Manipulation check.

A one-way ANOVA was conducted to check the experimental manipulation, with the single composite score of gratitude as the dependent variable, and the two conditions (gratitude and positive thinking) as the independent variable. Levene's test for Homogeneity of Variance was significant, $F(1, 10) = 5.29$, $p = 0.04$; however, the results of the one-way ANOVA showed that the mean level of daily gratitude was not significantly different between the gratitude and positive thinking conditions, $F(1, 10) = 0.74$, $p = 0.41$.

Health-related quality of life outcomes.

A 2 x 2 mixed ANOVA was conducted to determine any significant differences on HRQOL. The first mixed ANOVA evaluated the differences on the PDQ-Summary Index (total HRQOL) between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 8) = 0.04$, $p = 0.85$, $\eta_p^2 = 0.005$, suggesting no significant change on total HRQOL from baseline to follow-up. There was no significant main effect of condition, $F(1, 8) = 0.95$, $p = 0.36$, $\eta_p^2 = 0.005$, suggesting no significant difference on the effectiveness of the intervention (gratitude or positive thinking). There was a significant interaction between time and condition, $F(1, 8) = 6.20$, $p = 0.04$, $\eta_p^2 = 0.44$. See figure 2 for interaction effects.

Four contrasts were conducted to examine the interaction. The first contrast showed was no significant difference between baseline PDQ-SI scores ($M = 31.98$, $SD = 19.28$) and follow-up PDQ-SI scores ($M = 31.73$, $SD = 17.50$) for participants in the gratitude condition, $t(18) = 0.03$, $p = 0.98$. The second contrast showed no significant difference between baseline PDQ-SI scores ($M = 15.56$, $SD = 14.52$) and follow-up PDQ-SI scores ($M = 22.13$, $SD = 13.99$) for participants in the positive thinking condition, $t(18) = -0.66$, $p = 0.52$. The third contrast showed no significant difference between baseline PDQ-SI scores in the gratitude condition ($M = 31.98$, $SD = 19.28$) and baseline PDQ-SI scores in the positive thinking condition ($M = 15.56$, $SD = 14.52$), $t(18) = 1.65$, $p = 0.12$. The fourth contrast showed no significant difference between follow-up PDQ-SI scores in the gratitude condition ($M = 31.73$, $SD = 17.50$) and follow-up PDQ-SI scores in the positive thinking condition ($M = 22.13$, $SD = 13.99$), $t(18) = 0.97$, $p = 0.35$.

These results do not support hypothesis 2 (participants in the gratitude condition will show a greater increase in HRQOL than participants in the positive thinking condition).

Figure 2. The Effect of the Manipulation on Health-Related Quality of Life

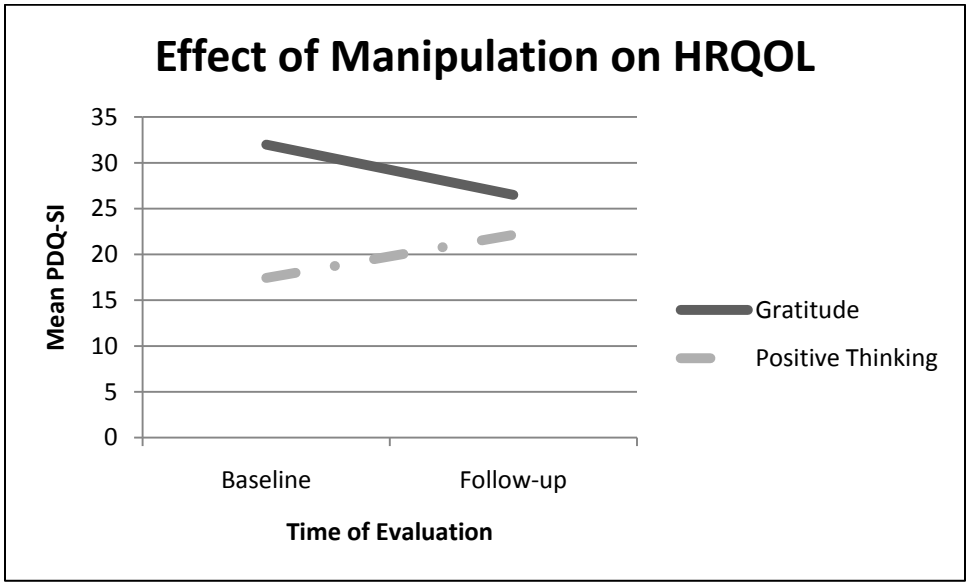

Figure 2. The effect of the manipulation on HRQOL in PD.
Note. PDQ-SI = Parkinson's Disease Questionnaire-Summary Index.

The second mixed ANOVA was conducted to determine any significant differences on the PDQ-Mobility subscale between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 9) = 1.01$, $p = 0.34$, $\eta_p^2 = 0.10$, suggesting no significant change in Mobility from baseline to follow-up. There was no significant main effect of condition, $F(1, 9) = 0.23$, $p = 0.65$, $\eta_p^2 = 0.02$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition, $F(1, 9) = 2.55$, $p = 0.15$, $\eta_p^2 = 0.22$.

The third mixed ANOVA was conducted to determine any significant differences on the PDQ-Activities of Daily Living (ADL) subscale between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 9) = 3.82$, $p = 0.08$, $\eta_p^2 = 0.29$, suggesting no significant change on ADL from baseline to follow-up. There was no significant main effect of condition, $F(1, 9) = 0.00$, $p = 0.95$, $\eta_p^2 = 0.00$, suggesting no significant difference on the effectiveness of the intervention. However, there was an unexpected significant interaction between time and condition, $F(1, 9) = 114.58$, $p = 0.04$, $\eta_p^2 = 0.39$. See Figure 3 below for interaction effects.

Four contrasts were conducted to examine the interaction. The first contrast showed was no significant difference between baseline PDQ-ADL scores ($M = 26.67$, $SD = 29.99$) and follow-up PDQ-ADL scores ($M = 34.72$, $SD = 34.93$) for participants in the gratitude condition, $t(19) = -0.52$, $p = 0.61$. The second contrast showed no significant difference between baseline PDQ-ADL scores ($M = 22.92$, $SD = 16.19$) and follow-up PDQ-ADL scores ($M = 31.25$, $SD = 16.19$) for participants in the positive thinking condition, $t(19) = -0.57$, $p = 0.58$. The third contrast showed no significant difference between baseline PDQ-ADL scores in the gratitude condition ($M = 26.67$, $SD = 29.99$) and baseline PDQ-ADL scores in the positive thinking condition ($M = 22.92$, $SD = 16.19$), $t(19) = 0.24$, $p = 0.81$. The fourth contrast showed no significant difference between follow-up PDQ-ADL scores in the gratitude condition ($M = 31.73$, $SD = 17.50$) and follow-up PDQ-ADL scores in the positive thinking condition ($M = 31.25$, $SD = 16.19$), $t(19) = 0.24$, $p = 0.82$.

Figure 3. The Effect of the Manipulation on Activities of Daily Living

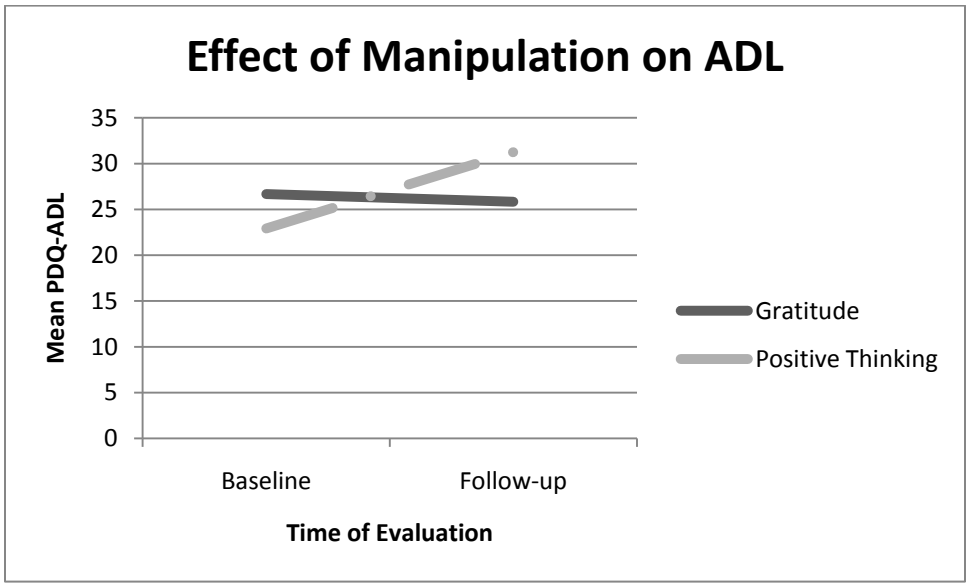

Figure 3. The effect of the manipulation on ADL in PD.
Note. PDQ-ADL = Parkinson's Disease Questionnaire-Activities of Daily Living.

The fourth mixed ANOVA was conducted to determine any significant differences on the PDQ-Emotional Well-being (EWB) subscale between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 0.59$, $p = 0.46$, $\eta_p^2 = 0.06$, suggesting no significant change on EWB from baseline to follow-up. There was a significant main effect of condition, $F(1, 10) = 6.67$, $p = 0.03$, $\eta_p^2 = .40$, showing that participants in the gratitude condition had significantly higher EWB scores ($M = 31.59$, $SD = 6.46$) than participants in the positive thinking condition ($M = 7.98$, $SD = 6.46$). Finally, there was no significant interaction between time and condition, $F(1, 10) = 2.35$, $p = 0.16$, $\eta_p^2 = 0.19$.

The fifth mixed ANOVA was conducted to determine any significant differences on the PDQ-Stigma subscale between the gratitude and positive thinking conditions. Box's Test of Equality of Covariance Matrices was significant, $F(3, 18000) = 3.74$, $p < 0.01$, suggesting that the observed covariance matrices of the Stigma variables are not equal across the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 0.01$, $p = 0.91$, $\eta_p^2 = 0.001$, suggesting no significant change on Stigma from baseline to follow-up. Levene's Test of Equality of Error Variances was significant, $F(1, 10) = 25.79$, $p < 0.01$, suggesting that the error variance of the Baseline Stigma subscale is not equal across the gratitude and positive thinking conditions. There was no significant main effect of condition, $F(1, 10) = 3.29$, $p = 0.10$, $\eta_p^2 = 0.25$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition, $F(1, 10) = 0.12$, $p = 0.74$, $\eta_p^2 = 0.01$.

The sixth mixed ANOVA was conducted to determine any significant differences on the PDQ-Social Support subscale between the gratitude and positive thinking conditions. Box's Test of Equality of Covariance Matrices was significant, $F(3, 18000) = 3.81$, $p = 0.01$, suggesting that the observed covariance matrices of the Social Support variables are not equal across the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 0.01$, $p = 0.93$, $\eta_p^2 = 0.001$, suggesting no significant change on Social Support from baseline to follow-up. Levene's Test for Equality of Error Variance was significant, $F(1, 10) = 5.56$, $p = 0.04$, suggesting that the error variance on the Baseline Social Support subscale is not

equal across the gratitude and positive thinking conditions. There was no significant main effect of condition, $F(1, 10) = 3.13$, $p = 0.11$, $\eta_p^2 = 0.24$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition, $F(1, 10) = 0.18$, $p = 0.68$, $\eta_p^2 = 0.02$.

The seventh mixed ANOVA was conducted to determine any significant differences on the PDQ-Cognitions subscale between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 2.00$, $p = 0.19$, $\eta_p^2 = 0.17$, suggesting no significant change on Cognitions from baseline to follow-up. There was no significant main effect of condition, $F(1, 10) = 2.66$, $p = 0.13$, $\eta_p^2 = 0.21$, suggesting no significant difference on the effectiveness of the intervention. However, there was an unexpected significant interaction between time and condition, $F(1, 10) = 18.00$, $p < 0.01$, $\eta_p^2 = 0.64$. See Figure 4 below for interaction effects.

Four contrasts were conducted to examine the interaction. The first contrast showed was no significant difference between baseline PDQ-Cognition scores ($M = 44.79$, $SD = 20.32$) and follow-up PDQ-Cognition scores ($M = 36.46$, $SD = 22.85$) for participants in the gratitude condition, $t(20) = 0.65$, $p = 0.52$. The second contrast showed no significant difference between baseline PDQ-Cognition scores ($M = 17.71$, $SD = 22.51$) and follow-up PDQ-Cognition scores ($M = 21.88$, $SD = 23.30$) for participants in the positive thinking condition, $t(20) = -0.32$, $p = 0.75$. The third contrast showed a significant difference between baseline PDQ-Cognition scores in the gratitude condition ($M = 44.79$, $SD = 20.32$) and baseline PDQ-Cognition scores in the positive thinking condition ($M = 17.71$, $SD = 22.51$), $t(20) = 2.11$, $p < 0.05$. This shows that

participants in the gratitude condition had significantly worse cognition scores than participants in the positive thinking condition at baseline. The fourth contrast showed no significant difference between follow-up PDQ-Cognition scores in the gratitude condition (M = 36.46, SD = 22.85) and follow-up PDQ-Cognition scores in the positive thinking condition (M = 21.88, SD = 23.30), $t(20) = 1.13$, $p = 0.27$.

Figure 4. The Effect of the Manipulation on Cognitions

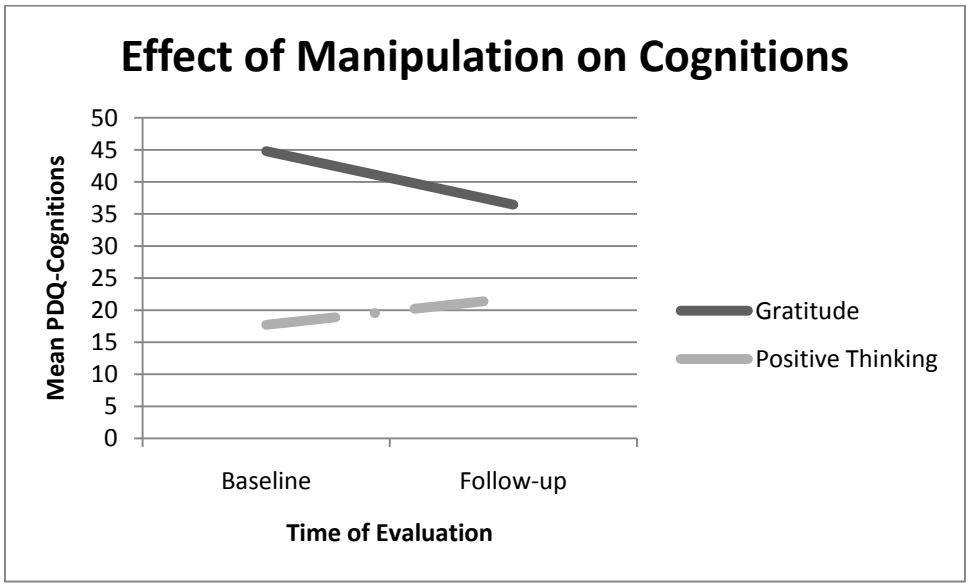

Figure 4. The effect of the manipulation on Cognitions.

The eighth mixed ANOVA was conducted to determine any significant differences on the PDQ-Communication subscale between the gratitude and positive thinking conditions. Box's Test of Equality of Covariance Matrices was significant, $F(3, 25149.98) = 4.04$, $p < 0.01$, suggesting that the observed covariance matrices of the Social Support variables are not equal across the gratitude and positive thinking conditions. There was no main effect of time, $F(1, 9) = 0.02$, $p = 0.91$, $\eta_p^2 = 0.002$, suggesting no significant change on Communication from baseline to follow-up. There

was no significant main effect of condition, $F(1, 9) = 0.11$, $p = 0.75$, $\eta_p^2 = 0.01$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition, $F(1, 9) = 1.23$, $p = 0.29$, $\eta_p^2 = 0.12$.

The ninth mixed ANOVA was conducted to determine any significant differences on the PDQ-Bodily Discomfort subscale between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 0.72$, $p = 0.42$, $\eta_p^2 = 0.07$, suggesting no significant change on Bodily Discomfort from baseline to follow-up. There was no significant main effect of condition, $F(1, 10) = 1.71$, $p = 0.22$, $\eta_p^2 = 0.15$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition, $F(1, 10) = 0.72$, $p = 0.42$, $\eta_p^2 = 0.07$.

Positive and negative affect outcomes.

A 2 x 2 mixed ANOVA was conducted to determine any significant differences on PA between the gratitude and positive thinking conditions. Box's Test of Equality of Covariance Matrices was significant, $F(3, 18000) = 3.74$, $p = 0.01$, suggesting that the observed covariance matrices of the PA variables are not equal across the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 1.28$, $p = 0.28$, $\eta_p^2 = 0.11$, suggesting no significant change on PA from baseline to follow-up. There was no significant main effect of condition, $F(1, 10) = 0.15$, $p = 0.70$, $\eta_p^2 = 0.02$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition,

$F(1, 10) = 0.72$, $p = 0.42$, $\eta_p^2 = 0.07$. These results do not support hypotheses 3 (the manipulation will increase PA of participants in both conditions).

A 2 x 2 mixed ANOVA was conducted to determine any significant differences on NA between the gratitude and positive thinking conditions. There was no significant main effect of time, $F(1, 10) = 0.77$, $p = 0.40$, $\eta_p^2 = 0.07$, suggesting no significant change on NA from baseline to follow-up. There was no significant main effect of condition, $F(1, 10) = 0.96$, $p = 0.40$, $\eta_p^2 = 0.09$, suggesting no significant difference on the effectiveness of the intervention. Finally, there was no significant interaction between time and condition, $F(1, 10) = 0.00$, $p = 0.00$, $\eta_p^2 = 0.00$. These results do not support hypotheses 4 (the manipulation will decrease NA of participants in both conditions).

Mediation analyses.

In a previous study conducted by Emmons and McCullough (2003), support was not found for positive affect as a mediator of the relationship between gratitude and well-being. However, several studies of the relation between positive and negative affect and quality of life have shown that the affects play a vital role in well-being and subjective quality of life (Casten, Lawton, Winter, Kleban, & Sando, 1997; Hu & Gruber, 2008; Watson, 1988). Therefore, mediation hypotheses were designed to test whether positive and/or negative affect mediate the relationship between gratitude and HRQOL. However, mediation analyses were not conducted because the ANOVA examining the effects of the intervention on HRQOL was not significant. In addition, the ANOVAs examining the effects of the intervention on PA and NA were also not significant. Therefore, the

hypotheses that predicted an increase in PA and a decrease in NA would mediate the relationship between the gratitude intervention and HRQOL could not be tested.

Discussion

Previous research has demonstrated that focusing on things in life that one is grateful for can have a positive influence on various facets of well-being (Emmons & McCullough, 2003; Froh et al., 2008; Watkins et al., 2003). However, previous research has not examined the relationship between a grateful outlook and HRQOL. Study 2 examined the effects of a gratitude and positive thinking intervention on HRQOL in individuals with PD.

The hypothesis that predicted the mean daily gratitude for participants in the gratitude condition would be significantly higher than the mean daily gratitude for participants in the positive thinking condition was not supported. This result suggests that the gratitude manipulation was not effective. A possible explanation for the non-significant result could be that the scale used on the daily rating form was only from one to three. It can be more challenging to find a significant difference between groups when the range of the scale is small. Future research should use a scale with at least a range from one to five.

The hypothesis that predicted that participants in the gratitude condition will show a greater increase in HRQOL than participants in the positive thinking condition was not supported. There are several possible explanations for this inconsistent result. First, and most important, the intervention only took place once per day for seven days. In previous

gratitude intervention studies, the minimum duration was 14 days and the maximum was 21 days (Emmons & McCullough, 2003). For the current study, a longer intervention duration was not feasible due to limited funding, the specific population being studied, and time constraints. Second, this study was occurred during the winter season. Weather may have an affect mobility and mood, as well as many other factors that contribute to HRQOL. Finally, outside factors can have a large impact on HRQOL. By examining the qualitative statements participants provided after the intervention, the researcher was able to determine several outside factors that could have impacted HRQOL. Three participants had friends pass away during the week of the intervention. In addition, one participant also has cancer that has gotten worse. Taken together, these factors could account for the inconsistent results.

This study also predicted that participants in the gratitude and positive thinking conditions would experience an increase in PA, and a decrease in NA. These hypotheses were not supported for participants in either condition. Although previous research has shown that individuals who focus on things they are grateful for experience an increase in PA and decrease in NA (Emmons & McCullough, 2003; Watkins et al., 2003), the current study was not able to support those results. A possible explanation for why these hypotheses were not supported is that although the participants in both conditions were directed to focus on either grateful or positive things, not all participants were able to do so. There were participants in each condition who thought about positive and negative things. For example, two participants in the gratitude condition reported friends passing away during the week of the intervention, and one participant in the positive thinking

condition reported a friend passing away, while another participant has cancer that is getting worse. These outside factors could explain why positive affect decreased in both conditions, while negative affect increased in both conditions. These results should not deter future research from examining the relationship of grateful and positive thinking on PA and NA. Any future research conducted should examine what participants thought about during the intervention, so as to better understand inconsistent results.

General Discussion, Limitations, and Conclusion

The current studies examined the relationship between gratitude and HRQOL in individuals with PD. The results of Study 1 provided mixed evidence that higher levels of trait gratitude are associated with social, psychological, and physical distress in individuals with PD. It was not surprising that higher levels of trait gratitude were associated with lower levels of social distress because gratitude, in itself, is a social construct. This result provides support for the idea that individuals with PD who have high levels of trait gratitude are less likely to experience social distress than individuals with PD who have lower levels of trait gratitude. There was no support for the association of trait gratitude with psychological distress or physical distress. Future research should continue to examine this association as small sample size may have contributed to non-significant results.

The results of Study 2 did not support the hypothesis that participants in the gratitude condition will show a greater increase in HRQOL than participants in the positive thinking condition. In addition, the manipulation failed to increase PA and decrease NA. Lack of support for the hypotheses can be partially explained by several limitations, such as high levels of trait gratitude and outside factors. Participants in the gratitude condition averaged very high levels of trait gratitude. Because of this, participants in the gratitude condition may not have had much room to improve in terms of the amount of daily gratitude felt after grateful reflection. However, these results could be explained by outside factors that occurred during the week of the intervention.

Limitations

Study 1.

In addition to the potential implications of study1, it is important to note some of the limitations. One important limitation relates to the small sample size ($N = 27$). According to the following equation, $N \geq 50 + 8m$, the minimum recommended sample size to run a simple linear regression is 58. Because the minimum sample size was not reached, the significant result found in this study cannot be generalized beyond the population of the study. Using the same equation, the minimum sample size to run a multiple regression with two predictor variables is 66. Although the multiple regression conducted in this study was not significant, future research should examine the relationship between trait gratitude, psychological distress, and physical distress using the recommended minimum sample size. It is possible that a relationship does exist between these variables, but a larger sample size it needed to detect it.

Another limitation of Study 1 is that the mean level of trait gratitude was fairly high ($M = 36.76$ on a 42 scale). In order to effectively evaluate the relationship between trait gratitude and social, psychological, and physical distress in individuals with PD, there should be varying levels of trait gratitude. Perhaps future studies could examine the relationship between these variables after identifying individuals with varying levels of trait gratitude.

Study 2.

The effects of a grateful outlook on HRQOL, PA, and NA in individuals with PD have not been previously examined. Although support was not found for the hypotheses

of this study, it is important to discuss the limitations, and what effect they may have had on the results. Several important limitations need to be addressed by future studies.

First, the length of the study was too short. Previous research conducted on gratitude interventions used a minimum of 14 days (Emmons & McCullough, 2003). A gratitude thinking intervention may indeed have an effect on HRQOL, but perhaps the study duration was too short of a time period to see significant changes.

Second, the sample size was very small. The recommended number of participants for multiple condition studies is 30 per condition. Because this study had a sample of $N = 6$ for each condition, the results would not have been generalizable beyond the participants in the study. In addition, the results may not be reliable with such a small sample size. Future research should examine the effects of a gratitude intervention with a larger, more generalizable sample.

Third, the mean level of trait gratitude was high for participants in both conditions, but was very high for participants in the gratitude condition (i.e., a mean total score of 41 out of a possible total of 42). It is possible that the gratitude manipulation was not effective because the levels of trait gratitude were already at the top of the scale. Previous research has shown that high levels of trait gratitude predispose individuals to feel consistently high amounts of gratitude in their daily mood, regardless of the number of gratitude-relevant events that occur (McCullough, Tsang, & Emmons, 2004). Therefore, a ceiling effect may have been observed for participants in the gratitude condition. Because the participants were already experiencing high levels of gratitude in their daily moods, it may not have been possible for them to experience an increase in

daily gratitude. Future studies should examine the effects of a gratitude intervention on individuals who do not score high in trait gratitude.

Finally, the design of Study 2 was cross-sectional. The cross-sectional design limited the study because participants of different ages, varying degrees of disease length and disease severity are studied at the same point in time. Using this type of design it is not possible to control for certain threats to internal validity, such as history and maturation. Because PD affects different individuals to different extents, perhaps a design that matches participants on disease severity and health-related quality of life scores would be more applicable to use in future research.

Conclusion

In conclusion, both studies in this research contribute to the body of literature on gratitude, and in addition, provide a stepping stone for future research regarding the effects of gratitude interventions on HRQOL in individuals with PD. Because individuals with PD can be at an increased risk for depression and decreased psychological well-being, it is imperative that this line of gratitude research is pursued.

APPENDIX A

Informed Consent

INFORMED CONSENT

Project Title: Strengths and Positive Attributes in Parkinson's Disease

Professor Susan McFadden, of the Department of Psychology in the University of Wisconsin Oshkosh, and her student, Jenna McGwin, are conducting a study of how individuals with Parkinson's disease use their strengths and positive attributes in managing life's many challenges. We would appreciate your participation in this study as it will assist us in contributing to the research on the Psycho-Social approaches to managing life with Parkinson's disease.

As part of this study, we would like for you to fill out a questionnaire once per day, for the next seven days. The questionnaire will take approximately two minutes to complete each day.

We do not anticipate that the study will present any medical or social risk to you, other than the inconvenience of extra time required for you to answer the questionnaire. Participation in this study may directly benefit you.

The information we gather through the questionnaires will be recorded in anonymous form. We will not release information about you to anyone in a way that could identify you.

If you want to withdraw from the study at any time, you may do so without penalty. The information collected from you up to that point would be destroyed if you so desire.

Once the study is completed, we would be glad to give the results to you. In the meantime, if you have any questions, please ask us or contact:

Dr. Susan McFadden
Department of Psychology
UW Oshkosh
Oshkosh, WI 54901
920/424-2308

If you have any concerns about your treatment as a participant in this study, please call or write:

Chair, Institutional Review Board For Protection of Human Participants
c/o Grants Office
UW Oshkosh
Oshkosh, WI 54901
920/424-1415

Although the chairperson may ask for your name, all complaints are kept in confidence.

Please include your address on the lines below so that we may send the study materials directly to you.

Address_____ **City/State/Zip**_____

I have received an explanation of the study and agree to participate. I understand that my participation in this study is strictly voluntary.

_____	_____	_____
PRINTED NAME	**SIGNATURE**	**DATE**

This research project has been approved by the University of Wisconsin Oshkosh IRB for Protection of Human Participants for a 1-year period, valid until (one year from the IRB approval date).

APPENDIX B

Parkinson's Disease Questionnaire-39

HEALTH SERVICES RESEARCH UNIT
DEPARTMENT OF PUBLIC HEALTH
UNIVERSITY OF OXFORD

English (USA)

PDQ-39

Parkinson's Disease Quality of Life Questionnaire

DUE TO HAVING PARKINSON'S DISEASE, how often have you experienced the following, during the last month?

Due to having Parkinson's disease, how often during the last month have you ….		*Please check **one box** for each question*				
		Never	**Occasionally**	**Sometimes**	**Often**	**Always or Cannot do At all**
1.	**had difficulty doing the leisure activities you would like to do?**	☐	☐	☐	☐	☐
2.	**had difficulty looking after your home, for example, housework, cooking or yardwork?**	☐	☐	☐	☐	☐
3.	**had difficulty carrying grocery bags?**	☐	☐	☐	☐	☐
4.	**had problems walking half a mile?**	☐	☐	☐	☐	☐
5.	**had problems walking 100 yards (approximately 1 block)?**	☐	☐	☐	☐	☐
6.	**had problems getting around the house as easily as you would like?**	☐	☐	☐	☐	☐
7.	**had difficulty getting around in public places?**	☐	☐	☐	☐	☐
8.	**needed someone else to accompany you when you went out?**	☐	☐	☐	☐	☐
9.	**felt frightened or worried about falling in public?**	☐	☐	☐	☐	☐

Please check that you have marked one box for each question before going on to the next page

Due to having Parkinson's disease, how often <u>during the last month</u> have you ….		***Please check* ***one box*** *for each question***				
		Never	**Occasionally**	**Sometimes**	**Often**	**Always or Cannot do At all**
10.	**been confined to the house more than you would like?**	☐	☐	☐	☐	☐
11.	**had difficulty showering and bathing?**	☐	☐	☐	☐	☐
12.	**had difficulty dressing?**	☐	☐	☐	☐	☐
13.	**had difficulty with buttons or shoelaces?**	☐	☐	☐	☐	☐
14.	**had problems writing clearly?**	☐	☐	☐	☐	☐
15.	**had difficulty cutting up your food?**	☐	☐	☐	☐	☐
16.	**had difficulty holding a drink without spilling it?**	☐	☐	☐	☐	☐
17.	**felt depressed?**	☐	☐	☐	☐	☐
18.	**felt isolated and lonely?**	☐	☐	☐	☐	☐
19.	**felt weepy or tearful?**	☐	☐	☐	☐	☐

Please check that you have marked <u>one box for each question</u> before going on to the next page

Due to having Parkinson's disease, how often <u>during the last month</u> have you ….

*Please check **one box** for each question*

		Never	Occasionally	Sometimes	Often	Always or Cannot do at all
20.	**felt angry or bitter?**	☐	☐	☐	☐	☐
21.	**felt anxious?**	☐	☐	☐	☐	☐
22.	**felt worried about your future?**	☐	☐	☐	☐	☐
23.	**felt you had to hide your Parkinson's from people?**	☐	☐	☐	☐	☐
24.	**avoided situations which involve eating or drinking in public?**	☐	☐	☐	☐	☐
25.	**felt embarrassed in public?**	☐	☐	☐	☐	☐
26.	**felt worried about other people's reaction to you?**	☐	☐	☐	☐	☐
27.	**had problems with your close personal relationships?**	☐	☐	☐	☐	☐
28.	**lacked the support you needed from your spouse or partner?** ***If you do not have a spouse or Partner, please check here*** ☐	☐	☐	☐	☐	☐
29.	**lacked the support you needed from your family or close friends?**	☐	☐	☐	☐	☐

Please check that you have marked <u>one box for each question</u> before going on to the next page

Due to having Parkinson's disease, how often <u>during the last month</u> have you ….

*Please check **one box** for each question*

		Never	Occasionally	Sometimes	Often	Always or Cannot do at all
30.	**unexpectedly fallen asleep during the day?**	☐	☐	☐	☐	☐
31.	**had problems with your concentration, for example when reading or watching TV?**	☐	☐	☐	☐	☐
32.	**felt your memory was failing?**	☐	☐	☐	☐	☐
33.	**had distressing dreams or hallucinations?**	☐	☐	☐	☐	☐
34.	**had difficulty speaking?**	☐	☐	☐	☐	☐
35.	**felt unable to communicate effectively?**	☐	☐	☐	☐	☐
36.	**felt ignored by people?**	☐	☐	☐	☐	☐
37.	**had painful muscle cramps or spasms?**	☐	☐	☐	☐	☐
38.	**had aches and pains in your joints or body?**	☐	☐	☐	☐	☐
39.	**felt uncomfortably hot or cold?**	☐	☐	☐	☐	☐

Please check that you have checked <u>one box for each question</u>

APPENDIX C

I-PANAS-SF

I-PANAS-SF

Thinking about yourself and how you normally feel, to what extent do you generally feel:

	Never 1	2	3	4	Always 5
1. Upset	☐	☐	☐	☐	☐
2. Hostile	☐	☐	☐	☐	☐
3. Alert	☐	☐	☐	☐	☐
4. Ashamed	☐	☐	☐	☐	☐
5. Inspired	☐	☐	☐	☐	☐
6. Nervous	☐	☐	☐	☐	☐
7. Determined	☐	☐	☐	☐	☐
8. Attentive	☐	☐	☐	☐	☐
9. Active	☐	☐	☐	☐	☐
10. Afraid	☐	☐	☐	☐	☐

APPENDIX D

Gratitude Questionnaire-6

GQ-6

Place a tick mark in the box below each statement to indicate how much you agree with it.

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

☐	☐	☐	☐	☐	☐	☐
strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree

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

☐	☐	☐	☐	☐	☐	☐
strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree

3. When I look at the world, I don't see much to be grateful for.

☐	☐	☐	☐	☐	☐	☐
strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree

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

☐	☐	☐	☐	☐	☐	☐
strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree

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

☐	☐	☐	☐	☐	☐	☐
strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree

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

☐	☐	☐	☐	☐	☐	☐
strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree

APPENDIX E

Demographic Questionnaire

Demographic Questionnaire

1. What year were you born? (Fill in the blank) _____

2. What is your gender? (Place a tick mark in one box)

   ☐ Male

   ☐ Female

   ☐ Would rather not say

3. What is the highest level of education you have completed?

   ☐ Grammar school

   ☐ High school or equivalent

   ☐ Vocational/technical school (2 year degree)

   ☐ Some college

   ☐ Bachelor's degree

   ☐ Master's degree

   ☐ Doctoral degree

   ☐ Professional degree (MD, JD, etc.)

4. What is your current employment status?

   ☐ Employed

   ☐ Unemployed

   ☐ Retired

Please continue to Page 2

5. How would you classify your ethnicity?

- ☐ Arab
- ☐ Asian/Pacific Islander
- ☐ African American
- ☐ Caucasian/White
- ☐ Hispanic
- ☐ Latino
- ☐ Native American
- ☐ Multiethnic
- ☐ Would rather not say
- ☐ Other

6. What is your current marital status?

- ☐ Married
- ☐ Divorced
- ☐ Separated
- ☐ Living with another
- ☐ Single
- ☐ Widowed
- ☐ Would rather not say

7. At what age were you diagnosed with Parkinson's disease? _____

8. How long have you been diagnosed with Parkinson's disease? _____

APPENDIX F

Religiousness Questionnaire

Religiousness Questionnaire

Please place a tick mark next to the statement you most agree with:

1. How often do you go to religious services?

- ☐ More than once a week
- ☐ Every week or more often
- ☐ Once or twice a month
- ☐ Every month or so
- ☐ Once or twice a year
- ☐ Never

2. Besides religious services, how often do you take part in other activities at a place of worship?

- ☐ More than once a week
- ☐ Every week or more often
- ☐ Once or twice a month
- ☐ Every month or so
- ☐ Once or twice a year
- ☐ Never

3. To what extent do you consider yourself a religious person?

- ☐ Very religious
- ☐ Moderately religious
- ☐ Slightly religious
- ☐ Not religious at all

APPENDIX G

Promotional Research Flyer

RESEARCH OPPORTUNITY:
HAVE YOU BEEN DIAGNOSED WITH PARKINSON'S DISEASE?

Since 2000, a new area of Psychology has emerged that focuses on an individual's **strengths** and **positive attributes**, and how those are used in the face of life's many challenges. This area, known as Positive Psychology, has not yet been applied to individuals living with Parkinson's disease.

If you have been diagnosed with Parkinson's disease and are willing to dedicate a few minutes each day, for seven days, please fill out the consent form attached to this flyer, and mail it in the envelope provided. A member of the research team will contact you. This research will contribute to the development of psycho-social approaches to managing life with Parkinson's disease.

APPENDIX H

Instructions for Study 2

Dear Participant,

Thank you for agreeing to participate in this study. We request that you complete the study within two weeks of receiving this packet in the mail.

It is important that the daily forms be completed as close to the end of the day as possible, but before you are too tired. If you forget to fill out the daily form, it is better to omit the form, than to go back and complete it from memory the next day. If you are experiencing difficulty completing the forms, it is appropriate for a caregiver or spouse to assist you.

As you will see, there are three business reply envelopes inside the packet. We request that you mail the "Baseline" measures, demographic questionnaire, religiousness questionnaire, and GQ-6 questionnaire in one envelope after you complete them on day 1. Please mail all of the "daily experience rating forms" (Days 1-7) in a separate envelope after you complete all of the forms. Finally, please mail the "Follow-up" forms in the last envelope on the final day of the study.

Below are a few directions that need to be read before you get started.

On the first day of the study, please complete the forms marked "Baseline" first, then complete the Demographic Questionnaire, the Religiousness Questionnaire, and the GQ-6 questionnaire.

On the second day of the study, please complete the form marked "Daily Experience Rating – Day 1."

On the third day of the study, please complete the form marked "Daily Experience Rating – Day 2."

On the fourth day of the study, please complete the form marked "Daily Experience Rating – Day 3."

On the fifth day of the study, please complete the form marked "Daily Experience Rating – Day 4."

On the sixth day of the study, please complete the form marked "Daily Experience Rating – Day 5."

On the seventh day of the study, please complete the form marked “Daily Experience Rating – Day 6.”

On the eighth day of the study, please complete the form marked “Daily Experience Rating – Day 7.”

On day nine, please complete the forms marked “Follow-up.”

If you have any questions about this study, please call (608) 697-3605, and a member of the research team will assist you.

APPENDIX I

Daily Rating Scale for Positive Thinking Condition

Day 1

Daily Experience Rating

Please indicate the extent to which you experienced each of the following emotions **today** and place a tick mark in the correct box:

	Did not Experience	Experienced A Few Times	Experienced Many Times
1. Excited	☐	☐	☐
2. Bitter	☐	☐	☐
3. Grateful	☐	☐	☐
4. Happy	☐	☐	☐
5. Sad	☐	☐	☐
6. Thankful	☐	☐	☐
7. Inspired	☐	☐	☐
8. Afraid	☐	☐	☐
9. Appreciative	☐	☐	☐

Please turn the page over once you have completed the form.

Please read the following directions:

Take the next **1 to 2 minutes** to think about positive things.

(It is recommended that you have a watch or clock with a second hand so that you can time yourself.)

APPENDIX J

Daily Rating Scale for Gratitude Condition

Day 1

Daily Experience Rating

Please indicate the extent to which you experienced each of the following emotions **today** and place a tick mark in the correct box:

	Did not Experience	Experienced A Few Times	Experienced Many Times
1. Excited	☐	☐	☐
2. Bitter	☐	☐	☐
3. Grateful	☐	☐	☐
4. Happy	☐	☐	☐
5. Sad	☐	☐	☐
6. Thankful	☐	☐	☐
7. Inspired	☐	☐	☐
8. Afraid	☐	☐	☐
9. Appreciative	☐	☐	☐

Please turn the page over once you have completed the form.

Please read the following directions:

There are many things in life that we might be grateful for. Whether those things are big or small, take the next **1 to 2 minutes** to think about things or people in your life that you are grateful for.

(It is recommended that you have a watch or clock with a second hand so that you can time yourself.)

APPENDIX K

Follow-up Manipulation Check Form

Follow-Up

Please read the following statements and place a mark in the appropriate box.

1. To what extent during the past week did you think about positive things?

☐	☐	☐	☐	☐
Not at all	Rarely	Sometimes	Quite a Few Times	All the Time

2. To what extent during the past week did you think about negative things?

☐	☐	☐	☐	☐
Not at all	Rarely	Sometimes	Quite a Few Times	All the Time

3. To what extent during the past week did you think about things or people you are grateful for?

☐	☐	☐	☐	☐
Not at all	Rarely	Sometimes	Quite a Few Times	All the Time

4. In one or two sentences, please write what you thought about over the past seven days.

_____
_____
_____
_____
_____

APPENDIX L

Debriefing Letter for Study 2

Dear Participant,

We would like to extend our deepest gratitude for participating in our study. Your participation was incredibly valuable to us. We know you are very busy and very much appreciate the time you devoted to participating in our study.

There was some information about the study that we were not able to discuss with you prior to the study, because doing so may have impacted your actions and thus skewed the study results. I would like to explain these things to you now.

The purpose of the study was to understand the effect that grateful thinking has on health-related quality of life in individuals with Parkinson's disease. Based on prior research, we expect to find that focusing on things or people in life that you are grateful for will positively influence how you feel about the state of your physical and mental health. In addition, we also expect that grateful thinking, as well as positive thinking will increase the occurrence of positive emotions, and decrease the occurrence of negative emotions. During the study, this information had to be kept confidential so it would not influence your responses.

We hope this clarifies the purpose of the study, and the reason why we could not tell you all of the details about the study prior to your participation. We expect the findings of the study to be completed by the end of May, 2011. If you are interested in knowing the results of the study, we would be happy to send you a summary of the findings in early summer.

It is very important that you do not discuss this study with anyone else. Our efforts will be greatly compromised if other participants know what the study is about. If you have any questions or concerns, please contact Jenna at (608) 697-3605, or by email at phillj42@uwosh.edu.

Thank you again for your participation!

Sincerely,

Jenna McGwin

APPENDIX M

Comparison Results of Study 2

A series of 2 x 2 mixed ANOVAs were conducted to examine the effects of the manipulation on the three component variables used in Study 1. The first mixed ANOVA examined the effects of the manipulation on the psychological distress component variable (emotional-well being and cognitions) There was no significant main effect for time, $F(1, 10) = 0.06$, $p = 0.82$, $\eta_p^2 < 0.01$, suggesting no significant change on psychological distress from baseline to follow-up. There was a significant main effect of condition, $F(1, 10) = 6.35$, $p = 0.03$, $\eta_p^2 = 0.39$.

A contrasts follow-up test showed that the baseline psychological distress score was significantly higher in the gratitude condition ($M = 37.50$, $SD = 17.46$) than in the positive thinking condition ($M = 10.00$, $SD = 12.35$), $t(20) = 3.02$, $p < 0.01$. There was a significant interaction between time and condition, $F(1, 10) = 8.05$, $p = 0.02$, $\eta_p^2 = 0.45$. A contrasts follow-up test showed that the baseline psychological distress score was significantly higher in the gratitude condition ($M = 37.50$, $SD = 17.46$) than in the positive thinking condition ($M = 10.00$, $SD = 12.35$), $t(20) = 3.02$, $p < 0.01$.

The second 2 x 2 mixed ANOVA examined the effects of the manipulation on the physical distress component variable (mobility, activities of daily living, and bodily discomfort). There was no significant main effect for time, $F(1, 10) = 0.67$, $p = 0.44$, $\eta_p^2 = 0.08$, suggesting no significant change on physical distress from baseline to follow-up. There was no significant main effect of condition, $F(1, 10) = 0.08$, $p = 0.79$, $\eta_p^2 < 0.01$, suggesting no significant difference on physical distress between the gratitude and positive thinking conditions. There was a significant interaction, $F(1, 10) = 6.79$, $p = 0.03$, $\eta_p^2 = 0.46$.

A series of four contrasts follow-up tests were conducted to examine the interaction effects. The first contrast showed no significant difference between baseline physical distress scores (M = 40.53, SD = 28.49) and follow-up physical distress scores (M = 42.76, SD = 26.19) in the gratitude condition, t(18) = -0.15, p = 0.89. The second contrast showed no significant difference between baseline physical distress scores (M = 27.41, SD = 23.98) and follow-up physical distress scores (M = 37.63, SD = 21.37) in the positive thinking condition, t(18) = -0.67, p = 0.51. The third contrast showed no significant difference between baseline physical distress score in the gratitude condition (M = 40.53, SD = 28.49) and baseline physical distress score in the positive thinking condition (M = 27.41, SD = 23.98), t(18) = 0.86, p = 0.40. The fourth contrast showed no significant difference between follow-up physical distress score in the gratitude condition (M = 42.76, SD = 26.19) and follow-up physical distress scores in the positive thinking condition (M = 37.63, SD = 21.37), t(18) = 0.34, p = 0.74.

The final 2 x 2 mixed ANOVA examined the effects of the manipulation on the social distress component variable (stigma, social support, and communication). There was no main effect of time, $F(1, 9) = 0.03$, $p = 0.86$, $\eta_p^2 < 0.01$, suggesting no significant change on social distress from baseline to follow-up. There was no significant main effect of condition, $F(1, 9) = 1.23$, $p = 0.29$, $\eta_p^2 = 0.12$, suggesting no significant difference on social distress between the gratitude and positive thinking conditions. There was no significant interaction, $F(1, 9) = 1.47$, $p = 0.26$, $\eta_p^2 = 0.14$.

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