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The Relationship between Gratitude and Health Behaviors

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The Relationship Between Gratitude and Health Behaviors

by

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Presented to the Faculty of the
Graduate Department of Clinical Psychology

George Fox University

in partial fulfillment

of the requirements for the degree of

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in Clinical Psychology

Newberg, Oregon

February, 2017

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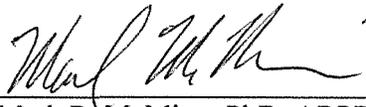
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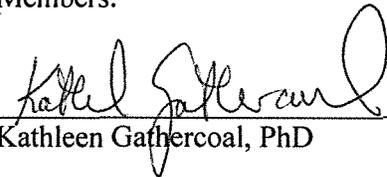
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The Relationship Between Gratitude and Health Behaviors

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Abstract

Gratitude interventions lead to significant increases in subjective, psychological, spiritual, and physical well-being. These benefits may be because grateful individuals are better able to form social bonds, better able to utilize coping skills to defer stress, better able to maintain positive affect, and are more creative in problem solving. It remains unclear what mechanism(s) are responsible for the positive benefits associated with gratitude and whether the link between gratitude and health enhancement is bidirectional. The current study seeks to explore the link between gratitude and health behaviors by measuring the increase or maintenance of gratitude over time in response to an exercise intervention. It was found that an exercise intervention and education regarding health behaviors was not shown to increase gratitude in this sample. Also, current research on gratitude was not able to be replicated which shows individuals with higher gratitude display more positive health behaviors.

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Chapter 1

Introduction

Gratitude has been considered virtuous for centuries among many of the world's largest religions, as well as being the focus of numerous philosophers, theologians, and popular contemporary authors throughout time (Emmons & McCullough, 2004; McCullough, Emmons, & Tsang, 2002). Historically, gratitude has been viewed from a religious or philosophical perspective and can be seen throughout the scriptures, teachings, and prayers of Christianity, Islam, Judaism, Buddhism, and Hinduism (Bono, Emmons, & McCullough, 2004; Emmons & McCullough, 2004; McCullough, Kilpatrick, Emmons, & Larson, 2001). Almost universally, the expression of gratitude is considered virtuous, while ingratitude is viewed as an iniquity (Bono et al., 2004). In the world's monotheistic religions, God is viewed as a giver, and as humans receive gifts they respond appropriately with gratitude and grow closer to God and in understanding of themselves because of their experience with gratitude (Emmons & McCullough, 2004). The virtues of gratitude are not limited to religious worldviews, as gratitude is also adaptive as a higher order function of reciprocity. Without feelings of appreciation when an individual does something for another, how would our society exist as it does? Therefore, it has been argued that gratitude is the "glue and lubricant" of human society (Bonnie & de Waal, 2004, p. 214).

Gratitude as a Psychological Construct

Though gratitude has historically been closely connected to philosophy and religion, it has become a topic of scientific inquiry over the last few decades. Gratitude has emerged as a

psychological construct related to overall well-being as well as more specifically to subjective, psychological, spiritual, and physical well-being (Wood, Froh, & Geraghty, 2010). In a recent in-depth annotated bibliography focusing on the construct of gratitude in psychological research, Tsang and McCullough (2004), both leading gratitude researchers, report the earliest empirical work related to gratitude in psychology to be a study reported by Baumgarten-Tramer in 1936 and 1938 regarding children's expression and comprehension of gratitude throughout early development. The next studies were reported several decades later, in 1968 and 1972, looking at determinants of gratitude, altruistic behavior, and reinforcement and helping behavior. The recent increase in gratitude research can be connected to Martin Seligman's 1998 choice to make positive psychology his American Psychological Association presidential initiative. Over the past two decades there has been impressive growth in the psychological study of how to improve one's life, instead of simply focusing on treating mental illness. This boom of positive psychology has included a focus on gratitude and how it can be beneficial to improving the overall well-being of an individual. In a topical search of the PsycINFO database between 2010 and 2017, 2,359 articles have been published related to the construct of gratitude.

One of the first major attempts to conceptualize gratitude as a psychological construct took place in 2001 by McCullough et al. In this study, the authors defined gratitude as a moral affect because it "largely results from and stimulates behavior that is motivated by a concern for another person's well-being" (Linley, 2004, p. 489). They stated that gratitude functions as a moral barometer, a moral motive, and a moral reinforcer. These three functions of gratitude essentially place gratitude as an emotion that is relevant to people's thoughts and behaviors in a

moral domain, resulting in behavior that is motivated by the concern for another's well-being (Bono et al., 2004; McCullough et al., 2001).

According to Emmons and McCullough (2004), the word gratitude comes from the Latin word *gratia*, which means "favor," and *gratus*, or "pleasing." Pruyser reports that all products of this root "have to do with kindness, generousness, gifts, the beauty of giving and receiving, or getting something for nothing" (as cited in Emmons & McCullough, 2004, p. 4). As a simple psychological definition, gratitude is viewed as the positive recognition of benefits received, usually some kind of underserved merit, where the person receiving the benefits has done nothing directly to deserve the benefits they are receiving.

State gratitude versus trait gratitude. An important element in understanding gratitude is distinguishing between different types of gratitude. Most previous research breaks gratitude down into two forms: state and trait (Rash, Matsuba, & Prkachin, 2011; Wood et al., 2010; Wood, Maltby, Stewart, Alex, & Joseph, 2008). State gratitude is considered to be temporary emotions, or shorter duration moods (Wood, Maltby, Stewart, et al., 2008). According to Roberts (2004) state gratitude can also be referred to as episodic gratitude, when a brief, positive and intense physiological change occurs based on the feelings of gladness. State gratitude is considered to be a higher-level emotion according to Rash et al. (2011), because it requires a higher-level cognitive understanding to acknowledge that the act of giving was intentional on the part of the giver. Overall, state gratitude is largely determined by an individual's interpretation of a specific situation.

In contrast, trait gratitude is considered to be a character trait or a virtue that some individuals live by, which is incorporated into their personality structure more deeply than

interpreting a specific circumstance and being grateful for the outcome. Wood et al. (2010) describe trait gratitude as a “life orientation towards noticing and appreciating the positive in life” (p. 891). Some of the leading researches in understanding gratitude defined it as an affective trait, specifically, the “general 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” (Bono et al., 2004, p. 462).

While state and trait gratitude have distinctions, they appear to be connected. Specific mechanisms of the relationship have only recently been identified. Wood, Maltby, Gillett, et al. (2008) found support that the relationship between state and trait gratitude is mediated by a social-cognitive model, in which social situations, individual differences, and other cognitive mediating factors affect the relationship between the two. Specifically, something called benefit appraisals were found to have a causal effect on state gratitude and mediate the relationship between state and trait gratitude. Benefit appraisal is a cognitive process that can be broken down into three parts: (a) how costly is the help being provided to me by the giving individual, (b) how valuable is the help being provided, and (c) was the help intended altruistically. Individuals who tend to make positive benefit appraisals have higher trait gratitude and have a heightened chance of experiencing state gratitude in different social situations (Wood, Maltby, Gillett, et al., 2008). McCullough, Tsang, and Emmons (2004) also found that state and trait gratitude were linked as people with higher trait gratitude experienced more state gratitude on a daily basis.

Distinguishing gratitude from related constructs. Just as it is important to distinguish different types of gratitude from one another, it is also crucial to differentiate gratitude from other similar psychological constructs. For example, one might consider gratitude to be

appreciation, just positive affect, or even a personality trait. It is important to understand and differentiate the concepts for the sake of research. Personality factors are among the most significant variables in overall life satisfaction (Fagley, 2012; McCullough et al., 2002).

Specifically, the big five factors of personality make up the largest contribution to overall life satisfaction in research, accounting for 31% of the variance. Both gratitude and appreciation have also been shown to explain some of the variance in life satisfaction (Fagley, 2012; Wood, Joseph, & Maltby, 2009), as well as correlating positively with openness, conscientiousness, agreeableness, and extraversion, while correlating negatively with neuroticism (Emmons & McCullough, 2003; Fagley, 2012). Fagley (2012) took eight smaller constructs to create a larger construct of appreciation, which explains 11% of the variance in life satisfaction (awe, ritual, being in the present, focus on what one has, self/social comparison, loss/adversity, interpersonal contributions, and gratitude). However, when removing gratitude from the construct of appreciation in Fagley's study, it alone accounted for 5.9% of overall life satisfaction demonstrating that, as a construct, gratitude is separate from appreciation and important in being satisfied with life.

Benefits of Gratitude

Beyond simply impacting overall life satisfaction, gratitude has also been shown to have a multitude of other benefits. The benefits of gratitude should be considered broad, as they seem to seep into many aspects of life and relationship. Gratitude enhances subjective, psychological, spiritual and physical well-being. Specifically, trait gratitude is shown to have a positive effect on both psychological well-being (Kashdan, Mishra, Breen, & Froh, 2009; Watkins, 2004) and

subjective well-being (Chen & Kee, 2008; Froh et al., 2009). It could also be assumed that state gratitude similarly has an effect on subjective well-being (Kashdan, Uswatte, & Julian, 2006).

Grateful people are more inclined than others to notice and appreciate the positive things in life (Wood, Maltby, Stewart, et al., 2008), utilize coping skills and strategies (Wood, Joseph, & Linley, 2007), experience positive and reciprocal relationships (Froh, Yurkewicz, & Kashdan, 2009; Kashdan et al., 2009), experience positive affect (Emmons & McCullough, 2003; Froh, Sefick, & Emmons, 2008; McCullough et al., 2002), and have social and psychological health (Hill, Allemand, & Roberts, 2013).

In addition to subjective and psychological well-being, gratitude has been associated with benefits in physical well-being (Emmons & McCullough, 2003), though Hill et al. (2013) discuss that the mechanism for this “gratitude-to-health” (p. 95) link is difficult to pinpoint. Gratitude has been shown to decrease stress over time (Krause, 2006; Wood, Maltby, Gillett, et al., 2008), which in turn increases an individual’s physical health and health behaviors due to decreased stress. Shipon (2007) found significant evidence to see that utilizing a gratitude intervention reduced blood pressure in participants due to inducing relaxation. Utilizing gratitude interventions also helps individuals show an increase in energy and vitality (Emmons & McCullough, 2003; Hill et al., 2013). Furthermore, gratitude may have a positive impact on sleep. Emmons and McCullough (2003) and Wood, Joseph, Lloyd, and Atkins (2009) found during an intervention designed to increase gratitude that individuals increased the amount of sleep they were getting related to “pre-sleep cognitions” (Wood, Joseph, Lloyd, et al., 2009).

It is important to note that the associations between gratitude and health are not simply correlational. The robust benefits of gratitude naturally led researchers to question if it could be

instilled through experimental interventions, and indeed interventions designed to increase gratitude have been shown to be successful in increasing subjective, psychological, social, and physical well-being (Emmons & McCullough, 2003; Froh et al., 2008; Hill et al., 2013; Huffman et al., 2014).

Mediating and Moderating Factors

While gratitude clearly has benefits to psychological, subjective, and physical well-being, it does not necessarily affect everyone the same way. It is important to explore different factors in order to better understand how gratitude might affect an individual. Specifically, emotional expression, social support, gender, age, personal responsibility, and religiosity may mediate or moderate the effects of gratitude (Chen, Chen, & Tsai, 2012; Chen, Wu, & Chen, 2014; Chow & Lowery, 2010; Froh et al., 2009; Sun, Jiang, Chu, & Qian, 2014).

One moderating factor is ambivalence concerning emotional expression. According to Heisel and Mongrain (2004), ambivalence over emotional expression is considered to be “an interactional deficit in interpersonal relationships” (p. 2). Chen et al. (2012) discovered that high ambivalence with emotional expression moderated both the beneficial effect of gratitude and well-being indexes used in the study. This indicates that the beneficial effect of gratitude on subjective happiness was inhibited by ambivalence. In 1990, King and Emmons similarly found that ambivalence over emotional expression negatively predicted life satisfaction and daily negative affect, as well as positively predicting depression and anxiety. Therefore, it seems ambivalence over emotional expression is related to lower-well being, and significantly reduces the positive effect of gratitude on an individual.

Another factor that may interact with gratitude is social support. Chen et al. (2014) discuss how gratitude interacts with social support, specifically within an adolescent athletic team. While the sample makes this research difficult to generalize, Chen and his colleagues focus on important relationships between trait gratitude and social support. For instance, they found that the support provided by peers versus coaches is different on the effect of gratitude, indicating that individuals are affected differently by people who play different roles in their lives. Social support is not necessarily a mediator of gratitude itself, however, as Chen et al. (2014) discuss, the amount of gratitude one has will shape one's perception of social support and therefore perpetuate a grateful cycle increasing social support. This cycle can be reflected as a broaden-and-build theory (Emmons & McCullough, 2003) in that gratitude allows individuals to broaden-and-build their social support to achieve a higher overall well being, allowing gratitude to have a significant positive effect on an individual. Emmons and McCullough (2003) described the broaden-and-build theory in relation to gratitude as an "upward spiral" (p. 387).

Research also suggests that gender may be another mediating factor of gratitude. Both Froh et al. (2009) and Kashdan et al. (2009) explored gender differences in experiencing gratitude and benefitting from the positive effects. Each study looked at gender differences in a different population, one of adult men and women (Kashdan et al., 2009) and the other in early adolescents (Froh et al., 2009). In the sample of adults, women were more likely to benefit from gratitude than men, consistent with the hypothesis that women are more emotionally expressive and experience emotions more intensely than men (Kashdan et al., 2009; Simon & Nath, 2004). According to Kashdan et al. (2009), women may have an increased experience of gratitude

because they more often display altruistic behavior, which stimulates broad and meaningful social ties, leading others to act more prosocial toward them.

In contrast, Froh et al. (2009) discovered little evidence to support significant gender differences between adolescent girls and boys. This is inconsistent with gratitude gender differences studies among adults according to Kashdan et al. (2009), but may be explained by the level of socialization at a point in time, or the androgyny hypothesis where boys have more “feminine” traits than they once did. Despite this overall lack of difference among adolescents, Froh et al. (2009) speculate that gratitude in adolescent boys could have a causal relationship with levels of familial support, where girls tend to shower higher levels of dispositional gratitude independent of the level of familial support.

Gratitude may also be mediated by age, as seen by the differences in outcomes of the two studies described above. Krause (2006) also found that elderly women benefitted more from gratitude than older men. Similarly, Hill and Allemand (2011) found greater effects of gratitude on older individuals than younger individuals.

Recently, researchers have started exploring perceptions of personal responsibility, or how an individual may or may not feel responsible for positive outcomes, as a mediating factor for gratitude (Chow & Lowery, 2010). In the past, research has suggested that individuals need to believe that others are responsible for a desired outcome to feel gratitude (Weiner, Russell, & Lerman, 1979). In contrast, Chow and Lowery (2010) found that an individual can feel personally responsible for a positive outcome and still feel grateful to others for help, supporting the idea that internal (from themselves) and external (from others) attributions leading to

gratitude can be independent of each other, depending on the situation (McClure, 1998). There is not a consensus on how personality moderates the effects of gratitude on an individual.

The Mechanisms of Gratitude

Numerous individuals and researchers have designed, used, and tested multiple interventions to increase gratitude in an individual (Huffman et al., 2014; Maslow, 1991; Wood et al., 2010). Huffman et al. (2014) describe some of these interventions, include writing a letter to another person to express gratitude, focusing on personal strengths, performing acts of kindness for others, counting one's blessings (gratitude journaling/gratitude lists), writing about one's best possible self, or writing a letter to someone asking for forgiveness. The most simple of exercises, such as the gratitude letter and counting blessings, seemed to decrease negative symptoms the most, while writing a letter asking for forgiveness performed the most poorly because it brought up past negative emotions (Huffman et al., 2014). Both Huffman et al. (2014) in their research and Wood et al. (2010) in their meta-analysis saw the largest positive increase with gratitude letters.

Wood et al. (2010) also discussed two kinds of gratitude lists in their meta analysis, one in which individuals wrote what they were grateful for on a regular basis and the other where individuals wrote things that they were grateful to be able to do over a period of time. Both types of lists seemed to improve an individual's mood and increase satisfaction. However, the specific mechanism linking gratitude to well-being may be different with gratitude interventions and trait gratitude. Wood et al. (2010) state that there is "little evidence to show that gratitude interventions operate through the mechanisms of increased gratitude" (p. 900). One of the

reasons this is unknown is because levels of gratitude were not assessed after interventions were given.

Wood et al. (2010) assert in their meta-analysis that more research is needed to understand why gratitude interventions work, and they give four hypotheses of different mechanisms of gratitude. First, the positive affect hypothesis states that positive emotions are protective, and gratitude is a positive emotion that may help to change negative experiences to positive, therefore increasing life-satisfaction and well being.

The second hypothesis proposed by Wood et al. (2007) is the coping hypothesis, in which more grateful people consistently showed that they had better coping skills, and would therefore be less likely to experience high levels of stress increasing overall well-being. In this theory, Wood et al. (2010) also acknowledge that coping is likely only a part of understanding gratitude's mechanism and effect.

Third is the schematic hypothesis, which states that grateful people have characteristic schemas that influence how they interpret situations in which help has been given (Wood, Maltby, Gillett, et al., 2008). Therefore, they would value help from others more than individuals with low trait gratitude and experience gratitude more often, consistent with McCullough et al.'s (2004) research linking state and trait gratitude.

The last mechanism of gratitude explored by Wood et al. (2010) is Fredrickson's (2004) broaden-and-build theory, which states that negative emotions make it more difficult to deal with specific problems, while positive emotions help to encourage creativity and build resources. For gratitude, trait gratitude would help an individual build social bonds during times of low stress so that resources are available in times of high stress (Wood et al., 2010)

While all of these hypotheses of the mechanism of gratitude exist and do play some part in how gratitude works in individuals, there is not a concrete link to understanding how they interact with each other (Wood et al., 2010). Further, though it is clear that gratitude interventions enhance well-being in a variety of domains, the inverse relationship has not been studied. That is, do interventions to enhance well-being function to also increase gratitude?

Current Study

It is now clear that increasing gratitude promotes increases in subjective, psychological, spiritual, and physical well-being. People with high levels of trait gratitude experience enhanced health and health behaviors (Hill et al., 2013) and gratitude interventions increase individuals' health behaviors in the form of exercise and sleep (Emmons & McCullough, 2003). Grateful people experience positive affect on a daily basis and see things in their lives more positively than others. They enjoy increased social and physical health. These benefits may occur because grateful individuals are better able to form social bonds, better able to utilize coping skills to defer stress, better able to maintain positive affect, and are more creative in problem solving.

The bidirectionality of the relationship between gratitude and health behaviors is less clear. Increasing gratitude enhances various dimensions of health and well-being, but is the inverse also true? Will those who increase physical well-being experience increases in gratitude? The current study seeks to better understand the reciprocal nature of the link between gratitude and health behaviors. This will be done by measuring gratitude and health behaviors before and after utilizing an intervention designed to increase physical exercise and knowledge of positive health behaviors, including positive exercise habits, nutrition, and other skills to maintain lifelong health.

I hypothesize that:

1. Those with higher gratitude at Time 1 will show better exercise and eating at Time 1 (this hypothesis replicates previous research showing that gratitude is associated with positive health behaviors).
2. Gratitude will increase over the course of a semester-long life fitness class.
3. Those who engage in the most exercise throughout the semester will show greater increases in gratitude and positive affect than other participants.
4. Those who demonstrate the greatest increase in lean muscle from Time 1 to Time 2 will show greater increases in gratitude and positive affect than other participants.
5. Those who demonstrate the greatest increases in nutritious eating from Time 1 to Time 2 will show greater increases in gratitude and positive affect than other participants.

Chapter 2

Methods

Participants

Incoming first year college students at George Fox University who were enrolled in a required life long fitness course in the fall semester of 2015 were recruited to participate in this study. Participants ranged in age from 17 to 23. All participants completed the measures required for this study during the first week of class and again during the last week of class. They were also required to wear a Jawbone fitness tracker throughout the semester as part of the course.

In total, the participants were between the ages of 17-23 (Mean age: 18.89). 216 individuals started in the study and 149 participants had complete data that was analyzed. Out of the 149 participants, 86 identified as male and 63 identified as female. There were 67 first year students, 63 second year students, 9 third year students, 8 fourth year students, and 2 fifth year, or untraditional students. Regarding Ethnicity, 1.6% identified as American Indian or Alaskan Native; 6.7% Hispanic; 74.2% White, non-Hispanic; 9.5% Asian or Pacific Islander; 5.2% Black, non-Hispanic; and 1.6% as International. Regarding Race, approximately 5.2% of the participants identified as African American, 1.6% as American Indian or Alaskan Native, 9.5% as Asian American or Pacific Islander, 74.2% as White or Euro American, 6.7% as Hispanic and 1.6% as Latino.

Instruments

Demographics. A short demographics survey was developed with questions to include age, race, ethnicity, gender, and year in school (see Appendix A).

Behavioral data. Behavioral data was collected in a free response form including athletic involvement, amount of sleep, current eating habits, water drinking habits, caffeine intake, and social media usage. (see Appendix A).

Lifestyle. A short questionnaire with 10 questions was used to assess the importance of faith to an individual, choices about food and nutrition, if an individual tracked exercise or nutritional intake, self rated health and quality of life, and how relevant the information learned in the intervention was to each participant. Each question is on a 7-point Likert scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). (see Appendix A).

Nutrition. Nutrition knowledge was measured by 8 multiple-choice questions written by a nutrition professor. (see Appendix A).

Exercise. Amount of exercise was self-reported by participants answering two questions, as well as recorded objectively by a Jawbone fitness tracker as the number of steps per day. The self report questions are as follows: (a) How many minutes per week do you currently spend in moderate to vigorous physical activity? (b) How many times do you participate in moderate to vigorous physical activity in one week? Both questions are free response (see Appendices A and B).

Trait gratitude. Trait Gratitude was measured using two scales: the Gratitude Questionnaire – Six Item Form (GQ-6; McCullough et al., 2002) and the Gratitude Resentment and Appreciation Test– Short Form (GRAT-S; Watkins, Woodward, Stone, & Kolts, 2003). The GQ-6 ($\alpha = .76-.84$) has six items that are rated on a 7-point Likert scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). People that self-report higher scores on the GQ-6 report feeling more grateful, thankful, and appreciative than others who self-report lower scores. The GRAT-S

has three subscales that measure a Lack of a Sense of Deprivation (LOSD), Simple Appreciation (SA), and Appreciation for Others (AO). These scales are shortened from the most important items on the GRAT, which shows high reliability in similar scales: Lack of a Sense of Deprivation ($\alpha = .80$), Appreciation for Simple Pleasures ($\alpha = .87$), and Social Appreciation ($\alpha = .76$). The GRAT scale has excellent reliability ($\alpha = .92$), while reliability for the GRAT-S is unreported at this time. The GRAT-S is composed of 16 items that are rated with a 9-point Likert scale ranging from 1 (*Strongly Disagree*) to 9 (*Strongly Agree*) (see Appendix A).

Affect and state gratitude. The Positive and Negative Affect Scale will be used as a measurement of affective state (PANAS; Watson, Clark, & Teilegen, 1988). State gratitude will be measured as McCullough et al. (2002) demonstrated by embedding three items: “Grateful,” “Thankful,” and “Appreciative” into the PANAS. The PANAS originally consists of 10 positive and 10 negative items related to mood rated on a 5-point Likert scale from 1 (*very slightly or not at all*) to 5 (*extremely*). The PANAS has high validity between both the positive and negative affect scales ($\alpha = .85-95$). With the three items related to gratitude embedded, the modified PANAS has 23 items total (see Appendix A).

Procedure

Participants were asked to sign informed consent at the beginning of the study. Students enrolled in a Lifelong Fitness course in the Fall Semester of 2015 made up the experimental group. The Lifelong Fitness class itself is the intervention, as it requires weekly exercise and provides education regarding fitness. All participants enrolled in the course will have a four-day time period at the beginning of the semester after their introductory class to take all self-report survey materials on Survey Monkey at their convenience, including the *Demographic*

Questionnaire, Nutrition Assessment, Behavioral Data, GQ-6, GRAT-S, and the PANAS. At the end of the semester and after completing the course/intervention, participants were re-administered the same questionnaire (see Table 1).

Table 1

Data Collection and Design

Time 1	14-Week Intervention	Time 2
Pretest	Exercise	Posttest
Begin using Fitness Tracker	Intervention/Lifelong Fitness Course	Fitness Tracker Data Uploaded

At the first class of the semester, students were also introduced to their Jawbone fitness trackers. Fitness tracker data were uploaded at the end of the semester and included all days of the semester in a spreadsheet downloaded from Jawbone web servers.

Chapter 3

Results

Hypothesis 1 was tested with a Pearson product-moment correlation based on Time 1 data. Hypothesis 2 was tested with a repeated-measures *t*-test comparing gratitude at Time 1 and Time 2. Hypothesis 3 called for a multiple regression with changes in gratitude and positive affect as the dependent variables and overall minutes of activity, Time 2 activity levels, lean muscle percentage at Time 1 and Time 2 as the predictor variables. Hypothesis 4 also required multiple regression analyses with changes in gratitude and affect as the dependent variables and change in percentage of body fat at the predictor variables. A similar procedure was used for Hypothesis 5, but with healthy eating rather than physical exercise as the predictor variables. Answers to various health and nutrition questions (see Appendix A) were used to construct a healthy eating metric.

Hypothesis 1

A Pearson Product correlation was used to evaluate the relationships between the three Measures of gratitude (GQ-6, PANAS, GRAT-S) and measures of health at Time 1. The expected relationship was not observed for gratitude at Time 1 as seen in Table 2, gratitude on the GQ-6 at Time 1 was significantly related to the amount of sleep participants were getting at Time 1, $r = .184$, $p = .027$. No other significant relationships were seen between Gratitude at Time 1 and health at Time 1.

Hypothesis 2

For Hypothesis 2, I utilized a series of paired sample *t*-tests to investigate the differences between pre and post measures of gratitude. All comparisons were evaluated using an alpha level of .05 for statistical significance. Table 3 shows the mean scores for all gratitude measures at Time 1 and Time 2. No significant differences were observed, except that participants decreased slightly on the GRAT-S total score from Time 1 to Time 2, $t(92) = 2.354, p = .021$.

Hypothesis 3

Neither amount of exercise during the semester nor lean body mass at Time 2 predicted change on the GRAT-S or PANAS Gratitude measures. Minutes of activity throughout the semester was significantly related to change on GQ-6, $p = .009$, but not in the direction anticipated. Minutes of activity predicted decreases in GQ-6 scores rather than increases. See Tables 4 – 6 for regression results.

Hypothesis 4

Neither lean body mass at Time 1 or Time 2 predicted changes in the PANAS or GRAT-S gratitude scores. Lean body mass at Time 1 predicted a small amount of variance in GQ-6 change, with those lower in lean body mass showing slightly greater change in gratitude. Time 2 lean body mass, which is more closely related to the hypothesis than Time 1 lean body mass, was not significantly related to change in GQ-6 score. Tables 7 – 9 shows the results of the regression.

Hypothesis 5

It was not possible to test this hypothesis because nutrition data was not collected at the time of the post test.

Table 2

Correlations Hypothesis 1

	T1 GQ-6	T1 PANAS State Gratitude	T1 Grat-S Total	T1 Times Active	T1 Amount of Sleep	T1 Amount of Water	T1 Minutes Active	T1 Amount of Fruits and Vegetables
T1 GQ-6	1							
T1 PANAS State Gratitude	.307**	1						
T1 Grat-S Total	.612**	.398**	1					
T1 Times Active	.136	.056	.013	1				
T1 Amount of Sleep	.184	.020	.101	-.180*	1			
T1 Amount of Water	.062	.141	.110	.449**	-.061	1		
T1 Minutes Active	.130	.144	.030	.543**	-.088	.328**	1	
T1 Amount of Fruits and Vegetables	.081	.092	.106	.255**	.024	.307**	.118	1

Notes. T1 – Time 1.

** $p < .01$.

* $p < .05$

Table 3

Paired Samples T-test

Time 1 & Time 2 Gratitude Measures	Mean Total	Mean Difference	<i>t</i>	<i>df</i>	Sig. (2 tailed)
T1 GRAT-S LOSD	44.60	1.375	1.668	87	.099
T2 GRAT-S LOSD	43.23				
T1 GRAT-S SA	45.44	.837	.941	85	.349
T2 GRAT-S SA	44.60				
T1 GRAT-S AL	31.24	1.110	1.738	90	.086
T2 GRAT-S AL	30.13				
T1 GRAT-S Total	120.65	4.871	2.354	92	.021*
T2 GRAT-S Total	115.77				
T1 GQ-6	36.95	.663	1.128	94	.262
T2 GQ-6	36.28				
T1 PANAS State Gratitude	12.45	-.221	-.795	94	.428
T2 PANAS State Gratitude	12.66				
T1 PANAS Positive	37.59	-.042	-.069	94	.945
T2 PANAS Positive	37.63				
T1 PANAS Negative	21.92	.011	.019	94	.985
T2 PANAS Negative	21.91				

Note. * - Significance at $p < .05$. T1 – Time 1, T2 – Time 2. GRAT-S Subscales: LOSD – Lack of Sense of Deprivation, SA- Simple Appreciation, AO - Appreciation for Others. PANAS State Gratitude – Gratitude Specific Items, PANAS Positive – PANAS Positive Affect Items, PANAS Negative – PANAS Negative Affect Items

Table 4

Exercise and Lean Body Mass: Change in Grat-S

Predictor Variables	β	t	p
Minutes Active	-.29	-.202	.840
Post Times Active	-.005	-0.36	.972
Muscle % at Time 2	-.018	-.151	.881

Table 5

Exercise and Lean Body Mass: Change in GQ-6

Predictor Variables	β	t	p
Minutes Active	-.372	-2.678	.009*
Post Times Active	.196	1.442	.153
Muscle % at Time 2	.103	.895	.374

Table 6

Exercise and Lean Body Mass: Change in PANAS Gratitude

Predictor Variables	β	t	p
Minutes Active	-.092	-.638	.526
Post Times Active	.96	.680	.499
Muscle % at Time 2	-.109	-.908	.367

Table 7

Lean body mass at Time 1 and Time 2: Change in Grat-S

Predictor Variables	β	t	p
Lean Muscle % at T1	.282	.302	.764
Lean Muscle % at T2	-.457	-.488	.627

Table 8

Lean body mass at Time 1 and Time 2: Change in GQ-6

Predictor Variables	β	t	p
Lean Muscle % at T1	-.617	-2.324	.024
Lean Muscle % at T2	.473	.1.771	.082

Table 9

Lean body mass at Time 1 and Time 2: Change in PANAS Gratitude

Predictor Variables	β	t	p
Lean Muscle % at T1	-.028	-.240	.811
Lean Muscle % at T2	-.026	-.117	.827

Chapter 4

Discussion

The purpose of this study was to explore the link between gratitude and health behaviors, as it remains unclear what mechanism(s) are responsible for the positive benefits associated with gratitude and whether the link between gratitude and health enhancement is bidirectional. I explored this link by measuring the change in gratitude over time in response to an exercise intervention – a freshman level college course requiring exercise and health education.

Findings

Based on the present study, an exercise intervention and education regarding health behaviors was not shown to increase gratitude in this sample. I was also not able to replicate existing research that has shown individuals with higher gratitude display more positive health behaviors. The one exception to this was in regard to sleep, where people with higher gratitude, as measured by the GQ-6 at the beginning of my study, showed better sleep, which is consistent with previous research done by Emmons & McCullough (2003). Additionally, there were limited changes in gratitude on both state and trait measures at Time 1 and Time 2. In fact, on the GRAT-S individuals decreased in their overall gratitude throughout the semester long intervention. The findings also suggest that exercise may not increase gratitude as the higher number of minutes of exercise throughout the semester predicted lower gratitude on the GQ-6, though the relationship was small. Further, on an objective measure of lean muscle mass (higher percentage indicating better health), as measured by the Bod Pod, those with a lower lean muscle

percentage showed a slightly greater change in gratitude on the GQ-6 before the intervention, but not afterward. Overall, in this sample, there was not an increase in gratitude over a semester long exercise and health education intervention as hypothesized. While all measures of gratitude used in this study (PANAS, GQ-6, GRAT-S) showed significant correlation and relationship with each other, it appears, based on the most significant results displayed, that the GQ-6 was the most sensitive to any change in gratitude.

Implications

These findings suggest two primary explanations for the outcome of this study. First, participants in the study may not have changed very much in terms of health behaviors. Or, if they did change in their health behaviors, it may have been simply due to the course requirement of increasing exercise rather than changing due to personal commitments to change. If this is the case, then the results are not informative for the study of gratitude in relation to health behaviors other than to suggest essential pitfalls to be avoided in further research.

The second possibility is that participants did fully engage in a more healthy lifestyle with personal commitments to change. This would suggest that there may not be a bidirectional relationship between health and gratitude as expected. If this is the case, then there are significant implications of how to work toward improving overall health. Knowing that gratitude has been shown to increase health behaviors, without the inverse being true, future attempts at health promotion should focus on positive psychology interventions as well as traditional exercise interventions. The findings of this study suggest that focusing on positive psychology and gratitude may lead to an increase in positive health behaviors, while a sole focus on increasing health behaviors will not have an increase on gratitude.

Limitations

When considering this study's findings and their implications, there are several significant limitations that must be taken into account. One major limitation is the efficacy and sensitivity of the gratitude measures that are currently used in this area of research. While all the gratitude measures used in this study are researched-based, they have been condensed to a handful of questions designed to assess either a state or a trait of gratitude. As such, individuals that are not exposed to the research oriented definitions of gratitude may understand it differently and, therefore, interpret these measures in their own way. The gratitude measures also seemed to show a ceiling affect: if an individual had a higher gratitude score at the pretest, there was not much room to increase their score by the posttest. Or, on the measures of state gratitude, if a participant gave an answer of yes to the two embedded gratitude questions, there could be no improvement over time.

Another limitation to this study was the lack of a control or comparison group. An established university course was used as the intervention in this study and a control group was not able to be obtained. This made it difficult to isolate variables and understand what the mechanisms of change in the study may have been, or how the exercise intervention did or did not affect the sample as compared to individuals that were not participating in the study.

The method of fitness data collection was also a limitation in this study. Fitness information was collected using both self-report and fitness tracker data, which was to be uploaded by the participants. The fitness tracker data itself was often hard to get, and many individuals took excessive time to get started with their trackers, while others didn't upload their data at all. Further, despite being directed to wear the fitness tracker every day during the

semester, they often did not, which resulted in missing data. These missing data, however, were not recognizable due to the required upload being a total number of steps for the week or month, which did not indicate if any time was missed. Data from the fitness trackers in this instance turned out to be unreliable and a poor measure of exercise.

Data were also impacted by the fact that the participants, who were busy college students, had a difficult time completing requests to turn in data or complete surveys. This resulted in the moderately large rate of participants that did not have complete data to analyze. This may have been further exacerbated by the time it took for a large amount of data being collected for the larger project that subsumed this study. Each time participants had to answer questions, they were required to spend a significant amount of time doing it, and many participants skipped over certain sections or did not complete the surveys they were given. In addition to participants not providing all required data, there was also a limitation in the collection of data. Some important data, specifically nutrition data, were only collected at the beginning of the study, and not repeated on the posttest, making it impossible to test Hypothesis 5.

Along with concerns about data collection, another limitation in this study was the potential for confounding variables and events that may have skewed the results. First, an alternative explanation may be related to the intervention itself, as it was a mandatory college course where individuals were required to exercise in order to earn a passing grade. Therefore, the increase in exercise was not voluntary, which may have affected the outcome of the study. The mandatory nature of the intervention is a possible explanation for the results that indicated individuals who exercised fewer minutes were the more grateful, which contradicts the expected direction of the relationship between gratitude and physical activity. In the same vein, the type of

exercise may have played a significant part in the outcome of the study. This study did not dictate what kind of exercise was to be done, instead utilizing the fitness course as the intervention, which heavily focuses on traditional cardiovascular (running, walking, treadmill, elliptical) and strength-training (weight lifting, resistance machines) exercises. A focus on yoga or other more mindful exercises, which have a directional relationship increasing gratitude (Ivtzan & Papantoniou, 2014), may have demonstrated different results. Also, the social aspect of how the participants completed their exercise, individually or with friends, may have affected the outcomes, as gratitude has a strong base in social interaction and reciprocity (Bonnie & de Waal, 2004; Wood, Maltby, Gillett, et al., 2008).

The results may also have been confounded by the other events occurring in the participants' lives. In particular, the majority of the participants in this study were first-year university students. The first year of college is widely known to be a significant lifestyle change for most traditional students. One piece of that transition is the anecdotal "freshman fifteen," which implies that freshman college students will gain weight during their first year of college due to the lifestyle change they are experiencing. In fact, Cluskey and Grobe (2009) found that 62% of college students gain five or more pounds in the first year, with males gaining slightly more weight than females overall. Research also indicates that first-time college students living on campus may experience unwanted emotional and adjustment problems related to roommate issues, housing concerns, and social life (Hicks & Heastie, 2008). These factors may have influenced levels of gratitude in the majority of the sample independent from the exercise intervention. As a whole, studying students during the transition from high school to college

creates a difficult research environment with significant variables that are impossible to control for completely.

Another potentially confounding variable is the impact that participants' religious beliefs may have had on gratitude. The sample for this study consists entirely of undergraduate students at a private Quaker university. Although not all students are required to be religious at this university, the majority of them hold some form of evangelical Christian beliefs. There could be many implications of this. For instance, gratitude is often viewed from a religious perspective, where monotheistic religions, including Christianity, view God as a caregiver and who deserves gratitude for what God provides. Understanding gratitude in this way may have been a reason for higher initial gratitude scores in this sample, leading to the ceiling effect and lack of change post-intervention. The mean gratitude score on the GQ-6 for US college students is 35.87 (based on an average of eight studies including college students; McCullough, n.d.), while the mean for this sample was 36.79 at the pretest and 36.01 at the post test. This elevated gratitude score may also have been impacted by the relatively higher SES of college students at a private university, as individuals with more resources tend to have less difficulty navigating through life.

Future Directions

Moving forward in gratitude research, we must continue to further understand and operationally define gratitude as well as continuing to research current measures. Whereas gratitude has been thoroughly researched, it is still difficult to study, as it is a broad concept. The mechanisms, or possible interaction of multiple mechanisms, of change in gratitude are hypothesized but not understood in a concrete way at this point in time (Wood et al., 2010; Wood, Maltby, Gillett, et al., 2008). Also, previous research has confirmed that gratitude does

play a significant part in life satisfaction and health behaviors, but it is still difficult to pinpoint how gratitude interacts with the complex lives and lifestyles of individuals (Emmons & McCullough, 2003). Because of this, research on gratitude in the future must continue to focus on how gratitude is tied to personality traits, how it is differentiated from other similar constructs, and if it is possible to increase or change personality traits over time. Research also needs to be targeted specifically to help understand the mechanisms of change in gratitude and what confounding factors may be increasing or decreasing the effect of gratitude.

Gratitude researchers might also consider how the demographics of a group or individual affect gratitude. The limitations and narrow sample of this present study raised the following research questions for future studies: Are religious groups more grateful overall? Are specific religious groups more or less grateful than other religious group? How do individuals of different ages and developmental stages experiencing gratitude, and what affect does it have on their health and wellbeing? Do individuals that have had easier/harder life experiences experience gratitude differently?

Finally, the field of research in gratitude would benefit from further study into the differentiation between types of physical exercise and health behaviors. For instance, how do different forms of exercise (e.g., cardiovascular, yoga, crossfit, etc.) impact gratitude? Similarly, how do different versions of healthy eating (e.g., juicing, dieting, decreasing calorie intake, etc.) influence gratitude?

Conclusion

The current study built upon previous research on gratitude and its connection to health behaviors, seeking to better explore the bidirectional relationship between gratitude and exercise.

While the expected results were not found, information was collected and presented to better help guide future research efforts. The current study was hindered by a number of difficulties related to methods and efficacy of data collection, homogeneity and developmental stage of the sample, and challenges in understanding a complex attribute in relation to confounding variables. Despite these limitations, the study serves as a springboard to continue exploring gratitude and how it can be increased or maintained through tangible health behavior interventions.

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Appendix A

Questionnaires and Measure

Demographic Survey

What is your gender?

Male Female

What is your age?

Semester

What is your year in school?

Freshman/First Year

Sophomore/Second Year

Junior/Third Year

Senior/Fourth Year

Height in Inches

Weight in Pounds

Ethnicity

American Indian/Alaskan Native

Hispanic

First Nations

Asian American

Pacific Islander

Multi-ethnic

International Student

If you are an international student, what country do you come from?

Are you now or do you anticipate participating in any sports at GFU?

Yes

No

If yes, what sports?

Are you now or do you participate in intermurals at GFU?

Yes

No

If yes, what intermurals?

Did you participate in a sport in High School?

Yes

No

If yes, what sport(s)?

How many servings of fruits and vegetables do you eat in a typical day?

How many 8-ounce glasses of water do you drink in a typical day?

How many minutes per week do you currently spend in moderate to vigorous physical activity?

How many times do you participate in moderate to vigorous physical activity in one week?

How many hours per week do you spend on Facebook?

How many hours have you slept in a typical night this week?

How many high caffeine drinks (e.g. coffee, espresso shots, energy drinks, etc.) do you consume in a typical day?

How many times in the last week have you eaten beyond the feeling of fullness?

Nutrition Questions

What is one serving size of rice, pasta, cooked beans or other grain (1/2 cup) closest to in size?

- a. Deck of cards
- b. Four dice
- c. Tennis ball
- d. Computer mouse

What is one serving of meat, fish or poultry (3 ounces) closet to in size?

- a. Deck of cards

- b. Four dice
- c. Tennis ball
- d. Computer mouse

I am an excellent source of fiber, complex carbohydrates and B vitamins.

- a. Celery
- b. Oatmeal
- c. Blueberry muffin
- d. Apple

This "breakfast" food contains about 50% fat.

- a. Scrambled egg
- b. English muffin
- c. Donut
- d. Oatmeal

Don't buy food where you buy your gasoline. In the US, _____% of food is eaten in the car?

- a. 10
- b. 15
- c. 20
- d. None of the above

The best fat to add to your diet every day is:

- a. Soybean oil
- b. Hydrogenated oil
- c. Sunflower oil
- d. Olive oil

A Carmel Ribbon Crunch Frappuccino from Starbucks has 600 calories, _____grams of fat (more than half a day's worth) and about 21 teaspoons of sugar.

- a. 5
- b. 8
- c. 10
- d. 12

A handy rule of thumb: Fill _____ your plate with vegetables.

- a. 1/8
- b. 1/4
- c. 1/2
- d. 3/4

Lifestyle Questions

Please respond to each of the questions below.

	1	2	3	4	5	6	7
	Strongly Disagree	Disagree	Somewhat Disagree	Neural	Somewhat Agree	Agree	Strongly Agree
My faith is very important to me	1	2	3	4	5	6	7
I have consistently made healthy food choices in the past month	1	2	3	4	5	6	7
My current nutrition will impact my health 10 years from now	1	2	3	4	5	6	7
The nutrition of a female college student impacts the health of the children she will have in the future	1	2	3	4	5	6	7
I consistently track or monitor my fitness activities	1	2	3	4	5	6	7
I consistently track or monitor my nutritional intake	1	2	3	4	5	6	7
The information I learned in Life Long Fitness improved my nutritional choices	1	2	3	4	5	6	7
The information I learned in Life Long Fitness improved my fitness activity choices	1	2	3	4	5	6	7
Overall, my General Health is very good	1	2	3	4	5	6	7
Overall, my Quality of Life is very good	1	2	3	4	5	6	7

GRAT-S

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

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

- _____ 1. I couldn't have gotten where I am today without the help of many people.
- _____ 2. Life has been good to me.
- _____ 3. There never seems to be enough to go around and I never seem to get my share.
- _____ 4. Oftentimes I have been overwhelmed at the beauty of nature.
- _____ 5. Although I think it's important to feel good about your accomplishments, I think that it's also important to remember how others have contributed to my accomplishments.
- _____ 6. I really don't think that I've gotten all the good things that I deserve in life.
- _____ 7. Every Fall I really enjoy watching the leaves change colors.
- _____ 8. Although I'm basically in control of my life, I can't help but think about all those who have supported me and helped me along the way.
- _____ 9. I think that it's important to "Stop and smell the roses."
- _____ 10. More bad things have happened to me in my life than I deserve.
- _____ 11. Because of what I've gone through in my life, I really feel like the world owes me something.
- _____ 12. I think that it's important to pause often to "count my blessings."
- _____ 13. I think it's important to enjoy the simple things in life.
- _____ 14. I feel deeply appreciative for the things others have done for me in my life.
- _____ 15. For some reason I never seem to get the advantages that others get.
- _____ 16. I think it's important to appreciate each day that you are alive.

The Gratitude Questionnaire-Six Item Form (GQ-6)

By Michael E. McCullough, PhD, Robert A. Emmons, PhD, Jo-Ann Tsang, PhD

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

1 = strongly disagree

2 = disagree

3 = slightly disagree

4 = neutral

5 = slightly agree

6 = agree

7 = strongly agree

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

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

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

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

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

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

* Items 3 and 6 are reverse-scored.

Positive and Negative Affect Scale (PANAS)

This scale consists of a number of words and phrases that describe different feelings and emotions.

Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past few weeks.

Use the following scale to record your answers:

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

_____ active	_____ guilty	_____ enthusiastic	_____ attentive
_____ afraid	_____ thankful	_____ nervous	_____ distressed
_____ excited	_____ determined	_____ strong	_____ grateful
_____ hostile	_____ proud	_____ alert	_____ jittery
_____ interested	_____ irritable	_____ upset	_____ appreciative
_____ ashamed	_____ inspired	_____ scared	

Appendix B

Simplified Jawbone Data Example

DATE	age	bmr	gender	m_active_tin	m_calories	m_distance	m_inactive_t	m_lcat	m_lcit	m_steps	m_total_calories
20141208	25.9424658	1905.50741	0	1567	142.495079	2375.83388	27329	241	4740	3097	2048.00249
20141209	25.9452055	1905.4889	0	2619	236.050918	3873.81682	24427	250	3814	5050	2141.53982
20141210	25.9479452	1905.47039	0	5285	780.410627	3862.80337	25277	373	4328	4915	2685.88102
20141211	25.9506849	1905.45189	0	2721	240.586798	4102.34129	25446	439	4320	5325	2146.03868
20141212	25.9534247	1905.43338	0	2009	219.919614	2113.24925	29697	170	9348	2686	2125.35299
20141213	25.9561644	1905.41487	0	1141	222.439113	3048.08992	26403	48	5439	3788	2127.85399
20141214	25.9589041	1905.39637	0	2478	233.049776	3758.58107	24419	442	6231	4896	2138.44614
20141215	25.9616438	1905.37786	0	2787	260.515817	4293.3368	23210	281	2780	5571	2165.89368
20141216	25.9643836	1905.35935	0	2214	166.625999	3003	28260	352	7500	3992	2071.98535
20141217	25.9671233	1905.34084	0	2646	220.366	3655	28560	754	14640	4808	2125.70684
20141218	25.969863	1905.32234	0	3154	249.864001	4278	27240	1155	6480	5693	2155.18634
20141219	25.9726027	1905.30383	0	2197	173.423	2994	25620	406	3540	3976	2078.72683
20141220	25.9753425	1905.28532	0	3734	293.505	5212	24480	403	6000	6852	2198.79032
20141221	25.9780822	1905.26682	0	2641	216.679001	3738	24840	456	5040	4906	2121.94582
20141222	25.9808219	1905.24831	0	4291	361.426001	6293	23640	605	5340	8143	2266.67431
20141223	25.9835616	1905.2298	0	4308	360.028	6282	27600	316	7680	8136	2265.2578
20141224	25.9863014	1905.2113	0	5513	447.895	7714	22440	2282	3420	10151	2353.1063
20141225	25.9890411	1905.19279	0	2631	245.370226	4046.70455	25320	454	3000	5200	2150.56302
20141226	25.9917808	1905.17428	0	4216	366.421836	6303.96544	25123	1452	6153	8188	2271.59612
20141227	25.9945205	1905.15578	0	2149	264.902876	4290.50044	28210	260	8414	5332	2170.05865
20141228	25.9972603	1905.13727	0	2104	247.853052	4163.23316	27193	343	10615	5252	2152.99032
20141229	26	1905.11876	0	2689	227.419204	3848.92771	24600	269	4432	5018	2132.53797
20141230	26.0027397	1905.10026	0	1938	248.342174	3909.64673	29061	482	7417	4765	2153.44243
20141231	26.0054795	1905.08175	0	4477	441.210472	7264.4191	22142	838	2760	9167	2346.29222

Appendix C

Curriculum Vitae

Jacob M. Lowen
 1264 Osceola St.
 Denver, CO
 jlowen07@georgefox.edu
 503.930.2798

Education

2012 – Present	George Fox University, Newberg, Oregon Doctor of Clinical Psychology Program: APA Accredited Anticipated PsyD – August 2017 Advisor: Mark McMinn, PhD, ABPP
2014	Master of Arts, Clinical Psychology George Fox University, Newberg, Oregon: APA Accredited
2011	Bachelor of Science, Psychology George Fox University, Newberg, Oregon

Supervised Clinical Training and Experience

8/2016 – Present	Denver Health Medical Center – Health Psychology Track Intern APA Accredited Denver, CO <i>Title: Psychology Resident</i> <i>Treatment Settings/Rotations: Large Safety Net Hospital/Clinic Setting: Internal Medicine, Pediatric Primary Care, Managed Care – Health Coaching, Consultation Liaison, Neuropsychology</i> <i>Populations: Diverse, low income populations of individuals of all ages</i> <i>Training Director: Christopher Sheldon, PhD</i> <i>Primary Supervisor: Joseph Longo, PhD</i> <i>Secondary Supervisors: Rachael Meir, PsyD; Christopher Pierce, PhD; Jennifer Peraza, PsyD; Robert House, MD</i> <i>Clinical Duties:</i> <ul style="list-style-type: none"> • Deliver psychological/behavioral health services throughout a broad medical setting
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- Provide brief intervention using empirically supported practice, including Motivational Interviewing, CBT, and Acceptance & Commitment Therapy
- Train parents in evidence-based parenting skills and provide support for parenting concerns
- Provide developmental screening and appropriate referrals for children and families.
- Provide Neuropsychological assessment, consultation, and feedback for adults referred from medical providers
- Provide telehealth/health coaching services to patients with chronic comorbid conditions
- Provide and coordinate care among a multidisciplinary team including doctors, physician assistants, nurses, medical assistants, social workers, and administrative staff
- Chosen by fellow psychology interns to represent cohort on Denver Health Chief Resident Council
- Participate in weekly didactic trainings

8/2015 – 6/2016

Childhood Health Associates of Salem
Salem, OR

Title: Behavioral Health Provider

Treatment Setting: Pediatric Primary Care

Populations: Diverse populations of children 0-21 and families.

Supervisors: Joel Lampert, PsyD, LPC, NCC; Joy Mauldin, PsyD

Clinical Duties:

- Treated patients for behavioral concerns as well as mental health, medication management
- Trained parents in evidence-based parenting skills and provided support for parenting concerns
- Provided brief intervention using empirically supported practice, including Motivational Interviewing, CBT, and Acceptance & Commitment Therapy
- Provided developmental screenings for children and families to assess appropriate services/referrals.
- Coordinated care among a multidisciplinary team including doctors, nurses, medical assistants, case workers, and administrative staff
- Provided warm hand-offs with providers to increase work flow as well as patient and provider health
- Teach psychoeducational classes for clinic and community

1/2014 – 4/2016

Behavioral Health Crisis Consultation Team
Newberg, OR

Title: Behavioral Health Intern, QMHP

Treatment Setting: Providence Newberg Medical Center; Willamette Valley Medical Center

Populations: Children, adolescents, adults, and geriatric patients from culturally and socioeconomically diverse backgrounds.

Supervisors: Mary Peterson, PhD, ABPP; Bill Buhrow, PsyD; Joel Gregor, PsyD

Clinical Duties:

- Provide on-call behavioral health consultation services for Providence Newberg Medical Center and Willamette Valley Medical Center
- Assess patient mental health concerns and risk factors, including suicidal ideation and intent, self-injurious behaviors, cognitive decline, substance-induced psychiatric diagnoses, and psychosis
- Use diagnostic tools to determine level of risk to coordinate discharge planning, providing resources for follow-up care
- Collaborate with supervisors, medical staff, and Yamhill County Mental Health to provide ongoing integrative care

9/2014 – 7/2015

George Fox Behavioral Health Clinic
Newberg, OR

Title: Behavioral Health Intern, QMHP

Treatment Setting: Hospitals

Populations: Populations from across the lifespan in a large rural community

Supervisors: Mary Peterson, PhD, ABPP; Bill Buhrow, PsyD; Joel Gregor, PsyD

Clinical Duties:

- Provided long-term and short-term evidence-based treatment, primarily solution-focused brief therapy and cognitive behavioral therapy
- Facilitated group therapy: Anger Management, Changes that Heal
- Performed intake interviews and treatment planning sessions with clients
- Administered psychodiagnostic and neuropsychological assessment services to the greater Willamette Valley
- Wrote psychological reports and provided assessment feedback to clients
- Managed and operated a community mental health clinic with a team of other psychological trainees
- Scheduled clients and maintained a waitlist of clients interested in services

8/2013 – 6/2014

**School-Based Community Mental Health,
Rural School District Consortium**
St. Paul, Oregon

Title: School-Based Behavioral Health Specialist

Treatment Setting: Public K-12 School

Populations: Diverse populations of students, parents, and staff of K-12 multi-systemic school setting

Supervisor: Elizabeth Hamilton, PhD; Kristie Knows His Gun, PsyD

Clinical Duties

- Provided long-term and short-term evidence-based treatment, primarily CBT

- Conducted structured diagnostic and developmental interviews with parents, students, and teachers
- Selected and administered comprehensive psychodiagnostic assessment batteries, including intellectual, achievement, psychosocial, and behavioral evaluations
- Wrote integrated psychodiagnostic reports and consulted with multidisciplinary professionals concerning Individual Education Plans for students
- Provided crisis intervention, consultation, and risk assessment of suicidal ideation and high risk behavior for elementary through high school students
- Engaged in treatment planning and documented weekly clinical notes
- Implemented class-wide psychoeducational interventions focused on promoting positive health behaviors
- Worked within multisystemic environments of parents, administrators, teachers, and other professionals

1/2013 – 4/2013

George Fox University Pre-Practicum Therapy

Newberg, OR

*Title: Pre-Practicum Therapist**Treatment Setting: University**Populations: George Fox University undergraduate students**Supervisors: Carlos Taloyo, PhD; Michelle Block, M.A.**Clinical Duties*

- Conducted intake interviews
- Provided weekly individual psychotherapy
- Engaged in treatment planning
- Wrote professional reports and presented cases

1/2013 – 2016

Clinical Conceptualization and Application Team

George Fox University, Newberg, OR

Supervisors: Carlos Taloyo, PhD; Joel Gregor, PsyD; Mary Peterson, PhD, ABPP; Winston Seegobin, PsyD

- Participated in formal presentations and team dialogue to help conceptualize individual cases from different perspectives and brainstorm appropriate evidence based interventions

Additional Clinical Experiences

2015

Parkinson's Resources of Oregon

Lake Oswego, Oregon

- Developed cognitive compensatory strategies based on neuropsychological symptoms associated with Parkinson's Disease using empirically supported interventions
- Delivered psychoeducational services and practical compensatory strategies to support groups in western Oregon

5/2011 – 2/2014

Albertina Kerr Centers – Subacute

Gresham, OR

*Title: Psychiatric Technician**Treatment Setting: Inpatient lockdown facility**Populations: Diverse youth and adolescents age 4-18**Supervisors: Krisanne Haerr, MA, LPC**Director: Beth Putz, MA, LPC**Clinical Duties*

- Consulted with medical doctors and nurses regarding client presentation, diagnoses, and medication
- Accompanied clients to the emergency department and communicated pertinent information and documentation to medical doctors
- Worked quickly, ethically, and efficiently in a high stress and sometimes volatile environment
- Maintained safety of individual clients and staff members
- Planned and implemented therapeutic skills groups
- Frequently used collaborative problem solving and de-escalation tactics
- Piloted experimental program to help clients transition from residential treatment to foster care

Supervision Experience

2015

Clinical Conceptualization and Application Team

George Fox University, Newberg, Oregon

Title: Fourth Year Oversight**Treatment Setting:** Doctoral Program**Supervisor:** Winston Seegobin, PsyD; Roger Bufford, PhD

- Provided clinical oversight of first and second year PsyD students
- Helped develop students' clinical and assessment skills
- Observed clinical skills
- Collaborated in development of theoretical orientation and personal style of therapy
- Evaluated each student's development of clinical and professional skills
- Taught clinical skills in a small group format
- Provided feedback on clinical work

Research Experience

- 2014 – Present **Dissertation Title:** The Relationship Between Gratitude and Health Behaviors
Summary: The present study is designed to evaluate whether or not increasing health behaviors and education about health behaviors increases gratitude in an undergraduate population.
Committee Chair: Mark McMinn, PhD, ABPP
Committee Members: Mary Peterson, PhD, ABPP; Kathleen Gathercoal, PhD
Relevant Dates:
- | | |
|----------------------------|-----------------|
| Proposal Approved: | September, 2015 |
| Data Collection Completed: | December, 2015 |
| Anticipated Defense: | February 2017 |
- 2014 – Present **Grant Funded Research**
George Fox University Nutrition Matters Initiative, a four-year wellness education program **Position:** Researcher
Primary Researchers: Mary Peterson, PhD, ABPP; Kathleen Gathercoal, PhD
- Goal: Promote health and wellness in 1st year college students through evidence based practices.
- 2013 **Grant Funded Research**
Oregon Commission on Autism Spectrum Disorder Grant through Oregon Health and Sciences University Child Development and Rehabilitation Center
Amount: \$3,750
Position: Researcher
Primary Researcher: Darryn Sikora, PhD
- Goal: Identification of mental health professionals who may be competent in screening, diagnosis, and assessment of autism spectrum disorders; creation and monitoring of survey; creation of assessment tool
- 2013 – Present **Research Vertical Team Member**
George Fox University, Newberg, Oregon
Chair: Mark McMinn, PhD, ABPP
- Bi-monthly small group for developing research competencies
 - Dissertation development
 - Collaborative supplemental research projects
 - Develop fellow colleagues' areas of research interests
 - Various areas of team interest and focus: Health Psychology, Technology, Religion/Spirituality

Professional Projects

2016 – Present

Primary Care Cognitive Screening Project*Denver Health Medical Center Integrated Behavioral Health Team*

Goal: Design a brief evidence-based standardized cognitive assessment battery to assist the primary care setting in diagnosis and referral of cognitive problems.

Symposiums and Professional Presentations

Lowen, J., Fligelman, S., Lampert, J. (2015). *A healthy lifestyles course: Obesity prevention and intervention*. Symposium presented at the Salem Hospital Community Health Education Center. Salem, OR.

McMinn, M., **Lowen, J.**, Geczy-Haskins, L., Jasper, L., & Uhder, J. (2014). *Large-scale psychotherapy data collected via smartphones and tablets*. Symposium presented at the 121st annual convention of the *American Psychological Association, Division 40*, Washington, DC

Poster Presentations

Fligelman, S., Dinsmore, S., Stice, J., Lampert, J., Mauldin, J., **Lowen, J.**, ... Bui, K. (2016) *Healthy lifestyles: An innovative approach to team-based care for childhood obesity*. Poster presented at the annual meeting of the Collaborative Family Healthcare Association, Charlotte, NC.

Lowen, J., Davis, S., Hamilton, L. (2015). *The effects of a social-emotional learning intervention on rural middle school students*. Poster presented at the annual meeting of the Oregon Psychological Association. Portland, Oregon.

Bui, K., Kenagy, A., **Lowen, J.**, Fligelman, S., Lampert, J., Mauldin, J. (2015). *Resiliency interventions across paediatrics*. Poster presented at Oregon Pediatric Improvement Partnership (OPIP), Portland, OR

Oliver, H., Smith, C., Olsen, D., **Lowen, J.**, Hartman, T., Song, C. (2015). *A training evaluation of county mental health workers participating in a CAMS training*. Poster presented at the 122nd annual convention of the American Psychological Association, Division 27 (Community Psychology) Toronto, ON.

Smith, C., Oliver, H., Olsen, D., **Lowen, J.**, Hartman, T. A. (2015). *Comparison of community crisis workers determining suicide risk using case vignettes*. Poster presented at the 122nd annual convention of the American Psychological Association, Division 27 (Community Psychology) Toronto, ON.

- Smith, C., **Lowen, J.**, Oliver, H., Peterson, M., Theye, A., Lee, J., . . . Ellis, J. (2015). *Predictors of success in a graduate clinical psychology program*. Poster presented at the 122nd annual convention of the American Psychological Association (APAGS), Toronto, ON.
- Speck, C., Hamilton, E., Knows His Gun, K., **Lowen, J.** (May, 2015). *A summary analysis of the implementation of evidence-based psychosocial interventions within an interdisciplinary rural school district partnership*. Poster presented at the annual meeting of the Oregon Psychological Association, Eugene, Oregon.
- Jasper, L., Koch, C., **Lowen, J.**, Schloemer, J., & Kays, D. (2014). *Changes in verbal memory during youth football*. Poster presented at the 121st annual convention of the American Psychological Association, Division 40, Washington, DC
- Lowen, J.**, Olsen, D., Davis, S., Maloney, C. Jasper, L. (2012). *Students against bullying*. Poster presented at Providence Kid's Day Health Fair, Portland, OR.
- Koch, C., **Lowen, J.**, McWilliams, M. (2011). *Developmental differences using a nonverbal Stroop task*. Poster presented at the 19th annual conference on Object Perception, Attention, & Memory, Seattle, WA
- Lowen, J.**, Mole, A. (2009). *The effects of intuitive decision making: Judgments of trustworthiness and attractiveness*. Poster presented at the George Fox Research Methods Symposium, Newberg, OR
- Lowen, J.**, Mole, A. (2010). *Influence of primary caregiver's gender on adolescent intrinsic religiosity*. Poster presented at the George Fox Research Methods Symposium, Newberg, OR

Publications

- Lampert, J., Bui, K., Fligelman, S., Kenagy, A., & **Lowen, J.** (2016). On raising a resilient child. Take Care Newsletter. Retrieved from http://www.chfoundation.org/images/take_care_fall_2016_Generic_8.5x11.pdf
- Jasper, L., Koch, C., **Lowen, J.**, Schloemer, J., & Kays, D. (2014). Changes in verbal memory during youth football [Abstract]. As cited in Lisdahl, K. (2014). Division 40 (society for clinical neuropsychology) annual meeting abstracts, *The Clinical Neuropsychologist*, 28, 699. <http://dx.doi.org/10.1080/13854046.2014.929795>

Teaching Experience

- Spring 2015 Neuropsychological Assessment – *George Fox University Graduate Department of Clinical Psychology, Newberg, Oregon*
Position: Graduate Assistant
Supervisor: Glenna Andrews, PhD
- Course provides students with understanding of neuropsychological assessment and utilization of a brain-based behavior assessment perspective to conceptualize, evaluate, and respond to common referral questions

- Grade assignments, papers
- Guest lecture
- Assist in assessment instruction and conduct labs
- Assist with test interpretation, report writing, and referrals

2015 Psychopathology – *George Fox University Graduate Department of Clinical Psychology, Newberg, Oregon*

Position: Graduate Assistant

Supervisor: Elizabeth Hamilton, PhD

- Course provides students with understanding of psychopathology and diagnosis to conceptualize, evaluate, and respond to common referral questions
- Grade assignments and papers
- Guest lecture
- Assist in helping students develop diagnostic skills
- Create and modify teaching materials

2014 – 2015

Guest Lectures

George Fox University

Masters Level – *George Fox University Graduate Counselor Education Program*

Portland, Oregon

- Tests and Assessments
- Personality Assessments
- Diagnostic Assessments

Undergraduate - *George Fox University Psychology Department*
Newberg, Oregon

- Research Methods

Professional Affiliations and Memberships

2015 – Present	Collaborative Family Healthcare Association
2013 – Present	Association for Contextual Behavioral Science
2012 – Present	American Psychological Association

Leadership and Involvement

2016 – Present	<i>Cohort Representative, Chief Resident Council, Denver Health Medical Center</i>
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2015 – 2016 Department of	<i>Member, Admissions Advisory Committee, George Fox University Graduate Clinical Psychology</i>
2015 – 2016	<i>Student Council President, George Fox University Graduate Department of Clinical Psychology</i>
2014 – 2016	<i>Member, George Fox Pediatric Psychology Special Interest Group</i>
2014 – 2016	<i>Member, George Fox Health Psychology Special Interest Group</i>
2014 – 2016	<i>Member, George Fox Gender, Sexuality and Identity Special Interest Group</i>
2014 – 2015	<i>Student Council Treasurer, George Fox University Graduate Department of Clinical Psychology.</i>
2008 – 2015	<i>Participant, George Fox University Annual Community Service Day</i>

Assessments Trained and Supervised In

- | | |
|---|---|
| - 16 Personality Factor Questionnaire | - Expressive Vocabulary Fluency |
| - 21 Item Test | - Grey Oral Reading Tests 4 th Edition |
| - Adaptive Behavioral Assessment System II | - Grey Oral Reading Tests 5 th Edition |
| - Behavioral Assessment System for Children 2 | - Grooved Pegboard Test |
| - Behavioral Rating Inventory of Executive Function | - Halstead Reitan Tactual Performance Test |
| - Boston Naming Test | - House-Tree-Person Test |
| - Booklet Category Test | - Medical Symptom Validity Test |
| - California Verbal Learning Test-2 | - Millon Adolescent Clinical Inventory |
| - Conner's Continuous Performance Test II | - Millon Clinical Multiaxial Inventory-III |
| - Conner's Continuous Performance Test III | - Minnesota Multiphasic Personality Inventory 2 & MMPI-Restructured Forms |
| - Conner's 3 rd Edition | - Minnesota Multiphasic Personality Test-Adolescent |
| - Conner's Adult ADHD Rating Scale | - Peabody Picture Vocabulary Test 4 |
| - Delis-Kaplan Executive Function System | - Personality Assessment Inventory |
| - Developmental Neuropsychological Assessment (NEPSY) | - Personality Assessment Inventory-Adolescent |
| | - Rey-Osterrieth Complex Figure Test |
| | - Robert's Apperception Test for Children 2 |
| | - Test of Memory and Malinger |

- Trauma Symptom Checklist
- Wechsler Abbreviated Scale of Intelligence-II
- Wechsler Adult Intelligence Scale IV
- Wechsler Individual Achievement Tests-III
- Wechsler Intelligence Scale for Children-4
- Wechsler Memory Scales
- Wechsler Nonverbal Scale of Ability
- Wide Range Assessment of Memory and Learning 2
- Wide Range Intelligence Test
- Wide Range Achievement Test 4
- Wisconsin Card Sorting Test
- Woodcock-Johnson III Tests of Cognitive Abilities
- Woodcock-Johnson III Tests of Achievement
- Woodcock- Johnson IV Tests of Cognitive Abilities
- Woodcock-Johnson IV Tests of Achievement

Population Based Screeners

- Adult ADHD Self-Report Scale
- Autism Spectrum Rating Scale
- Brown Attention-Deficit Disorder Scales
- Center for Epidemiologic Studies Depression Scale
- CRAFFT Screening Test
- General Anxiety Disorder-7
- Geriatric Depression Scale
- Montreal Cognitive Assessment
- Mood Disorder Questionnaire
- NICHQ Vanderbilt Assessment Scales
- Outcome Rating Scale
- Pain Catastrophizing Scale
- Pain Disability Index
- Pain Stages of Change
- Patient Activation Measure
- Patient Health Questionnaire-9
- Pediatric Symptom Checklist
- PTSD Checklist
- Session Rating Scale
- Spence Children’s Anxiety Scale
- Tampa Scale for Kinesiophobia
- Therapeutic Presence Scale
- Trauma Symptom Checklist for Children
- Wender Utah Rating Scale

Additional Professional Clinical Training

Primary Care/Health Psychology Training

- 8/2015 *Primary Care Behavioral Health Boot Camp*
George Fox University, Newberg, Oregon
Joel Gregor, PsyD. and Jeri Tergusen, PsyD
40 hour integrated behavioral health care training
- 1/2014 *Action and Commitment in Psychotherapy: A Mindful Approach to Rapid Clinical Change*
George Fox University, Newberg, Oregon
Brian Sandoval, PsyD. and Juliette Cutts, PsyD.

9/2013 *Primary Care Behavioral Health*
George Fox University, Newberg, Oregon
Brian Sandoval, PsyD. and Juliette Cutts, PsyD.

Child & Adolescent Training

10/2015 *Let's Talk About Sex: Managing Emerging Sexuality*
George Fox University, Newberg, Oregon
Joy Mauldin, PsyD.

11/2014 *"Face Time" in an Age of Technological Attachment*
George Fox University, Newberg, Oregon
Doreen Dodgen-Magee, PsyD.

8/2014 *Understanding and Treating ADHD in Children*
George Fox University, Newberg, Oregon
Erika Doty, PsyD.

6/2013 *Child Sex Trafficking and Sexual Exploitation in Oregon*
Lifeworks NW, Portland, Oregon
Cassie Eichenberger, LCSW, RN

6/2011 *Collaborative Problem Solving*
Albertina Kerr Centers, Portland, Oregon
Beth Putz, MA

Diversity Training

1/2013 *Afrocentric Approaches to Clinical Practice*
George Fox University, Newberg, Oregon
OHSU Avel Gordly Center for Healing
Danette C. Haynes, LCSW and Marcus Sharpe, PsyD

Assessment Training

1/2014 *Learning Disabilities: A Neuropsychological Perspective*
George Fox University, Newberg, Oregon
Tabitha Becker, PsyD.

6/2014 *Northwest Psychological Assessment Conference*
George Fox University, Newberg, Oregon

- WISC-V: Overview and Demonstration of Upcoming Revisions; Patrick Moran, PhD.
- Woodcock Johnson-IV: A New Era of Assessment and Interpretation; Stephanie Rodriguez, EdS.
- Assessing Therapeutic Outcomes: Improving Your Effectiveness in Clinical Practice, Carlos Taloyo, PhD.

5/2013

Using Tests of Effort in a Psychological Assessment
 George Fox University, Newberg, Oregon
 Mark Bondi, PhD, ABPP/CN; Paul Green, PhD

3/2015 **Other Related Training**

Spiritual Formation & Psychotherapy
 George Fox University, Newberg, Oregon
 Barrett McRay, PsyD.

4/2014

Evidence-Based Treatments for PTSD in Veteran Populations: Clinical and Integrative Perspectives
 George Fox University, Newberg, Oregon
 David Beil-Adaskin, PhD.

1/2014

DSM 5: Essential Changes in Form & Function
 George Fox University, Newberg, Oregon
 Jeri Turgesen, PsyD. and Mary Peterson, PhD.

1/2014

Acceptance & Commitment in Psychotherapy: A Mindful Approach to Rapid Clinical Change
 Institute for Better Health
 Steven Hayes, PhD.

1/2013

The Person of the Therapist
 George Fox University, Newberg, Oregon
 Brooke Kuhnhausen, PhD