August 2016

The Impact of a Gratitude Intervention on Health: a Psychophysiological Approach

Morgan Hodge
University of Wisconsin-Milwaukee

THE IMPACT OF A GRATITUDE INTERVENTION ON HEALTH: A PSYCHOPHYSIOLOGICAL APPROACH

by

Morgan Hodge

A Dissertation Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

in Psychology

at

The University of Wisconsin-Milwaukee

August 2016

ABSTRACT

THE IMPACT OF A GRATITUDE INTERVENTION ON HEALTH:
A PSYCHOPHYSIOLOGICAL APPROACH

by

Morgan Hodge

The University of Wisconsin-Milwaukee, 2016
Under the Supervision of Professor Raymond Fleming

Gratitude has been shown to be beneficial for self-reported positive health measures in previous research (Aghababaei, & Farahani, 2011; Algoe & Stanton, 2012; Emmons & Stern, 2013; Hill & Allemand, 2011; Hill, Allemand, & Roberts, 2013; Hyland, Whalley, & Geraghty, 2007; Lin, 2014; Lin & Yeh, 2014). However, previous research had not evaluated a gratitude intervention in conjunction with physiology. The current study attempted to evaluate the impact of a 14-day gratitude intervention on self-reported health measures, positive emotions, and heart rate and pNN50 in a sample of undergraduate college students. Self-reported health measures were taken before and after the intervention with mood being assessed during an ambulatory period. Physiological measures were recorded during the same ambulatory period and also in a laboratory setting. The results indicated non-significant differences between gratitude and control on physiology, self-reported positive health and mood, seemingly due to a lack of a successful manipulation.

To

my parents,

my advisors,

and my family and friends

Thank you for all of your mentorship and support

TABLE OF CONTENTS

Introduction

The Impact of a Gratitude Intervention on Health: A Psychophysiological Approach

What is gratitude?

Gratitude is a feeling that a person experiences from obtaining a positive outcome from another person and it is often associated with the idea that one person helped another person (Chow & Lowery, 2010; Emmons & McCullough, 2003). However, receiving help from someone does not automatically mean that a person will experience gratitude. In order to do so, the person receiving help needs to feel responsible for the positive outcome (Chow & Lowery, 2010). A broader definition of gratitude looks at gratitude from a "life orientation" approach (Wood, Froh, & Geraghty, 2010). This approach divides gratitude into 8 specific categories: " (1) individual differences in the experience of grateful affect, (2) appreciation of other people, (3) a focus on what the person has, (4) feelings of awe when encountering beauty, (4) behaviors to express gratitude, (5) focusing on the positive, (6) appreciation rising from understanding life is short, (7) a focus on the positive in the present moment, and (8) positive social comparisons" (Wood et al., 2010, p. 891). This definition is broad enough to encompass the majority of gratitude research with the exception of perhaps gratitude towards a higher power (Krause, 2006). Although the category model of gratitude seems to be sufficient, researchers have found that lay people tend to have a broader definition of gratitude than researchers (Lambert, Graham, & Fincham, 2009).

Gratitude is also a positive psychology variable that is distinct from mindfulness, optimism, and forgiveness. However, gratitude can be cultivated through meditation (Emmons & Stern, 2013) and gratitude has been linked to forgiveness and optimism. Forgiveness and gratitude are both related to personality characteristics, negative emotional characteristics (e.g., depression and anger), and additional positive psychological variables (e.g., well-being and self-compassion) (Breen, Kashdan, Lenser, & Fincham, 2010). Optimism has also been shown to be linked to

gratitude as adults in an outpatient clinic who were given a gratitude intervention showed a trend towards higher optimism compared to adults who were not in the intervention (Kerr, O'Donovan, & Pepping, 2015). Furthermore, college students who were given the opportunity to self-select into a happiness intervention (either gratitude or optimism) had increased well-being immediately following the interventions and 6-weeks later compared to a control group (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). A separate study employed a combined intervention of optimism and gratitude. The results indicated that the intervention led to decreased levels of depression and anxiety, while happiness and quality of life both increased (Huffman et al., 2011). Although gratitude and optimism together seem to positively impact health outcomes, gratitude on its own has been associated with numerous positive health benefits.

What are the health benefits of gratitude?

Gratitude can be experienced as a disposition or as a state. High dispositional gratitude is associated with increased self-acceptance, life satisfaction, happiness, perceived social support, well-being, psychological health, sleep quality, active coping strategies, positive attitudes, quality of life, and health status (Aghababaei, & Farahani, 2011; Algoe & Stanton, 2012; Emmons & Stern, 2013; Hill & Allemand, 2011; Hill, Allemand, & Roberts, 2013; Hyland, Whalley, & Geraghty, 2007; Lin, 2014; Lin & Yeh, 2014). People with chronic illnesses, including chronic obstructive pulmonary disease, reported experiencing an enhanced quality of life if they had a high dispositional gratitude (Eaton, Bradley, & Morrisey, 2014). Furthermore, breast cancer patients with high gratitude reported increased levels of post-traumatic growth, positive affect, and decreased distress (Ruini, & Vescovelli, 2013). Concerning physical health, people who are more grateful engage in more healthy activities, address health concerns by seeking help, and have better psychological health than people who are less grateful (Hill et al., 2013). Dispositional gratitude is also negatively associated with tobacco use, alcohol consumption, depression, anxiety, post-

traumatic stress disorder, self-blame, stress, and denial (Chen, Ye, Hu, Li, Jiang, 2012; Stoeckel, Weissbrod, Ahrens, 2014; Wood et al., 2010; Vernon, Dillon, Steiner, 2009). From a longitudinal perspective, high trait gratitude has been associated with increased perceived social support, decreased reported stress, and decreased reported depression over the span of a three month period, indicating that the benefits of dispositional gratitude are not temporary (Wood, Maltby, Gillet, Linley, & Joseph, 2008). Unlike dispositional gratitude, state gratitude is normally achieved through a situational circumstance (e.g., receiving help from another person) or the use of a gratitude intervention.

Gratitude Interventions

Gratitude interventions vary in their procedures, but they tend to last for a brief, specified period of time, contain a written component, and have at least one comparison group. Most interventions last for 2 weeks with participants doing the intervention every day (Emmons & McCullough, 2003; Froh, Sefick, & Emmons 2008; Harbaugh & Vasey, 2014; Kerr et al., 2015; Krejtz, Nezlek, Michnicka, Holas, & Rusanowska, 2014). Other interventions last around 4 weeks with the number of times per week participants actually engage in the intervention ranging from one to two times (Cheng, Tsui, & Lam, 2014; Toepfer, Cichy, & Peters, 2012). Three types of written gratitude interventions seem to exist: letters, journaling, and lists. Lists are the preferred method of gratitude interventions with letters being the least preferred method (Wood et al., 2010). However, several interventions have combined listing and ranking (Kerr et al., 2015; Harbaugh & Vasey, 2014).

The most common experimental and comparison groups consist of a gratitude group, a hassles group, and a control group (Cheng et al., 2014; Froh et al., 2008; Emmons & McCullough, 2003). The hassles group can be viewed as the opposite of the gratitude group as participants in this category write about hassles that they encountered during a specified period of time. A few

interventions have omitted the hassles group in favor of a standard control group (Krejtz et al., 2014; Harbaugh et al., 2014; Toepfer et al., 2012) and one intervention included gratitude, kindness, and control groupings (Kerr et al., 2015). However, no matter how the gratitude interventions differ, all of the interventions have led to positive health outcomes for participants in the gratitude groups. This may indicate that listing what you are grateful for may amount to, in part, reminding oneself of assets that are available, especially when face with negative situations.

People who have engaged in gratitude interventions report increased happiness, sleep quality, meaningfulness, social connectedness, satisfaction with life, satisfaction with school, optimism, positive affect, and self-esteem. They also report decreased anger, stress, worry, depression, negative affect, and anxiety (Baxter, Johnson, & Bean, 2012; Cheng et al., 2014; Digdon & Koble, 2011; Emmons & McCullough, 2003; Flinchbaugh, Moore, Chang, May, 2012; Froh et al., 2008; Rash, Matsuba, Prkachin, 2011; Yanmei, 2009). From a physical perspective, people in gratitude conditions report less physical symptoms and more exercise than people in hassle groups (Emmons & McCullough, 2003). Although the benefits of dispositional and intervention-based gratitude on health seem robust, the studies previously conducted have used self-report to demonstrate the outcomes.

What is the connection between gratitude and physiology?

Although previous gratitude interventions have used self-report measures for assessing health outcomes, a benefit of gratitude on physiology, more specifically on blood pressure, has been mentioned (Emmons & McCullough, 2003). In actuality only one study seems to evaluate a gratitude intervention with physiology. Rash et al. (2011), looked at the impact of a 4-week gratitude intervention versus a ‘memorable event’ control condition on psychological variables and cardiac coherence, measured from impedance cardiography. A gratitude induction procedure was used where participants thought about something for which they were grateful in the past week and

tried to maintain the grateful feelings. Some of those participants were then assigned to a gratitude intervention condition using a list and journaling method for 4-weeks. The physiology was only compared pre-test between conditions (gratitude induction, memorable events, and baseline). As predicted, cardiac coherence was highest in the gratitude induction condition. However, this study did not evaluate the physiological response from the actual written gratitude intervention.

Due to the fact that there is not sufficient research on physiology and gratitude, the relationship between physiology and optimism will be used as a basis for physiological predictions. Optimism is similar to gratitude in that in can be a disposition or experienced in a state, it can refer to future or past events, and it is a positive psychology variable (Boehm & Kubzansky, 2012). Optimism is associated primarily with vagal activity and, consequently, the parasympathetic system (Boehm & Kubzansky, 2012; Puig-Perez et al., 2015; Williams & Riels, 1990). More specifically, optimism is associated with less cardiovascular reactivity in general and optimism is associated with decreased blood pressure in the presence of a stressor (Puig-Perez et al., 2015; Williams & Riels, 1990). Optimism is also associated with faster cardiovascular recovery to stressors (Puig-Perez et al., 2015). Therefore for the current study, heart rate (HR) and pNN50 will be measured.

Current study

The purpose of the current study is to be psychophysiological in nature: 1) to replicate the previous findings that a gratitude intervention will increase positive health measures as obtained through self-report; 2) to evaluate if ambulatory physiology is impacted post gratitude intervention; 3) to determine if physiology is altered during a gratitude practice; and 4) to compare the impact of a gratitude intervention on mood post intervention. In accordance with previous literature, a two group, gratitude vs. control, typed intervention will be used. Emmons' recommended procedure will also be followed with participants listing and then elaborating on grateful items (Hart, 2013),

however, a 14-day timeline instead of a 4 week intervention will be used. A 14-day timeline will be used as it has been successful in previous literature and to reduce the risk of attrition rates (Emmons & McCullough, 2003; Froh, Sefick, & Emmons 2008; Harbaugh & Vasey, 2014; Kerr et al., 2015; Krejtz, Nezlek, Michnicka, Holas, & Rusanowska, 2014). For the purpose of this study, gratitude will be assessed from the broader viewpoint of Wood et al. (2010) and Krause (2006). In other words, gratitude will not be limited to the emotional response felt from receiving help from another person.

Hypothesis one: Following the intervention, participants in the gratitude intervention group will score more positively on the self-reported health measures than participants in the control group.

Hypothesis two: Following the intervention, participants in the gratitude condition will endorse a higher degree of positivity of emotions during the four-hour ambulatory period than people in the control condition.

Hypothesis three: Following the intervention, participants in the gratitude condition will have lower heart rates and higher pNN50 for both the average (time points 1-3) and the baseline (time point 4) periods during the ambulatory phase compared to participants in the control condition.

Hypothesis four: Following the intervention, participants in the gratitude condition will have lower heart rates and higher pNN50 during both the lab baseline and lab writing components compared to participants in the control condition.

Method

Participants

College students (N = 297) from the University of Wisconsin-Milwaukee enrolled in psychology courses were recruited via SONA to participate in a large survey. The large survey

included questionnaires assessing health behaviors and positive psychology variables. Based on responses from the survey, 33 participants were selected and actually participated in the current study. Participants were predominantly female (90%) and were generally health as only 6.7% were smokers, 70% did not consume caffeine, only 3.3% did not exercise, no one had cardiovascular problems (0%), and only 3.3% had a respiratory condition.

Three of the participants were dropped from the dataset due to unusable data (i.e., no physiology data or not properly following instructions for the intervention). Therefore, the full dataset contained 33 people. However, a second dataset was created that contained only the matched pairs of participants. All participants had been matched upon entry to the study with another participant who had the same levels of trait gratitude, meditation practice, and yoga practice (one participant from each match went into control and the other to gratitude based on random assignment). Due to three participants being removed from the dataset and one participant not having a match, the matched dataset only contained 26 people for a total of 13 matches. Students who had a daily practice of gratitude, had any type of cardiovascular condition, or were taking medications that could interfere with physiology were not invited to participate in the current study.

Materials

Physiological Data Collection

A Zephyr Bioharness 3 remote physiology monitor (Zephyr Technology; Annapolis Maryland) was used to collect ambulatory physiological data. The monitor consisted of a memory flash card and a chest strap. The flash card recorded and stored heart rate, respiration rate, skin temperature, posture, and activity level for 4 hours. Skin temperature and posture were not assessed. ECG data was sampled at 250 Hz and recorded using a high pass filter at 15 Hz and a low pass filter at 78 Hz. Cardiac parameters included HR (beats/min) and pNN50 calculated by

Bioharness analysis software (Zephyr Technology) were measured. Physiology data was analyzed during a 5-minute baseline, a 5-minute intervention practice, and the 4 hour ambulatory period.

Ecological Momentary Assessment

Ecological momentary assessment (EMA) is a sampling method which captures real time data in real world settings, using multiple assessments of momentary states collected over time to characterize human behavior and experience (Stone & Schiffman, 1994). The objective of EMA is to provide reliable accounts of biopsychosocial phenomenon in the natural setting. For this study, the aim was to acquire real time physiological, behavioral, and cognitive data, while participants were going about their day. Participants were asked to answer two questions, "What were you doing for the last 10 minutes" and "What were you thinking about for the last 10 minutes" and one brief scale (PAAS) in order to provide information about what they were experiencing at the times that we were collecting physiology data. They completed those questions 4 times during a 4-hour period. Only the physiology during those 10-minute windows and one 5-minute baseline window were measured during the ambulatory component.

Exclusionary Questionnaire

Cardiovascular Health History Questionnaire. The cardiovascular health history questionnaire is a questionnaire that is used to assess the overall cardiovascular health of the participants (Appendix A). Any person who indicated a cardiovascular condition or who took medications that could interfere with physiology was not included in the remainder of the study. As this questionnaire is composed of demographic and health history questions, a reliability analysis was not necessary.

Matching Questionnaires

Gratitude Questionnaire – 6. The Gratitude Questionnaire – 6 ***(****GQ-6,* McCullough, Emmons, & Tsang, 2002, Appendix E) is a 6-item questionnaire that focuses on trait gratitude. For

example, participants see the statement, "I have so much in life to be thankful for" and will respond on a 7 point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree". The GQ-6 has been shown to be valid and reliable with an alpha ranging from .82 to .87 (McCullough et al., 2002; Toepfer et al., 2012; Wood, Maltby, Stewart, Linley, & Joseph, 2008). In order to score the questionnaire, 2 items were reverse coded and all items were summed. A higher score indicated more trait gratitude. Participants were matched based on high and low levels of trait gratitude. For the current study, this scale was found to be reliable, Cronbach's alpha = .882.

Brief Meditation Questionnaire. A brief meditation questionnaire was administered to participants to match them based on meditators and non-meditators (Appendix M). The meditation questionnaire contained 6 items. The first question was used to determine if participants meditated and was a yes or no question. The remainder of the questionnaire was used to acquire more information about the meditation practices of participants. Most participants did not meditate (80%).

Yoga Questionnaire. A yoga questionnaire was administered to participants to match them based on yogis and non-yogis (Appendix I). The yoga questionnaire contained 7 items. The first question was used to determine if participants practiced yoga. The remainder of the questionnaire was used to acquire more information about the yoga practices of participants. The majority of participants did not practice yoga (63.3%).

Pre and Post Questionnaires

The Revised Life Orientation Test. The Revised Life Orientation Test (LOT-r, Scheier, Carver, & Bridges, 1994; Appendix B) is a 10-item questionnaire that measures satisfaction with life. Participants respond on a 5-point Likert scale ranging from, "strongly disagree" to 4 "strongly agree". An example of an item is, "In uncertain times, I usually expect the best." The LOT-R has been shown to be valid and reliable with reliability ranging from .78 to .84 (Creswell et al., 2005;

Scheier et al., 1994). This questionnaire was scored by reverse coding 3 items and summing participant responses. Four filler items were removed prior to summation. A high score indicated more satisfaction with life. The reliability for the current study was a little low (alpha = .672).

Physical Symptoms. A Physical Symptoms questionnaire (Emmons & McCullough, 2003, Appendix F) was used to assess what physical symptoms, if any, participants experienced during the intervention. This questionnaire is a list of physical symptoms that participants check to indicate if they experienced any of those symptoms. The measure has been found to be reliable and valid (Emmons & McCullough, 2003). All participants except 13.3% indicated at least 1 physical symptom.

Pittsburg Sleep Quality Index. The Pittsburg Sleep Quality Index (PSQI, Buysse, Reynolds, Monk, Berman, & Kupfer, 1989, Appendix G) is a 24-item questionnaire that assesses sleep quality over the course of the past month. For each question participants are given 4 response options. An example item is, "During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes". Only the 19 questions that can be answered without a roommate or bed partner will be analyzed. The responses for each question were coded 0 to 3. A total score was calculated by summing up the coded responses for all items. Final scores can range from 0 to 21 with 0 being no problem with sleep quality and 21 being problem with sleep quality. The PSQI has been found to be valid and reliability with alpha around .8 (Buysseet al., 1989). The PSQI was reliable for the current study (alpha = .790).

COPE. The COPE (COPE, Carver, Scheier, & Weintraub, 1989, Appendix H) is a 60 item questionnaire that measures 15 different ways of coping with a stressful event. Participants respond to statements such as, "I try to grow as a person as a result of the experience" on a 4-point Likert scale ranging from 1 "I usually don't do this at all" to 4 "I usually do this a lot". An overall score does not exist for this questionnaire. Instead, participants' scores on each of the 15 subscales are

summed independently. The subscale with the highest score is that person's way of coping with stressful events. The COPE has been found to be reliable and valid with all scales having an alpha higher than .6 (Carver, Scheier, & Weintraub, 1989). The questions for the COPE questionnaire were reliable (alpha = .914).

Center for Epidemiologic Studies Depression Scale. The Center for Epidemiologic Studies Depression Scale **(**CES-D, Radloff, 1977, Appendix J) is a 20-item questionnaire that measures how often people felt or behaved in a depressed way over the past week. The responses are on a 4-point scale that are anchored by "rarely or none of the time (less than 1 day)" to "most or all of the time (5-7 days)". An example of a statement is, "I was bothered by things that usually don't bother me." The CES-D has been found to be valid and reliable with alpha around .85 (Kaczmarket et al., 2013; Radloff, 1977). The CES-D was scored by summing the responses. A higher score is indicative of depression. The CES-D questionnaire was found to be reliable (alpha = .919).

State Trait Anxiety Inventory for Adults. The State Trait Anxiety Inventory for Adults (STAI, Spielberger, 1983, Appendix K) is a 40-item questionnaire that assesses how anxious a person feels in general and at the current moment. The questionnaire is divided into two subscales: the state anxiety scale and the trait anxiety scale. For each statement on the state anxiety scale, participants indicate how anxious they are at the current moment by responding on a 4-point Likert scale ranging from 1 "not at all" to 4 "very much so". An example item is, "I feel calm." The trait anxiety scale is also a 4-point Likert scale ranging from 1 "almost never" to 4 "almost always", but participants respond to how anxious they generally feel. An example of an item is, "I feel pleasant." Each subscale consists of 20 items that were scored by reverse coding the appropriate items and then summing the responses for each subscale. For each subscale the scores can range from 20 to 80. The STAI has been found to be valid and reliable with alphas ranging from .78 to

.91 (Rimmele, Seiler, Marti, Wirtz, Ehlert, & Heinrichs, 2009; Uchino, Hold-Lunstad, Uno, & Flinder, 2001). For the current study, STAI was found to be reliable (alpha = .965).

Satisfaction with Life Survey. The Satisfaction with Life Survey **(**SWLS, Diener, Emmons, Larsen, & Griffin, 1985, Appendix N) is a 5-item questionnaire that measures how satisfied participants are with their life at the current moment. Participants respond to statements using a 7-point scale anchored by 1 "strongly disagree" and 7 "strongly agree". An example of an item is "In most ways my life is close to my ideal." The questions were summed for a total score. A higher score indicates more satisfaction with life. The SWLS has been found to be valid and reliable with alphas around .8 and above (Uchino, Hold-Lunstad, Uno, & Flinder, 2001). The SWLS was found to be reliable for the current study (alpha = .883).

Index of Happiness and Mental Health. The Index of Happiness and Mental Health (Fordyce, 1988, Appendix O) is a two question scale that measures how happy participants are on average. The first part asks participants to check one statement out of ten that describes their average happiness. The scale ranges from 0 "Extremely unhappy (utterly depressed, completely down) to 10 "Extremely happy (feeling ecstatic, joyous, fantastic). The second question is a combination of three questions all relating to the percent of time a person feels either happy, unhappy, or neutral. The percentages have to add up to 100%. Participants fill in a percentage for each. The scale has been found to be valid and reliable with an alpha ranging from .67-.86 (Compton, 1998; Fordyce, 1988; Toussaint and Friedman, 2009). As the majority of this questionnaire is fill-in-the-blank, a reliability score was not calculated.

Positive and Negative Affect Schedules. The Positive and Negative Affect Schedules (PANAS, Watson, Clark, Tellegan, 1988; Appendix C) are used to measure the degree to which participants are feeling positive and negative at the current moment. The schedules contain 20 words (½ positive and ½ negative) that participants use to indicate how they are feeling at the

current moment. They respond on a 5-points Likert scale anchored with 1 “Very slightly or not at all” and 5 “Extremely.” In order to score the PANAS, the responses to the negative words were summed to form a negative affect score. Summing participants’ responses to the positive items created a positive affect score. This scale has been found to be valid and reliability with alpha ranging from .84 to .90 (Watson, Clark, Tellegan, 1988). The PANAS was found to be reliable (alpha = .880).

The Purpose in Life Test. The Purpose in Life Test (PIL, Crumbaugh & Maholic, 1964; Appendix Q) is a 20-item scale that measures well-being by having participants respond to statements about the meaningfulness of their current life. Participants respond on a 5-point Likert scale. The anchor points change based on the questionnaire, however, the 1 end is always negative and the 5 end is always positive. Scores were summed and can range from 20-100 with scores below 50 indicating a lack of purpose in your life. The PIL has been shown to be valid and reliable with an alpha level around .9 (Crumbaugh, 1968; Crumbaugh & Maholic, 1964; Kerr et al., 2015). The scale was found to be reliable (alpha = .931).

The Five Facet Mindfulness Questionnaire. The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Appendix R) is a 39-item questionnaire that measures 5 subscales of mindfulness (observing, describing, acting with awareness, nonjudgmental of inner experiences, and nonreactivity to inner experiences). Participants respond to each item on a 5-point Likert scale ranging from 1 “Never or Very rarely true” to 5 “Very often or Always true.” An example of an item is, “In difficult situations, I can pause without immediately reacting.” For scoring, items were reverse coded as needed and items corresponding to each subscale were summed for a total of 5 composite scores. The FFMQ has been found to be valid and reliability with alphas from .77 to .90 (Baer, Smith, Lykins, Button,

Krietemeyer, Sauer, et al., 2008; Tomfohr et al., 2015). The FFMQ was found to be reliable (alpha = .898).

The Perceived Stress Scale. The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983; Appendix P) is a 14-item questionnaire that is used to measure the amount of stress felt in the past month. Participants respond on a 5-point Likert scale anchored by 0 "Never" and 4 "Very Often." An example item is, "In the last month, how often have you felt nervous and "stressed?" The responses were reverse coded as needed and summed. A higher score means more perceived stress. The PSS has been found to be valid and reliable with alpha around .8 (Andreou et al., 2011). The PSS was found to be reliable (alpha = .860).

Manipulation Check

Gratitude (State). State gratitude was measured following the procedure in Emmons & McCullough (2003). Participants were shown a list of 30 affect words and were asked to indicate on a scale from 1 "not at all" to 5 "extremely" how much they have felt each emotion in the past month. Three of the words thankful, appreciative, and grateful were used to verify that the gratitude intervention did indeed provoke the feeling of gratitude.

During the Ambulatory Period

Physical Activity Affect Scale. The Physical Activity Affect Scale (PAAS; Lox, Jackson, Tuholski, Wasley, & Treasure, 2000; Appendix D) is a 16-item scale that measures the following subscales: positive affect, negative affect, fatigue, and tranquility. Participants respond to how they are currently feeling on a 5-point Likert scale anchored by 0 "Do not feel" to 4 "Feel very strongly." Each subscale was scored by summing appropriate items. The PAAS has been shown to be valid and reliability with alphas ranging from .85 to .90 (Carpenter, Tompkins, Schmiege, & Nilsson, 2010). For the current study, we also added in the variable "stressed" to determine how stressed participants felt. The reliability for the current scale was a Cronbach's alpha of .843.

Procedure

Participants were recruited via SONA to participate in the large survey, which contained all of the aforementioned questionnaires with the exception of the PAAS and state gratitude. Once participants signed up for the survey, they were provided a link to Qualtrics that contained an informed consent document, the survey, and a debriefing form. At the completion of the study, they received extra credit and their responses were analyzed. Anyone who had any of the exclusionary criteria were not allowed to participate in part two of the study. The remaining participants' were invited to participate in the rest of the study. Once they agreed to participate, they were given 14 Qualtrics links one for each intervention for the next 14 days. Participants were also asked if they wanted to receive daily text message or email reminders to complete the daily intervention. Most participants did ask for reminders.

Prior to accessing the second part of the study, participants were matched on their trait gratitude, engagement in yoga, and if they meditated. Once matched, participants were randomly assigned into either the gratitude intervention or the control intervention. Participants were told that for the next 14 days they would need to set aside 5 minutes each day to sign-on to the appropriate Qualtrics survey and follow the prompts. Participants either received the control or gratitude intervention links, but not both. Each questionnaire link contained instructions and the intervention. Participants were instructed to complete one questionnaire each day.

The prompt for the gratitude condition was: "*There are many things in our lives, both large and small, that we might be grateful about. Think back over the [day yesterday] and write down on the lines below up to five [items (people, place, things, events, etc.)] in your life that you are grateful for. [Then select three of the items on your list and write one paragraph for each explaining why you are grateful]" (*Emmons & McCullough, 2003, p.379*).*

The prompt for the control condition was, "*There are many things in our lives, both large and small, that might happen to us. Think back over the [day yesterday] and write down on the lines below up to five items that happened. These can be things that happened to you (e.g. got called on in class, got invited to a party, got sick) or things that you did (e.g. went to class, worked out, called a friend). […] [Then select three of the items on your list and write one paragraph for each explaining in detail what happened]" (Harbaugh & Vasey,*

2014, p. 537).

When participants completed the last day of the intervention, they were automatically directed to the post-intervention questionnaire. This questionnaire included all questionnaires except the exclusionary survey, the ambulatory questions, and trait surveys. Once the post-intervention questionnaire was completed, researchers contacted the participants to schedule the ambulatory and in-lab part of the study.

Upon arrival at the lab, participants were given an informed consent document, which they signed, a Bioharness device to wear for the next four hours, and a paging device. They were informed that during the first three hours, they would be paged once during each hour at random intervals. When they got paged, they were to use their smart phone to click on a link found in their email or text message (if preferred), which directed them to a four-block Qualtrics survey. They answered one block each hour. Each block contained two questions (what have you been thinking about for the past 10 minutes and what have you been doing for the past 10 minutes) and the PAAS with the inclusion of a "stressed" affect to measure their current affect. During the fourth hour, participants were asked to complete block four, but they were also told to simple stop what they were doing and sit quietly for 5 minutes. This was used as a baseline measure for their physiology.

At the end of four hours, participants returned to the lab where they sat in a comfortable chair for a 5-minute baseline measure and for an additional 5-minutes writing task (they completed the same intervention that they were assigned during the previous two weeks). Their physiology was measured throughout the lab period. At the end of the task, the Bioharness was removed, participants were debriefed, and given extra credit for their participation.

Results

Health Measures. To assess hypothesis one, that following the intervention, participants in the gratitude intervention group would score more positively on the self-reported health measures than

participants in the control group, components were created out of the following health questionnaires: physical symptoms, PSQI, CES-D, STAI (state), SWLS, the Index of Happiness and Mental Health, PANAS, PIL, and the Perceived Stress Scale.

The first component, named the negative component, contained the physical symptoms questionnaire, PSQI (sleep), CES-D (depression), STAI (state anxiety), negative subscale of the PANAS, and the Perceived Stress Scale. The reliability for this component was .777 as assessed by Cronbach's alpha. The second component, named the positive component, contained the SWLS (satisfaction with life), the Index of Happiness and Mental Health, positive subscale of the PANAS, and PIL (Purpose in Life) scale. The reliability for this component was .715 as assessed by Cronbach's alpha. The components were based on previous literature, which shows that happiness, satisfaction with life, and purpose in life are related to the over-arching term of "well-being." The other component is based on the fact that anxiety, depression, sleep quality, and physical symptoms can all be related. A factor analysis was not used as the sample size was too small.

Without Matching. Once the components were formed, they were used as dependent variables (DVs) in a One-way repeated measures Multivariate Analysis of Variance (MANOVA) with condition (gratitude or control) being the independent variable (IV). Repeated measures was used because we were interested in the difference in the health measures from pre to post intervention. The One-Way MANOVA revealed a significant main effect of the negative component, $F(1, 27) = 28.696$, $p < .001$, $\eta^2 = .515$, indicating that participants became less negative from pre-intervention ($M = 121$) to post-intervention ($M = 103$) post. A significant main effect of the positive component was also found $F(1, 27) = 18.452$, $p = .001$, $\eta^2 = .406$, indicating that participants became less positive from pre ($M = 175$) to post ($M = 169$) intervention. The

negative component by condition was not significant, $F(1, 27) = 1.554$, $p = .22$, $\eta^2 = .054$, and neither was the positive component by condition, $F(1,27) = 0.038$, $p = .85$, $\eta^2 = .001$.

Matched Pairs. Difference scores were created for each component at pre and post intervention by taking the summed score for the gratitude condition and subtracting the summed score for the control condition. The new pre and post difference scores (for the n by 2 pairs) were then used as DVs in paired samples t-tests. The negative component difference score was found to be significant, $t(12) = -2.383$, $p = .04$, indicating that the mean difference score increased from 2.84 to 18.69 from pre to post intervention. The positive component difference score was not significant, $t(12) = 1.335$, $p = .21$, indicating no change pre to post intervention.

Manipulation Check. To test that participants in the gratitude condition really did experience gratitude, the summed, three affective words related to state gratitude (thankfulness, grateful, and appreciative) from both the pre and post questionnaires were used in a one-way repeated measures ANOVA. The results for state gratitude were not significant, $F(1, 27) = 0.592$, $p = .45$, $\eta^2 = .021$, nor were the results for state gratitude by condition, $F(1, 27) = 0.592$, $p = .45$, $\eta^2 = .021$. The means indicate that, regardless of condition, state gratitude levels were high for both pre ($M = 3.67$) and post ($M = 3.72$) intervention, and that the gratitude and control conditions did not differ from one another.

Ambulatory Mood. To test hypothesis two that, following the intervention, participants in the gratitude condition would endorse a higher degree of positivity of emotions during the four-hour ambulatory period than participants in the control condition, mood was averaged at time points 1-3 and then compared to the time point 4 (baseline measure). Each of the five subscales of mood was evaluated individually.

Without Matching. The change for each mood subscale from pre to post intervention was evaluated by condition using one-way repeated measures ANOVAs. The positive subscale, $F(1,$

23) = 2.822, p = .11, η^2 = .109, and positive subscale by condition was not significant, $F(1, 23)$ = 0.044, p = .84, η^2 = .002. The negative subscale, $F(1, 23)$ = 0.352, p = .56, η^2 = .015, and negative subscale by condition was not significant, $F(1, 23)$ = 0.807, p = .38, η^2 = .034. The fatigue subscale, $F(1, 23)$ = 2.836, p = .11, η^2 = .106, and fatigue subscale by condition was not significant, $F(1, 23)$ = 1.582, p = .22, η^2 = .064. The tranquility subscale, $F(1, 23)$ = 2.476, p = .13, η^2 = .097, and tranquility subscale by condition was not significant, $F(1, 23)$ = 0.42, p = .52, η^2 = .018. The stressed subscale, $F(1, 23)$ = 0.082, p = .78, η^2 = .004, and stressed subscale by condition was not significant, $F(1, 23)$ = 0.033, p = .86, η^2 = .001.

Matched Pairs. Difference scores were calculated at pre and post intervention by subtracting control from gratitude for each subscale. Paired samples t-tests were then run for each subscale. The positive subscale difference score was not significant, $t(8)$ = 0.327, p = .75. The negative subscale difference score was not significant, $t(8)$ = 1.068, p = .32. The fatigue subscale difference score was not significant, $t(8)$ = 0.809, p = .44. The tranquility subscale difference score was not significant, $t(8)$ = 0.588, p = .57. The stressed subscale difference score was not significant, $t(8)$ = -0.717, p = .49. That is, the difference scores between the gratitude participants and their matched controls did not change across time for each of the subscales.

Ambulatory Physiology. To test hypothesis three, that following the intervention participants in the gratitude condition would have lower heart rates and higher pNN50 for both the average (time points 1-3) and the baseline (time point 4) periods during the ambulatory phase compared to participants in the control condition, pNN50 and HR were averaged at time points 1-3 and then compared to the time point 4.

Without Matching. The change for each physiological component from pre to post intervention was evaluated by condition using one-way repeated measures ANOVAs. The main effect for pNN50 was not significant, $F(1, 26)$ = 3.833, p = .06, η^2 = .128. For pNN50 by

condition, the ANOVA was not significant, $F(1, 26) = 2.448$, $p = .13$, $\eta^2 = .086$. The main effect of HR was not significant, $F(1, 26) = 1.359$, $p = .25$, $\eta^2 = .050$. For HR by condition, the ANOVA was also not significant, $F(1, 26) = 0.016$, $p = .90$, $\eta^2 = .001$.

Matched Pairs. Difference scores were calculated at the average of time points 1-3 and time point 4 by subtracting control from gratitude for each physiological component. Paired samples t-tests were then run for each physiological component difference score. The pNN50 difference score was not significant, $t(10) = -0.477$, $p = .64$. The HR difference score was not significant, $t(10) = -1.333$, $p = .21$.

Laboratory. To test hypothesis four, that following the intervention participants in the gratitude condition would have lower HR and higher pNN50 during both the lab baseline and lab writing components compared to participants in the control condition, participants were brought into the lab to determine the impact of the gratitude intervention on physiology during a baseline period and while participants were engaging in the writing intervention practice.

Without Matching. One-way repeated measures ANOVAs on baseline to survey by condition were run for pNN50 and HR. Concerning pNN50, a significant main effect was found, $F(1, 25) = 5.451$, $p = .03$, $\eta^2 = .179$. From baseline ($M = 29.14$) to survey ($M = 21.64$), pNN50 decreased. The interaction between pNN50 and condition was not significant, $F(1, 25) = 0.806$, $p = .38$, $\eta^2 = .031$. For HR, the main effect was not significant, $F(1, 25) = 0.005$, $p = .95$, $\eta^2 = .000$, and the interaction was not significant, $F(1, 25) = 0.864$, $p = .36$, $\eta^2 = .033$.

Matched Pairs. Difference scores were calculated at baseline and during the writing intervention by subtracting control from gratitude for each physiological component. Paired Samples t-tests were then run for each physiological component difference score. The pNN50 difference score was not significant, $t(10) = -0.305$, $p = .77$. The HR difference score was not significant, $t(10) = 0.500$, $p = .63$.

Discussion

The hypotheses that participants in the gratitude condition would score more positively on self-reported positive health measures, have a higher degree of positive emotions during the ambulatory period, and would have better physiology (lower HR and higher pNN50) during both the ambulatory and laboratory periods were not supported. Furthermore, the manipulation check failed to support that the 14 day intervention actually made people feel grateful.

Intervention. The gratitude intervention and manipulation check are established measures in previous literature (Emmons & McCullough, 2003). However, the intervention can be done in several different ways and for the current study the 14-day method was selected. Even though participants were reminded to complete the surveys daily, the majority of participants did not complete the intervention on 14 consecutive days and several participants also completed numerous links on the same day. It has been argued that there is a preferred method of administering a gratitude intervention to get the most self-reported health benefits. According to Emmons (Hart, 2013) the intervention should require participants to engage in gratitude writing one to three times per week for a month. Writing should combine listing and journaling, with participants listing and then elaborating on a couple of grateful items. The list should focus on people (psychological resources/assets) more than on things and situations for which one is grateful. Finally, the list should also include items that were unexpected. A procedure like this could not be used in its entirety for the current study due to the concern about attrition rates and the difficulty of creating a control group focusing on people and unexpected events without inadvertently encouraging gratitude.

The current study also used intervention prompts that were a combination of previous prompts found in the literature in an attempt to make the prompts between the gratitude and control conditions as similar as possible, with the exception of encouraging gratitude or not. Due to the fact

that each prompt asks people to recall things that happened to them over the previous day and write about them, people in the control condition could be recalling things for which they are grateful. However, as all participants, regardless of condition, reported high and consistent levels of gratitude at both the pre and post questionnaires and the majority of this sample all had high trait gratitude coming into the study, the problem may be more rooted in the fact that this sample seems to be a generally grateful one. Therefore, the gratitude intervention may be less likely to make the gratitude group more grateful and the intervention would not encourage the control group to lose any gratefulness they already had.

Although tempting to write off the intervention as not successful, the written words from the 14 day intervention were ran through LIWC for both the gratitude and control condition. LIWC is a linguistic inquiry and word count software that analyzes the content of written responses and then provides an output of the percentage of words that fit into each category. LIWC was made especially for academics in psychology (Tausczik & Pennebaker, 2010). One of the categories that it creates is a positive emotion words category. For the gratitude condition, LIWC indicated that people used significantly more positive emotion words in the 14 day intervention than participants in the control group. This could indicate that the intervention impacted participants, but the initial manipulation check measure may not have been sensitive enough to pick up on how exactly they were being impacted.

A final point about the intervention is that two participants were removed from the study because they wrote that they could not think of anything to be grateful for. This brings to the forefront the possibility that people in the gratitude condition might have used more cognitive effort to recall things they are grateful for than the control condition. If this were happening, and people were struggling to recall grateful events, then they might have simply reported recalling

events from the previous day as things for which they were grateful. In other words, they would have experienced the same intervention as the control group.

Regardless of the reasoning, the fact that the intervention did not provide a difference in gratitude vs. control for the amount of gratitude experienced is a problem. Without a solid intervention, the other hypotheses cannot adequately be tested. After all, one cannot argue that there are no differences in mood and physiology between the gratitude and control conditions if in reality the differences between the gratitude and control conditions do not exist. At most, the conclusion can be made that the intervention needs to be improved as well as participant adherence to the intervention.

Intervention Improvements. For the 14-day intervention, a different system may be needed to ensure participants correctly complete the intervention for all 14 days. Currently, a reminder system was used where participants were emailed or texted in the morning of each day only if they asked for reminders. The first improvement would be to send everyone reminders. The second improvement would include sending at least two reminders. One reminder would be sent in the morning and, then, if participants had not completed the intervention by the evening, a second reminder would be sent at that time. Another improvement would be to assign a researcher to each participant. The researcher would track their participant's progress throughout the 14 days ensuring that the participant completed the links appropriately.

Concerning the prompts, the issue that would need to be addressed is to make sure that the control and gratitude groups are different. The easiest way to solve this may be to put the word 'neutral' in the control condition's prompt. The instructions would still tell participants to recall things that happened to them from the previous day, but the word neutral would be highlighted to indicate that participants need to recall neutral events from the previous day. The gratitude condition prompt would remain the same as gratitude is already highlighted in the prompt.

Changing the wording of the prompt for the control condition might also help equate the amount of cognitive load, as it might take more effort for people to recall neutral events as opposed to just writing down the first events that come to mind.

Cognitive load would also need to be measured for each group. To do this participants could simply indicate how cognitively demanding they found the 14-day intervention to be. To accomplish this with consistency, and without overwhelming participants, one could ask how cognitively demanding the writing task was after completion of the tasks at a few points during the intervention (e.g., on days 1, 7, 14, and the lab day).

Limitations and Future Research. In addition to the intervention problem, the sample is also a concern. For the current study, only 26 people were actually used in the data analysis. This number is still fairly low for both physiology data and, especially, for self-report measures. Therefore, in the future, a greater sample size should be recruited. Another problem with the sample was that everyone except two people were high in trait gratitude. We know from previous literature that trait gratitude plays a role in impacting people's health (Eaton, Bradley, & Morrisey, 2014). Therefore, if people come into the study with high levels of trait gratitude, they may not have any room to improve their grateful outlook. Future studies should try to recruit more of a mix of high and low trait gratitude to see if this is indeed impacts the effectiveness of the intervention.

In addition to improving on sample size and characteristics, future studies would also benefit from a pilot study only on gratitude intervention methods. Future studies should compare differences in the length of the gratitude intervention and the wording of the prompts for written responses to maximize gratitude while minimizing attrition rates and cognitive load. Once a solid intervention is established, then that intervention can be used to test the differences in physiology and mood for people in the gratitude group compared to people in the control groups.

Conclusion. In conclusion, gratitude has been shown to be beneficial for self-reported positive health measures in previous research (Aghababaei, & Farahani, 2011; Algoe & Stanton, 2012; Emmons & Stern, 2013; Hill & Allemand, 2011; Hill, Allemand, & Roberts, 2013; Hyland, Whalley, & Geraghty, 2007; Lin, 2014; Lin & Yeh, 2014). However, previous research has not evaluated a gratitude intervention in conjunction with physiological measurements. The current study attempted to do this, but found non-significant differences between gratitude and physiology, self-reported positive health measures, and mood seemingly due to a lack of a successful manipulation. In other words, the gratitude intervention did not invoke gratitude. That is, the two groups were not different on their experience of gratitude. At this point, the author is unable to conclude that a gratitude intervention is not beneficial for physiology. Instead, the conclusion can merely be made that the current data may not be a valid test of the effects of gratitude.

Future research studies using gratitude interventions that actual promote gratitude may be better able to test physiological, mood, and positive health differences due to a gratitude practice. The relationship between gratitude, physiology, and mood is important as more and more people engage in gratitude practices and claim positive benefits including mood and improved physical symptoms (Emmons & McCullough, 2003). Unfortunately, all previous research focuses on self-reported measures alone. Measuring physiology along with mood using EMA would allow researchers to understand whether gratitude impacts mood and may provide an underlying marker of how gratitude impacts the body. Gratitude might then become a tool for people to use to help themselves feel better and deal with stress.

References

Aghababaei, N., & Farahani, H. (2011). The role of trait gratitude in predicting psychological and subjective well-being. *Journal of Iranian Psychologists, 8,* 75-84.

Algoe, S. B., & Stanton, A. L. (2012). Gratitude when it is needed most: Social functions of gratitude in women with metastatic breast cancer. *American Psychological Association, 12,* 163-168. Doi: 10.1037/a0024024

Andreou, E., Alexopoulous, E. C., Lionis, C., Varvogli, L., Gnardellis, C., Chrousos, G. P., & Darviri, C. (2011). Perceived stress scale: Reliability and validity study in Greece. *International Journal of Environmental Research and Public Health, 8,* 3287-3298. doi: 10.3390/ijerph8083287

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L.(2006). Using self-report assessment methods to explore facets of mindfulness. Assessment, 13, 27–45.

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., et al. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. Assessment, 15, 329–342.

Baxter, H. J., Johnson, M. H., & Bean, D. (2012). Efficacy of a character strengths and gratitude intervention for people with chronic back pain. *Australian Journal of Rehabilitation Counselling, 18,* 135-147. Doi: 10.1017/jrc.2012.14

Boehm, J. K., & Kubzansky, L. D. (2012). The heart's content: The association between positive psychological well-being and cardiovascular health. *Psychological Bulletin, 138,* 655-691. doi: 10.1037/a0027448

Breen, W. E., Kashdan, T. B., Lenser, M. L., Fincham, F. D. (2010). Gratitude and forgiveness: Convergence and divergence on self-report and informant ratings. *Personality and Individual Differences, 49,* 932-937. Doi: 10.1016/j.paid.2010.07.033

Buysse, D.J., Reynolds, C.F., Monk, T.H., Berman, S.R., & Kupfer, D.J. (1989). The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. Psychiatry Research, 28(2), 193-213.

Carpenter, L.C., Tompkins, S., Schmiege, S.J., & Nilsson, R. (2010). Affective response to physical activity: Testing for measurement invariance of the Physical Activity Affect Scale across active and non-active individuals. *Measurement in Physical Education and Exercise Science, 14*, 1-14.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267-283.

Cheng, S., Tsui, P. K., Lam, J. H. M. (2014). Improving mental health in health care practitioners: Randomized controlled trial of a gratitude intervention. *Journal of Consulting and Clinical Psychology, 83*, 177-186. Doi: http://dx.doi.org/10.1037/a0037895

Chen, Y., Ye, B., Hu, Z., Li, Y., Jiang, X. (2012). Relation of tobacco and alcohol use to stressful life events and gratitude in middle school students. *Chinese Mental Health Journal, 26*, 796-800.

Chow, R. M., & Lowery, B. S. (2010). Thanks, but no thanks: The role of personal responsibility in the experience of gratitude. *Journal of Experimental Social Psychology, 46*, 487-493. Doi: 10.1016/j.jesp.2009.12.018

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385-396.

Compton, W. C. (1998). Measures of mental health and a five factor theory of personality. *Psychological Reports, 83*, 371-381.

Creswell, J. D., Welch, W. T., Taylor, S. E., Sherman, D. K., Gruenewald, T. L., & Mann, T. (2005). Affirmation of Personal Values Buffers Neuroendocrine and Psychological Stress Responses. *Psychological Science*, *16*(11), 846-851. doi:10.1111/j.1467-9280.2005.01624.x

Crumbaugh, J. C. (1968). Cross-validation of purpose in life test based on Frankl's concepts. Journal of Individual Psychology, 24, 74–81.

Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. Journal of Clinical Psychology, 20(2), 200–207. doi:10.1002/1097-4679.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, *49*, 71-75.

Digdon, N., & Koble, A. (2011). Effects of constructive worry, imagery, distraction, and gratitude interventions on sleep quality: A pilot trial. *Applied Psychology: Health and Well-being*, *3*, 193-206. Doi: 10.1111/j.1758-0854.2011.01049.x

Eaton, R. J., Bradley, G., & Morrisey, S. (2014). Positive predispositions, quality of life and chronic illness. *Psychology, Health & Medicine*, *19*, 473-489. Doi: http://dx.doi.org/10.1080/13548506.2013.824593

Emmons, R. A., & Stern, R. (2013). Gratitude as a psychotherapeutic intervention. *Journal of Clinical Psychology: In Session*, *69*, 846-855. Doi: 10.1002/jclp.22020

Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology*, *84*, 377-389. Doi: 10.1037/0022-3514.84.2.377

Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). Gpower 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175-191. Doi:10.3758/BF03193146

Flinchbaugh, C. L., Moore, W. E., Chang, Y. K., May, D. R. (2012). Student well-being interventions: The effects of stress management techniques and gratitude journaling in the management education classroom. *Journal of Management Education, 36,* 191-219. Doi: http://dx.doi.org/10.1177/1052562911430062

Fordyce, M. W. (1988). A review of research on the happiness measures: A sixty second index of happiness and mental health. *Social Indicators Research, 20,* 355-381.

Froh, J. J., Sefick, W. J., & Emmons, R. A. (2008). Counting blessings in early adolescents: An experimental study of gratitude and subjective well-being. *Journal of School Psychology, 46,* 213-233. Doi: 10.1016/j.jsp.2007.03.005

Harbaugh, C. N., & Vasey, M. W. (2014). When do people benefit from gratitude practice? *The Journal of Positive Psychology, 9,* 535-546. Doi: http://dx.doi.org/10.1080/17439760.2014.927905

Hart, J. (2013). Practicing gratitude linked to better health: A discussion with Robert Emmons, PhD. *Alternative and Complementary Therapies, 19,* 323-325. Doi: 10.1089/act.2013.19609

Hill, P. L., & Allemand, M. (2011). Gratitude, forgivingness, and well-being in adulthood: Tests of moderation and incremental prediction. *The Journal of Positive Psychology, 6,* 397-407. Doi: 10.1080/17439760.2011.602099

Hill, P. L., Allemand, M., & Roberts, B. W. (2013) Examining the pathways between gratitude and self-rated physical health. *Personality and Individual Differences, 54,* 92-96. Doi: http://dx.doi.org/10.1016/j.paid.2012.08.011

Huffman, J. C., Mastromauro, C. A., Boehm, J. K., Seabrook, R., Fricchione, G. L., Denninger, J. W., and Lyubomirsky, S. (2011). Development of a positive psychology intervention for

patients with acute cardiovascular disease. *Heart International, 6,* 47-54. Doi: 10.4081/hi.2011.e13

Hyland, M. E., Whalley, B., & Geraghty, A. W. A. (2007). Dispositional predictors of placebo responding: A motivational interpretation of flower essence and gratitude therapy. *Journal of Psychosomatic Research, 62,* 331-340. Doi: 10.1016/j.jpsychores.2006.10.006

Kaczmarket, L. D., Kashdan, T. B., Kleiman, E. M., Baczkowski, B., Enko, J., Siebers, A., … Baran, B. (2013). Who self-initiates gratitude interventions in daily life? An examination of intentions, curiosity, depressive symptoms, and life satisfaction. *Personality and Individual Differences, 55,* 805-810. doi: http://dx.doi.org/10.1016/j.paid.2013.06.013

Kerr, S. L., O'Donovan, A., & Pepping, C. A. (2015). Can gratitude and kindness interventions enhance well-being in a clinical sample. *Journal of Happiness Studies, 16,* 17-36. Doi: 10.1007/s10902-013-9492-1

Krause, N. (2006). Gratitude toward God, stress, and health in late life. *Research on Aging, 28,* 163-183. Doi: 10.1177/0164027505284048

Krejtz, I., Nezlek, J. B., Michnicka, A., Holas, P., & Rusanowska, M. (2014). Counting one's blessings can reduce the impact of daily stress. *Journal of Happiness Studies,* 1-15. Doi: 10.1007/s10902-014-9578-4

Lambert, N. M., Graham, S. M., & Fincham, F. D. (2009). A prototype analysis of gratitude: Varieties of gratitude experiences. *Personality and Social Psychology Bulletin, 35,* 1193-1207. Doi: 10.1177/0146167209338071

Lin, C. (2014). A higher-order gratitude uniquely predicts subjective well-being; Incremental validity above the personality and a single gratitude. *Social Indicators Research, 119,* 909-924. Doi: 10.1007/s11205-013-0518-1

Lin, C., & Yeh, Y. (2014). How gratitude influences well-being: A structural equation modeling approach. *Social Indicators Research, 118,* 205-217. Doi: 10.1007/s11205-013-0424-6

Lox, C.L., Jackson, S., Tuholski, S.W., Wasley, D., & Treasure, D.C. (2000). Revisiting the measurement of exercise-induced feeling states: The Physical Activity Affect Scale (PAAS). *Measurement in Physical Education and Exercise Science, 4,* 79-95.

Lyubomirsky, S., Dickerhoof, R., Boehm, J. K., & Sheldon, K. M. (2011). Becoming happier takes both a will and a proper way: An experimental longitudinal intervention to boost well-being. *Emotion, 11*, 391-402. Doi: 10.1037/a0022575

McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*, 112-127. doi: 10.1037//0022-3514.82.1.112

Puig-Perez, S., Villada, C., Pulopulos, M. M., Almela, M., Hidalgo, V., & Salvador, A. (2015). Optimism and pessimism are related to different components of the stress response in healthy older people. *International Journal of Psychophysiology*. doi: http://dx.doi.org/10.1016/j.ijpsycho.2015.09.002

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.

Rash, J. A., Matsuba, K. M., & Prkachin, K. M. (2011). Gratitude and well-being: Who benefits the most from a gratitude intervention? *Applied Psychology: Health and Well-Being, 3,* 350-369.

Rimmele, U., Seiler, R., Marti, B., Wirtz, P. H., Ehlert, U., & Heinrichs, M. (2009). The level of physical activity affects adrenal and cardiovascular reactivity to psychosocial stress. *Psychoneuroendocrinology, 34*, 190-198. doi: 10.1016/j.psyneuen.2008.08.023

Runi, C., & Vescovelli, F. (2013). The role of gratitude in breast cancer: Its relationships with post-traumatic growth, psychological well-being and distress. *Journal of Happiness Studies, 14*, 263-274. Doi: 10.1007/s10902-012-9330-x

Shcheslavskaya, O. V. (2008). Psychophysiology of human stress responding: A clarification of the hardiness effect. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *68*, 5620.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*(6), 1063-1078. doi:10.1037/0022-3514.67.6.1063

Stoeckel, M., Weissbrod, C., & Ahrens, A. (2014). The adolescent response to parental illness: The influence of dispositional gratitude. *Journal of Child and Family Studies, 24*, 1501-1509. Doi: 10.1007/s10826-014-9955-y

Tausczik, Y.R., & Pennebaker, J.W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, 29, 24-54.

Toepfer, S. M., Cichy, K., & Peters, P. (2012). Letters of gratitude: Further evidence for author benefits. *Journal of Happiness Studies, 13*, 187-201. Doi: 10.1007/s10902-011-9257-7

Toussaint, L., & Friedman, P. (2009). Forgiveness, gratitude, and well-being: The mediating role of affect and beliefs. *Journal of Happiness Studies, 10*, 635-654. Doi: 10.1007/s10902-008-9111-8

Uchino, B. N., Holt-Lunstad, J., Uno, D., & Flinders, J. B. (201). Heterogeneity in the social networks of young and older adults: Prediction of mental health and cardiovascular reactivity during acute stress. *Journal of Behavioral Medicine, 24*, 361-382.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063

William, R. D., & Riels, A. G. (1990). Optimism and distractibility in cardiovascular reactivity. *Psychological Record, 40*, 451-458.

Wood, A. M., Maltby, J., Gillet, R., Linley, P. A., & Joseph, S. (2008). The role of gratitude in the development of social support, stress, and depression: Two longitudinal studies. *Journal of Research in Personality, 42*, 854-871. Doi: 10.1016/j.jrp.2007.11.003

Wood, A. M., Froh, J. J., & Geraghty, A. W. A. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review, 30*, 890-905. Doi: 10.1016/j.cpr.2010.03.005

Wood, A. M., Maltby, J., Stewart, N., Linley, P. A., & Joseph, S. (2008). A social-cognitive model of trait and state levels of gratitude. *Emotion, 8*, 281-290. doi: 10.1037/1528-3542.8.2.281

Vernon, L. L., Dillon, J. M., & Steiner, A. R. W. (2009). Proactive coping, gratitude, and posttraumatic stress disorder in college women. *Anxiety, Stress, & Coping, 22*, 117-127. Doi: 10.1080/10615800802203751

Yanmei, W. (2009). Cultivating positive emotions and well-being: Recording happy events and expressing gratitude. *Psychological Science (China), 32*, 598-600.

APPENDIX A:

Cardiovascular Health History Questionnaire

HHI Please answer the following questions about your cardiovascular health, possible medications you are currently taking, the history of cardiovascular health in your family, and your fitness level. Remember, your responses will be kept confidential

HH1 Do you have history of any of the following cardiovascular problems:

- ❑ a. Hypertension (high blood pressure)
- ❑ b. Coronary Artery Disease
- ❑ c. Atherosclerosis
- ❑ d. Stroke
- ❑ e. Myocardial Infarction (heart attack)
- ❑ f. Aortic stenosis
- ❑ g. Mitral regurgitate
- ❑ h. Any other cardiovascular disease not listed above
- ❑ i. I DO NOT HAVE ANY CARDIOVASCULAR PROBLEMS

HH2 Please indicate the name of the cardiovascular disease.

HH3 Does your biological mother have history of any of the following cardiovascular problems:

- ❑ a. Hypertension (high blood pressure)
- ❑ b. Coronary Artery Disease
- ❑ c. Atherosclerosis
- ❑ d. Stroke
- ❑ e. Myocardial Infarction (heart attack)
- ❑ f. Aortic stenosis
- ❑ g. Mitral regurgitate
- ❑ h. Any other cardiovascular disease not listed above
- ❑ i. MY MOTHER DOES NOT HAVE ANY CARDIOVASCULAR PROBLEMS

HH4 Please indicate the name of the cardiovascular disease.

HH5 Does your biological father have history of any of the following cardiovascular problems:

- ❑ a. Hypertension (high blood pressure)
- ❑ b. Coronary Artery Disease
- ❑ c. Atherosclerosis
- ❑ d. Stroke
- ❑ e. Myocardial Infarction (heart attack)
- ❑ f. Aortic stenosis
- ❑ g. Mitral regurgitate
- ❑ h. Any other cardiovascular disease not listed above
- ❑ i. MY FATHER DOES NOT HAVE ANY CARDIOVASCULAR PROBLEMS

HH6 Please indicate the name of the cardiovascular disease.

HH7 Does anyone in your immediate family have any of the following cardiovascular problems:

- ❑ a. Hypertension
- ❑ b. Coronary Artery Disease
- ❑ c. Atherosclerosis
- ❑ d. Stroke
- ❑ e. Myocardial Infarction (heart attack)
- ❑ f. Aortic stenosis
- ❑ g. Mitral regurgitate
- ❑ h. Any other cardiovascular disease not listed above
- ❑ i. NONE OF MY RELATIVES HAS ANY CARDIOVASCULAR PROBLEMS

HH8 Which family member(s) has hypertension?

HH9 Which family member(s) has Coronary Artery Disease?

HH10 Which family member(s) has Atherosclerosis?

HH11 Which family member(s) had a Stroke?

HH12 Which family member(s) had a Myocardial Infarction (heart attack)?

HH13 Which family member(s) has Aortic stenosis?

HH14 Which family member(s) has Mitral regurgitate?

HH15 Which family member(s) have another type of cardiovascular disease AND what is that disease?

HH16 Do you have any respiratory problems?

- ❍ Yes
- ❍ No

HH17 If yes, please indicate what type of respiratory problem you have.

HH18 Do you currently take any of the following medications in any form:

- ❑ a. Dexamethasone
- ❑ b. Steroids (e.g., prednisone, or inhaled steroids for asthma)
- ❑ c. Diet pills
- ❑ d. Beta-blockers
- ❑ e. Histamines
- ❑ f. Decongestants
- ❑ g. Any other medications not listed above
- ❑ h. I DO NOT CURRENTLY TAKE ANY MEDICATIONS

HH19 Please indicate what diet pills you take.

HH20 Please indicate what other medications you are taking.

HH21 Do you smoke cigarettes?

- ❍ Yes
- ❍ No

HH22 If yes, how many cigarettes per day do you smoke?

HH23 Do you smoke electronic cigarettes?

- ❍ Yes
- ❍ No

HH24 If yes, how many milligrams per day do you smoke?

HH25 How many 8oz cups of coffee have you had today?

HH26 How much soda have you had today?

HH27 Please list other caffeinated beverages or foods that you have had today and the amount.

HH28 How many 8oz cups of coffee do you usually have per day?

HH29 How much soda do you usually have per day?

HH30 Please, list other caffeinated beverages or foods you usually have per day and the amount

HH31 How many times a week do you exercise?

- ❍ a. Less than once a week
- ❍ b. Once a week
- ❍ c. Twice a week
- ❍ d. Three times a week
- ❍ e. Four or more times a week

HH32 How vigorous is your exercise?

- ❍ a. Very intense (such as fast jogging, weight lifting, etc.)
- ❍ b. Moderate (such as slow jogging, fast walk)
- ❍ c. Light (such as walking to school)
- ❍ d. I am unsure how to classify my exercise

HH33 If you are unsure, please provide the description of your exercise.

HH34 Do you have any implant devices, such as a pacemaker?

- ❍ Yes
- ❍ No

HH35 If yes, what type of implant device do you have?

HH36 What is your biological sex? (The sex assigned to you at birth)

HH37 What gender do you identify with today?

HH38 What is your sexual orientation? (i.e., gay, straight, lesbian, bisexual, asexual, pansexual, etc.)

HH39 Do you engage in a written or typed gratitude practice one or more times per week?

- ❍ Yes
- ❍ No

HH40 Are you currently or do you plan on becoming pregnant within the next 4 months?

- ❍ Yes
- ❍ No

HH41 How old are you?

Source: Shcheslavskaya (2008)

APPENDIX B:

Revised Life Orientation Test (LOT-R)

Using the scale below as a guide, indicate how much you agree with each statement below.

0 = Strongly Disagree

1 = Disagree

2 = Neutral

3 = Agree

4 = Strongly Agree

_____ 1. In uncertain times, I usually expect the best.

_____ 2. It's easy for me to relax.

_____ 3. If something can go wrong for me it will.

_____ 4. I am always optimistic about my future.

_____ 5. I enjoy my friends a lot.

_____ 6. It's important for me to keep busy.

_____ 7. I hardly ever expect things to go my way.

_____ 8. I don't get upset too easily.

_____ 9. I rarely count on good things happening to me.

_____ 10. Overall, I expect more good things to happen to me than bad.

Scoring:

1. Reverse code items 3, 7, and 9 prior to scoring (0 = 4) (1 = 3) (2 = 2) (3 = 1) (4 = 0)
2. Sum items 1, 3, 4, 7, 9, 10 to obtain an over score.

Note. Items 2, 5, 6, and 8 are filler items only.

Source: Scheier, Carver, & Bridges, (1994)

APPENDIX C:

Positive and Negative Affect Schedules (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. 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

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

Source: Watson et al. (1988)

APPENDIX D:

Physical Activity Affect Scale (PAAS)

Instructions. Using the scale provided below, please respond to the following statements indicating how you are feeling at this moment.

0	**1**	**2**	**3**	**4**
Do Not Feel				**Feel Very Strongly**

1. Energetic _____
2. Peaceful _____
3. Tired _____
4. Miserable _____
5. Calm _____
6. Enthusiastic _____
7. Fatigued _____
8. Relaxed _____
9. Worn-Out _____
10. Discouraged _____
11. Upbeat _____
12. Crummy _____

APPENDIX E:

GQ-6

The Gratitude Questionnaire– 6 (GQ-6)
Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.
1 _ strongly disagree
2 _ disagree
3 _ slightly disagree
4 _ neutral
5 _ slightly agree
6 _ agree
7 _ strongly agree

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

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

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

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

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

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

Items 3 and 6 are reverse scored.

APPENDIX F:

Physical Symptoms

Please check off whether you have experienced any of the following
Sensations within the past month:

Headaches
Faintness/dizziness
Stomachache/pain
Shortness of breath
Chest pain
Acne/skin irritation
Runny/congested nose
Stiff or sore muscles
Stomach upset/nausea
Irritable bowels
Hot or cold spells
Poor appetite
Coughing/sore throat

Please write in any unlisted symptoms they you experienced within the last month.

APPENDIX G:

PSQI

PSQII The following questions relate to your usual sleep habits during the past 2 weeks only. Your answers should indicate the most accurate reply for the majority of days and nights in the past 2 weeks. Please answer all questions.

PSQI1 During the past 2 weeks, what time have you usually gone to bed at night?
Bed Time:

PSQI2 During the past 2 weeks, how long (in minutes) has it usually taken you to fall asleep each night?
Number of Minutes:

PSQI3 During the past 2 weeks, what time have you usually gotten up in the morning?
Getting Up Time:

PSQI4 During the past 2 weeks, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
Hours of Sleep Per Night:

PSQI5 During the past 2 weeks, how often have you had trouble sleeping because you . . . Cannot get to sleep within 30 minutes

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI6 During the past 2 weeks, how often have you had trouble sleeping because you . . . Wake up in the middle of the night or early morning

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI7 During the past 2 weeks, how often have you had trouble sleeping because you . . . Have to get up to use the bathroom

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI8 During the past 2 weeks, how often have you had trouble sleeping because you . . . Cannot breathe comfortably

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI9 During the past 2 weeks, how often have you had trouble sleeping because you . . . Cough or snore loudly

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI10 During the past 2 weeks, how often have you had trouble sleeping because you . . . Feel too cold

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI11 During the past 2 weeks, how often have you had trouble sleeping because you . . . Feel too hot

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI12 During the past 2 weeks, how often have you had trouble sleeping because you . . . Had bad dreams

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI13 During the past 2 weeks, how often have you had trouble sleeping because you . . . Have pain

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI14 During the past 2 weeks, how often have you had trouble sleeping because you . . . Other reason(s), please describe

PSQI15 How often during the past 2 weeks have you had trouble sleeping because of this?

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI16 During the past 2 weeks, how would you rate your sleep quality overall?

- ❍ Very Good
- ❍ Fairly Good
- ❍ Fairly Bad
- ❍ Very Bad

PSQI17 During the past 2 weeks, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

- ❍ Not during the 2 weeks
- ❍ Less than once a week
- ❍ Once or twice a week
- ❍ Three or more past times a week

PSQI18 During the past 2 weeks, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- ❍ Not a problem at all
- ❍ Only a very slight problem
- ❍ Somewhat of a problem
- ❍ A very big problem

APPENDIX H:

COPE

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by blackening one number on your answer sheet for each, using the response choices listed just below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1 = I usually don't do this at all
2 = I usually do this a little bit
3 = I usually do this a medium amount
4 = I usually do this a lot

1. I try to grow as a person as a result of the experience.
2. I turn to work or other substitute activities to take my mind off things.
3. I get upset and let my emotions out.
4. I try to get advice from someone about what to do.
5. I concentrate my efforts on doing something about it.
6. I say to myself "this isn't real."
7. I put my trust in God.
8. I laugh about the situation.
9. I admit to myself that I can't deal with it, and quit trying.
10. I restrain myself from doing anything too quickly.
11. I discuss my feelings with someone.
12. I use alcohol or drugs to make myself feel better.
13. I get used to the idea that it happened.
14. I talk to someone to find out more about the situation.
15. I keep myself from getting distracted by other thoughts or activities.
16. I daydream about things other than this.
17. I get upset, and am really aware of it.
18. I seek God's help.
19. I make a plan of action.
20. I make jokes about it.
21. I accept that this has happened and that it can't be changed.
22. I hold off doing anything about it until the situation permits.
23. I try to get emotional support from friends or relatives.
24. I just give up trying to reach my goal.
25. I take additional action to try to get rid of the problem.
26. I try to lose myself for a while by drinking alcohol or taking drugs.
27. I refuse to believe that it has happened.
28. I let my feelings out.

29. I try to see it in a different light, to make it seem more positive.
30. I talk to someone who could do something concrete about the problem.
31. I sleep more than usual.
32. I try to come up with a strategy about what to do.
33. I focus on dealing with this problem, and if necessary let other things slide a little.
34. I get sympathy and understanding from someone.
35. I drink alcohol or take drugs, in order to think about it less.
36. I kid around about it.
37. I give up the attempt to get what I want.
38. I look for something good in what is happening.
39. I think about how I might best handle the problem.
40. I pretend that it hasn't really happened.
41. I make sure not to make matters worse by acting too soon.
42. I try hard to prevent other things from interfering with my efforts at dealing with this.
43. I go to movies or watch TV, to think about it less.
44. I accept the reality of the fact that it happened.
45. I ask people who have had similar experiences what they did.
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.
47. I take direct action to get around the problem.
48. I try to find comfort in my religion.
49. I force myself to wait for the right time to do something.
50. I make fun of the situation.
51. I reduce the amount of effort I'm putting into solving the problem.
52. I talk to someone about how I feel.
53. I use alcohol or drugs to help me get through it.
54. I learn to live with it.
55. I put aside other activities in order to concentrate on this.
56. I think hard about what steps to take.
57. I act as though it hasn't even happened.
58. I do what has to be done, one step at a time.
59. I learn something from the experience.
60. I pray more than usual.

Scales (sum items listed, with no reversals of coding):
Positive reinterpretation and growth: 1, 29, 38, 59
Mental disengagement: 2, 16, 31, 43
Focus on and venting of emotions: 3, 17, 28, 46
Use of instrumental social support: 4, 14, 30, 45
Active coping: 5, 25, 47, 58
Denial: 6, 27, 40, 57
Religious coping: 7, 18, 48, 60
Humor: 8, 20, 36, 50
Behavioral disengagement: 9, 24, 37, 51
Restraint: 10, 22, 41, 49
Use of emotional social support: 11, 23, 34, 52
Substance use: 12, 26, 35, 53
Acceptance: 13, 21, 44, 54

Suppression of competing activities: 15, 33, 42, 55
Planning: 19, 32, 39, 56

APPENDIX I:

Yoga

Please answer the following questions about yoga.

1. Do you practice yoga?
Yes No

If yes, please answer the additional questions below.

2. Of the following, which type of yogi do you consider yourself to be:
Beginner Intermediate Expert

3. How long have you been practicing yoga?
< 1 year 1-2 years 3-4 years 5-6 years 7-8 years 9 or more

4. What type of yoga do you practice?_____

4. How often per week do you practice yoga? _____

5. When you do yoga, how long is your typical practice? _____

6. Please briefly describe your typical yoga practice.

APPENDIX J:

Center for Epidemiologic Studies Depression Scale

CESDI Below is a list of the ways you might have felt or behaved. Please indicate how often you have felt this way during the past week.

CESD1 I was bothered by things that usually don't bother me.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD2 I did not feel like eating; my appetite was poor.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD3 I felt that I could not shake off the blues even with help from my family and friends.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD4 I felt that I was just as good as other people.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD5 I had trouble keeping my mind on what I was doing.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD6 I felt depressed.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD7 I felt that everything I did was an effort.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD8 I felt hopeful about the future.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD9 I thought my life had been a failure.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD10 I felt fearful.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD11 My sleep was restless.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD12 I was happy.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD13 I talked less than usual.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD14 I felt lonely.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD15 People were unfriendly.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD16 I enjoyed life.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD17 I had crying spells.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD18 I felt sad.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD19 I felt that people dislike me.
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

CESD20 I could not get "going."
- ❍ Rarely or none of the time (less than 1 day)
- ❍ Some or a little of the time (1-2 days)
- ❍ Occasionally or a moderate amount of time (3-4 days)
- ❍ Most or all of the time (5-7 days)

APPENDIX K:

The State-Trait Anxiety Inventory

STAISI DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then select the option that indicates how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer that seems to describe your present feelings best.

STAIS1 I feel calm.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS2 I feel secure.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS3 I am tense.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS4 I feel strained.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS5 I feel at ease.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS6 I feel upset.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS7 I am presently worrying over possible misfortunes.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS8 I feel satisfied.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS9 I feel frightened.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS10 I feel comfortable.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS11 I feel self-confident.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS12 I feel nervous.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS13 I am jittery.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS14 I feel indecisive.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS15 I am relaxed.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS16 I feel content.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS17 I am worried.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS18 I feel confused.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS19 I feel steady.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAIS20 I feel pleasant.
- ❍ NOT AT ALL
- ❍ SOME WHAT
- ❍ MODERATLEY SO
- ❍ VERY MUCH SO

STAITI A number of statements which people have used to describe themselves has been given below. Read each statement and then indicate the appropriate option to indicate how you generally

feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

STAIT1 I feel pleasant.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT2 I feel nervous and restless.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT3 I feel satisfied with my life.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT4 I wish I could be as happy as others seem to be.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT5 I feel like a failure.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT6 I feel rested.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT7 I am "calm, cool, and collected".
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT8 I feel that difficulties are pilling up so that I cannot overcome them.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT9 I worry too much over something that really doesn't matter.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT10 I am happy.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT11 I have disturbing thoughts.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT12 I lack self-confidence.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT13 I feel secure.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT14 I make decisions easily.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT15 I feel inadequate.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT16 I am content.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT17 Some unimportant thought runs through my mind and bothers me.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT18 I take disappointments so keenly that I can't put them out of my mind.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT19 I am a steady person.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

STAIT20 I get in a state of concern or turmoil as I think over my recent concerns or interests.
- ❍ ALMOST NEVER
- ❍ SOMETIMES
- ❍ OFTEN
- ❍ ALMOST ALWAYS

APPENDIX L:

Gratitude State

Please rate the extent to which you have experienced each feeling during the past day on a scale from 1 to 5 with 1 being “not al all” and 5 being “extremely”.

Interested
Distressed
Excited
Alert
Irritable
Sad
Stressed
Ashamed
Happy
Grateful
Tired
Upset
Strong
Nervous
Guilty
Joyful
Determined
Thankful
Calm
Attentive
Forgiving
Hostile
Energetic
Hopeful
Enthusiastic
Active
Afraid
Proud
Appreciative
Angry

APPENDIX M:

Meditation

Please answer the following questions about meditation.

1. Do you meditate?
   Yes No

If yes, please answer the additional questions below.

2. Of the following, which type of meditator do you consider yourself to be:
   Beginner Intermediate Expert

3. How long have you been practicing meditation?
   < 1 year 1-2 years 3-4 years 5-6 years 7-8 years 9 or more

4. How often per week do you engage in your mediation practice? _____

5. When you engage in your meditation practice, how long is your typical practice? _____

6. Please briefly describe your typical meditation practice.

APPENDIX N:

Satisfaction With Life Scale

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

•7-Strongly agree
•6-Agree
•5-Slightly agree
•4-Neither agree nor disagree
•3-Slightly disagree
•2-Disagree
•1-Strongly disagree

____ In most ways my life is close to my ideal.
____ The conditions of my life are excellent.
____ I am satisfied with my life.
____ So far I have gotten the important things I want in life.
____ If I could live my life over, I would change almost nothing.

Scoring:

Though scoring should be kept continuous (sum up scores on each item), here are some cut-offs to be used as benchmarks.

31-35 Extremely satisfied
26-30 Satisfied
21-25 Slightly satisfied
20 Neutral
15-19 Slightly dissatisfied
10-14 Dissatisfied
5-9 Extremely dissatisfied

APPENDIX O:

Index of Happiness and Mental Health

Happ1 Use the list below to answer the following question: In general how happy or unhappy do you usually feel? Select the ONE statement below that describes your average happiness.

- 11: Extremely happy (feeling ecstatic, joyous, fantastic!)
- 10: Very happy (feeling really good, elated!)
- 9: Pretty happy (spirits high, feeling good.)
- 8: Mildly happy (feeling fairly good and somewhat cheerful.)
- 7: Slightly happy (just a bit above neutral.)
- 6: Neutral (not particularly happy or unhappy.)
- 5: Slightly unhappy (just a bit below neutral.)
- 4: Mildly unhappy (just a little low.)
- 3: Pretty unhappy (somewhat "blue", spirits down.)
- 2: Very unhappy (depressed, spirits very low.)
- 1: Extremely unhappy (utterly depressed, completely down.)

Happ2 Consider your emotions a moment further. On average, what percent of the time do you feel happy? What percent of the time do you feel unhappy? What percent of the time do you feel neutral (neither happy nor unhappy)? Write down your best estimates, as well as you can, in the spaces below. Make sure the three figures add-up to an equal 100%.ON THE AVERAGE:

The percent of the time I feel happy
The percent of the time I feel unhappy
The percent of the time I feel neutral

APPENDIX P:

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

1. In the last month, how often have you been upset because of something that happened unexpectedly?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

3. In the last month, how often have you felt nervous and "stressed?"

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

4. In the last month, how often have you dealt successfully with irritating life hassles?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

6. In the last month, how often have you felt confident about your ability to handle your personal problems?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

7. In the last month, how often have you felt that things were going your way?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

8. In the last month, how often have you found that you could not cope with all the things that you had to do?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

9. In the last month, how often have you been able to control irritations in your life?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

10. In the last month, how often have you felt that you were on top of things?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

11. In the last month, how often have you been angered because of things that happened that were outside of your control?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

13. In the last month, how often have you been able to control the way you spend your time?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

0	1	2	3	4
Never	almost never	sometimes	fairly often	very often

APPENDIX Q:

The Purpose in Life Scale

PILI Select the number (1 to 5) next to each statement that is most true to you right now.

PIL1 I am usually:
- ❍ Bored
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Enthusiastic

PIL2 Life to me seems:
- ❍ Completely Routine
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Always Exciting

PIL3 In life, I have:
- ❍ No goals, or aims
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Clear goals, and aims

PIL4 My personal existence is:
- ❍ Utterly meaningless, without purpose
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Purposeful and meaningful

PIL5 Everyday is:
- ❍ Exactly the same
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Constantly new and different

PIL6 If I could choose, I would:
- ❍ Prefer to have never been born
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Want 9 more lives just like this

PIL7 After retiring, I would:
- ❍ Loaf completely the rest of my life
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Do some of the exciting things I have always wanted to do

PIL8 In achieving life goals, I have:
- ❍ Made no progress whatever
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Progressed to complete fulfillment

PIL9 My life is:
- ❍ Empty, filled only with despair
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Running over with exciting things

PIL10 If I should die today, I'd feel that my life has been:
- ❍ Completely worthless
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Very worthwhile

PIL11 In thinking of my life, I:
- ❍ Often wonder why I exist
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Always see reasons for being here

PIL12 As I view the world in relation to my life, the world:
- ❍ Completely confuses me
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Fits meaningfully with my life

PIL13 I am a:
- ❍ Very irresponsible person
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Very responsible person

PIL14 Concerning freedom to choose, I believe humans are:
- ❍ Completely bound by limitations of hereditary and environment
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Totally free to make all life choices

PIL15 With regard to death, I am:
- ❍ Unprepared and Frightened
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Prepared and Unafraid

PIL16 Regarding suicide, I have:
- ❍ Thought of it seriously as a way out
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Never given it a second thought

PIL17 I regard my ability to find a purpose or mission in life as:
- ❍ Practically none
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Very great

PIL18 My life is:

- ❍ Out of my hands and controlled by external factors
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ In my hands and I am in control of it

PIL19 Facing my daily tasks is:

- ❍ A painful and boring experience
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ A source of pleasure and satisfaction

PIL20 I have discovered:

- ❍ No mission or purpose in life
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ A satisfying life purpose

APPENDIX R:

The Five Facet Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely	**rarely**	**sometimes true**	**often true**	**very often or always**

_____1. When I'm walking, I deliberately notice the sensations of my body moving.

_____2. I'm good at finding words to describe my feelings.

_____3. I criticize myself for having irrational or inappropriate emotions.

_____4. I perceive my feelings and emotions without having to react to them.

_____5. When I do things, my mind wanders off and I'm easily distracted.

_____6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____7. I can easily put my beliefs, opinions, and expectations into words.

_____8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____9. I watch my feelings without getting lost in them.

_____10. I tell myself I shouldn't be feeling the way I'm feeling.

_____11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____12. It's hard for me to find the words to describe what I'm thinking.

_____13. I am easily distracted.

_____14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____15. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____16. I have trouble thinking of the right words to express how I feel about things

_____17. I make judgments about whether my thoughts are good or bad.

_____18. I find it difficult to stay focused on what's happening in the present.

_____19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

_____20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____21. In difficult situations, I can pause without immediately reacting.

1	2	3	4	5
never or very rarely	**rarely**	**sometimes true**	**often true**	**very often or always**

_____22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

_____23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____24. When I have distressing thoughts or images, I feel calm soon after.

_____25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____26. I notice the smells and aromas of things.

_____27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____28. I rush through activities without being really attentive to them.

_____29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____32. My natural tendency is to put my experiences into words.

_____33. When I have distressing thoughts or images, I just notice them and let them go.

_____34. I do jobs or tasks automatically without being aware of what I'm doing.

_____35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____36. I pay attention to how my emotions affect my thoughts and behavior.

_____37. I can usually describe how I feel at the moment in considerable detail.

_____38. I find myself doing things without paying attention.

_____39. I disapprove of myself when I have irrational ideas.

FFMQ Scoring instructions

For all items marked "R" the scoring must be reversed. Change 1 to 5, 2 to 4, 4 to 2, and 5 to 1 (3 stays unchanged). Then sum the scores for each subscale.

Observing

1, 6, 11, 15, 20, 26, 31, 36

Describing

2, 7, 12R, 16R, 22R, 27, 32, 37

Acting with awareness

5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R

Nonjudging of inner experience

3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R

Nonreactivity to inner experience

4, 9, 19, 21, 24, 29, 33

June, 2016

Morgan H. Hodge

Address

Department of Psychology

University of Wisconsin-Milwaukee

224 Garland Hall

2441 E. Hartford Ave.

Milwaukee, WI 53211

Education

Ph.D., Health and Social Psychology, University of Wisconsin-Milwaukee,

Milwaukee, WI

August, 2016

Data Analysis Courses: Experimental Design, Advanced Experimental Design and Analysis, and Applied Multiple Regression Analysis.

Research Project: Primary Investigator on a research project evaluating the impact of a gratitude intervention on health from a psychophysiological approach. Developed the project after finding gaps in the literature on gratitude and health. Created all aspects of the project from advertisements to procedural scripts. Trained 15 research staff to conduct literature reviews, collect data, and analyze data. Managed datasets for numerous research projects across two labs. Developed skills reviewing and critiquing research proposals for publications.

M.A, Experimental Psychology, Radford University,

Radford, VA

May, 2012

Statistical Courses: Analysis of Behavioral Data, Method and Program Evaluation in Psychology, and Psychological Theory of Assessment.

Research Project: Primary Investigator on a research project evaluating the effects of attachment style on cardiovascular reactivity to stress. Developed and implemented the entire project including: literature review, physiology training, research proposal, participant recruitment, data collection, data analysis, and presentation of findings. Trained research assistants to be experimenters. Collaborated with two faculty members concerning the design and procedure of the study.

B.A., Psychology and Religion, Furman University,

Greenville, SC

May, 2010

Research Methods Courses: Gained knowledge of designing and implementing a research project including research methods and data analysis.

Research Project: Co-Investigator on a research project evaluating the effects of an inclusive educational program on neurotypical students' attitudes toward autism. Collaborated with four different elementary schools and created age appropriate questionnaires that assessed attitudes towards disabilities in order to evaluate the effectiveness of the schools' educational programs.

Publications

Toussaint, L. L., Lange, L., Chen, W., Hodge, M., O'Connor, M., & Fleming, R. (2016). Control-oriented coping buffers stress responses in evacuees from a technological accident. *Journal of Applied Biobehavioral Research. Paper Accepted.*

Editorial Review

Hodge, M., Crowley, O. V., Chen, W., Reddy, D., & Fleming, R. (2016). Perceived technological risks on willingness to eat irradiated spinach. *Food Control*. *Manuscript in preparation*.

Chen, W., Hodge, M., & Fleming, R. (2016). Effects of non-contingency on diagnosis of controllability of one's environment. *Manuscript in preparation*.

Weinstein, B., Chen, W., Hodge, M., & Fleming, R. (2016). Buffering and main effects of social support on traumatic evacuation stress. *Manuscript in preparation*.

Presentations

Juett, A., Kirkpatrick, J., Hodge, M., & Fleming, R. The effects of frequency and intensity of exercise on health, anxiety, self-esteem, and positive emotions. (2016). Poster presented at the Undergraduate Research Symposium Milwaukee, WI.

Chen, W., Jones, F. H., Dickmann, J. S., Brookins, D. B., Olin, K., Yang, N. …Fleming, R. (2016). Smoking affects cardiovascular reactivity during manipulations of emotion. Poster presented at the Midwestern Psychological Association, Chicago, IL.

Hodge, M., & Fleming, R. (2015). Perceived severity of irradiation predicts willingness to eat irradiated spinach. Poster presented at the Midwestern Psychological Association, Chicago, IL.

Mosack, K. E., Hodge, M., & Billig, A. K. (2014). Using Facebook to illustrate observational research methods in an on-line Research Methods course: Lessons from cyberspace. Poster presented at the annual meeting of the National Institute on the Teaching of Psychology, St. Pete's Beach, FL.

Hodge, M. H., DiPaolo, M. R., Graves, N. L., & Merritt, M. M. (2013). Stay positive!: Life satisfaction predicts better examination day awakening cortisol. Poster presented at Midwestern Psychological Association, Chicago, IL.

DiPaolo, M. R., Hodge, M., & Merritt, M. (2013). Walk it off: Physically active coping styles and perseverative cognition. Poster presented at Midwestern Psychological Association, Chicago, IL.

Merritt, M. M., DiPaolo M. R., Hodge, M. H., & Zawadzki, M. (2013). Be encouraged!: Striving at low childhood socioeconomic status predicts vascular recovery to post-anger recall distraction, but not rumination. Poster presented at American Psychosomatic Society, Miami, FL.

Hodge, M. H., Pierce, T., & Grim, R. (2011). Anticipation of different types of stressors moderates the effect of a family history of hypertension on baseline blood pressure. Poster presented at Society of Behavioral Medicine Conference, New Orleans, LA.

Hodge, M. H., & Hahn, E. R. (May, 2010). The effects of inclusive education on neurotypical students' attitudes toward autism. Poster presented at the International Meeting of Autism Research, Pittsburgh, PA.

Hodge, M. H., & Hahn, E. R. (July, 2009). A study of 4th – 8th grade neurotypical students in an inclusive education program. Poster presented at the annual Furman-Davidson Research Conference, Greenville, SC.

Oral Presentations

Hodge, M. H. (April, 2010). Being near Davie would scare me! Factors that predict children's attitudes toward exceptional peers. Study presented at annual Furman Engaged conference, Greenville, SC.

Teaching Experience – Lecturer

Social Psychology, UWM

Fall 2013, Fall 2014, Fall 2015, Spring 2016

- Created and taught lectures
- Created and proctored tests and quizzes
- Kept record of students' grades

- Collaborated with teaching assistant concerning material taught in discussion sections

Introduction to Psychology, Radford University, UWM

Fall 2011, Spring 2012, & Spring 2015

- Created and taught lectures
- Conducted review sessions
- Created and proctored tests and quizzes
- Graded assignments

Teaching Experience – Teaching Assistant

Cognitive Processes, UWM

Spring 2014 & Spring 2016

- Conducted lab sessions
- Prepared equipment to be used for cognitive experiments
- Graded lab assignments
- Provided feedback on research reports
- Conducted review sessions on writing research reports
- Recorded students' grades

Research Methods in Psychology, UWM

Fall 2012, Fall 2013, Fall 2014, Fall 2015

- Addressed questions related to the course
- Graded research papers
- Graded response forms
- Met with students via Skype
- Created quizzes using Desire2Learn

Psychophysiology, UWM

Spring 2015

- Taught students how to collect and analyze physiological measures
- Created and was primary investigator on a semester long in-class study
- Graded response forms
- Taught a couple lectures on psychophysiology
- Graded assignments

Psychopharmacology and Addiction, UWM

Spring 2013

- Met with students to address questions related to the course
- Created study guide and review questions
- Created and monitored an online discussion forum

Analysis of Psychological Data, *Radford University*

Spring 2011

- Conducted review sessions
- Graded homework and lab assignments
- Kept track of students' grades
- Assisted students with lab assignments

Analysis of Psychological Data, *Radford University*

Fall 2010

- Taught students how to use SPSS
- Graded lab and homework assignments
- Prepared for and attended weekly meetings with the instructor
- Kept track of students' grades and attendance
- Introduced students to APA writing style

Professional Experience

The Pet Outpost, Milwaukee, WI

June 2014 – December 2015

Sales Associate

- Cashier
- Managed and maintained scheduling for employees
- Trained new employees
- Ordered and received merchandise
- Created a folder for new employees that contained up-to-date knowledge of store products

Psychology Developmental Learning Lab, *Furman University*

Fall 2009 – Spring 2010

Lab Manager

- Interacted with parents, participants, and students
- Oversaw student researchers
- Formulated advertisements
- Met with schools to formulate a research project

Psychology Club, Furman University

Fall 2009 – Spring 2010

Treasurer

- Formulated a budget
- Determined distribution of money
- Selected psychology club events for the year

Crossroads Group Home, Greenville, SC

Spring 2009

Intern

- Evaluated weekly counseling sessions
- Attended administrative meetings
- Administered questionnaires
- Formulated a rules workbook

Health Psychology Lab, Furman University

Fall 2008

Research Assistant

- Formulated advertisements for an experiment
- Trained as a researcher

Service Work

Elected to serve on the College of Humanities and Behavioral Sciences Dean Search Committee

Spring 2010 – Fall 2011

Treasurer of Furman University Psychology Club

Fall 2009 – Spring 2010

Honors and Awards

Phi Kappa Phi

2012 - Present

Dean's List

2008 - 2010

Phi Eta Sigma

2007 - 2010