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Abstract

Gratitude is one of the most well researched traits of positive psychology, and several studies have investigated interventions for cultivating gratitude in individuals. One common intervention is the gratitude visit, in which individuals write and deliver a gratitude letter to someone to whom they feel thankful (Seligman & Steen, 2005). The current study tested an adapted version of this gratitude visit using notes instead of letters and instant communication technology (e.g. text message, Facebook and Twitter messages, e-mail) instead of personal visits. This instant gratitude-note intervention condition was tested against two other control conditions. One control group was asked to send notes to others regarding recent events (social control), and another control group was asked to keep a brief personal journal on recent events (non-social group). All three groups were instructed to send messages three times a day (preferably around breakfast (morning), lunch (mid-day), and dinner (evening) for two weeks. It was hypothesized that, compared to both the social and non-social control groups, the gratitude intervention would have greater positive effect across three psychological well-being indicators (i.e., gratitude, life satisfaction, and optimism), three psychological distress indicators (i.e., depression, stress, and anxiety), and two interpersonal connectedness indicators (i.e., school connectedness and loneliness). When compared to control groups, the gratitude treatment intervention had a significant moderate effect on optimism and social connectedness, but did not significantly reduce distress or loneliness, nor did it enhance life satisfaction. However, findings indicated that some aspects of well-being, distress, and social connectedness were significantly improved for all experimental groups.

Keywords: college students, gratitude, intervention, positive psychology

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Defining Gratitude

The research on gratitude does not yield one clear definition of the construct. While in the past gratitude has been defined “as the sense of appreciation experienced by someone who has received a material gift or benefit from another person” (Furlong, You, Renshaw, O’Malley, & Rebelez, 2013, p. 3), some researchers take a broad view of gratitude and do not limit it to a response to another person but extend it to include aspects like admiring the beauty of nature and appreciating the present moment and what it offers. From their 2008 factor analytic study, Wood, Maltby, Stewart and Joseph (2010) concluded that gratitude and appreciation are a single-factor personality trait. Trait (or dispositional) gratitude has been defined as “a life orientation towards noticing and appreciating the positive in the world” (Wood et al., p. 891). Wood et al.’s life orientation view attributes eight components to gratitude: “(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, (5) behaviors to express gratitude, (6) focusing on the positive in the present moment, (7) appreciation rising from understanding life is short, (8) a focus on the positive and present moment, and (9) positive social comparisons” (p. 891).

The current study employed this life orientation view of gratitude and used Furlong et al.’s (2013) definition of gratitude, which is "gratitude . . . [is the] sense of thankfulness that arises in response to receiving any kind of personal benefit (be it material or nonmaterial) as a result of any transactional means (be it a personal encounter with another person, with nature, with an object, or even with ideas; Emmons, 2007)." The current study has particular focus on the aspect of gratitude that McCabe, Bray, Kehle, Theodore, and Gelbar (2011) describe as creating a feeling of being valued by others and inspires thoughts of ways to return kindness. Watkins (2004)

emphasized the importance of the reciprocity of gratitude is it creates a “positive cycle” where both individuals, the receiver and the giver, appreciate and are grateful for each other leading to higher self-reports of life satisfaction.

Correlates of Gratitude

While definitions of gratitude vary throughout the literature as Wood et al. (2010) point out, studies do however similarly describe gratitude as a well-being indicator that is highly related to other well-being indicators (e.g., life satisfaction and optimism). Jones, You, and Furlong (2013) coined the term *covitality* to describe the covariance of gratitude, hope, optimism, self-efficacy and life satisfaction. Wood et al.’s (2010) research review indicates that gratitude correlates with a broader range of traits than indicated by Jones et al. (2013). The question becomes will an intervention designed to enhance one of the covital well-being indicators, such as gratitude, have collateral effects on other well-being indicators?

Terjesen, Jacofsky, Froh, and Digiuseppe (2004) propose “a paradigm shift in school psychology toward positive psychology” by enhancing student strengths (p. 163). They observe many educators want to implement prevention programs in schools; however, there are not many proactively employing positive psychology interventions, such as gratitude interventions. As Jones et al. (2013) point out, there are a proliferation of positive traits that correlate with gratitude; so, it is possible that if gratitude interventions were implemented in school prevention programs they might moderate or facilitate other positive outcomes, like life satisfaction and optimism.

Several classic studies have demonstrated that gratitude is related to engaging in positive behaviors towards others as well as with multiple positive personality traits. For example, McCullough et al. (2002, 2004) found in their construct validation studies that grateful people

report higher levels of well-being, positive emotions, life satisfaction, vitality, and optimism, as well as lower levels of depression, envy, and stress—and that they are more likely to exhibit prosocial behaviors toward others. Grateful people are “more open to experience, more conscientious, more extroverted, more agreeable, and less neurotic” (Peterson & Seligman, 2004). Several studies (McCullough et al., 2002, 2004; Park, Peterson, & Seligman, 2004; Wood, Maltby, Stewart, Linley, & Joseph, 2008; Wood, Joseph, & Maltby, 2009; Wood et al., 2010) demonstrate that gratitude offers incremental validity and correlates with well-being and social relationships above the big-five personality traits (McCrae & Costa, 1999). After reviewing the literature, Wood et al. (2010) conclude “the size of the unique relationships between gratitude and subjective and eudemonic well-being appears substantial, suggesting that gratitude has a unique and distinct impact on well-being, and is a worthwhile subject for specific future research in the area” (p. 896).

Beyond its relations with prosocial behavior and other well-being indicators, gratitude has also been correlated with certain personality dispositions and religious activities. People who are more grateful value material objects less and are more likely to share (McCullough et al., 2002; Algoe et al., 2008). Also, those that go regularly to religious services and participate in activities such as praying and reading religious material are more likely to be grateful (Emmons & Kneezel, 2005; Peterson & Seligman, 2004; Tsang, Schulwitz, & Carlisle, 2012; Wood et al., 2010).

Not only are positive thoughts, supportive behaviors, personal dispositions, and religious activity related to gratitude, but so is physical and mental health. McCraty, Atkinson, Tiller, Rein, and Watkins (1995) found that gratitude correlated with physiological functioning and health, especially with improvements in cardiovascular and immune performance. In McCraty et al.’s (1995) study, individuals in one group were asked to think of something that made them

angry, and the other group something that made them appreciative, with findings indicating that these thoughts were reflected in their peripheral nervous system's parasympathetic activity appreciation slowed respiration and lowered pulse transit time and changed heart rate variability. Similarly, in Emmons and Crumpler's (2002) study, when the gratitude-journaling group was compared to other groups, the gratitude group exercised more frequently, reported less physical problems, had a better outlook on their lives as a whole, and were more positive about the week to come than the other two groups. Moreover, in examining the results of his longitudinal study, Vaillant (1993) posited that gratitude improves functioning for a successful life course. Likewise, Krauss (2009) found gratitude correlated with a decrease in depressive symptoms due to financial strain, and Wood, Maltby, Gillett, Linley, and Joseph (2008) suggest that gratitude promotes social support and helps shield individuals from stress and depression. Since increases in gratitude are associated with enhanced well-being, researchers turned attention to interventions that augment gratitude to determine if the results would facilitate increases in well-being and positive interpersonal relationships.

Gratitude Interventions

Sin and Lyubomirsky's (2009) meta-analysis of 51 studies employing various positive psychology interventions with 4,266 individuals indicated that, in general, positive psychology interventions do indeed significantly enhance well-being and decrease distress. One of the most commonly researched of contemporary positive-psychological interventions is gratitude, with findings from several studies supporting its efficacy. One of the most well-known classic gratitude interventions is Seligman's (2005) *three good things* or *counting blessings* exercise, which was successfully used in previous studies with adults (Mongrain & Anselmo-Matthews, 2012). Seligman (2005) found that this exercise enhanced happiness and reduced depression in

adults. Seligman asked his participants to independently write three things that occurred and were good that day, and their causes while at home before bed. Since this study, there have been many journaling interventions of listing things, usually three or five, for which the individual is grateful (Wood et al., 2010). Other research on interventions designed to increase gratitude, such as “counting blessings,” were associated with enhanced self-reported gratitude, optimism, life satisfaction, and decreased negative affect in adolescents (Froh, Sefick, & Emmons, 2008). Additionally, Emmons and McCullough (2003) conducted a gratitude intervention study that also indicated that gratitude was significantly positively correlated with supportive behaviors and demonstrated that focusing on blessings could enhance positive interpersonal behaviors as well as increasing personal well-being. Recently, Algoe, Haidt, and Gable (2008) studied naturally occurring gift-giving in sororities and found that “perceptions of benefactor responsiveness predicted gratitude for benefits, and gratitude during the week predicted future relationship outcomes” (p. 425). They further asserted that gratitude may promote relationship formation and maintenance.

The benefits of such interventions are clear and McCabe, Bray, Kehle, Theodore, and Gelbar (2011) have indicated a need for a school-based gratitude intervention that would have increased social validity and sustainable efficacy for longer periods of time. Some gratitude interventions have been found to have greater long-term benefits than others. In Seligman and Steen’s (2005) original study, participants were assigned to one of the following groups: a placebo control exercise of writing about early memories, *gratitude visit*, *three good things in life*, *you at your best*, *using signature strengths in a new way*, and *identifying signature strengths*. Findings from this study showed that those who continued to do their assigned intervention after the assigned amount of time experienced long term benefits. The *gratitude visit*, where

participants wrote and delivered a gratitude letter to someone, was the intervention that had the largest positive change, increasing happiness and decreased depressive symptoms, which were maintained at both the one-week and one-month follow-up.

Despite these encouraging findings, some concerns have been raised regarding the quality and generalizability of gratitude intervention studies. Specifically, Wood et al. (2010) believe it is misleading to say current gratitude interventions are effective even though they have been touted as the “most successful positive psychology intervention” (p. 898). Wood et al. explain that many gratitude interventions previously studied have increased gratitude when compared to listing hassles or other so called “placebo control groups” but not more than a “true control group” such as a commonly used therapy (p. 898). They assert that the studies neglect to control for expectancy effects (Wood et al., 2010).

Purposes of the Present Study

The current study tested a new gratitude intervention that was an adaptation of the *gratitude* visit, using notes instead of letters and instant communication technology instead of personal visits. This new intervention was intended to be simpler, more sustainable, and more socially valid than the *gratitude visit*, making it easier to maintain gratitude as a habit and hopefully contributing to better long-term benefits. Also, it is likely that gratitude notes sent via instant communication technologies will increase the efficiency of communication, speeding up the resulting rewards or positive effects of gratitude sharing. Since the notes were sent with instant electronic communication, it is more likely the writer will receive a prompt response, which will most likely reinforce and encourage them to continue the behavior.

Beyond making the intervention simpler and more socially valid, the present study also aimed to improve the control conditions against which the effectiveness of the intervention was

evaluated. The present study used two controls instead of one, and included both a social control and a non-social control. These two controls were an attempt to further potentially confounding influences of social interaction and the content of the note. Both controls wrote notes about material they learned in school over the past two weeks; however, one control group sent the note with instant communication technology and the other control group did not share their notes but kept them in a personal journal format. In the past, Wood et al.'s (2010) gratitude interventions were compared to negative experiences such as daily hassles or things the participant wanted to do over the previous summer but were unable to do. In the present study, the participant is citing a positive accomplishment, something they have learned, instead of a setback or disappointment, which are likely to trigger negative affect. Alternatively, past research's controls requested the participant to write about childhood experiences or a typical day. In these earlier studies, the experimenter was unaware if the task elicited negative, positive, or neutral emotions and could not control for or be aware of these emotions and their potential effects. With an intervention that requires socializing through sending a message to another and possibly receiving a message in response, simply writing about a typical day, as used in the past, will not account for the potential influence of general socializing within the effect of the gratitude intervention.

Thus, to clarify results in the present study, we used a social and a non-social control. In their meta-analysis, Sin and Lyubomirsky (2009) point out some past studies simply did not even have a control treatment. In the present study, the gratitude treatment intervention notes were about recent actions performed by someone the participant knows and is grateful, and the two controls also reflects current events in the forms of recently learned information. Because both the cited accomplishment of material learned and the gratitude notes reflect recent events, the present study's controls are hoped to be time neutral and control for recent positive or negative

events. Since the current study attempts to control for social interaction, the positive nature of the note's message content, and the timeliness of the events referred to in the note, it will help researchers determine if the intervention itself is what is altering gratitude and effecting any other changes.

Finally, this study will also be the first to investigate the effects of a gratitude intervention for enhancing school connectedness and reducing loneliness among college-age students. Froh et al. (2008) studied school connectedness and gratitude in middle school students and found counting blessings enhanced school satisfaction. A literature search did not reveal any study employing a gratitude intervention and looking at school connectedness and loneliness with college-age students. It seems likely that enhancing gratitude might reduce loneliness and increase connectedness given the impact of gratitude on enhancing other indicators related to successful social relationships (Emmons & McCullough, 2003) and relationship maintenance (Algoe, Haidt, & Gable, 2008). Reference Figure 4 to see the Measurement Model for the current study.

Research Questions and Hypotheses

Given the background presented above, this study investigated the following research questions (R), paired with the following hypotheses (H):

R1. Compared to the control conditions, does the gratitude intervention enhance psychological well-being as indicated by improvements in gratitude, life satisfaction, and optimism?

H1. It was hypothesized that the gratitude intervention would have positive effects (with comparable effect sizes) across all three psychological well-being indicators.

R2. Compared to the control conditions, does the gratitude intervention decrease

psychological distress as indicated by reductions in depression, stress, and anxiety?

H2. It was hypothesized that the gratitude intervention would have positive effects (with comparable effect sizes) across all three psychological distress indicators.

R3. Compared to the control conditions, does the gratitude intervention enhance interpersonal connectedness as indicated by increases in school connectedness and reductions in loneliness?

H3. It was hypothesized that the gratitude intervention would have a positive effect on interpersonal connectedness as indicated by an increase in school connectedness and a decrease in loneliness.

Method

Participants

Participants were recruited through the Department of Psychology's online research participation System. Students sign up for studies voluntarily and most are awarded partial course credit based for participating. Participants were 115 undergraduate students attending a large, public university located in the southern region of the United States. They were between 18 and 32 years of age ($M = 20.56$; $SD = 1.92$), with 82.6% identifying as female. There was an attrition rate of 12.9% from pretest to posttest. Reported ethnicity was 74.8% Caucasian, 10.4% Black/African American, 3.5% Hispanic/Latino, 7.8% Asian/Pacific Islander, 1.7% Native American, 1.7% Indian, and 1.7% Other. Participants were randomly assigned to either the gratitude treatment group (G) of writing about someone or an action someone did and sending it with instant communication to that person, the social control group (S) of writing about what they learned in school recently with instant communication, or the non-social control group (NS) of writing about recently learned material in school. Participants in all the assigned groups were

predominantly female ($G = 80.5\%$, $S = 84.2\%$, $NS = 83.3\%$) and had a mean age of about 20 ($G = 20.66$, $S = 20.55$, $NS = 20.44$) with similar standard deviations ($G = 1.78$, $S = 2.18$, $NS = 1.81$). The majority of the participants in all groups self-identified as White/Caucasian ($G = 78.0\%$, $S = 73.7\%$, $NS = 72.2\%$), with far fewer identifying as Black/African American ($G = 9.8\%$, $S = 5.3\%$, $NS = 16.7\%$), Hispanic/Latino ($G = 4.9\%$, $S = 5.3\%$, $NS = 0\%$), Asian/Pacific Islander ($G = 0\%$, $S = 13.2\%$, $NS = 5.6\%$), and other ethnicities ($G = 2.4\%$, $S = 2.6\%$, $NS = 5.6\%$). All groups contained students who were at various years of enrollment at the university, with fourth-or-more-year students being most prevalent ($G = 34.1\%$, $S = 36.8\%$, $NS = 30.6\%$), followed by third year ($G = 29.3\%$, $S = 28.9\%$, $NS = 25.0\%$), second-year ($G = 26.8\%$, $S = 13.2\%$, $NS = 30.6\%$), and first-year students ($G = 9.8\%$, $S = 21.1\%$, $NS = 13.9\%$).

Procedure

The study was submitted to and approved by the University Institutional Review Board Human Use Committee, and all participants gave informed consent to participate in the study. Since the current study required the student to come take measures at pre-test and at post-test, the participants signed up for two sessions that two weeks apart. Before signing up, they were informed that the study was on gratitude and would require being present to at least two sessions and participating independently three times a day—preferable around breakfast (morning), lunch (mid-day), and dinner (evening)—for two weeks in a short note-writing activity that would take about five minutes each time.

Once students took the pre-test measures, they were randomly assigned to a group—the gratitude intervention, non-social control, or the social control—and informed of the related required activities. The participants were given the gratitude worksheet if they were in the gratitude treatment group, a non-social control participation worksheet if they were in the non-

social control group, and social control participation worksheet if they were in the social group. The gratitude group worksheet instructed participants to send a note using instant communication technology (e.g., private text messages, private e-mail, private Twitter, or private Facebook inbox) about something they are grateful about the person they are sending the note to or an action that person did that they are grateful for. The social group also used instant communication technology, but the worksheet instructed them to write about something they learned in school within the past week. Both the gratitude treatment group and the social group were instructed that they were not limited to one type of instant communication technology for the study, not to show a note to anyone they did not originally send it to, and to try to send notes to more than just a couple of people. The non-social control group worksheet instructed participants to write about something they learned about in school within the past week and to not send or share their notes with anyone. The notes for all the groups were instructed to have a minimum of 20 words and a maximum of 200 words.

To monitor treatment integrity for each 5-minute intervention session, each participant was asked to record a summary sentence that demonstrated that had completed the steps on their respective instructions worksheet. For example, a participant in the gratitude treatment group might record on the worksheet that she thought of a person they knew and a reason why they were thankful for the person (or for an action the person did) as follows: “I am grateful that my friend was patient with me yesterday when I was frustrated” or “ I am thankful for my classmate sharing her notes with me when I was sick on Monday.”

Participants also signed up for a time for the second session. In case anyone had future questions, all participants turned in their worksheets and took the post-test measures.

Measures

The Gratitude Questionnaire-Six Item (GQ-6). The GQ-6 (McCullough et al., 2002) was used to assess college students' dispositional gratitude. The GQ-6 is a self-report questionnaire that measures the tendency to respond with gratitude in daily life. Participants are asked to rate each statement on how much he/she agrees with each of the six statement on a 7-point Likert scale from (1) *strongly agree* to (7) *strongly disagree*. Ratings assess the intensity, frequency span and density of gratitude. Wood et al. (2008) report that psychometric development included demonstrating item-level factor structure, convergent validity peer reports, unique correlations with well-being (controlling for social desirability), and discriminate validity from related traits.

The Life Orientation Test—Revised (LOT-R). The LOT-R (Scheier, Carver, & Bridges, 1994) was used to measure dispositional optimism, which Scheier and Carver (1985) and Glaesmer et al. (2012) describe as generally believing that good things will occur. The LOT-R is a 10-item measure using a 5-point Likert scale with responses of (0) *strongly disagree* to (4) *strongly agree* with three items assessing optimism, three assessing pessimism (reverse scored), and four filler items. Scheier and Carver report a Cronbach's alpha of 0.78. Glaesmer et al. (2012) found that optimism and pessimism are two separate traits rather than "a single bipolar trait" (p. 441). They believe the LOT-R is a valid measure of dispositional optimism and pessimism.

The Satisfaction with Life Scale (SWLS). The SWLS (Diener, Emmons, Larsen, & Griffin, 1985) assess satisfaction with life as a global whole. The scale consists of five items (e.g. I am satisfied with my life). The respondent rates each item on a 7-point Likert rating scale (1) *strongly disagree*, (2) *disagree*, (3) *slightly disagree*, (4) *neither disagree or agree*, (5) *slightly agree*, (6) *agree*, and (7) *strongly agree*. The range of scores is from 5 minimal satisfaction to 35

a very high satisfaction with life. Pavot, Diener, Colvin, & Sandvik (1991) found the SWLS to have a unitary factor structure and to be both valid and reliable. Pavot and Diener (1993) found that the SWSL has discriminant validity from emotional well being measures, adequate temporal stability (.54 over four years), and “sufficient sensitivity to be potentially valuable to detect change in life satisfaction during the course of clinical intervention” (p. 164).

Depression-Anxiety-Stress Scale—21 (DASS-21). The DASS-21 (Lovibond & Lovibond, 1995a) is a measure that assesses three negative emotional states: Depression, Anxiety and Stress (Lovibond & Lovibond 1995a, 1995b, Bieling, Cox, Enns, & Swinson, 1998). The DASS-21 consists of 21 items that ask one to answer to statements referring to the past week. Each item is scored on a 4-point scale from (0) *did not apply to me at all* to (3) *applied to me very much or most of the time*. Subscale scores are summed and multiplied by two. Subscale scores range from 0 to 14 with higher number indicating more distress. Crawford and Henry (2003) report that “the reliability of the DASS was excellent, and the measure possessed adequate convergent and discriminant validity.” Black Dog Institute (DASS-21 (with scoring sheet) n.d.) indicated that most studies using a nonclinical population employ cutoff scores of ‘extremely severe’ of 14 or more on depression, 10 or more on anxiety, and 17 or more on stress.

The Psychological Sense of School Membership Scale (PSSMS). The PSSMS (Goodenow, 1993) was used to measure sense of school membership. The PSSMS is an 18-item, 5-point Likert scale with responses ranging from (1) *not at all true* to (5) *completely true*. You, Ritchey, Furlong, Schochet, and Boman (2011) point out that the PSSMS is used in various studies and many correlations have been discovered in reference to it, but that the defining characteristics of a sense of school membership were not statistically discovered. In order to learn more, You, Ritchey, Furlong, Schochet, and Boman (2011) ran a confirmatory factor

analysis (CFA) and found that a three-factor structure fit the model that was composed of caring relationships, acceptance, and rejection.

UCLA Loneliness Scale-Revised (UCLA LSR). The UCLA LSR (Russell, Peplau, & Ferguson, 1978; Russell, 1996) is a revised version of the original UCLA Loneliness Scale. The revision simplifies wording and reverse scores some of the original items. It is composed of 20-items which measures the respondents' subjective feelings of loneliness and social isolation on a scale from (1) *never* to (4) *often*. Russell's (1996) results demonstrated the UCLA LSR showed good convergent validity with other loneliness measures as well as to be highly reliable, with the internal consistency coefficient a ranging from .89 to .94 and good test-retest reliability over a one-year period ($r = .73$).

Data Analyses

Preliminary analyses. Descriptive statistics and the internal consistency of each of the measures was investigated primary to conducting the primary analyses. Inter-correlations among all scales were also conducted to explore the relationships among variables and to ensure that each represented an appropriate well-being, distress, or connectedness construct, respectively.

Primary analyses. For the primary analyses, three Repeated-Measures Multivariate Analysis of Variance (RM-MANOVA) were conducted. The first RM-MANOVA tested the main effect of intervention condition on psychological distress, using condition (i.e., gratitude intervention, social control, non-social control) as the independent variable and depression (DASS-21 depression subscale score), anxiety (DASS-21 anxiety subscale score), and stress (DASS-21 stress subscale score) as the dependent variables. The second RM-MANOVA tested the main effect of the intervention condition on psychological well-being, using condition (i.e., gratitude intervention, social control, non-social control) as the independent variable and life

satisfaction (SWLS), optimism (LOT-R), and gratitude (GQ-6) as the dependent variables. The third RM-MANOVA tested the main effect of intervention condition on interpersonal connectedness, using condition (i.e., gratitude intervention, social control, non-social control) as the independent variable and school connectedness (PSSMS) and loneliness (UCLA LSR) as the dependent variables.

Results

Preliminary Analyses

As anticipated, descriptive statistics showed all the scales had at least good internal consistency ($.7 \leq \text{Cronbach's } \alpha < .9$), with the scale for loneliness showing excellent internal consistency ($\alpha \geq .9$). Scales for gratitude, life satisfaction, depression, anxiety, and loneliness were skewed and had abnormal kurtosis (skewness $> |1|$; kurtosis $> |3|$). Scales for optimism, stress, and school connectedness were approximately normally distributed (see Table 1).

Results from the bivariate correlations indicated significant, yet weak, positive correlations among well-being variables, significant moderate negative correlations among distress and well-being variables, significant positive moderate correlations among distress variables, and a significant moderate negative correlation between loneliness and school connectedness. Findings suggest that all the well-being scales measured positive outcomes and all the distress scales measured negative outcomes. Overall, findings indicated significant associations among all scales in the expected directions. The highest bivariate correlation was .69, which means that the scales were measuring distinct constructs as intended (see Table 2).

Primary Analyses

Findings from the RM-MANOVA indicated that there was a significant time main effect across well-being, distress, and social connectedness outcomes. Furthermore, although non-

significant time-by-group interaction effects were observed for well-being and distress, a significant time-by-group interaction was observed for social connectedness (see Table 3).

Findings from the follow-up univariate ANOVA for psychological well-being showed significant time main effects for optimism and life satisfaction, but not for gratitude. Furthermore, a significant time-by-group interaction effect favoring the gratitude group was observed for optimism, but not for life satisfaction (see Table 4 and Figure 1). Univariate ANOVA for psychological distress showed a significant time main effect size for anxiety, but no time-by-group interaction effect. Non-significant effects were observed for both depression and stress (see Table 5 and Figure 2). Finally, univariate ANOVA for social connectedness showed a significant time main effect for school connectedness, but not for loneliness. A significant time-by-group interaction effect was also observed for school connectedness (see Table 6 and Figure 3).

Post-Hoc Analyses

Post-hoc comparisons were conducted for optimism and school connectedness outcomes, since they both yielded significant time-by-group interaction effects. Results from these comparisons indicated that the gratitude intervention significantly improved optimism compared to the social control group; however, it did not significantly improve optimism compared to the non-social control group. The non-social control group had a higher mean gain of optimism than the social control group, but this difference was non-significant. Furthermore, the gratitude intervention significantly improved school connectedness more than both the social control group and the non-social control group; however, there was no significant difference in the improvement of school connectedness observed between the social control group and the non-social control group (see Table 7).

Discussion

The current study tested an adapted version of Seligman and Steen's (2005) gratitude visit intervention using notes instead of letters and instant communication technology (e.g., text message, Facebook and Twitter messages, e-mail) instead of personal visits. The current gratitude intervention was tested against two control conditions. One control group was asked to send notes on recent events (social control) and another control group was asked to keep a brief journal on recent events (non-social control). All groups were instructed to send the messages three times a day—preferably around breakfast (morning), lunch (mid-day), and dinner (evening)—for two weeks. It was hypothesized that, compared to both the social and the non-social control groups, the gratitude intervention group would show greater positive gains across three psychological well-being indicators (i.e., gratitude, life satisfaction, and optimism), three psychological distress indicators (i.e., depression, anxiety, stress), and three social connectedness indicators (i.e., school connectedness and loneliness) at post-test.

Interpretation of Findings

It was hypothesized that, compared to the control groups, the gratitude intervention would have positive effects across all three of the psychological well-being indicators of gratitude, life satisfaction, and optimism, with comparable effect sizes for each. This hypothesis was only partially rejected, because although the gratitude intervention had a greater positive effect on optimism, it did not have a significant positive effect on gratitude or life satisfaction. This finding suggests that the positive effect of gratitude on well-being may not be ubiquitous, but may target specific aspects or elements of well-being. Gratitude and life satisfaction relate to individuals' current well-being while optimism relates to the future. It may be that time is a salient feature determining the effect of gratitude intervention on the various well-being outcomes. Future researchers may wish to investigate these relationships in greater detail.

It was further hypothesized that, compared to the control groups, the gratitude intervention would have greater positive effects across all three psychological distress indicators, with comparable effect sizes. This hypothesis was rejected because the gratitude intervention did not appear to have a positive effect on any of the three psychological distress indicators. This finding contrasts those from Seligman's (2005) study, where he found that a similar exercise enhanced happiness and reduced depression in adults. It is possible that some of the variation in results may be due to the use of different measures. Seligman (2005) used a depression symptom survey while the current study used a less detailed scale, which measures three aspects of distress: depression, stress, and anxiety. It is also possible that the difference in the format of the intervention or the younger college age sample may have influenced this result.

The hypothesis that, compared to the control groups, the gratitude intervention would have a positive effect on social connectedness as indicated by an increase in school connectedness and a decrease in loneliness was also partially rejected. Findings indicated that the gratitude intervention had a positive effect on school connectedness, but not on loneliness. It is possible that one can feel interpersonally lonely and yet still have a strong sense of connectedness to a school. Imagine someone who attends a school sporting event by themselves. They might cheer for the school and feel connected to the institution but experience themselves as lonely or socially isolated. Social connectedness does not appear to be a simple construct and the gratitude intervention appears to affect school connectedness more than loneliness.

Post-hoc comparisons for optimism and school connectedness showed which groups proved most effective. The gratitude intervention significantly improved optimism compared to the social control, but not compared to the non-social control. It is possible participants in gratitude intervention and the participants in the non-social control wrote notes that were more

future oriented than the social control. Also, the gratitude intervention significantly improved school connectedness more than the social and the non-social controls. It is possible that the gratitude intervention promotes deeper school relationships, which lead to more improvement in school connectedness. Students may have sent gratitude messages to other students on their campus. This could lead them to feeling they have deep relationships on campus and that they have a support group, which would take notes for them if they were sick or meet them for lunch on campus.

Overall, findings from the present study suggest that the original hypotheses were all partially rejected. Because although the gratitude intervention did significantly improve optimism and school connectedness more than the two controls, it did not show greater improvements for gratitude, life satisfaction, depression, anxiety, stress, and loneliness. These findings both contrast with past research, which has shown that gratitude intervention improve one's life satisfaction and gratitude while also decreasing depression, and provide evidence that adds to existing research, showing that gratitude interventions can enhance optimism and school connectedness.

Furthermore, the findings regarding the control groups used in the present study are also interesting. Specifically, the social control group and the non-social group both yielded positive effects in the present study—showing a time main effect for anxiety and life satisfaction. They also showed differential effects for optimism and school connectedness. These findings suggest that simply taking time to reflect and interact with others with instant communication technologies improves psychological well-being and interpersonal connectedness and decreases psychological distress. Since these are behaviors commonly, easily, and inexpensively done in this era, it would be valuable to investigate in future research.

Limitations and Possible Confounds

In retrospect, a passive control group, which would not complete any activity and would simply take pre and post measures, would have benefited the present study. Since there was not a passive control group, we cannot determine if the changes are due to maturation or if participating in the control exercises had some kind of therapeutic effect or just a placebo effect. As the students in this sample move through the semester, it may be that approaching exams or other elements of the academic calendar exercise stronger effect on their sense of well-being or personal distress and may be a more salient determinate than any intervention. Seligman's (2005) study's use of an Internet sample of convenience may have controlled for universal effects of the academic environment. If this study was repeated in a college environment, it could run a longer period of time running across semesters ending at the same point in a semester as the study began, which might obviate some of the academic influences. Furthermore, a larger, more diverse sample size and possibly longer measures would enhance the study.

Future Research

Future research could examine the construct of gratitude further by seeing if using multiple measures for gratitude would result in a more normal distribution rather than one that is highly skewed, as we found with the GQ-6 in the current study. It may also be possible that gratitude is something that most people already have high amounts of and do not need to improve upon. It is strange that an intervention focused on gratitude would not result in change in gratitude. It is important for future researchers to look at the effects of positive psychology interventions in more detail. The current studies findings suggest that well-being, distress, and interpersonal connectedness are multidimensional and that a positive psychology exercise such as the current study's may differentially affect the various aspects.

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