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# Framing gratitude journaling as prayer amplifies its hedonic and eudaimonic well-being, but not health, benefits

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## ABSTRACT

Gratitude is commonly practiced as prayer, but experimental studies testing the ability of gratitude journaling interventions to increase well-being have only examined secular forms of thanksgiving. We hypothesized that framing gratitude journaling as prayer would amplify its well-being effects. Undergraduate participants ( $N = 196$ ) were instructed to write 10 things for which they were grateful once a week for five weeks. Participants were randomly assigned to read their thanks aloud to themselves, read their thanks to another person, or pray their thanks aloud to God. Participants in the prayer condition experienced a decrease in negative affect, and participants in the prayer condition who also exerted high effort demonstrated gains in gratitude, positive affect, and hope. Results indicate that the prayer condition may have led to increased health symptoms. Non-significant effects for the social condition suggest that the mechanisms explaining the effects of prayer are related to the theistic and sacred elements of prayer rather than its social features.

## ARTICLE HISTORY

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## KEYWORDS

Gratitude; prayer; well-being; hope; journal; gratitude to God

The practice of gratitude has traditionally been embedded in religious systems and rituals. The sacred texts of nearly all major faith traditions espouse the importance of expressing gratitude to God (Lundberg, 2010), and many religious festivals feature thanksgiving as a central theme (e.g. Jewish festival of Sukkot, Muslim festival of Eid Al-Fitr). Most world religions extol gratitude as a desirable trait (Emmons & Crumpler, 2000), and many people naturally experience feelings of gratitude in response to a deity. In a study where participants were given 50 emotional words to describe feelings toward God, gratitude was the second most frequently chosen term (Samuels & Lester, 1985).

Prayer, in particular, may be a religious practice that is replete with elements of gratitude. Researchers analyzing the frequency of gratitude expression in prayer found that amongst 219 features of prayer, “thanking” was most frequently mentioned by participants after the concept of “God” (Lambert, Graham, & Fincham, 2009). Similarly, prayers of thanksgiving were found to be the second most common type of prayer practiced by college students (McKinney & McKinney, 1999). Given that 6 in 10 of American adults pray at least once a day (Pew Research Center, 2007), prayers of thanksgiving are a common occurrence.

Despite the historical and empirical connections between gratitude, religion, and prayer, the science of gratitude has largely separated the practice of gratitude

from its religious roots. A few studies have examined the well-being effects of gratitude toward God (Krause, 2006; Rosmarin, Pirutinsky, Cohen, Galler, & Krumrei, 2011), and other studies have examined the effects of prayer on well-being (e.g. Lambert, Fincham, Braithwaite, Graham, & Beach, 2009). However, previous research has not examined the effects of framing gratitude exercises as practices of prayer rather than psychological activities devoid of religious meaning.

## Gratitude interventions and well-being

Experimental studies have demonstrated the benefits of engaging in gratitude practices, especially the practice of journaling about things for which one is grateful. Both college students and adults with neuromuscular diseases assigned to engage in weekly gratitude journaling exercises experienced increases in well-being outcomes compared to control participants (Emmons & McCullough, 2003). Similarly, a gratitude journaling intervention administered to an internet sample of middle-aged adults led to increases in happiness and decreases in depression that were sustained for six months (Seligman, Steen, Park, & Peterson, 2005). Experimental studies have also shown that gratitude journaling is able to reduce clinical symptoms to the same extent as more traditional thought regulation tasks, and gratitude journaling is more likely to be

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sustained over time (e.g. Geraghty, Wood, & Hyland, 2010). Gratitude practices have even been found to increase well-being in children and adolescents. Early adolescents assigned to a gratitude journaling condition (vs. a hassles or neutral condition) experienced enhanced gratitude, optimism, life satisfaction, and decreased negative affect (Froh, Sefick, & Emmons, 2008).

Research has also shown that the well-being effects of gratitude journaling are dependent upon how people approach the activity. Lyubomirsky, Dickerhoof, Boehm, and Sheldon (2011) found that gratitude journaling led to greater increases in well-being when participants self-selected into a study presented as testing happiness interventions (rather than the same study presented as testing cognitive exercises) and when participants continued to invest effort into the activity over time. In fact, participants who invested little effort into the study activities did not experience any changes in mood, life satisfaction, or happiness as a result of the gratitude condition whereas participants who invested average or high levels of effort experienced increases in well-being. However, effort alone was not a predictor of increased well-being. Participants in the control condition who exhibited moderate to high levels of effort did not experience any increases in well-being. Lyubomirsky and colleagues concluded that participants need both a “will” (i.e. effort and motivation) and an appropriate “way” (i.e. effective intervention) to increase well-being.

Although these studies have been able to establish the effectiveness of gratitude journaling, they have not examined counting blessings in the framework through which it is arguably most commonly practiced – as prayers of thanksgiving. Lyubomirsky et al.’s work (2011) demonstrated that the perceived purpose of gratitude practice (in their study, as a happiness intervention or cognitive exercise) can affect its well-being effects, so it is possible that framing gratitude journaling as prayer versus a psychological exercise will affect the intervention’s effectiveness. The question is, then, how will framing activities as prayer affect their effectiveness? Literature related to expressions of gratitude to God through prayer, the effects of prayer on well-being, and goal sanctification provide more specific expectations for how framing gratitude journaling as prayer might affect well-being.

## **Gratitude to God through prayer**

### ***Gratitude toward God and well-being***

Gratitude has been conceptualized by researchers as a moral barometer in that it is an emotion that marks having received intentional benefits from a benefactor (McCullough, Kilpatrick, Emmons, & Larson, 2001). By this

definition, gratitude is more naturally expressed and cultivated when it has an object who is an agent – a someone to whom a person is grateful (McCullough, Emmons, & Tsang, 2002). McCullough et al. (2002) theorize that spiritually inclined people are more apt to attribute gratitude to a nonhuman agent (i.e. God) for experiences in nature or other circumstances in which an active human agent cannot receive the thanks, and their subsequent findings show that spiritual transcendence is related to daily experiences of gratitude and positive affect (McCullough, Tsang, & Emmons, 2004). Other researchers have replicated this finding that more religious people across diverse religious traditions (Christian, Muslim, Hindu, Buddhist, and Jewish participants from 49 nations) rate themselves more highly in both the experienced and desired levels of gratitude, and manipulating the salience of religious identity increases the experience of gratitude (Kim-Prieto & Diener, 2009).

In addition to potentially providing more opportunities to experience gratitude, expression of gratitude to God has been shown to have well-being and health effects beyond generalized gratitude. In a correlational study of 405 diverse adults, participants with strong religious commitments who experienced gratitude to God had better mental health and higher well-being than less religious participants who experienced only general gratitude (Rosmarin et al., 2011). Similarly, gratitude toward God buffered against the negative effects of stress (i.e. living in a deteriorated neighborhood) on health declines in older women (Krause, 2006). Gratitude to God was also found to be associated with both lower depressive symptoms and physical health symptoms in a sample drawn from the U.S. Congregational Life Survey, though the effect size for the relation with depressive symptoms was higher than health symptoms (Krause, Hayward, Bruce, & Woolever, 2014). Moreover, gratitude to God was associated with lower hemoglobin A1c, which indicates healthier blood sugar control, in women (but not men; Krause, Emmons, Ironson, & Hill, 2017).

Likewise, findings from the Landmark Spirituality and Health Survey indicate that gratitude to God is associated with higher levels of hope, which was associated with higher self-rated health and lower physical symptoms (Krause, Emmons, & Ironson, 2015). Moreover, church attendance, spiritual support, and a benevolent image of God were associated with higher levels of gratitude to God. Surprisingly, the researchers in this study found that spiritual support was associated with more symptoms of physical illness.

However, not all studies support the beneficial role of gratitude to God beyond the effects of general gratitude. In a sample of Iranian undergraduates with primarily Muslim affiliations, gratitude to God explained additional

variance only in depression symptoms after controlling for disposition gratitude; gratitude to God was not a significant predictor of life satisfaction, anxiety, or health symptoms after controlling for general gratitude (Naser & Tabik, 2013).

Qualitative research has revealed that many people attribute positive life outcomes and their ability to grow from adverse circumstances as a foundation of their ability to give thanks to God. Interviews with 21 geriatric patients revealed that over a lifetime, gratitude toward God enabled participants to experience growth, be resilient in hardships, help others, be more emotionally open, and have peace of mind (Krause, Evans, Powers, & Hayward, 2012). Similarly, analysis of 199 narratives collected from adult participants with neuromuscular diseases led Emmons and Kneezel (2005) to conclude that spirituality enables those who suffer to reflect with thanksgiving on their lives.

### **Gratitude and prayer**

In addition to studies looking at the relation between gratitude to God and well-being, several studies have examined the connection between prayer and gratitude. Prayer can be broadly defined from a psychological perspective as “every kind of inward communion or conversation with the power recognized as divine” (James, 1902, p. 352). Prayer is the primary way to express gratitude to God in many religious traditions, and thanksgiving is one of the most frequently cited forms of prayer in empirical studies (Laird et al., 2011). Gratitude is one of the most common themes of practiced prayer in addition to being one of the most frequently used words to describe religious life (Barusch, 1999; Pixley & Beekman, 1949).

For many people, the act of praying naturally leads to the experience and expression of gratitude. People randomly assigned to pray for four weeks reported higher levels of gratitude than people who wrote positive things about their partners (Lambert, Fincham, Braithwaite, Graham, & Beach, 2009). This study demonstrates that for many people, prayer automatically activates the expression and experience of gratitude – even more than an intervention that specifically asks people to notice positive qualities of a close other. It seems, then, that prayer and gratitude are intricately connected.

### **Prayer and well-being**

Beyond the evidence that prayer increases gratitude and that gratitude toward God is related to well-being, studies examining the effects of prayer on well-being have determined that engaging in prayer increases well-being and that prayers of thanksgiving predict higher levels of well-being than other types of prayers.

### **General prayer and well-being**

Prayer has both mental and physical health benefits for those who engage in the practice. For instance, prayer has been shown to evoke feelings of inner strength and rest (Bänziger, van Uden, & Janssen, 2008; Janssen, de Hart, & den Draak, 1990) as well as stimulate psychoneuroimmunologic pathways in the brain, which may improve immune system functioning (McCullough, 1995). In a study examining religious coping in African Americans, prayer regulated negative emotions by making problems seem less overwhelming, diverting attention from problems, and providing a schema through which to interpret those problems (Ellison & Taylor, 1996). These three mechanisms led to a minimization of stress and its resulting physical manifestations.

Expectations about how prayer works and how God responds often moderate the effects of prayer on health and well-being. In one study, older people who believe God answers prayers in the best time and way had greater self-worth than those who believe prayers are answered immediately and the way they want (Krause, 2004). Moreover, these effects were heightened for African American compared to Caucasian participants.

### **Well-being effects specific to prayers of thanksgiving**

Prayer of thanksgiving is only one of the various types of prayer that people practice (Ladd & Spilka, 2002; Laird, Snyder, Rapoff, & Green, 2004). Researchers have found that well-being effects differ for the various types of prayer (Watts, 2001). For example, prayers of supplication have been correlated with higher levels of pain, anxiety, and depression in chronic pain patients (Andersson, 2008). In contrast, prayers of thanksgiving have been negatively correlated with depression and anxiety and positively related to hope in patients with rheumatoid arthritis (Laird et al., 2004). Watts (2001) further dissected the distinct effects for the different types of prayer and postulated that prayers of thanksgiving are beneficial because they free the person from personal attribution of failures and successes, therefore protecting them from the negative outcomes of pride and shame.

### **Prayer and hope**

An increase in hope has been identified as an important correlate of prayer (Laird et al., 2004; Snyder, 2000; Wnuk & Marcinkowski, 2014). For instance, prayers of adoration and thanksgiving were positively correlated with hope in arthritis patients (Laird et al., 2004). In another study, hope mediated the relation between religious behaviors

(i.e. prayer and church attendance) and well-being outcomes (Wnuk & Marcinkowski, 2014). Prayer may provide people with a greater sense of agency as they manage life challenges because they become aware of spiritual resources available to them and begin to trust that God will help them to solve problems. Prayers of gratitude, in particular, may instill hope because people become aware of the good gifts that have previously been provided by God, which leads them to believe that additional gifts will be coming in the future. Although previous research has found positive correlations between prayer and hope, no studies have demonstrated that increases in prayer produce increases in hope.

## Research goals and hypotheses

Clearly gratitude and prayer both have an impact on well-being, but no experimental evidence has directly tested the benefits of expressing gratitude through prayer compared to non-spiritual expressions of gratitude. Thus, we tested whether framing gratitude journaling as a prayer practice led to different well-being outcomes than when the practice was framed as a psychological exercise. In light of previous research, we hypothesized that gratitude journaling framed as prayer would lead to greater increases in gratitude, subjective well-being (i.e. higher life satisfaction, lower negative affect, higher positive affect), and hope, as well as decreases in health symptoms, as compared to non-prayer-based gratitude journaling.

Several mechanisms may underlie the hypothesized effects of praying one's thanks. First, prayers of gratitude may lead to greater gains in well-being compared to gratitude journaling through the process of sanctification. Sanctification is the psychological process through which aspects of life are perceived by people as having spiritual character and significance (Emmons, 2005). Researchers have found that when people imbue their goals or strivings with spiritual meaning they pursue those goals with more effort, derive a greater sense of meaning and satisfaction from those goals, and experience more favorable outcomes related to the achievement of those goals (Pargament & Mahoney, 2005). Additionally, sanctification of goals is correlated with lower levels of anxiety, depression, and hostility (Tix & Frazier, 2005). Similarly, it may be that when people imbue their expressions of thanks with sacred meaning through prayer, they will be more heartfelt in their thanks, derive a greater sense of meaning from the practice, and may experience greater gains in well-being as a result of the thanksgiving practice.

Moreover, sanctification of thanks may reorient people to what is transcendent and ultimately important in life. Praying gratitude may imbue the practice of giving thanks with a sacredness that confers the power to organize

experience, afford meaning, and promote well-being that is absent in non-sacred practice (Mahoney & Pargament, 2005). Religion and spirituality have long been recognized as offering a unifying philosophy of life that can serve as an integrating force for the individual (Allport, 1950; Emmons, Colby, & Kaiser, 1998). Pairing an activity (gratitude journaling) that increases positive emotions and well-being with an activity (prayer) that can promote a unified sense of self and meaning is likely to amplify well-being effects.

It is also possible that the social nature of prayer augments the positive effects of the gratitude practice. In many of the gratitude journaling studies, participants are asked to keep a private journal of the things for which they are thankful. However, gratitude is a social emotion and highly relational. The emotion of gratitude may reach its fullest expression when it is shared with others, motivating and reinforcing prosocial behavior (Emmons & Crumpler, 2000; McCullough et al., 2001). Moreover, research has shown that positive experiences are experienced as more enjoyable when they are shared with others (Boothby, Clark, & Bargh, 2014). Thus, it may be that praying one's thanks versus journaling about them privately is more effective because the thanks are actually expressed to another "person" (i.e. God as a divine entity attributed personhood).

In light of this possibility, we sought to differentiate the effects of prayer attributable to the interaction with a divine figure from interaction with any agent. To do this, we added an experimental condition wherein participants were asked to share their gratitude list with another human who was close to them. Thus, we could test whether saying thanks to a divine other differs from saying thanks to a human other. We hypothesized that interaction with the divine other would be the defining feature of prayer that promotes well-being, but we also tested the possibility that interacting with another person when practicing gratitude leads to amplified well-being effects compared to a private gratitude practice.

In addition to demonstrating that the framing of gratitude journaling can affect its impact on well-being, Lyubomirsky et al. (2011) found that investment of effort was an important moderator of the effectiveness of gratitude interventions. Thus, we include moderation by effort in our analyses. We hypothesize that higher effort in combination with assignment to the prayer framing condition will predict the greatest increases in well-being.

## Method

### Participants

Participants were 196 emerging adults recruited from a private Christian university in Southern California. The students were recruited through freshman level psychology

and writing courses. Participants were 18–23 years old ( $M = 18.35$ ,  $SD = 0.42$ ). The majority of participants classified themselves as Caucasian/white ( $n = 131$ ; 66.8%), followed by Latino/a ( $n = 29$ ; 14.8%), Asian/Pacific Islander ( $n = 18$ ; 9.2%), Other ( $n = 11$ ; 5.6%), African-American ( $n = 3$ ; 1.5%), and Middle Eastern ( $n = 2$ ; 1%). Two participants did not report their ethnicity. The participants were primarily female (88.4%). Most participants (74.5%) endorsed Christian/Protestant ( $n = 146$ ) as their religion. Participants also endorsed their religion as Christian/Catholic (12.2%;  $n = 24$ ), Other (7.7%;  $n = 15$ ), and Jewish (0.5%;  $n = 1$ ). At the time of post-test, the number of participants was 102, an attrition rate of 48.0%. Those who attrited were not significantly different from those who completed the study on demographic factors or the variables measured (i.e. life satisfaction, affect, health symptoms, gratitude, hope). Moreover, attrition did not differ based on the experimental condition to which the participant was assigned. Although the attrition rate was high, it is important to note that the only incentives offered in the study were two opportunities to win \$100 at the completion of the entire study, selected through a random raffle process. Only participants who participated in at least one week of the intervention ( $n = 102$ ) were included in analyses; participants who did not engage in the intervention for any of the weeks were removed as non-compliant. Of the participants included in the analyses, 33 were in the just journaling condition, 37 were in the social journaling condition, and 31 were in the prayer journaling condition.

### Procedure

Participants were randomly assigned to an intervention condition that varied by type of journaling (Just Journaling, Social Journaling, Prayer Journaling). The data were collected and interventions administered via Qualtrics, a professional survey platform. All participants took an initial pre-test survey and then were asked to engage in their assigned journaling exercise once a week for five weeks. Participants were sent a Qualtrics survey for each week of the journaling and asked to write their journal response within three days of receiving the survey. Participants were assigned weekly gratitude journaling rather than daily journaling given previous research suggesting gratitude journaling might have a stronger impact when practiced on a weekly basis (Lyubomirsky, Sheldon, & Schkade, 2005). One week after completing their final journaling exercise, participants were asked to complete a post-test survey, which included the same physical and psychological well-being questionnaires administered at pre-test.

### Just journaling condition

In the Just Journaling condition, participants were asked to list 10 things from the past week for which they were grateful or thankful and then read the list aloud to themselves.

### Social journaling condition

In the Social Journaling condition, participants were asked to list 10 things from the past week for which they were grateful or thankful and then read the list aloud to a best friend or significant other.

### Prayer journaling condition

In the Prayer Journaling condition, participants were asked to list 10 things from the past week for which they were grateful or thankful and then read the list aloud to God.

In both the Just Journaling and Social Journaling conditions, participants were told that they were participating in a journaling activity, but in the Prayer Journaling condition, participants were told that they were participating in a prayer practice. All other introductory instructions were held constant across conditions.

### Measures

Participants completed questionnaires assessing life satisfaction, affect, health symptoms, gratitude, and hope. Cronbach's alphas for all measures were acceptable ( $\alpha > 0.70$ ).

### Satisfaction With Life Scale

The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item scale that measures global satisfaction with life. Participants rated items such as "In most ways, my life is close to my ideal" on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

### Positive and Negative Affect Schedule

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item scale comprised of two subscales, one which measures positive affect (e.g. "excited", "enthusiastic"), and the other which measures negative affect (e.g. "distressed", "angry"). Each affect item was rated on a 5-point Likert scale (1 = *very slightly or not at all* to 5 = *extremely*) indicating how intensely the person felt that way during the past week.

### Health Questionnaire

Participants were administered 27 items regarding health symptoms from the Health and Lifestyles Questionnaire (HLQ; e.g. runny/congested nose, shortness of breath, headaches, chest pain). Participants were asked to rate the extent to which they experienced each symptom within

the last week on a Likert scale (1 = *very slightly or not at all* to 3 = *moderately* to 5 = *extremely*).

### Gratitude Questionnaire 6-item

The Gratitude Questionnaire 6-item scale (GQ-6; McCullough et al., 2002) was used to assess participants' levels of trait gratitude. Participants were asked to rate on a Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) items such as, "If I had to list everything that I felt grateful for, it would be a very long list."

### Hope

The Hope Scale (Snyder et al., 1991) was used to measure dispositional hope. This 8-item measure (the original 12 items minus the 4 distracter items) included items measuring pathways to meet goals (e.g. "I can think of many ways to get out of a jam") and items measuring agency (e.g. "I energetically pursue my goals" or "My past experiences have prepared me well for my future"). Items were rated on an 8-point Likert scale (1 = *definitely false* to 8 = *definitely true*).

### Effort

Effort on the intervention was operationalized as the number of weeks the participants completed their assigned gratitude exercise by listing the ten thanks, following their condition specific instructions, and submitting their responses for the week on Qualtrics. Given that the distribution for effort was bimodal, we dichotomized the effort variable. Participants who completed three or more weeks of the intervention were coded with a one for high effort, and participants who completed less than three weeks of the intervention were coded with a zero for low effort. Only participants who completed at least one week of the intervention were included in the analyses.

## Results

The data were examined for outliers and adherence to assumptions of normality. Due to substantial negative skewedness in the distributions, gratitude, health symptoms, and life satisfaction scores were reverse log transformed for analyses.

### Testing for main effects for change over time for all participants and by condition

Table 1 displays the descriptive statistics for the main study variables (i.e. well-being, virtues, health, emotions) without consideration of intervention condition. Repeated measures ANOVAs were used to determine whether there was significant change over time for all participants in the study on each of the variables. Participants demonstrated

**Table 1.** Descriptive statistics for the main study variables and results of repeated measures ANOVA.

Study variable	Pre-		Post-		Repeated measures ANOVA		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> (100)	<i>p</i>	$\eta_p^2$
Gratitude <sup>a</sup>	6.20	0.76	6.27	0.83	2.72	0.10	0.03
Life satisfaction <sup>b</sup>	5.18	1.21	5.42	1.22	4.57	0.04	0.05
Health symptoms <sup>c</sup>	1.52	0.38	1.54	0.39	0.42	0.52	0.00
Hope	6.22	1.04	6.29	1.00	0.48	0.49	0.01
Negative affect	2.03	0.65	1.83	0.65	9.41	<0.01	0.09
Positive affect	3.52	0.62	3.31	0.81	7.35	<0.01	0.07

<sup>a</sup>*M* = 0.23, *SD* = 0.16 for Pre-; *M* = 0.20, *SD* = 0.18 for Post- with Reverse Log Transformation.

<sup>b</sup>*M* = 0.41, *SD* = 0.18 for Pre-; *M* = 0.37, *SD* = 0.20 for Post- with Reverse Log Transformation.

<sup>c</sup>*M* = 0.17, *SD* = 0.10 for Pre-; *M* = 0.17, *SD* = 0.10 for Post- with Reverse Log Transformation.

a general increase in life satisfaction and general decreases in negative affect and positive affect, with 95% CIs for difference [0.003, 0.09], [-0.34, -0.07], and [-0.37, -0.06], respectively. These effect sizes were moderate (see Table 1).

Next, each intervention group (Just Journaling, Social Journaling, Prayer Journaling) was added to the repeated measures models to test whether there would be a change in outcomes based on the type of journaling participants completed without consideration of any moderator variables. There was a significant interaction of intervention condition and time for two variables in the repeated measures ANOVA: negative affect,  $F(1, 98) = 3.47, p = 0.04, \eta_p^2 = 0.07$ , and health symptoms,  $F(2, 93) = 4.71, p = 0.01, \eta_p^2 = 0.09$ . There were no differences in change over time based on condition without moderation in the repeated measures ANOVAs for life satisfaction,  $F(1, 95) = 0.14, p = 0.87$ ; positive emotions,  $F(1, 98) = 0.11, p = 0.89$ ; gratitude,  $F(1, 97) = 0.85, p = 0.43$ ; or hope,  $F(1, 93) = 0.59, p = 0.56$ .

Regarding the significant interaction of time and condition for negative affect, none of the post-hoc comparisons were significant, but examination of the means across time for the three conditions indicates that the decrease in negative affect is larger for the Prayer Journaling condition than the other two conditions. The mean of negative emotions for Just Journaling at pre-test was  $M = 1.87$  and  $M = 1.81$  at post-test. For Social Journaling, the mean at pre-test was  $M = 1.91$  and at post-test was  $M = 1.83$ . For Prayer Journaling, the mean at pre-test was  $M = 2.14$  and  $M = 1.68$  at post-test. This highlights the ways in which praying thanks may have acted as a buffer against negative emotions.

**Table 2.** Regressions on well-being outcomes, health symptoms, hope, and gratitude.

Predictor	Dependent variable at post-test ( $\beta$ )					
	Post-test positive affect	Post-test negative affect	Post-test life satisfaction	Post-test health symptoms	Post-test hope	Post-test gratitude <sup>a</sup>
Step 1						
Pre-test scores of DV	0.42**	0.45**	0.41**	0.50**	0.61**	0.59**
$\Delta R^2$	0.17	0.20	0.17	0.27	0.37	0.35
Step 2						
Effort	0.02	-0.06	-0.05	-0.04	-0.08	0.19*
Prayer journaling	0.01	-0.16	0.11	0.16	-0.01	0.02
Social journaling	-0.01	0.04	-0.07	-0.08	0.07	0.09
$\Delta R^2$	0.00	0.04	0.01	0.04	0.01	0.04
Step 3						
Effort*Prayer journaling	0.64*	-0.07	0.20	-0.46	0.53 <sup>b</sup>	0.70**
Effort*Social journaling	-0.21	0.04	-0.10	-0.26	-0.31	-0.11
$\Delta R^2$	0.07	0.00	0.01	0.03	0.04	0.06

Notes: Post-test variables (positive affect, negative affect, life satisfaction, health symptoms, hope, and gratitude) are regressed on the dependent variable at pre-test in Step 1; on effort, praying journaling, and social journaling in Step 2; and on the interaction terms for the two conditions and effort in Step 3.

<sup>a</sup>Coefficients are displayed as raw scores for gratitude to increase interpretability of effects. The same effects were found for reverse log transformed scores.

<sup>b</sup>Although the interaction term only approached significance at the  $p < 0.05$ , the interaction was significant when the social journaling condition and interaction term were dropped from the equation,  $\beta = 0.59$ ,  $p = 0.02$ , 95% CI [0.19, 2.43].

\* $p < 0.05$ ; \*\* $p < 0.01$ .

Similar to negative affect, none of the post-hoc comparisons for health symptoms were significant. Examination of the means indicates that participants in the prayer condition had an increase in health symptoms whereas those in the other conditions did not appear to change. The mean of health symptoms for just journaling at pre-test and post-test was  $M = 0.17$ . The mean for social journaling was  $M = 0.19$  at pre-test and  $M = 0.17$  at post-test. The mean for prayer journaling was  $M = 0.14$  at pre-test and was  $M = 0.19$  at post-test. However, it is important to note that there non-significant trend in the data such that participants who prayed their gratitude reported fewer health symptoms at the beginning of the study than the other conditions ( $p = 0.07$ ), perhaps resulting in a regression to the mean.

### **Moderation of intervention level of participation**

Given previous findings that effort is an important moderator of gratitude journaling activities, we tested whether effort moderated the effects of the journaling conditions on change in well-being. Hierarchical linear regression analyses were conducted to predict post-test scores of outcome variables (i.e. post-test scores on well-being, hope, health symptoms) controlling for pre-test scores of those variables (i.e. pre-test scores on well-being, hope, health symptoms) in step 1 of the regressions. In step 2 of the regression, dummy coded variables indicating social journaling and prayer journaling (with just journaling as the baseline condition) as well as the dichotomous effort variable (0 = completed exercises 1–2 weeks, 1 = completed exercises 3–5 weeks) were entered into the equation. In

step 3, the interaction terms multiplying dummy coded prayer journaling by effort and dummy coded social journaling by effort were entered.

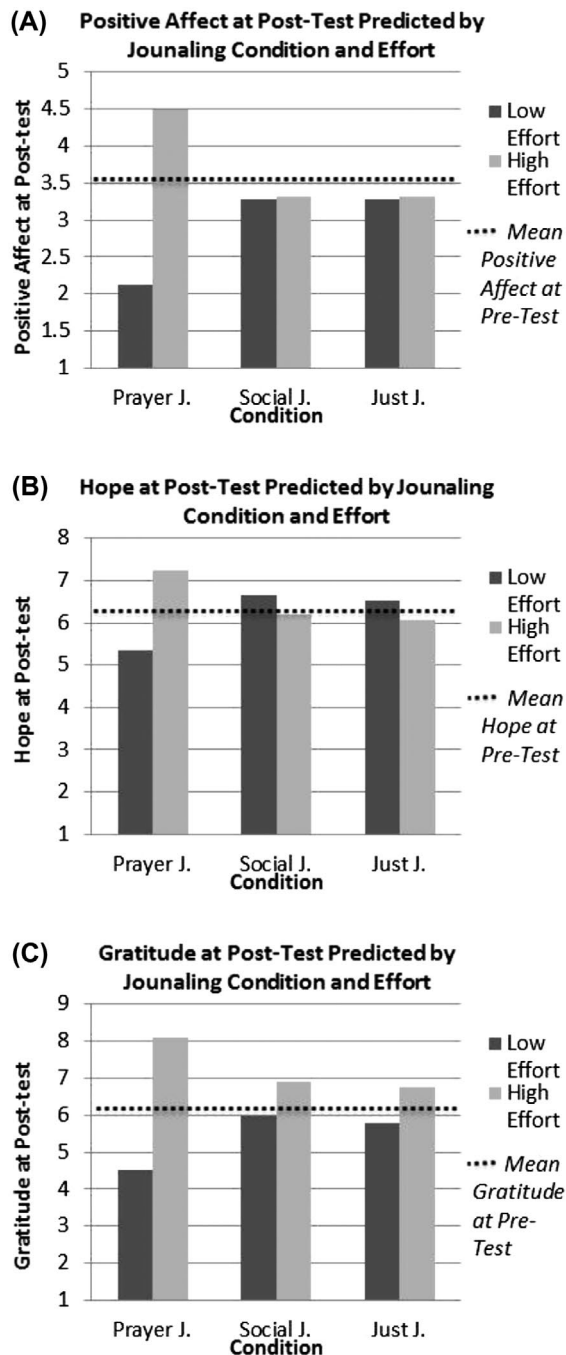
As can be seen in Table 2, significant moderation effects for effort and prayer journaling were found for positive affect and gratitude with 95% CIs [0.16, 2.19] and [0.41, 2.19] respectively. Although the interaction term (prayer journaling \* effort) for hope only approached significance at the  $p < 0.05$  level in the regression displayed in Table 2, 95% CI [-0.01, 2.37], the interaction was significant when the social journaling condition and interaction term were dropped from the equation,  $\beta = 0.59$ ,  $p = 0.02$ , 95% CI [0.19, 2.43]. This indicates that the interaction of prayer and effort is significant compared to the other two conditions rather than only the Just Journaling condition. No significant main effects or moderation effects were found for negative affect, life satisfaction, or health symptoms in the regression analyses.

Figure 1 displays graphical depictions of the interaction effects for (a) positive affect, (b) gratitude, and (c) hope. For all three variables, when participants were in the prayer journaling condition and exhibited high effort, they experienced increases in positive affect, gratitude, and hope. However, if they were in the prayer journaling condition and exhibited low effort, they experienced a decrease in positive affect, gratitude, and hope.

### **Discussion**

As predicted, participants in the prayer condition who also exerted high effort demonstrated gains in gratitude, positive affect, and hope. Although not significant in the





**Figure 1.** Effort moderates the effect of the prayer journaling condition on changes in (a) positive affect, (b) gratitude, and (c) hope.

regression analyses, the repeated measures ANOVA predicting change in negative affect indicated that there was a significant interaction between time and condition, and the descriptive statistics indicate that participants assigned to the prayer condition experienced a greater decrease in negative affect than the other two conditions. Likewise, the repeated measures ANOVA predicting change in health symptoms indicated a significant interaction between time and condition, prayer, and the descriptive statistics indicate that

those in the prayer condition showed a greater increase in health symptoms.

Consistent with previous gratitude studies (Emmons & McCullough, 2003; Krause, 2006), life satisfaction increased and negative affect decreased for all participants who engaged in a gratitude intervention – regardless of condition (Prayer Journaling, Social Journaling, Just Journaling). There were benefits to practicing gratitude no matter how the intervention was framed. However, it was not until the gratitude practice was imbued with spiritual significance (i.e. prayer condition) that well-being effects extended beyond hedonic well-being outcomes (i.e. emotions and life satisfaction) to eudaimonic well-being outcomes (i.e. virtues of gratitude and hope). Moreover, the prayer framing amplified the well-being effects of gratitude practice on affect.

On average, all participants had a significant decrease in positive affect over the course of the study. This was somewhat unanticipated given Krause's (2006) research demonstrating that gratitude acts as a positive coping mechanism that buffers against stress. Although it is regularly observed that well-being decreases across the term for college undergraduates due to accumulating academic stressors and continuous evaluation (Ross, Neibling, & Heckert, 1999), we had originally anticipated that engaging in gratitude exercises would prevent our participants from experiencing this decline. Even though this was not found, it may be that the gratitude exercises prevented what would have been a larger decrease without intervention. Moreover, when gratitude exercises were framed as prayer and the participants exerted high effort, participants reported a small increase in positive affect. Whereas secular gratitude practice was not powerful enough to eliminate the typical decrease in low arousal positive affect for college students, gratitude practiced as prayer was able to prevent the loss.

Relatedly, it was also surprising that there was not a statistically significant increase in gratitude for the entire sample; instead, the increase in gratitude only approached significance. We had expected that all the participants would increase in gratitude because they all engaged in gratitude exercises. There are several potential explanations for why this effect only approached significance. First, it may be that gratitude only increased for participants who exerted higher levels of effort. In fact, effort was a significant predictor of change in gratitude in the regression analyses (see Table 2). Second, the gratitude measure was strongly skewed and exhibited ceiling effects. Even though the gratitude scores were transformed for analyses, it may be that there was still a restriction of variance that impacted finding main effects for change over time. Finally, it could be that gratitude practice must be framed in spiritual terms for participants in a religious setting to

lead to change in trait level self-assessments of dispositional gratitude.

A final unexpected finding from the study was the increase in health symptoms observed for participants in the prayer condition. Although previous studies have shown that gratitude practices increase physical health (Breslin & Lewis, 2008; Wood, Joseph, & Linley, 2007), our repeated measures ANOVA findings indicated that gratitude practice framed as prayer corresponded to a decrease in physical health. These results, however, should be interpreted with caution because no post-hoc tests were significant and the effect was not found in the regression analyses controlling for effort. It is important to note that participants who prayed their gratitude may have experienced fewer health symptoms at the beginning of the study than participants in the other conditions (although the difference only approach statistical significance at  $p = 0.07$ ). Their increase in health symptoms for participating in the prayer condition may have merely brought them up to the level of symptoms reported by participants in the other conditions.

### ***How does prayer amplify well-being benefits of gratitude journaling?***

Altogether, the study results demonstrate that framing gratitude journaling as prayer leads to some greater gains in hedonic and eudaimonic well-being outcomes when practiced regularly; however, prayer does not benefit physical well-being in this sample and may even have a negative effect on health. Focusing in the hedonic and eudaimonic well-being factors, what psychological mechanisms might or might not explain these effects?

#### ***General social mechanisms***

One explanation that can be ruled out is that the prayer condition was more effective because it added a social component to the gratitude activity. Previous research has shown that sharing experiences with others amplifies the enjoyability of activities (Boothby et al., 2014), and gratitude researchers have highlighted the social nature of gratitude (Emmons & Crumpler, 2000; McCullough et al., 2001). We had anticipated the possibility that practicing gratitude with another “person” – human or divine – is what would produce a boost in well-being. If this were the case, we would have also observed effects for the social journaling condition in which participants were asked to read aloud their gratitude list to another person. Instead, we found no significant effects for the social journaling condition. Reading aloud one’s gratitude lists to another person did not significantly differ from privately reading aloud one’s gratitude lists. Only when the gratitude lists

were frequently read aloud to God were enhanced well-being effects observed.

#### ***Thanking God as the ultimate benefactor***

We can conclude that prayer was not more effective because of its broad social components, but it is important to recognize that the social journaling condition did not perfectly replicate all the social aspects of the prayer condition. When participants prayed to God about their gratitude lists, it was reasonable for them to directly thank God for nearly all the blessings on the list. Even if God was not the main benefactor for a particular item (e.g. “I’m grateful my professor gave me an extension for my final paper”), participants could ultimately thank God for orchestrating the human events (e.g. “I thank God for influencing the professor to grant the extension”). In contrast, it is likely that when participants in the social journaling condition read aloud their lists to another person, many of the items could not be expressed as direct thanks to the person listening. Thus, one reason the prayer condition outperformed the other conditions when effort was high could be that it included a direct expression of thanks to the benefactor. This direct expression of thanks may have strengthened the participants’ relationships with God, which could lead to gains in well-being (Kirkpatrick & Shaver, 1992).

Would the same benefits be found if we had included a condition whereby participants directly thanked all the benefactors for the items they listed in their journals? This is an unanswered question, but it is clear that this would have been a time consuming and potentially difficult endeavor. Participants were grateful to a variety of people, and many benefits listed did not have a specific human benefactor (in which case thanking God would be the likely course of action). Prayer may be unique in that it allows people to thank one benefactor (God) with relative ease for a variety of benefits. Future studies should further compare the benefits of directly thanking human benefactors, directly thanking God as the “ultimate” benefactor, and sharing gratitude with a third party.

#### ***Sanctification of gratitude practice***

We originally anticipated that prayer might lead to greater gains in well-being than just journaling about thanks because it would activate participants to sanctify their gratitude expression. The fact that the prayer condition alone – not the social journaling condition – intensified the well-being effects of gratitude journaling when it was frequently practiced supports sanctification as a potential primary mechanism. Participants instructed to pray about their thanks likely assigned sacred meaning to the task. As has been found in previous research (Mahoney & Pargament, 2005; Pargament & Mahoney, 2005; Tix &

Frazier, 2005), the act of sanctifying gratitude practice may have stimulated participants to be more heartfelt in their thanks, derive a greater sense of meaning and satisfaction from the activity, and integrate the practice into other parts of their lives or identity.

Moreover, the practice of sanctifying thanks may have directly fostered a sense of transcendence or being connected with something beyond the self (in this case, God), which is associated with enhanced well-being (Piedmont, 1999). A feeling of connection to God, in particular, may have spurred an increase in hope. When people begin to account for all the ways they believe God has taken care of them in the past, they may anticipate that he will continue to provide for them in the future. This faith in God's provision likely provides a sense of agency and hope.

Additional evidence for the premise that sanctification may serve as the primary mechanism for prayer's effects is the finding that participants in the prayer condition who exerted low effort actually showed a small decrease in positive affect, gratitude, and hope (see Figure 1). Research on sanctification has found that failures or violations related to goals, relationships, or objects viewed as sacred lead to greater negative affect, more negative health symptoms, and poorer psychological health (Mahoney et al., 2002, 2005; Pargament, Magyar, Benore, & Mahoney, 2005). It may be that when participants failed to exert effort in an activity framed as prayer, they experienced a decrease in well-being because they were failing in an activity that was imbued with sacred meaning.

However, it is important to recognize that we did not directly test levels of sanctification in this study, so we are unable to make any firm conclusions regarding the role of sanctification in the effects of the prayer condition. Instead, these potential pathways should be interpreted as speculative and fodder for future inquiry.

### **Limitations and future directions**

Although this study makes a contribution to the literature on prayer and gratitude, several limitations constrain the interpretation of effects, and there are still many questions to be investigated. First, the constitution of the sample limits the generalizability of effects, but it also enhances their internal validity. The sample was drawn from students at a Christian undergraduate institution, and 87% of participants were Protestant or Catholic. The sample was intentionally chosen because we wanted to ensure that the participants would be accustomed to praying and would be engaged in prayer to a monotheistic God to reduce variability of practice. In some ways, this sample provided the opportunity for a more stringent test of effects given that many participants were already regularly engaged in prayer. Any effects of the prayer condition should be

interpreted as the effects of praying thanks above and beyond regular prayer practice. It may be that participants in the non-prayer journaling conditions prayed their thanks as an aspect of their typical prayer practice, so findings should be interpreted as the effects of additional prayers of thanksgiving. Future studies should assess regular prayer behaviors in order to include these as control variables.

Although limiting the sample to a Christian group increased internal validity, we cannot assume that effects will be the same for a non-Christian sample. In particular, the well-being benefits of praying thanks may differ in the context of religions that do not have a personal, monotheistic God. Although we would anticipate sanctifying thanks will still amplify well-being for non-monotheists, praying thanks may not comprise directly thanking the benefactor for these individuals. Future studies should examine how the well-being effects of praying thanks in diverse religious contexts converge and diverge.

It is also unknown how a prayer intervention might affect participants who are only nominally religious or spiritual. It could be that the prayer framing may only be effective in people for whom prayer fits into their broader meaning system and social context, but it could also be that the prayer framing is most effective in those who do not regularly pray because it provides new spiritual resources. Participant religiosity/spirituality should be examined as a potential moderator of prayer's effects in future research.

Another direction for future research is further exploration of the mechanisms that underlie the effects of praying thanks. Although we were able to rule out general social interaction with another "person" (human or divine) as the means through which prayer amplifies the effects of gratitude journaling, we did not directly test whether participants in the prayer condition sanctified their thanks or felt that they directly thanked benefactors more than participants in the other conditions. In addition to directly testing mediation by these variables, researchers could also consider other mechanisms of prayer. For instance, Richardson and Schnitker (2018) are investigating whether praying thanks changes the content of gratitude lists. Perhaps when people are instructed to pray, they are more likely to focus their gratitude reflection on the types of benefits that are more important for well-being (e.g. relationships rather than material possessions).

Finally, researchers should continue conducting experimental studies to determine whether the ability of prayer to amplify well-being effects is transferrable to other types of prayer. For many types of prayer, a secular counterpart can be conceptualized to parallel the cognitions involved sans the transcendent elements. For example, prayers of adoration are characterized by worship and admiration of

God (Laird et al., 2004). Rather than praying adoration to God, people could focus on admiring the moral goodness of another human, which is an intervention used to foster the emotion of elevation and subsequent prosocial behaviors (Algoe & Haidt, 2009). Would prayers of adoration have greater well-being and pro-social behavior effects compared to admiring the moral goodness of another in the same way that prayers of gratitude outperformed gratitude journaling? Likewise, prayers of confession involve recounting to God the transgressions one has committed. Many of the psychological aspects of confession prayers are mimicked in self-disclosure interventions (Frattaroli, 2006). Would the emotional effects of confessing wrongdoings to God differ from disclosing them in a journal or to another person? In this instance, it is likely that people's views of God as benevolent and forgiving versus harsh and punishing would moderate the results (Ironson et al., 2011).

## Conclusion

Clearly, much remains to be explored to wholly understand the effects of prayer on well-being, gratitude, and other moral emotions. However, these initial findings that frequently practiced prayers of gratitude lead to greater gains in hedonic and eudaimonic well-being than non-religious gratitude practice will help to forge a more thriving line of inquiry. Although the present findings are mixed, with positive effects for psychological indicators and a potential negative effect for health symptoms, they indicate that it is important to attend to the impact of prayer and religion in the assessment of positive psychological interventions.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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