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Within-Person Relationships Among Prayer, Well-Being, and Daily Events

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A Thesis presented to the Graduate Faculty
of the College of William and Mary in Candidacy for the Degree of
Master of Arts

Department of Psychology

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APPROVAL PAGE

This Thesis is submitted in partial fulfillment of
the requirements for the degree of

Master of Arts



David Benjamin Newman

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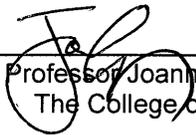


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ABSTRACT

Prayer is an important aspect of many people's daily lives; yet little is known about within-person relationships among prayer, daily events, and well-being. Over the course of two weeks, participants completed daily reports about their prayers, daily experiences, and well-being. Multilevel modeling analyses revealed that prayers of supplication and thanksgiving were the most frequently occurring types of prayers, followed by adoration and confession. Individuals were more likely to express prayers of thanksgiving and adoration when positive events occurred, were less likely to express prayers of thanksgiving when negative events occurred, and were more likely to express confession in their prayers when positive and negative events occurred. Highly religious participants were more likely than highly spiritual participants to pray, particularly thanksgiving and confession; individuals high in intrinsic religious motivation in contrast to those high in extrinsic religious motivation were also more likely to engage in all four prayer types. Daily prayers of supplication and confession were negatively related to well-being, whereas daily prayers of thanksgiving and adoration were positively related to well-being even after controlling for daily events. Daily rumination and guilt mediated the relationships between confession and well-being; lagged analyses revealed that negative deactivated affect led to confession, and confession led to positive deactivated affect the following day. Prayers of thanksgiving buffered the effect of negative events on negative deactivated affect. This repeated measures design has critically examined prayer at the within-person level of analysis and has provided initial empirical support for some of the theoretically proposed benefits of prayer.

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Within-Person Relationships Among Prayer, Well-Being, and Daily Events

Research has shown that there is a positive relationship between religious participation and subjective well-being (Diener, Tay, & Myers, 2011; Helliwell, 2003). This positive relationship remains even after controlling for life circumstances, and is relatively the same across the major world religions (Cohen, 2002; Diener et al., 2011). Of course, certain societal variables moderate this relationship. For example, religious participation relates more strongly to SWB in highly religious societies and in poorer nations, whereas there is either no relationship or even a slightly negative relationship in highly secular societies. Nevertheless, the key finding that there exists a positive relationship between religious involvement and well-being for many people across the globe merits attention.

Researchers have begun to explore potential explanations for this positive relationship. According to some evidence, religious participation enables one to find social support, close relationships, and meaning and purpose in life. In fact, social relationships were a greater predictor of life satisfaction than religiosity in one study (Diener & Seligman, 2002). According to terror-management theory, religion provides one with feelings of relief to the issue of mortality and meaninglessness (e.g., Greenberg, Solomon, & Pyszczynski, 1997; Norenzayan & Hansen, 2006). Religion also provides one with a coherent perspective and a way of integrating one's role with the larger world, ultimately fostering a sense of meaning in life (Baumeister, 1991). Additionally, religious practices may improve self-control, which subsequently promotes subjective well-being (McCullough & Willoughby, 2009).

Although many of these mediating variables have received empirical support, specific religious practices or behaviors may promote well-being directly. Religious behaviors include a wide range of activities such as meditation, baptism, church attendance, and fasting, and each practice may relate to well-being in various different ways. One specific type of religious practice that has gained increasing attention in recent years has been prayer (Masters & Spielmans, 2007; Spilka & Ladd, 2012).

Prayer and Well-being

Researchers have proposed several different psychological mechanisms associated with prayer that may explain how prayer could relate positively to well-being. For instance, prayer allows one to foster a connection or relationship with a divine being, and this close relationship increases well-being (Ellison, 1991; Ellison, Boardman, Williams, & Jackson, 2001). Prayer can also provide meaning, hope, optimism, and a sense of existential coherence (Worthington, Kurusu, McCollough, & Sandage, 1996). Moreover, prayer has a stress buffering effect and can act as a coping mechanism that indirectly promotes well-being by diminishing negative affect (Ellison et al., 2001; Hollywell & Walker, 2009; Masters & Spielmans, 2007; Spilka & Ladd, 2012). According to a cognitive-behavioral framework, prayer provides a means in which an individual can appraise life events and make sense of them (James & Wells, 2003). Relatedly, specific types of prayer may help people manage their emotions and self-control, ultimately improving their well-being (Sharp, 2010).

These theoretical models and proposed psychological mechanisms that describe potential relationships between prayer and well-being have provided useful frameworks to guide research. However, studies in this area have largely relied on cross-sectional

designs that measure prayer frequency and well-being. According to many of these studies, those who prayed frequently experienced greater levels of well-being. For example, in populations of Australian adults (Francis & Kaldor, 2002), Israeli Jewish adults (Levin, 2013), Muslims (Munir, Awan, Hamdani, & Nisar, 2012), and cancer patients (Gene Meraviglia, 2004), those who prayed more frequently experienced greater levels of happiness and psychological well-being. However, other studies have found no relationship between prayer frequency and well-being (see McCullough & Larson, 1999, for a review). In some studies, the positive relationship between prayer frequency and well-being disappeared after controlling for personality traits. In other studies, researchers simply found no significant relationship between prayer frequency and life satisfaction, or positive affect (Helm, Hays, Flint, Koenig, & Blazer, 2000), or sometimes even a negative relationship between prayer frequency and life satisfaction (Poloma & Pendleton, 1991). In fact, according to a meta analytic review that examined this relationship, Masters and Spielmans (2007) concluded that there was no significant relationship between prayer frequency and well-being. Instead, they argued that frequency of prayer is just the first question researchers might want to ask to address the relationship between prayer and well-being.

To gain a more complete understanding about the relationship between prayer and well-being, measures designed to assess the specific types of prayer are necessary. Poloma and Pendleton (1991) created one of the first widely used taxonomies by defining four types of prayer: colloquial, petitional, ritual, and meditative/contemplative. Poloma and Gallup (1991) used similar names for the same basic distinctions: conversational, recitations, meditation, and supplication. These prayer types were adapted from earlier

theoretical taxonomies proposed by Heiler (1966) and Pratt (1930). Petitional and ritualistic prayers related positively to negative affect, whereas colloquial and meditative prayers related positively to life satisfaction, happiness, and existential well-being.

McKinney and McKinney (1999) used a similar taxonomy by measuring four types of prayer that can be remembered by the acronym ACTS (adoration, confession, thanksgiving, and supplication), common in many denominations of Christianity.

Researchers gradually added new dimensions to these taxonomies, such as reception and obligatory prayer (Laird, Snyder, Rapoff, & Green, 2004; Whittington & Scher, 2010).

Confession and supplication related negatively to well-being, whereas adoration, thanksgiving, and reception related positively to well-being (Whittington & Scher, 2010).

Although other researchers have proposed additional prayer scales and taxonomies (e.g., Ladd & Spilka, 2002, 2006), the prayer types mentioned thus far cover many of the important findings and are advantageous over simple measures of prayer frequency. By defining prayer types, findings from recent studies have improved our understanding of the relationship between prayer and well-being.

Goals of the Present Study

The aim of the present study was to move beyond cross-sectional designs that have examined between-person differences in prayer and well-being. Although such studies provide useful information, they do not describe within-person relationships. Between-person relationships are statistically independent of within-person relationships (Nezlek, 2001) and can represent conceptually distinct psychological processes (Affleck, Zautra, Tennen, & Armeli, 1999). By employing an intensive repeated measures design, I was able to examine within-person relationships between daily prayer types and daily

well-being. An additional advantage of this type of study was the ability to examine the effect of daily events and experiences on daily prayers and well-being. Although 81% of Americans pray at least once a month and 58% pray daily (Pew Forum on Religion & Public Life, 2008), the within person relationships among prayer, well-being, and daily events have surprisingly not been examined. Thus, a daily diary study in which participants report their daily events, well-being, and prayers is an apt study design to examine these relationships.

Because this is the first diary study to examine these within-person relationships, many interesting questions and hypotheses emerged. Instead of relying on retrospective reports of prayer frequency, I was able to more accurately determine which prayer types occurred most frequently, when they were most likely to occur, which types of individuals were most likely to pray on a daily basis, and how specific daily prayer types related to daily well-being and daily events.

Hypotheses

I predicted that prayers of supplication and thanksgiving would occur most frequently, whereas prayers of confession and adoration would occur less frequently. Even among the non-religious individuals, people tend to pray in times of need and are likely to petition or ask for things in supplicatory prayer (Murray, Kendall, Boyd, Worth, & Benton, 2004). Thanksgiving would occur frequently simply because people think of expressing thanks when asked to name the words that are most easily or readily associated with prayer (Lambert, Fincham, & Graham, 2011). In fact, in a list of 74 prayer features, “thanking God” was listed third most frequently behind “God” and “talking to God.” Thus, people are likely to offer God thanks when they pray. Based on

findings at the trait-level that show that confession is the least frequently occurring prayer type (Laird et al., 2004), I expected that prayers of confession would be reported least often over a two week period. Prayers of confession are also uncomfortable by their very nature as they require one to examine the sins and mistakes one has made, likely leading to an aversion to confess. Prayers of adoration are conceptually distinct from prayers of thanksgiving because unlike thanksgiving, adoration is not based on daily situations or events, but rather on the nature of God. This type of prayer seems most likely to occur among the highly religious, whereas supplication and thanksgiving likely occur even among the non-religious. Therefore, adoration would likely not occur as frequently as supplication or thanksgiving.

In light of the definitions of these prayer types, I expected prayers of supplication and confession to occur more frequently when negative events occurred, whereas prayers of thanksgiving and adoration would likely occur more often when positive events occurred. Supplication is the act of asking for things in need, which likely occurs when negative events happen. For example, it seems likely that one would ask God for comfort or relief in response to a breakup with a boyfriend or girlfriend, or a poor grade on a test (e.g., “I pray that I will still pass the class”). Similarly, confession might occur when similar events occur if one is at fault for the negative event, such as a breakup. Positive events, on the other hand, likely provide one with a reason to offer thanksgiving to God in prayer. Although adoration is distinct from thanksgiving in that adoration does not address specific daily events that have occurred, daily positive events likely trigger prayers of thanksgiving, which in turn trigger prayers of adoration. Prayers of

thanksgiving likely remind people, especially religious individuals who normally pray, to also praise God's attributes and qualities.

An advantage of utilizing an intensive repeated measures design is that one can also measure individual differences in daily experiences through trait measures. Of particular relevance to this study are the measures of intrinsic and extrinsic religious motivation, quest religiosity and search for meaning in life, and spirituality and general religiosity. Gordon Allport distinguished an individual with intrinsic religious motivation (IRM) from one with extrinsic religious motivation (ERM) by stating that the former "lives his religion," whereas the latter "uses his religion" (Allport & Ross, 1967). The individual high in IRM sees religion as an end whereas the individual high in ERM views religion as a means to an end. In light of this distinction, I hypothesized that an individual high in IRM would be more likely to engage in all four prayer types compared to an individual high in ERM. Individuals high in ERM likely attend religious services and activities for the friendships and warm feelings associated with such events, and would likely not engage in prayers as often as they typically occur in private without immediate social benefits.

Following Allport's and Ross' conceptualization of intrinsic and extrinsic religious motivation, Batson and Schoenrade (1991) proposed a quest religiosity measure designed to assess the extent to which one doubts or questions one's religious beliefs. Similarly, the subscale of search for meaning in life from the meaning in life questionnaire (Steger, Frazier, Oishi, & Kaler, 2006) assesses the extent to which one tries to find meaning and purpose in life, not necessarily from a religious perspective though. Although these constructs are distinct, they share a similarity in the context of

prayer in that a search or quest for meaning or purpose likely leads one to ask for things in prayers of supplication. A search or quest for meaning may not lead one to express thanksgiving, adoration, or confession, however. Thus, those individuals high in quest religiosity and search for meaning in life likely engage in supplicatory prayers more frequently than those individuals low in these traits.

Finally, differences between spirituality and religiosity likely influence the frequency in which one prays. These two concepts are conceptually distinct and relate to different personality constructs and variables (Saucier & Skrzypińska, 2006). Spirituality can be defined as belief in a transcendent experience with the sacred, usually occurring in times when one questions the existential nature of the self (Shafranske & Gorsuch, 1984; Vaughan, 1991). Religiosity refers to a set of beliefs, practices, and rituals that bind people together and closer to God or a supernatural power (Argyle & Beit-Hallahmi, 1975). In fact, the Latin word *religio* comes from *ligo* which literally means to “tie or bind” (Saucier & Skrzypińska, 2006). Because religiosity is more closely defined to a sense of connectedness, I hypothesized that religious individuals would be more likely to engage in all types of prayer than spiritual individuals. One of the main purposes of each prayer types is to connect with God. Prayers of thanksgiving likely lead to a greater sense of closeness and attachment to God; supplication and confession, although less positive types of prayer, likely forge close connections and ties with a higher power.

Next, I hypothesized that daily prayers of supplication and confession would relate negatively to daily well-being, and daily prayers of thanksgiving and adoration would relate positively to daily well-being. These within-person hypotheses were partially based on between-person relationships of similar constructs. When entering six

similar prayer types simultaneously into a regression equation, supplication and confession related negatively to satisfaction with life (both marginally significant), and confession also related negatively to self-esteem and optimism (Whittington & Scher, 2010). Prayers of thanksgiving related positively to life satisfaction, self-esteem, and optimism, and prayers of adoration related positively to optimism. Although between-person relationships are independent of within-person relationships, these findings nevertheless guided my expectations. Because prayers of supplication and confession focus on the negative aspects of one's day, they likely relate negatively to daily life satisfaction and positive affect, but they may have beneficial effects on subsequent days. In particular, confession restores a relationship with God, assuming one believes that God will forgive one of his or her transgressions. Numerous studies have shown that gratitude has a positive relationship with various well-being measures (e.g., Emmons & McCullough, 2003; Wood, Froh, & Geraghty, 2010), so it is likely that daily prayers of thanksgiving and adoration have a similar positive relationship with daily well-being.

The next set of hypotheses concerned the potential mediating variables that could explain why certain types of prayer relate to daily well-being. First, one could argue that daily positive events could explain the positive relationship between thanksgiving and daily well-being as daily positive events likely lead to greater well-being. However, prayers of thanksgiving require one to reflect on the positive events and likely increase daily well-being above and beyond the effects of daily positive events. On the other hand, daily negative events may explain the negative relationships between daily supplication, daily confession, and daily well-being. Presumably, if negative events relate negatively to daily well-being, and if people are likely to express supplication and confession on these

days, the negative relationship between these prayer types and well-being might be accounted for by the negative events. That is, one is not unhappy because one asked for something in prayer, but rather an unpleasant interaction with a friend might explain both why one feels unhappy and why one engages in prayers of supplication and/or confession.

Regarding potential negative relationships between prayer types and well-being, rumination and reflection might mediate these relationships. Rumination refers to negative, self-focused thoughts related to losses, threats, or injustices to oneself, whereas reflection is defined as positive, self-reflected thought characterized by interest or curiosity (Trapnell & Campbell, 1999). These constructs are conceptually distinct and relate differentially to neuroticism and openness at the trait level. However, at the within-person level, they tend to covary. Prayers, similar to rumination and reflection, can often be self-focused in nature. Therefore, the negative relationship between confession and well-being could be explained by the extent to which one ruminates or reflects on a particular day.

Relating to the positive relationships between prayer and well-being, I expected daily meaning in life, attachment to God, and emotion regulation to act as psychological mediators. Daily experiences of meaning in life have mediated the within-person relationships between daily religious behaviors (defined as attending a religious service and engaging in religious readings or meditation) and daily well-being (defined as an aggregate of affect balance and life satisfaction) (Steger & Frazier, 2005). Because meditation and prayer share similar features, especially in Christian traditions, I expected meaning in life to mediate the positive within-person relationships between prayer and

well-being. Additionally, meaning in life mediated between-person relationships between religiosity and subjective well-being across many nations (Diener et al., 2011).

Daily feelings of closeness or attachment to God could potentially also act as a mediator based on trait-level findings that have shown that anxious attachment to God negatively predicted positive affect and positively predicted negative affect (Rowatt & Kirkpatrick, 2002). Because anxious attachment is negatively worded, I expected a positively worded daily attachment to God measure to relate positively to daily well-being. Additionally, as prayer is essentially a conversation with God, prayer should increase one's sense of closeness to God, and therefore, could mediate the positive relationships between prayer and well-being.

As yet another mediating variable, emotion regulation may explain why certain types of prayer relate positively to well-being. Of the two main types of emotion regulation typically measured in studies, cognitive reappraisal and suppression (Gross & John, 2003), cognitive reappraisal most likely takes place during prayer. In fact, positive cognitive reappraisal mediated the relationship between prayer and pain tolerance (Dezutter, Wachholtz, & Corveleyn, 2011). Based on a qualitative study of interviews on the topic of prayer, Sharp (2010) argued that people manage their emotions through prayer because prayers offer one an other being with whom one can vent anger and reinterpret negative events to appear less unpleasant. In particular, prayers of thanksgiving might allow one to reappraise negative events and view them as more bearable than they otherwise would have been, ultimately improving one's well-being.

Related to this hypothesis, prayers may act as a buffer against negative events and lower the levels of depression and negative affect one typically experiences in response

to daily negative events. Theoretical accounts suggest that prayer can mitigate the negative effects of negative events in several different ways, such as by providing one with the opportunity to reframe the events in terms of God's purpose or plan for one's life (e.g., Ellison, 1991; Ellison et al., 2001; Pargament, Tarakeshwar, Ellison, & Wulff, 2001). Prayer can also raise one's confidence that one can deal or cope with the negative situation and improve one's well-being. It is also believed that prayers can help one deal with uncontrollable negative events (Masters & Spielmans, 2007). However, little empirical evidence exists to support these theoretical notions, especially daily responses to negative events (see Ellison et al., 2001, and Williams, Larson, Buckler, Heckmann, & Pyle, 1991, for instances of religious beliefs or general religious attendance as a stress buffer). This dearth of evidence specific to prayer may be explained by the fact that studies have relied on cross-sectional designs that have asked participants to reflect on negative events, prayer frequency, and global reports of well-being. By measuring these variables at the daily level, I predicted that prayers will buffer the effect of negative events, such that negative affect will be less severe in response to negative events when individuals also engage in prayer.

Finally, I hypothesized that daily prayers of supplication, thanksgiving, confession, and adoration would positively relate to daily emotions of envy, gratitude, guilt, and awe, respectively. Of these relationships, I expected daily guilt to suppress the negative relationship between confession and well-being. That is, people likely experience lower levels of well-being not because they confess their sins but rather because they feel guilty about their actions. Although gratitude and thanksgiving are very similar, feelings of gratitude relate to anyone or anything in particular, whereas prayers of

thanksgiving are specifically directed to God. This act likely relates to feelings of meaning in life and attachment to God in ways that general feelings of gratitude may not, so it is expected that prayers of thanksgiving relate significantly to well-being above and beyond the effects of daily gratitude.

In sum, a daily diary study on prayer, daily experiences, and well-being allowed me to test several hypotheses that researchers have supported either theoretically or empirically at the between-person level of analyses.

Hypothesis 1: Prayers of supplication and thanksgiving occur more frequently than prayers of confession and adoration.

Hypothesis 2: People are more likely to express prayers of supplication and confession when negative events occur, whereas people are more likely to express prayers of thanksgiving and adoration when positive events occur.

Hypothesis 3: Those individuals high in intrinsic religious motivation, general religiosity, and quest religious motivation would engage in prayer more often than those low in those traits after controlling for extrinsic religious motivation, spirituality, and search for meaning in life, respectively.

Hypothesis 4: Daily prayers of supplication and confession would relate negatively to daily measures of well-being, whereas prayers of thanksgiving and adoration would relate positively to daily well-being even after controlling for daily events.

Hypothesis 5: The positive relationships would be mediated by daily experiences of meaning in life, feelings of attachment or closeness to God, emotion regulation, and a

buffer to negative events, whereas the negative relationships would be mediated by rumination and reflection.

Hypothesis 6: Prayers of supplication would relate positively to daily envy, thanksgiving to gratitude, confession to guilt, and adoration to awe. Guilt would mediate the negative relationship between confession and well-being, whereas thanksgiving would relate to well-being above and beyond the effect of gratitude.

Method

Participants and Procedure

130 undergraduate students ($M_{(age)} = 18.66$, $SD = .99$, 63.8% female) participated in the study and received course credit. Participants were recruited based on their responses to questions from an initial survey distributed at the beginning of the semester regarding the frequency in which they prayed, their race, and their willingness to participate in additional studies for payment. Because I sought a higher percentage of participants who pray daily to capture within-person variation, I oversampled high and mid frequency prayers. High frequency prayers were defined as those who prayed at least once a day, mid frequency prayers as at least once a week, and low frequency prayers as less than once a week. In total, 41 participants were high frequency prayers, 24 were mid frequency prayers, and 65 were low frequency prayers. Asians and Asian Americans were oversampled in each prayer frequency category; 93 white and 37 Asian or Asian Americans participated in the study. 48 were Methodist, Baptist, Presbyterian, Episcopalian, or other protestant; 29 were Catholic; 1 was Jewish; 1 was Eastern Orthodox; 2 were Muslim, 2 were Hindu, 6 were Buddhist; 28 were either Atheists or Agnostics; and 13 were other.

Information sessions were held to explain the diary study to the participants. Following the information sessions, trait-level questionnaires were distributed to the participants via the online survey provider Qualtrics. Participants were then sent daily questionnaires every evening at 9:00pm for 14 consecutive nights. Participants were instructed to complete the questionnaire just before going to bed. Nevertheless, a reminder email was sent at 7:00am the following morning to those students who forgot to complete the questionnaire the night before. Entries were accepted until noon, consistent with the practice of certain diary studies (e.g., Oishi, Diener, Choi, Kim-Prieto, & Choi, 2007).

1710 entries in total were collected. 61 entries (3.6%) were eliminated because they were either incomplete, completed after noon, were completed on the same day by the same participant, the participant incorrectly answered an instructed response item, or entered the same response across an entire page. (The last two strategies were recommended by Meade and Craig, 2012, in eliminating careless responses in online data.) In total, 1649 entries were included in the final analysis and the mean number of valid entries completed was 12.68 ($SD = 1.67$). The minimum number of valid entries completed by a participant was 5.

Trait Measures

Prayer. Participants completed an abbreviated version of the Multidimensional Prayer Inventory (Laird et al., 2004) that included just the prayer types of supplication, thanksgiving, confession, and adoration. Although numerous taxonomies of prayers have been proposed, the MPI captures four of the basic prayer types that have been assessed in several other taxonomies (e.g., Poloma & Pendleton, 1991; Whittington & Scher, 2010).

Due to the demanding nature of an intensive repeated measures design at the daily level, I sought parsimony in selecting these four types of prayer, and included the same prayer types at both levels of data collection. The abbreviated version of the MPI contained three items for each of the four prayer types. Participants indicated how frequently in the past month each statement described their prayers, ranging on an 8-point scale from “never” to “all of the time.” Cronbach alpha scores for each prayer type ranged from .95 to .96.

Well-being. Well-being was assessed through the satisfaction with life scale (Diener, Emmons, Larsen, & Griffin, 1985) and an affect circumplex (e.g., Feldman Barrett & Russell, 1998). Responses from the widely used 5-item satisfaction with life scale ranged on a 7-point scale from “strongly disagree” to “strongly disagree,” and was very reliable ($\alpha = .91$).

The circumplex of affect model distinguishes both valence (positive or negative) and arousal (activated or deactivated). Although many affective well-being measures use the positive and negative affect schedule (Watson, Clark, & Tellegen, 1988) which does not distinguish activated and deactivated affect, it was deemed necessary to measure activated and deactivated emotions as well because different prayer types might relate to activated and deactivated affect in slightly different ways. Positive activated affect (PA) was measured with enthusiastic, alert, happy, proud, and excited ($\alpha = .74$); positive deactivated affect (PD) was measured with calm, peaceful, relaxed, contented, and satisfied ($\alpha = .85$); negative activated affect (NA) was measured with stressed, embarrassed, upset, tense, and nervous ($\alpha = .83$); negative deactivated affect (ND) was measured with depressed, disappointed, sluggish, bored, and sad ($\alpha = .82$). Participants

were asked to report the extent to which they generally felt each adjective. Responses ranged from “do not feel this way at all” to “feel this way very strongly” with a midpoint labeled “feel this way moderately.”

Similarly, trait measures of envy, gratitude, guilt, and awe were assessed using the same response scales as affect. Adjectives to measure envy included “jealous” and “envious” ($\alpha = .91$); gratitude included “grateful” and “thankful” ($\alpha = .94$) (Thrash, Elliot, Maruskin, & Cassidy, 2010); guilt included “repentant,” “blameworthy,” and “guilty” ($\alpha = .80$) (Izard, 1977); and awe included “full of awe” and “full of wonder” ($\alpha = .84$) (Thrash, Maruskin, Cassidy, Fryer, & Ryan, 2010).

Religious measures. Intrinsic, extrinsic, and quest religious motivation were measured using a scale that has been used reliably in church and non-church members (Reitsma, Scheepers, & Janssen, 2007). The intrinsic and extrinsic subscales included 9 items each and the quest subscale included 10 items ($\alpha = .96$, $\alpha = .83$, $\alpha = .92$, respectively). Responses ranged on a 7-point scale from “does not apply to me at all” to “completely applies to me” with a midpoint of “neutral.” Examples of each subscale included “I try to live all my life according to my religious beliefs,” (intrinsic) “I pray mainly because I have been taught to pray,” (extrinsic) and “I am constantly questioning my religious beliefs” (quest).

Participants also completed the 10-item meaning in life questionnaire which contains subscales for presence and search for meaning in life (Steger et al., 2006). Responses ranged on a 7-point scale from “absolutely untrue” to “absolutely true.” The 5-item subscale for search for meaning was very reliable ($\alpha = .90$).

Spirituality was assessed through five items taken from a combination of the spiritual involvement and beliefs scale (Hatch, Burg, Naberhaus, & Hellmich, 1998) and a diary study on daily spirituality (Kashdan & Nezlek, 2012). The daily items were reworded to appropriately measure trait levels of the construct, and participants were asked to respond to each of the items on a 7-point scale that ranged from “strongly disagree” to “strongly agree” ($\alpha = .97$).

Participants completed a 4-item measure of religiosity. First, they were asked to select their religious preferences from a list of different religions and denominations. Choices of atheist or agnostic were given a value of 0, and all others selections were given a value of 1. Second, participants selected how important religious beliefs or personal faith was to them on 7-point scale ranging from “not at all important” to “extremely important.” Third, participants were asked if they had a personal relationship with God (0 = no, 1 = yes). Fourth, they were asked how frequently they attended religious services on a 7-point scale ranging from “never” to “several times per week.” Similar to a religiosity measure by Kirkpatrick, Shillito, and Kellas (1999), each item was first standardized, and then a final religiosity score was calculated by averaging the standardized items. Low scores indicated low levels of religiosity and high scores indicated high levels of religiosity.

Social desirability. Finally, participants completed an abbreviated 13-item measure of social desirability (Crowne & Marlowe, 1960). Participants responded to each question by answering true or false. After reverse coding the necessary items, socially desirable responses received a score of 2 and the other choice received a score of 1. Scores were summed to provide an index of social desirability.

Daily Measures

Daily events. Participants were presented with a list of 36 events that occur in everyday life and were asked to respond to each item on a scale from 0 to 4 that ranged from “did not occur”, “occurred and not important,” to “occurred and extremely important.” The daily event items were compiled from the Daily Event Schedule (Butler, Hokanson, & Flynn, 1994), the Objective/Subjective Event Checklist (Seidlitz & Diener, 1993), and other items from a diary study by Gable, Reis, and Elliot (2000). Similar to these methods, daily events were categorized as either positive or negative and as either social or achievement. The list included 9 social positive events (e.g., “Spent pleasant or relaxing time with friends/date/family”), 8 achievement positive events (e.g., “Made progress toward assignment/task that has a deadline”), 9 social negative events (e.g., “Had a disagreement or conflict with a friend, boyfriend/girlfriend, or family member”), and 10 achievement negative events (e.g., “Wanted to make progress on a assignment/task which has a deadline, but did not”).

Prayer. The Multidimensional Prayer Inventory (Laird et al., 2004) items were reworded at the daily level to assess daily prayers of supplication, thanksgiving, confession, and adoration. Similar to the daily events, both the occurrence of each prayer type and the importance or significance of the prayer was captured by asking the participant to respond to each item on a scale from 0 to 4 that ranged from “did not occur”, “occurred and not central to my prayer(s),” to “occurred and extremely central to my prayer(s).” Each prayer type was measured with three items. An example of a daily supplication item was as follows: “In my prayer(s) today, I asked for assistance with my daily problems.”

Well-being. To assess daily satisfaction with life, two items that have been used reliably at the daily level were used (Oishi et al., 2007). The question, “How was today” included a 7-point scale that ranged from “terrible” to “excellent,” and the question, “How satisfied were you with your life today?” ranged from “very dissatisfied” to “very satisfied” on a 7-point scale.

Daily affect was measured using the same circumplex model (e.g., Feldman Barrett & Russell, 1998) as was used for the trait measure. Participants were asked to rate on a 7-point scale how strongly they felt each adjective that day, ranging from “did not feel this way at all” to “felt this way very strongly” with a midpoint labeled “felt this way moderately.”

Similarly, daily states of envy, gratitude, guilt, and awe were measured using the same adjectives at the trait level. The same responses from the circumplex model of affect were used for these measures.

Based on Kashdan and Nezlek (2012), daily meaning in life was assessed using the items, “how meaningful did you feel your life was today?” and, “how much did you feel your life had purpose today?” The scale ranged from “not at all” to “very much” on a 7-point scale.

Attachment to God. I created a three-item measure to assess daily secure attachment with God based on a trait level measure by Rowatt and Kirkpatrick (2002). The items were reworded to reflect the daily state of the construct and included the following items: “Today I had a warm relationship with God”; “God knew when I needed support today”; and “Today I felt that God was generally responsive to me.” Responses

ranged on a 7-point scale from “not at all characteristic of me today” to “very characteristic of me today.”

Emotion regulation. Daily emotion regulation items were taken from a daily diary study on emotion regulation (Nezlek & Kuppens, 2008). Four items captured the cognitive reappraisal and suppression dimension as well as the positive and negative dimension. For example, the item that measures positive reappraisal stated, “Today when I wanted to feel more positive emotion (such as joy or amusement), I changed what I was thinking about.” Responses ranged on a 7-point scale from “strongly disagree” to “strongly agree.”

Rumination and reflection. Daily measures of rumination and reflection were used from a previous diary study on daily self-focused thoughts and daily events (Nezlek, 2005). The items were originally adapted from trait measures of each respective construct from the Rumination-Reflection Questionnaire (Trapnell & Campbell, 1999). Three items each measured these daily constructs. Participants were asked to indicate how much they spent that day thinking about each of the items on a 7-point scale from “not at all” to “very much” with a midpoint labeled “a moderate amount.” For example, participants were asked, “How much today did you ruminate or dwell on things that happened to you?” (rumination) and, “How much today did you think about the nature and meaning of things?” (reflection).

Results

Relationships at the between-person level of analysis were first conducted using traditional measures (e.g., regression analyses). Although not central to the hypotheses of the paper, between-person relationships are informative by allowing one to compare

between-person relationships with the current sample with samples from prior research. Next, multilevel random coefficients modeling techniques were used to conduct within-person analyses.

Individual Differences in Demographics, Well-being, and Prayer Frequency

Gender differences. Males ($M = 4.94$) reported higher levels of trait positive deactivated affect than females ($M = 4.47$), $t(128) = 2.61, p < .05$. Males ($M = 3.46$) reported lower levels of trait negative activated affect than females ($M = 4.02$), $t(128) = -2.96, p < .01$. There were no other significant differences between gender in satisfaction with life, positive activated affect, negative deactivated affect, or in the amount that they prayed.

Race differences. Overall, whites had much higher levels of well-being and prayed more frequently than the Asians or Asian Americans. Whites ($M = 5.38$) scored significantly higher than Asians or Asian Americans ($M = 3.96$) in trait satisfaction with life, $t(56.875) = -5.33, p < .001$ (equal variances could not be assumed for this test based on Levene's test for equality of variances, $p = .038$). Whites ($M = 4.96$) scored significantly higher than Asians or Asian Americans ($M = 4.42$) in trait positive activated affect, $t(128) = -3.21, p < .01$. Whites ($M = 4.76$) scored significantly higher than Asians or Asian Americans ($M = 4.36$) in trait positive deactivated affect, $t(128) = -2.18, p < .05$. Whites ($M = 3.71$) scored marginally significantly lower than Asians or Asian Americans ($M = 4.12$) in trait negative activated affect, $t(128) = 1.95, p = .054$. Whites ($M = 3.23$) reported significantly lower scores of negative deactivated affect than Asian or Asian Americans ($M = 3.89$), $t(128) = 3.05, p < .01$. Whites ($M = 6.66$) prayed significantly more often than Asian or Asian Americans ($M = 2.92$), $t(128) = -5.90, p < .001$.

Prayer frequency was positively correlated with satisfaction with life, $r(128) = .267, p < .01$, but did not relate significantly to any of the affect measures. However, after controlling for race and gender, prayer frequency no longer related significantly to life satisfaction, $\beta = .085, p > .05$.

Between-person Relationships between Prayer Types and Well-being

Correlations. Next, I examined relationships between particular types of prayer and well-being. The correlations presented in Table 1 indicate that all forms of prayer were positively related to satisfaction with life. Supplicatory prayer was also positively related to positive activated affect but not to any of the other well-being measures. Thanksgiving prayer was positively related to both forms of positive affect and negatively related to negative deactivated affect. Confession and adoration were not significantly related to any of the affect measures.

Regression analyses. Although the correlation analyses generally showed that the prayer types related positively to well-being, certain prayer types might not relate positively after controlling for each prayer type. In the first of a series of regression analyses, each prayer type was simultaneously entered into a regression analysis. In the second analysis, sex and race were entered as controls. Finally, social desirability was entered in the third analysis. These results are presented in Table 2, and a brief summary is provided here. Prayers of supplication related negatively to positive deactivated affect even after controlling for race, gender, and social desirability. Prayers of thanksgiving remained positively related to satisfaction with life and both positive affect measures, and was marginally negatively related to the negative affect measures, but these marginally significant relationships disappeared after controlling for race, gender, and social

desirability. These findings are largely consistent with the between-person analyses conducted by Whittington and Scher (2010).

However, forgetfulness and misremembering might bias global reports of well-being and prayer frequency. To account for these biases, mean values of the well-being measures and prayer types were calculated from the two-week diary study. These values were entered into the regression equations instead of the trait measures. As can be gathered from Table 3, there were a few differences in these regression equations from the previously described analyses in Table 2. Mean values of prayers of supplication related negatively to life satisfaction and positively to both measures of negative affect even after controlling for race, gender, and social desirability. Mean values of prayers of thanksgiving related positively to satisfaction with life and both positive affect measures as before, but thanksgiving also related negatively to the negative affect measures. Neither prayers of confession nor adoration related significantly to any of the well-being measures in these analyses. It appears as if negative emotions and prayers of supplication were recalled differently in the daily reports than they were in the trait measures.

Between-person Relationships between Prayer Types and Differential Emotions

Correlations. Similar to the analyses with prayer types and well-being measures, the same set of analyses were run with envy, gratitude, guilt, and awe as the dependent measures. A correlation matrix with all variables is listed in Table 4. Interestingly, supplication related positively to gratitude, guilt, and awe, but not to envy. Guilt related positively to all prayer types. This could be explained by the fact that those who tend to pray in general might feel greater levels of guilt overall.

Regression analyses. While correlation analyses are an interesting first step, regression analyses with each prayer type entered simultaneously more accurately portray how each prayer type predicts the dependent measure above and beyond the other prayer types. The first set of analyses considered the trait relationships between each prayer type and envy, gratitude, guilt, and awe. The following analyses controlled for race, gender, and social desirability and can be found in Table 5.

As hypothesized, prayers of supplication related positively to envy, prayers of thanksgiving related positively to gratitude, and prayers of confession related positively to guilt. However, prayers of adoration did not relate significantly to awe. In addition to our hypotheses, prayers of adoration related negatively to envy.

Similar to the critique that people may not accurately recall how often they pray or how often they experience various forms of well-being, they may not accurately recall how often they truly feel envy, gratitude, guilt, or awe. Therefore, I ran the same set of analyses as before with the exception that the mean scores of each prayer type and the mean scores of envy, gratitude, guilt, and awe from the diary study were used in the regression analyses. Results are presented in Table 6. After controlling for race, gender, and social desirability, our initial predictions were confirmed. Prayers of supplication related positively to envy, thanksgiving to gratitude, confession to guilt, and adoration to awe.

Daily Level Analyses

In the remaining analyses, multilevel modeling was used to analyze the results because of the nested data structure. In this diary study, days were nested within individuals. Separate regression equations were essentially created for each individual,

and variances at each level were appropriately considered. The program HLM 7.0 was used to run the analyses (Raudenbush, Bryk, & Congdon, 2011).

Reliabilities. Given that new measures were created at the daily level for prayer types and attachment to God, it was necessary to first examine the reliabilities of these measures along with all of the other variables. Three level models, with items nested within days, and days nested within persons were created. Separate null or unconditional models for each variable were set up as described in Nezlek (2012, pg. 98-104). The random level-1 coefficient reliability estimates provided by the HLM output accurately measures the ratio of true to total variance. If the reliabilities were quite low ($< .50$), one or more of the items were dropped to improve the reliability. For example, dropping the item “alert” from positive activated affect increased reliability just slightly, and likewise, dropping just the item “proud” increased the reliability just slightly. However, dropping both items increased the reliability considerably. After dropping several of the affect items, PA was measured with the adjectives enthusiastic, happy, and excited; NA with the adjectives stressed, upset, tense, and nervous; and ND with the adjectives depressed, disappointed, and sad. One of the items in the reflection scale was also dropped to improve reliability. All other measures were very reliable, and these reliability estimates are presented in Table 7.

Null models of prayer types. Before running any within-person analyses involving the prayer types, it is important to know at which level of analysis most of variance occurs, i.e., where the action occurs. If most of the variance occurs at level 2, this means that there will likely exist between-person differences in the variable, but little within-person differences. Null models of each prayer type were created to assess the

percent of variance that occurred at each level. The level-1 variance component (r) was divided by the total variance, which is just the sum of the variance of level-1 (r) and level-2 (u_0). These values are listed in Table 8. Roughly a third of the variance of prayers of supplication, thanksgiving, and adoration occurred at the within-person level, and roughly a quarter of the variance of prayers of adoration occurred at the within-person level.

Measurement model: Frequency of prayer types. According to my first hypothesis, prayers of supplication and thanksgiving would occur more frequently than prayers of confession and adoration. To test this prediction, I created a measurement model with three levels similar to the reliability models. Items were nested within days, and days were nested within people. In the item level file, a variable that contained the prayer item response that ranged from 0 to 4 was entered as the outcome measure. Dummy codes for each prayer type were entered uncentered at the item level and the intercept was dropped. The model is as follows:

Item level:
$$y_{ijk} \text{ (response)} = \pi_{1jk} \text{ (supplication)} + \pi_{2jk} \text{ (thanksgiving)} + \pi_{3jk} \text{ (confession)} + \pi_{4jk} \text{ (adoration)} + e_{ijk}$$

Day level:

supplication: $\pi_{1jk} = \beta_{10k} + r_{1jk}$

thanksgiving: $\pi_{2jk} = \beta_{20k} + r_{2jk}$

confession: $\pi_{3jk} = \beta_{30k} + r_{3jk}$

adoration: $\pi_{4jk} = \beta_{40k} + r_{4jk}$

Person-level:

supplication: $\beta_{10k} = \gamma_{100} + u_{10k}$

thanksgiving: $\beta_{20k} = \gamma_{200} + u_{20k}$

confession: $\beta_{30k} = \gamma_{300} + u_{30k}$

$$\text{adoration: } \beta_{40k} = \gamma_{400} + u_{40k}$$

The coefficients at the person-level represent the mean scores of each prayer type. The mean score of supplication (γ_{100}) was 1.11, thanksgiving (γ_{200}) was 1.17, confession (γ_{300}) was 0.51, and adoration (γ_{400}) was 0.82. Next, the coefficients were constrained through the use of a chi-squared based test. After constraining supplication (γ_{100}) and thanksgiving (γ_{200}), the chi-squared based test revealed that they were not significantly different, $\chi^2(1) = 1.00, p > .10$. After constraining the supplication coefficient (γ_{100}) and the adoration coefficient (γ_{400}), there was a significant difference, $\chi^2(1) = 12.82, p < .001$; There was also a significant difference between the adoration coefficient (γ_{400}) and the confession coefficient (γ_{300}), $\chi^2(1) = 19.47, p < .001$. In sum, supplication and thanksgiving were the most frequently occurring prayer types and were not significantly different. Adoration occurred third most frequently, and confession occurred the least frequently. In these analyses, it is important to remember that the impact of these prayers was considered. These scores represent not only how often these prayers were prayed, but also how important or central they were to the participants.

Measurement model: Frequency of prayer types and daily events. The previous model showed that supplication and thanksgiving were the types of prayer that people engaged in most frequently. But they do not describe when people pray. To answer this question and to test the second hypothesis, a measurement model was created as before with the addition of daily events at the day level (level 2). I trimmed error terms with significance values greater than .15 as recommended by Nezlek (2012, pg. 65-68). The model follows:

$$\text{Item level: } y_{ijk} (\text{response}) = \pi_{1jk} (\text{supplication}) + \pi_{2jk} (\text{thanksgiving}) + \pi_{3jk}$$

(confession) + π_{4jk} (adoration) + e_{ijk} .

Day level:

supplication: $\pi_{1jk} = \beta_{10k} + \beta_{11k}$ (positive events) + β_{12k} (negative events) + r_{1jk}

thanksgiving: $\pi_{2jk} = \beta_{20k} + \beta_{21k}$ (positive events) + β_{22k} (negative events) + r_{2jk}

confession: $\pi_{3jk} = \beta_{30k} + \beta_{31k}$ (positive events) + β_{32k} (negative events) + r_{3jk}

adoration: $\pi_{4jk} = \beta_{40k} + \beta_{41k}$ (positive events) + β_{42k} (negative events) + r_{4jk}

Person-level:

supplication intercept: $\beta_{10k} = \gamma_{100} + u_{10k}$.

supplication positive events: $\beta_{11k} = \gamma_{110} + u_{11k}$.

supplication negative events: $\beta_{12k} = \gamma_{120} + u_{12k}$.

thanksgiving intercept: $\beta_{20k} = \gamma_{200} + u_{20k}$.

thanksgiving positive events: $\beta_{21k} = \gamma_{210} + u_{21k}$.

thanksgiving negative events: $\beta_{22k} = \gamma_{220} + u_{22k}$.

confession intercept: $\beta_{30k} = \gamma_{300} + u_{30k}$.

confession positive events: $\beta_{31k} = \gamma_{310}$.

confession negative events: $\beta_{32k} = \gamma_{320} + u_{32k}$.

adoration intercept: $\beta_{40k} = \gamma_{400} + u_{40k}$.

adoration positive events: $\beta_{41k} = \gamma_{410}$.

adoration negative events: $\beta_{42k} = \gamma_{420} + u_{42k}$.

Coefficients at the person-level describe the relationship between prayer types and daily events. HLM produces unstandardized coefficients, which means that the

coefficients represent changes in the raw scale that was used. For example, the .02 value of the γ_{100} coefficient indicated that as positive events increased by 1 for each individual, prayers of supplication increased by .02 for each respective individual. This value was not significant. The coefficients are presented in Table 9.

To summarize, when positive events occurred, people were more likely to express thanksgiving, confession (both marginally significant), and adoration. When negative events occurred, people were less likely to express thanksgiving and more likely to express confession (marginally significant). Thus, my hypotheses were somewhat confirmed. Although not significant ($p = .153$), it appears that people offered prayers of supplication more often when negative events occurred. Similarly, although marginally significant, people did express more thanksgiving when positive events occurred, and they were less likely to express thanksgiving when negative events occurred. Interestingly, people were more likely to engage in prayers of confession when positive and negative events occurred. Finally, consistent with my expectations, people expressed adoration in their prayers when positive events occurred.

Trait predictors of prayer types. In the next set of analyses, I tested the third hypothesis regarding the relationships between trait-level religious variables and daily prayer types. For example, do those high in spirituality express more prayers of supplication than those low in spirituality? To answer these types of questions, separate models were created for each prayer type as an outcome measure and individual trait variables at level 2. The trait variables were spirituality, religiosity, intrinsic and extrinsic religious motivation, quest religious motivation, and search for meaning in life. Each trait variable was standardized prior to entering it into the model uncentered to allow for

easier interpretations of the findings. Because of this, an increase in one point in a trait variable represents an increase of one standard deviation.

Within-person level: y_{ij} (prayer type) = $\beta_{0j} + r_{ij}$.

Person-level: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (trait variable) + u_{0j} .

The results indicated that those high in spirituality, religiosity, intrinsic and extrinsic religious motivation were more likely to express all types of prayer than were those low in those traits (see Table 10). Those high in quest and search for meaning in life were more likely to express prayers of supplication but not any of the other prayer types.

Next, specific trait variables that share certain commonalities were entered simultaneously at level 2 to determine the extent to which each trait measure predicted each prayer type after controlling for the other trait measure. In the first of three sets of analyses, spirituality and religiosity were entered into level 2 together. Intrinsic religious motivation and extrinsic religious motivation were compared in the second set of analyses; quest religious motivation and search for meaning in life were compared in the third set of analyses. The model is shown below. Additionally, I constrained the γ_{01} coefficient with the γ_{02} coefficient to determine whether they differed in strength. The results are presented in Table 11.

Within-person level: y_{ij} (prayer type) = $\beta_{0j} + r_{ij}$.

Person-level: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (trait variable 1) + γ_{02} (trait variable 2) + u_{0j} .

After entering two trait variables at level 2, it became clear that those high in religiosity engaged in each of the prayer types more often than those individuals low in trait religiosity after controlling for spirituality. Those high in intrinsic religious motivation prayed more than those high in extrinsic religious motivation. There were no significant differences between those individuals high in quest religious motivation and search for meaning in life. They both engaged in prayers of supplication more often than those low in those traits.

Within-person relationships between prayer types and well-being. Of central importance to this paper are the within-person relationships between prayer and well-being. To examine the relationships between prayer and well-being, two sets of analyses were conducted.

First, each prayer type was entered group-mean centered as a single predictor of each well-being measure without controlling for any of the other prayer types. Separate models were created for each well-being measure. In this two-level model, i days were nested within j people.

$$\text{Within-person level: } y_{ij} (\text{well-being}) = \beta_{0j} + \beta_{1j} (\text{prayer type}) + r_{ij}.$$

$$\text{Person-level: } \beta_{0j} = \gamma_{00} + u_{0j}.$$

$$\beta_{1j} = \gamma_{10} + u_{1j}.$$

Second, all four prayer types were entered group-mean centered at level 1 simultaneously. The coefficients for each of the prayer types describes how much each prayer type predicts the well-being measure above and beyond the effects of the other prayer types. Separate models were run for each of the well-being measures as dependent

variables. The model is shown below and results for both sets of analyses are presented in Table 12.

Within-person level: y_{ij} (well-being) = β_{0j} + β_{1j} (supplicatory prayer) + β_{2j} (thanksgiving prayer) + β_{3j} (confession prayer) + β_{4j} (adoration prayer) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

$\beta_{2j} = \gamma_{20} + u_{2j}$.

$\beta_{3j} = \gamma_{30} + u_{3j}$.

$\beta_{4j} = \gamma_{40} + u_{4j}$.

According to the general pattern of findings from both sets of analyses, daily prayers of supplication and confession related negatively to daily well-being, whereas daily prayers of thanksgiving and adoration related positively to daily well-being. In the first set of analyses, supplication was only significantly related to PD, NA, and ND, but it related significantly to all well-being measures in the second set of analyses (negatively to daily life satisfaction, PA, and PD, and positively to NA and ND). Thanksgiving related significantly to all well-being measures except ND in the first set of analyses, but related significantly to all well-being measures when all prayer types were entered into level 1. Prayers of confession related significantly to PD, NA, and ND in the first analyses, but also related negatively to daily satisfaction with life in the second set of analyses. Daily prayers of adoration actually had more significant relationships when entered alone at level 1, but when all four prayer types were entered together, adoration only related significantly (positively) to PD.

Mediators of within-person relationships.

Daily events. Although certain prayer types related significantly to daily well-being, they might only relate significantly to well-being because of certain daily events that occur. For example, people experienced greater well-being when positive events occur. People were also more likely to express thanksgiving when positive events occurred (marginally significant). Therefore, thanksgiving prayers may not significantly relate to daily well-being after daily events are entered into the model. To test these possibilities, I first entered positive and negative events group-mean centered at level 1 in addition to the four prayer types. Separate models were created for each of the 5 well-being measures. The model was as follows and results can be found in Table 13:

Within-person level: y_{ij} (well-being) = β_{0j} + β_{1j} (supplicatory prayer) + β_{2j} (thanksgiving prayer) + β_{3j} (confession prayer) + β_{4j} (adoration prayer) + β_{5j} (positive events) + β_{6j} (negative events) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

$$\beta_{4j} = \gamma_{40} + u_{4j}$$

$$\beta_{5j} = \gamma_{50} + u_{5j}$$

$$\beta_{6j} = \gamma_{60} + u_{6j}$$

Prayer still related to well-being even after controlling for daily events with a few exceptions. When people expressed prayers of supplication, they experienced ND, but

this relationship became much weaker when daily events entered the model. Similarly, when people expressed confession in prayer, they experienced less PD, but this relationship became much weaker when daily events were entered. When people expressed adoration, they experienced PD, but this relationship too became completely not significant when daily events were controlled. However, it is important to note that the relationships between prayer and thanksgiving were still significant even after controlling for positive and negative events. This confirms one of the hypotheses that thanksgiving in prayer relates significantly to well-being above and beyond the effects of daily events.

Rumination and reflection. To examine the possibility that rumination and reflection would mediate the within-person relationships between prayer types and well-being, separate models for each well-being measure were created with all four prayer types entered group-mean centered at level 1 and with either rumination or reflection additionally entered as a mediator. The model was similar to the one listed above for daily events as mediators. Results (presented in Table 14) indicated that daily rumination mediated the relationships between prayers of confession and PD, NA, and ND. Rumination also mediated the positive relationship between adoration and PD. Reflection appeared to mediate the relationships between confession and ND (fully) and NA (partially).

Meaning in life and attachment to God. Some research at the daily level has shown that meaning in life mediates the relationship between religious participation and subjective well-being (Steger & Frazier, 2005). To test the hypothesis that meaning in life would mediate the within-person relationships between prayer types and well-being,

daily meaning in life was added to the models described above. Additionally, daily feelings of secure attachment to God were predicted to mediate these relationships. For example, when someone expresses thanksgiving in prayer, they might feel closer to God and this personal connection might relate positively to well-being. Expressions of gratitude and giving relate more strongly to well-being when the receiver is someone the giver knows personally. To test these possibilities, all four prayer types were group mean centered at level 1 and then meaning in life and attachment to God were group-mean centered at level 1 as follows (results presented in Table 15):

Within-person level: y_{ij} (well-being) = β_{0j} + β_{1j} (supplicatory prayer) + β_{2j} (thanksgiving prayer) + β_{3j} (confession prayer) + β_{4j} (adoration prayer) + β_{5j} (meaning in life) + β_{6j} (attachment to God) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

$$\beta_{4j} = \gamma_{40} + u_{4j}$$

$$\beta_{5j} = \gamma_{50} + u_{5j}$$

$$\beta_{6j} = \gamma_{60} + u_{6j}$$

Results showed that meaning in life and attachment to God did not fully mediate any of the relationships between daily prayer and daily well-being. There may be some instances where they partially mediated the relationship between adoration and PD, and between thanksgiving and all the well-being measures. Separate analyses not presented

here indicated that meaning in life had a stronger mediating effect than attachment to God.

Emotion regulation. A similar model was created to test the hypothesis that daily emotion regulation would mediate the within-person relationships between prayer and well-being. Each of the four different emotion regulation strategies (positive reappraisal, negative reappraisal, positive suppression, and negative suppression) were entered group-mean centered along with all four prayer types. Results indicated that emotion regulation did not mediate any of the within-person relationships.

Envy, gratitude, guilt, and awe. Because these four variables related significantly and positively to the respective prayer types at the between-person level, it is possible that they could relate positively to the respective prayer types at the within-person level. Additionally, I hypothesized that prayers of thanksgiving would relate significantly to well-being even after controlling for daily gratitude, and that daily guilt would suppress the negative relationship between confession and well-being.

First, each prayer type was entered group-mean centered at level 1 separately with each of the respective emotions listed above as the outcome measure. In these analyses, prayers of thanksgiving, confession, and adoration were significantly related to gratitude, guilt, and awe, respectively, but prayers of supplication did not relate significantly to envy. The model is listed below:

Within-person level: $y_{ij}(\text{emotion}) = \beta_{0j} + \beta_{1j}(\text{prayer type}) + r_{ij}$.

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

Second, envy, gratitude, guilt, and awe were the dependent variables and all prayer types were entered simultaneously group-mean centered as follows:

Within-person level: y_{ij} (emotion) = β_{0j} + β_{1j} (supplicatory prayer) + β_{2j} (thanksgiving prayer) + β_{3j} (confession prayer) + β_{4j} (adoration prayer) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

$\beta_{2j} = \gamma_{20} + u_{2j}$.

$\beta_{3j} = \gamma_{30} + u_{3j}$.

$\beta_{4j} = \gamma_{40} + u_{4j}$.

When each prayer type was entered simultaneously, daily envy, gratitude, guilt, and awe related positively to supplication, thanksgiving, confession, and adoration, respectively. These analyses differed from the first set of analyses because the within-person relationship between daily supplication prayer and daily envy was positive and significant. Additionally, daily thanksgiving prayer related negatively to daily envy and daily guilt, but positively to daily awe. Daily adoration prayer also related positively to daily gratitude. Results to both sets of analyses are presented in Table 16.

Third, to test the mediating effect of envy, gratitude, guilt, and awe on the within-person relationships between the prayer types and well-being, separate models were built with the different well-being measures as outcome measures, the four prayer types group-mean centered at level 1, and either envy, gratitude, guilt, or awe entered as the fifth variable at level 1. The model was as follows and the results of these analyses are presented in Table 17.

Within-person level: y_{ij} (well-being) = β_{0j} + β_{1j} (supplicatory prayer) + β_{2j} (thanksgiving prayer) + β_{3j} (confession prayer) + β_{4j} (adoration prayer) + β_{5j} (emotion) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

$\beta_{2j} = \gamma_{20} + u_{2j}$.

$\beta_{3j} = \gamma_{30} + u_{3j}$.

$\beta_{4j} = \gamma_{40} + u_{4j}$.

$\beta_{5j} = \gamma_{50} + u_{5j}$.

Envy did not mediate any of the relationships between the prayer types and well-being. Gratitude appeared to mediate only one relationship, namely between prayers of thanksgiving and PD. Thus, it seems that prayers of thanksgiving related positively to well-being even after controlling for feelings of gratitude. Guilt appeared to fully mediate the relationships between prayers of confession and well-being. Thus, individuals did not experience lower levels of well-being when they confessed their sins in prayer because of this, but rather because they felt guilty. Awe appeared to alter the relationships between prayers of adoration and positive affect. After controlling for awe, prayers of adoration no longer related significantly to PD, but it related negatively to PA.

Prayer as a buffer against negative events. Thus far, tests of mediation have been used to try to explain how daily prayer relates to well-being. In addition to these potentially mediating variables, prayer may improve one's well-being by acting as a buffer against negative events. Several researchers have theorized about this possibility,

but this idea has not been tested empirically at the daily level. To test the theory that prayer acts as a buffer to negative life events, a level 1 interaction model was created. Specifically, this particular level 1 interaction model addressed whether prayers alleviated the negative affect that is typically experienced in response to negative events.

Two sets of analyses were conducted, one with NA and one with ND as the outcome measure. Next, negative events and one of the prayer types were entered group mean centered. Then, an interaction term was created by zero-centering each variable and by then multiplying them together. Zero-centering refers to the process in which the mean score for each individual was calculated and then subtracted from each individual score. The interaction term was entered uncentered at level 1 and the model was as follows:

Within-person level: y_{ij} (NA or ND) = β_{0j} + β_{1j} (negative events) + β_{2j} (prayer type) + β_{3j} (negative event*prayer type) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

$\beta_{2j} = \gamma_{20} + u_{2j}$.

$\beta_{3j} = \gamma_{30} + u_{3j}$.

When ND was the dependent variable, a marginally significant interaction term was found for prayers of thanksgiving ($\gamma_{30} = -.226, p = .051$). To interpret this significant interaction term, I estimated predicted intercepts by calculating standard deviation scores above and below the means, as outlined by Nezlek (2011, pg. 39). Standard deviation scores for negative events and thanksgiving prayers were obtained from each respective unconditional model. The standard deviation for negative events was .32, and the standard deviation for thanksgiving prayers was .85. Predicted values are presented in

Table 18. To summarize the findings, when negative events were high (i.e., +1 *SD*) and when prayers of thanksgiving were high (+1 *SD*), ND was 2.89. When negative events were high (+1 *SD*) and prayers of thanksgiving were low (-1 *SD*), ND was 3.08. The difference between the two values is .19. When negative events were low and prayers of thanksgiving were high, ND was 1.89. When negative events were low and prayers of thanksgiving were also low, ND was 1.83. The difference between these two values is -.06, which means the buffering effect is .25 (.19 – (-.06)). Thus, expressing thanksgiving in prayer lowers the ND experienced on a day with many negative events.

In addition to the level 1 interaction, I also examined the moderating effect of prayers of thanksgiving at level 2. To do so, a mean score of thanksgiving prayers over the course of the 14 days was calculated as a trait level variable. Next, a model was created with ND as the outcome variable, negative events group-mean centered as a predictor at level 1, and the mean score of thanksgiving prayers as a level 2 moderator, standardized beforehand and entered uncentered. The model was as follows:

Within-person level: $y_{ij}(\text{ND}) = \beta_{0j} + \beta_{1j}(\text{negative events}) + r_{ij}$.

Person-level: $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{trait thanksgiving prayer}) + u_{0j}$.

$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{trait thanksgiving prayer}) + u_{1j}$.

In this model, a marginally significant interaction term was found ($\gamma_{11} = -.175, p = .094$). To interpret this finding, estimated scores one standard deviation above and below the mean score of prayers of thanksgiving should be calculated. The negative events intercept (γ_{10}) was 1.77. For those individuals who frequently expressed prayers of thanksgiving (+1 *SD*), -.175 is added to 1.77. Thus, the relationship between ND and

negative events was roughly 1.59 for those individuals who frequently expressed prayers of thanksgiving, whereas the relationship between the negative events and ND for those who did not regularly express thanksgiving in their prayers was roughly 1.95. Those who routinely expressed a lot of thanksgiving in prayer experienced less ND on days when negative events happened compared to those who did not engage in prayers of thanksgiving as often.

Although the interaction term was marginally significant, the fact that an interaction term was found for prayers of thanksgiving in models at level 1 and level 2 provides reasonable evidence to conclude that prayers of thanksgiving acted as a buffer against negative events.

Lagged analyses. The within-person relationships outlined so far have provided useful information in describing how prayer on one particular day relates to well-being on that same day, but they have not provided any information about directionality or causality. To determine directionality, two models of lagged analyses were conducted as outlined by Nezlek (2012, pg. 111). In the first model, prayer types on day $n - 1$ predict well-being on day n , after controlling for well-being on day $n - 1$. In the second model, well-being on day $n - 1$ predicts prayer types on day n , after controlling for prayer types on day $n - 1$. Of critical importance in these models are the β_{2j} coefficient in the first model and the β_{1j} coefficient in the second model. If the β_{2j} coefficient is significant in the first and the β_{1j} coefficient is not significant in the second, one can conclude that prayer leads to well-being. If the reverse pattern is found, one can conclude that well-being leads to prayer. Each prayer type and well-being measure was entered group-mean centered into the models as follows:

Equation 1:

Within-person level: y_{ij} (well-being day n) = β_{0j} + β_{1j} (well-being day $n - 1$) + β_{2j} (prayer type day $n - 1$) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

$\beta_{2j} = \gamma_{20} + u_{2j}$.

Equation 2:

Within-person level: y_{ij} (prayer type day n) = β_{0j} + β_{1j} (well-being day $n - 1$) + β_{2j} (prayer type day $n - 1$) + r_{ij} .

Person-level: $\beta_{0j} = \gamma_{00} + u_{0j}$.

$\beta_{1j} = \gamma_{10} + u_{1j}$.

$\beta_{2j} = \gamma_{20} + u_{2j}$.

In these analyses, prayers of confession led to greater PD on the following day ($\gamma_{20} = .102, p = .099$). Interestingly, although prayers of confession related negatively to well-being on the same day, prayers of confession led one to experience greater PD the next day. Additionally, increases in ND predicted increases in prayers of confession on the following day ($\gamma_{10} = .043, p < .05$). Because guilt suppressed the negative effect of confession on well-being, I additionally ran lagged analyses with guilt and confession and found that guilt predicted prayers of confession the following day ($\gamma_{10} = .043, p = .088$).

Discussion

To my knowledge, this is the first study that has examined within-person relationships among daily prayers, well-being, and daily events through the use of a diary study. Through this novel approach, I have been able to test several theoretical assumptions about prayer, well-being, and daily events that have not been empirically examined. Additionally, by measuring prayer and well-being at the daily level, I was able to measure within-person relationships and move beyond cross-sectional designs aimed at the between-person level. Many of the hypotheses were confirmed.

Summary of Findings

Prayers of supplication and thanksgiving were the most frequently occurring types of prayers in which people engaged over the course of two weeks. Adoration prayer was the next most frequently occurring type of prayer, followed by confession. These findings are not terribly surprising given that people tend to associate thanksgiving with prayer (Lambert et al., 2011), and that people are reminded to pray when they need things. Prayers of confession are uncomfortable as they require one to reflect on the faults and wrongdoings one has committed. Despite the intuitive nature of these findings, a diary study provides a more accurate method of measuring these frequencies than global self-reports.

People were more likely to express prayers of adoration when positive events occurred, and were less likely to express thanksgiving in prayer when negative events occurred. Even though prayers of adoration are defined as praise expressed to God despite one's current life circumstances, positive events likely prime one to offer adoration to God. Although marginally significant, results also suggested that people were more likely to express thanksgiving when positive events occurred, more likely to

express confession when negative events occurred, and interestingly, more likely to express confession when positive events occurred. Why individuals were more likely to express confession when positive events occurred likely depends on the specific positive events and the specific things for which one confessed, and future research can examine these possibilities.

Additionally, I expected individuals to engage in prayers of supplication when negative events occurred. Although the direction of the coefficient supported this hypothesis, the value was not significant. It is possible that negative events do not predict prayers of supplication on the same day, but they may predict prayers of supplication on subsequent days. Alternatively, negative events may not relate strongly to prayers of supplication if individuals request things for others or for things that have happened in the past or for events that will happen in the future.

The next set of analyses revealed that highly religious individuals were more likely to engage in prayer, especially prayers of thanksgiving and confession, than were highly spiritual individuals. In contrast to those people who were high in extrinsic religious motivation, people high in intrinsic religious motivation were more likely to engage in all prayer types. Finally, individuals who were searching for meaning in life and searched for the answers to religious doubts and beliefs were more likely to express supplication in their prayers than were those individuals not searching for these things.

One of the central purposes of this study was to examine the within-person relationships between prayer and well-being. Findings at the between-person level largely replicated prior research (Whittington & Scher, 2010), namely that prayers of supplication related negatively to traits measures of well-being, whereas prayers of

thanksgiving related positively to well-being in regression equations that accounted for all four prayer types. Prayers of confession and adoration were not significantly related to well-being.

However, at the within-person level of analysis, daily prayers of supplication and confession related negatively to daily measures of well-being, and prayers of thanksgiving related positively to well-being. Daily prayers of adoration were significantly related to daily PD. These relationships mostly held even after controlling for daily events. As hypothesized, the positive relationships between thanksgiving and well-being were not mediated by daily positive events. Instead, the act of expressing thanksgiving in prayers predicted daily well-being above the effect of daily positive events. Contrary to one of my hypotheses, daily negative events did not mediate the negative relationship between supplicatory prayer and well-being. This could be explained by the fact that supplicatory prayer may not focus on the present day, but rather forces one to reflect on negative experiences from the past or future. Alternatively, supplicatory prayer may force one to reflect on the present negative daily events and could even exacerbate the negative effects of daily negative events.

According to the analyses, rumination, and to a lesser degree reflection, mediated the relationships between prayers of confession and well-being. Rumination additionally mediated the relationship between adoration and PD. Thus, one experiences greater NA, ND, and less PD when one confesses their sins in prayer, but these feelings are not explained by the sins of confession, but rather in part by the extent to which one also ruminates and reflects. If one has committed sins, it would make sense that rumination and reflection on these wrongdoings would relate negatively to well-being.

Little evidence was found to support the hypotheses that daily meaning in life, feelings of secure attachment to God, and emotion regulation would mediate the positive relationships between certain prayer types and well-being. Although some evidence supports the notion that meaning in life mediates the relationship between religiosity and life satisfaction (Diener et al., 2011; Steger & Frazier, 2005), meaning in life may not specifically mediate the relationship between prayer and well-being. Similarly, emotion regulation may not be as highly related to prayer, or these mechanisms may only mediate between-person relationships but not within-person relationships.

Related to these findings, results of this study at the between- and within-person level of analyses showed that prayers of supplication related significantly to envy, thanksgiving to gratitude, confession to guilt, and adoration to awe. Although thanksgiving related to gratitude, prayers of thanksgiving related significantly to well-being even after controlling for daily gratitude. Additionally as predicted, daily guilt suppressed the negative relationships between confession and well-being. That is, people likely experience lower well-being on days when they confess their sins not because they confess their sins, but rather because they feel guilty about what they have done.

Coupled with the lagged analyses, findings regarding prayers of confession paint quite an interesting picture. ND and guilt lead one to confess their sins in prayer the next day. Subsequently, prayers of confession will actually lead to greater PD on the following day. Although one may experience lower well-being on a particular day when one confesses his or her sins in prayer, the act of confessing sins in prayer leads to greater well-being. This positive link suggests that prayers of thanksgiving, confession, and adoration can serve beneficial purposes for one's well-being.

Moreover, prayers of thanksgiving were beneficial to participants by buffering them against daily negative events. On days when negative events occurred, if people also expressed prayers of thanksgiving, they experienced lower levels of ND than they would have experienced if they had not expressed thanksgiving in prayer. Presumably, if one can find a silver lining and express thanksgiving even in the midst of negative events, it will likely reduce the depression and disappointment that typically accompany negative experiences. Additionally, those individuals who regularly or routinely expressed prayers of thanksgiving were less vulnerable to the negative effects of daily negative events on ND. This suggests that prayers of thanksgiving can build one's resilience to negative events. Consistent with the broaden and build theory of positive emotions (Fredrickson, 2001) and research that has shown that positive emotions, such as gratitude, love, and joy foster resilience to deal with tragedies (Fredrickson, Tugade, Waugh, & Larkin, 2003), prayers of thanksgiving help one cope with daily negative events. In addition to the benefit that prayers of thanksgiving exhibit on one particular day in response to negative events, continual or regular prayers of thanksgiving help build resilience to daily negative events.

Future Research

The present study has addressed several limitations in prior research on prayer and well-being through the use of an intensive repeated measures design. The findings from this technique open the door for researchers to address many questions that were not addressed in this particular study. For instance, future research can examine not only the type of prayer that occurred on a daily basis, but also the time perspective of the prayers. Prayers focused on the present day may influence daily well-being differently from

prayers focused on the past or the future. The relationship between well-being and prayers of supplication focused on the present may be mediated by daily negative events, whereas daily negative events may not mediate the relationship between well-being and prayers of supplication focused on the past or future. Similarly, different measures of well-being may also be differentially influenced by temporal focuses in prayer. Thinking about the present relates more strongly to hedonic measures of well-being, whereas thoughts about the past and future relate more strongly to eudaimonic measures of well-being, such as meaning in life (Baumeister, Vohs, Aaker, & Garbinsky, 2013).

In addition to measuring prayer types, future research can examine the extent to which one focuses on oneself or others in their prayers. Prayers of supplication and thanksgiving directed towards others may relate more strongly to well-being than prayers focused on the self because thoughts and prayers related to others might strengthen one's relationship with another. For example, informing a friend that one has prayed for him or her could strengthen that relationship and promote well-being. Thus prayers focused on others may have an indirect benefit on well-being. Relatedly, future research can compare the relationship between prayer and well-being with the relationship between conversations with friends, family members, or even therapists and well-being. Prayer can be conceptualized as a very specific type of conversation, and it may share some similarities to conversations with other individuals.

Moreover, future research can examine specific religious beliefs as trait-level moderators of within-person relationships between daily prayer and well-being. Although prayers of confession, for example, relate negatively to well-being, the relationship might be stronger for those who believe in a punishing and strict God than it would be for those

who believe in a loving, forgiving God. The strength of one's belief in the existence of God and the assurance of an afterlife may additionally moderate many of the within-person relationships between prayer and well-being.

Limitations

Despite the advantages of this study in examining many of the daily processes of prayer and well-being, a few limitations should be addressed. First, the sample consisted of undergraduate students. Because students who prayed frequently were oversampled in our study, Christians and Catholics were overrepresented. This raises questions regarding the generalizability of our findings. Prayers by other religious groups may show different patterns of relationships to well-being.

Second, I measured four types of prayer for the sake of parsimony, but there may be other forms of prayer worth measuring, particularly among other religions. Certain prayers are ritualistic in nature whereas others appear more like conversations that one might have with a friend (e.g., Poloma & Pendleton, 1991). Nevertheless, the prayer types of supplication, thanksgiving, confession, and adoration were selected in part because they are common prayer types in Christian and Catholic traditions. Given our sample, these measures were deemed appropriate. Future research can explore other prayer types among other religious traditions.

Third, although daily reports improve biases and issues of misremembering that are present in global reports, daily reports are nevertheless suspect to some of the same issues to a lesser degree. Prayers at the end of the day just prior to completion of the daily questionnaire likely received a greater weight than prayers from the morning. Future

research can sample prayer experiences throughout the day to help participants more accurately recall those experiences in the present moment.

Implications

There are a few implications worthy of note from this diary study. First, by illustrating several of the psychological benefits of certain prayer types, the findings suggest that religious practices may partially explain the positive relationship between religiosity and well-being. In addition to mediators such as meaning and purpose in life and strong social support networks, highly religious individuals may experience greater well-being in part because of the specific prayers in which they engage.

Second, the present study helps explain the inconsistent pattern of findings relating to the relationship between frequency of prayer and well-being in cross-sectional designs. Specific types of prayers might moderate these between-person differences, and the within-person relationships broaden our understanding of these general relationships.

Third, our findings imply that prayers of thanksgiving and confession could be used as a treatment against depression. Thanksgiving prayers buffer against depression associated with daily negative events, and prayers of confession lead to increases in PD the following day.

Fourth, our findings dovetail with research on resilience (e.g., Keltner & Bonanno, 1997; Stein, Folkman, Trabasso, & Anne, 1997). Prayers of thanksgiving behave in a similar manner to positive emotions by helping people cope with negative events.

Conclusion

In conclusion, prayer is an important aspect of many people's daily lives. Yet the within-person relationships among prayer, well-being, and daily events have remained largely unexplored. The goal of the present study was to extend the findings on this topic by exploring a new level of analysis. The within-person findings outlined here rule out the possibility that other individual differences, such as levels of social support, account for the relationships between prayer types and well-being. By measuring daily experiences in addition to prayer and well-being, the study has captured the daily fluctuations of prayer and well-being. In sum, prayers tend to have a beneficial impact on daily life and may help explain why religious people are happy.

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Table 1

Correlation matrix with between-person relationships between prayer types and well-being.

	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1. Supplicatory prayer	3.81	1.98	.948								
2. Thanksgiving prayer	3.94	2.12	.958	.772**							
3. Confession Prayer	2.91	1.81	.956	.714**	.666**						
4. Adoration Prayer	3.04	1.91	.948	.678**	.740**	.736**					
5. Satisfaction with life	4.98	1.42	.910	.201*	.376**	.196*	.244**				
6. Positive activated affect	4.80	0.90	.738	.178*	.259**	.115	.137	.603**			
7. Positive deactivated affect	4.64	1.01	.849	.019	.233**	.006	.115	.545**	.553**		
8. Negative activated affect	3.82	1.08	.825	-.052	-.136	-.031	-.050	-.496**	-.201*	-.486**	
9. Negative deactivated affect	3.42	1.15	.817	-.086	-.193*	-.104	-.164	-.630**	-.315**	-.402**	.693**

*Note: * $p < .05$. ** $p < .01$.*

Table 2

Standardized regression coefficients of between-person relationships. Each prayer type was entered simultaneously into the regression equations.

	Well-being measure				
	SWL	PA	PD	NA	ND
Analysis 1					
Supplication	-.208	.000	-.326*	-.090	.168
Thanksgiving	.561***	.367*	.566***	-.285†	-.267†
Confession	-.014	-.066	-.168	.046	.029
Adoration	-.020	-.086	.041	.066	-.103
Analysis 2					
Supplication	-.253†	-.025	-.342*	.106	.195
Thanksgiving	.499***	.335*	.573***	-.292†	-.224
Confession	-.021	-.072	-.197	.074	.028
Adoration	-.037	-.093	.059	.048	-.088
Sex	-.122	-.087	-.259**	.265**	.030
Race	.373***	.208*	.122	-.123	-.225*
Analysis 3					
Supplication	-.215	-.009	-.289*	.024	.114
Thanksgiving	.444**	.312*	.496**	-.173	-.107
Confession	-.017	-.071	-.191	.066	.020
Adoration	-.018	-.086	.086	.006	-.128
Sex	-.095	-.076	-.222**	.207*	-.027
Race	.365***	.205*	.110	-.105	-.207*
Social desirability	.147†	.061	.207*	-.321***	-.315***

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Standardized regression coefficients of between-person relationships of mean scores of well-being and daily prayers. Each prayer type score was calculated by finding the mean score across the two-week diary study.

	Mean well-being measure				
	SWL	PA	PD	NA	ND
Analysis 1					
Supplication	-.395*	-.179	-.312*	.590**	.595**
Thanksgiving	.681***	.452*	.710**	-.475*	-.631**
Confession	.018	.027	-.093	.026	.055
Adoration	.044	-.036	-.046	-.095	-.117
Analysis 2					
Supplication	-.392*	-.204	-.284*	.517**	.539**
Thanksgiving	.611***	.404†	.653**	-.414†	-.576**
Confession	-.009	.002	-.109	.032	.063
Adoration	-.076	-.016	-.020	-.126	-.144
Sex	-.105	-.009	-.146†	.259**	.211*
Race	.208*	.221*	.090	.031	-.001
Analysis 3					
Supplication	-.378*	-.194	-.274	.486**	.449**
Thanksgiving	.600**	.397†	.646**	-.390†	-.545**
Confession	-.006	.004	-.107	.026	.054
Adoration	.078	-.014	-.019	-.131	-.150
Sex	-.090	.001	-.137	.226**	.169*
Race	.200*	.216*	.085	.048	.023
Social desirability	.096	.063	.062	-.210*	-.267**

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.

Correlation matrix showing between-person relationships between prayer types and envy, gratitude, guilt, and awe.

	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1. Supplicatory prayer	3.81	1.98	.948								
2. Thanksgiving prayer	3.94	2.12	.958	.772**							
3. Confession Prayer	2.91	1.81	.956	.714**	.666**						
4. Adoration Prayer	3.04	1.91	.948	.678**	.740**	.736**					
5. Envy	3.46	1.52	.908	.046	-.138	.008	-.131				
6. Gratitude	5.33	1.13	.941	.321**	.432**	.228**	.321**	-.065			
7. Guilt	3.31	1.35	.795	.306**	.268**	.438**	.273**	.390**	.141		
8. Awe	3.93	1.42	.843	.167†	.245**	.124	.220*	.003	.459**	.198*	

*Note: * $p < .05$. ** $p < .01$.*

Table 5

Standardized regression coefficients of between-person relationships with envy, gratitude, guilt, and awe as dependent measures. Each prayer type was entered simultaneously into the regression equations.

	Dependent measure			
	Envy	Gratitude	Guilt	Awe
Analysis 1				
Supplication	.366*	.024	.023	-.034
Thanksgiving	-.350*	.456**	-.005	.235
Confession	.147	-.151	.508***	-.128
Adoration	-.229	.079	-.113	.163
Analysis 2				
Supplication	.347*	.015	.038	-.055
Thanksgiving	-.359*	.438**	.027	.187
Confession	.166	-.148	.501***	-.115
Adoration	-.242†	.072	-.098	.140
Sex	.170*	.011	-.042	.080
Race	-.059	.076	-.131	.186*
Analysis 3				
Supplication	.286*	.042	-.006	-.034
Thanksgiving	-.230	.399**	.092	.157
Confession	.157	-.145	.496***	-.113
Adoration	-.287*	.086	-.120	.150
Sex	.107	.030	-.073	.095
Race	-.039	.071	-.121	.182
Social desirability	-.348***	.106	-.173*	.081

Note: † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Standardized regression coefficients of between-person relationships with mean scores of envy, gratitude, guilt, and awe from the diary study as dependent measures. Each mean score of each prayer type was entered simultaneously into the regression equations.

	Mean dependent measure			
	Envy	Gratitude	Guilt	Awe
Analysis 1				
Supplication	.517**	.046	.131	-.029
Thanksgiving	-.219	.561**	-.170	.173
Confession	-.073	-.114	.349**	.051
Adoration	-.198	-.037	.149	.264*
Analysis 2				
Supplication	.469*	.041	.159	-.061
Thanksgiving	-.149	.549**	-.185	.167
Confession	-.057	-.120	.350*	.041
Adoration	-.231†	-.032	.158	.266*
Sex	.212*	-.004	-.088	.066
Race	-.072	.051	-.036	.114
Analysis 3				
Supplication	.423*	.073	.141	-.052
Thanksgiving	-.113	.524**	-.171	.160
Confession	-.067	-.113	.346*	.043
Adoration	-.239†	.027	.155	.267*
Sex	.162†	.031	-.108	.076
Race	-.046	.034	-.026	.109
Social desirability	-.311***	.216**	-.122	.060

*Note: †p < .10. *p < .05. **p < .01. ***p < .001.*

Table 7.

Reliability estimates of random level-1 coefficients for the daily measures

Daily measure	Reliability estimate
Attachment to God	.789
Awe	.753
Envy	.815
Gratitude	.848
Guilt	.709
Meaning in life	.861
Negative activated affect	.452
Negative deactivated affect	.497
Positive activated affect	.553
Positive deactivated affect	.742
Prayer (adoration)	.848
Prayer (confession)	.879
Prayer (supplication)	.902
Prayer (thanksgiving)	.906
Reflection	.471
Rumination	.784
Satisfaction with life	.806
Updated daily measures	Reliability estimate
Negative activated affect (4-items, embarrassed was dropped)	.573
Negative deactivated affect (sluggish and bored were dropped)	.674
Positive activate affect (alert and proud were dropped)	.713
Reflection (second item was dropped)	.587

Table 8.

Unconditional models of each of the prayer types.

Prayer type	Variance components		Percent of variance at within-person level
	r (level 1)	u_0 (level 2)	
Supplication	.792	1.510	34.41%
Thanksgiving	.728	1.679	30.25%
Confession	.321	.683	31.99%
Adoration	.401	1.289	23.73%

Table 9.

Measurement model coefficients representing relationships between daily events and prayer types.

	Supplication	Thanksgiving	Confession	Adoration
Intercept	1.11 (γ_{100})	1.17 (γ_{200})	.51 (γ_{300})	.82 (γ_{400})
Positive events	.02 (γ_{110})	.11 [†] (γ_{210})	.07 [†] (γ_{310})	.08* (γ_{410})
Negative events	.13 (γ_{120})	-.21** (γ_{220})	.09 [†] (γ_{320})	-.07 (γ_{420})

Note: [†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 10.

Unstandardized coefficients with two trait variables entered individually at level 2.

	Prayer type			
	Supplication	Thanksgiving	Confession	Adoration
Spirituality				
Intercept	1.113	1.166	.508	.819
Spirituality slope	.706***	.724***	.324***	.587***
Religiosity				
Intercept	1.112	1.165	.508	.819
Religiosity slope	.800***	.860***	.422***	.680***
Intrinsic religious motivation				
Intercept	1.113	1.164	.508	.819
IRM slope	.859***	.901***	.459***	.761***
Extrinsic religious motivation				
Intercept	1.114	1.167	.509	.820
ERM slope	.326**	.353***	.142*	.217*
Quest religious motivation				
Intercept	1.114	1.167	.509	.820
Quest slope	.230*	.188†	.025	.044
Search for meaning in life				
Intercept	1.114	1.167	.509	.820
Search slope	.205†	.105	.045	.083

Note: The slopes presented represent the effect each trait variable has on each prayer type when just that trait variables is entered at level 2. † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 11.

Unstandardized coefficients with two trait variables entered at level 2.

	Prayer type			
	Supplication	Thanksgiving	Confession	Adoration
Spirituality vs. Religiosity				
Intercept	1.112	1.165	.508	.819
Spirituality slope	.058	-.077	-.162	-.001
Religiosity slope	.750**	.927***	.563**	.681**
$\chi^2(1)$	2.589	5.129*	4.698*	2.576
Intrinsic vs. Extrinsic religious motivation				
Intercept	1.112	1.166	.508	.819
IRM slope	.913***	.949***	.507***	.853***
ERM slope	-.112	-.101	-.101	-.191*
$\chi^2(1)$	43.54***	45.16***	18.78***	39.55***
Quest vs. Search for meaning in life				
Intercept	1.114	1.167	.509	.820
Quest slope	.215*	.180†	.021	.038
Search for meaning in life slope	.187†	.090	.044	.080
$\chi^2(1)$.034	.348	.05	.083

Note: The slopes presented represent the effect each trait variable has on each prayer type after both trait variables are entered at level 2. † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 12.

Within-person relationships between prayer types and well-being.

		Prayer types entered individually at level 1			
		Supplication	Thanksgiving	Confession	Adoration
Analysis 1					
SWL		-.021	.246***	-.090	.233***
PA		-.019	.261***	-.046	.143*
PD		-.096**	.085**	-.114*	.093*
NA		.179***	-.048	.190***	.007
ND		.080**	-.097**	.187**	-.031
		Prayer types entered simultaneously at level 1			
	Intercept	Supplication	Thanksgiving	Confession	Adoration
Analysis 2					
SWL	4.808	-0.123**	0.273***	-0.165**	0.099
PA	4.228	-0.133**	0.336***	-0.065	-0.069
PD	3.934	-0.139***	0.133**	-0.123*	0.127*
NA	3.272	0.227***	-0.173***	0.117*	-0.006
ND	2.426	0.121**	-0.188***	0.175*	0.027

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 13.

Within-person relationships between prayer types and well-being, entered by themselves in analysis 1 and with daily events in analysis 2.

	Intercept	Variables entered simultaneously in level 1				Positive Events	Negative Events
		Supplication	Thanksgiving	Confession	Adoration		
Analysis 1							
SWL	4.808	-0.123**	0.273***	-0.165**	0.099		
PA	4.228	-0.133**	0.336***	-0.065	-0.069		
PD	3.934	-0.139***	0.133**	-0.123*	0.127*		
NA	3.272	0.227***	-0.173***	0.117*	-0.006		
ND	2.426	0.121**	-0.188***	0.175*	0.027		
Analysis 2							
	Intercept	Supplication	Thanksgiving	Confession	Adoration	Positive Events	Negative Events
SWL	4.806	-.068*	.188***	-.156**	.076	1.005***	-1.243***
PA	4.227	-.080*	.257***	-.072	-.089	1.241***	-.593***
PD	3.933	-.103**	.073*	-.084†	.048	.642***	-.863***
NA	3.271	.169***	-.086**	.092*	-.000	-.127†	1.798***
ND	2.425	.058†	-.099**	.111*	.064	-.341***	1.695***

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.
 † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 14.

Within-person relationships between prayer types and well-being, entered by themselves in analysis 1 and with rumination and reflection in subsequent analyses.

	Variables entered simultaneously in level 1					
	Intercept	Supplication	Thanksgiving	Confession	Adoration	
Analysis 1						
SWL	4.808	-0.123**	0.273***	-0.165**	0.099	
PA	4.228	-0.133**	0.336***	-0.065	-0.069	
PD	3.934	-0.139***	0.133**	-0.123*	0.127*	
NA	3.272	0.227***	-0.173***	0.117*	-0.006	
ND	2.426	0.121**	-0.188***	0.175*	0.027	
Analysis 2						
	Intercept	Supplication	Thanksgiving	Confession	Adoration	Rumination
SWL	4.807	-.110***	.271***	-.104*	.049	-.208***
PA	4.228	-.125**	.328***	-.034	-.087	-.072*
PD	3.934	-.136***	.133**	-.059	.053	-.089**
NA	3.271	.209***	-.153***	.018	.047	.285***
ND	2.425	.095**	-.156***	.056	.062	.338***
Analysis 3						
	Intercept	Supplication	Thanksgiving	Confession	Adoration	Reflection
SWL	4.807	-.118***	.277***	-.128**	.084	-.152***
PA	4.227	-.128**	.335***	-.077	-.011	-.030
PD	3.934	-.136***	.134**	-.113*	.113*	-.030
NA	3.271	.215***	-.144**	.096†	-.034	.227***
ND	2.425	.107**	-.156***	.072	.035	.297***

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 15.

Within-person relationships between prayer types and well-being, entered by themselves in analysis 1 and with meaning in life and attachment to God in analysis 2.

	Variables entered simultaneously in level 1						
	Intercept	Supplication	Thanksgiving	Confession	Adoration		
Analysis 1							
SWL	4.808	-0.123**	0.273***	-0.165**	0.099		
PA	4.228	-0.133**	0.336***	-0.065	-0.069		
PD	3.934	-0.139***	0.133**	-0.123*	0.127*		
NA	3.272	0.227***	-0.173***	0.117*	-0.006		
ND	2.426	0.121**	-0.188***	0.175*	0.027		
Analysis 2							
	Intercept	Supplication	Thanksgiving	Confession	Adoration	Meaning in life	Attachment to God
SWL	4.806	-.120***	.148***	-.137***	.063	.597***	.084*
PA	4.228	-.125**	.252***	-.049	-.090	.454***	.039
PD	3.934	-.144***	.078*	-.101*	.081†	.307***	.025
NA	3.271	.226***	-.121**	.110*	.010	-.256***	-.039
ND	2.425	.126**	-.093*	.124*	.019	-.321***	-.083*

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.
 † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 16.

Within-person relationships between prayer types and envy, gratitude, guilt, and awe.

	Prayer types entered individually at level 1				
	Intercept	Supplication	Thanksgiving	Confession	Adoration
Analysis 1					
Envy	1.892	.026			
Gratitude	4.015		.393***		
Guilt	2.003			.275***	
Awe	2.274				.243**
	Prayer types entered simultaneously at level 1				
	Intercept	Supplication	Thanksgiving	Confession	Adoration
Analysis 2					
Envy	1.892	.063*	-.074*	.051	.011
Gratitude	4.015	-.065	.366***	-.104	.177*
Guilt	2.003	.036	-.122**	.307***	.034
Awe	2.274	-.039	.171**	-.100	.198*

Note: † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 17.

Within-person relationships between prayer types and well-being, entered by themselves in analysis 1 and with envy, gratitude, guilt, and awe in subsequent analyses.

		Variables entered simultaneously in level 1					
		Intercept	Supplication	Thanksgiving	Confession	Adoration	
Analysis 1							
SWL	4.808	-0.123**	0.273***	-0.165**	0.099		
PA	4.228	-0.133**	0.336***	-0.065	-0.069		
PD	3.934	-0.139***	0.133**	-0.123*	0.127*		
NA	3.272	0.227***	-0.173***	0.117*	-0.006		
ND	2.426	0.121**	-0.188***	0.175*	0.027		
Analysis 2		Intercept	Supplication	Thanksgiving	Confession	Adoration	Envy
SWL	4.807	-.116**	.273***	-.162**	.108†	-.159***	
PA	4.228	-.119**	.349***	-.061	-.066	-.067†	
PD	3.934	-.134***	.127**	-.119*	.129*	-.078**	
NA	3.271	.216***	-.155***	.121*	-.024	.214***	
ND	2.425	.102*	-.155***	.166*	.003	.278***	
Analysis 3		Intercept	Supplication	Thanksgiving	Confession	Adoration	Gratitude
SWL	4.807	-.095**	.158***	-.130*	.043	.381***	
PA	4.227	-.088*	.181***	-.050	-.070	.412***	
PD	3.933	-.122***	.039	-.107*	.070†	.307***	
NA	3.272	.205***	-.100**	.133*	.007	-.162***	
ND	2.425	.010*	-.107*	.163*	.030	-.186***	
Analysis 4		Intercept	Supplication	Thanksgiving	Confession	Adoration	Guilt
SWL	4.807	-.117**	.235***	-.053	.098	-.267***	
PA	4.228	-.131**	.319***	-.015	-.070	-.120***	
PD	3.934	-.147***	.127**	-.043	.090†	-.154***	
NA	3.272	.220***	-.132**	.011	-.013	.341***	
ND	2.426	.092*	-.115**	.023	.012	.454***	
Analysis 5		Intercept	Supplication	Thanksgiving	Confession	Adoration	Awe
SWL	4.807	-.107**	.254***	-.163**	.061	.260***	
PA	4.227	-.107*	.295***	-.044	-.136*	.332***	
PD	3.934	-.131***	.110*	-.104*	.076	.205***	
NA	3.272	.219***	-.154***	.140*	-.003	-.106***	
ND	2.426	.112**	-.173***	.169*	.045	-.105***	

Note: SWL = satisfaction with life, PA = positive activated affect, PD = positive deactivated affect, NA = negative activated affect, ND = negative deactivated affect.
 † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 18.

Predicted scores describing the buffering effect of prayers of thanksgiving on the impact of negative events on negative deactivated affect.

Negative events Thanksgiving prayers	High High	High Low	Low High	Low Low	Buffering effect
ND	2.89	3.08	1.89	1.83	.25