

## PRIMING GOD-RELATED CONCEPTS INCREASES ANXIETY AND TASK PERSISTENCE

TINA TOBUREN AND BRIAN P. MEIER  
*Gettysburg College*

Research on the relationship between religiosity and anxiety has been mixed, with some studies revealing a positive relation and other studies revealing a negative relation. The current research used an experimental design, perhaps for the first time, to examine anxiety and task persistence during a stressful situation. Christians and Atheists/Agnostics/Others were primed with God-related or neutral (non-God related) concepts before completing an unsolvable anagram task described as a measure of *verbal intelligence*. The results revealed that the God-related primes increased both task persistence and anxiousness, which suggests that experimentally induced God-related thoughts caused participants to persist longer on a stressful task, but also to feel more anxious after finishing it. No effect of religious affiliation was found, however, indicating that God-related priming affected Christians and non-Christians in a similar fashion.

A growing amount of psychological research has examined the role religion (broadly defined) plays in mental health. Individuals as far back as Jung, Rogers, and Maslow believed that their patients' mental health was enhanced by the presence of religion (Bergin, 1985, 1991; Shreve-Neiger & Edelstein, 2004). While it is difficult to offer one definition of religion, people's practices and belief in a deity or creator seem to be core aspects (e.g., Shreve-Neiger & Edelstein, 2004).

---

This article is based upon honors research conducted by the first author.

Address correspondence to Brian P. Meier, Department of Psychology, Gettysburg College, Gettysburg, PA 17325; E-mail: bmeier@gettysburg.edu.

Anxiety is one specific component of mental health. Although there are different subtypes of anxiety, we consider anxiety at the general level by focusing on people's negative affective reactions (e.g., worry, apprehension) in response to a perceived threat or danger (Beck & Clark, 1997; Watson et al., 1995). While anxiety can be a beneficial response to an approaching danger, excessive anxiety in the moment or over time can have debilitating consequences for both mental and physical health (Beck, Emery, & Greenberg, 2005).

The relationship between religiosity and anxiety has been a complicated one to examine, and the results been somewhat mixed (Koenig, McCullough, & Larson, 2001; Miller & Kelley, 2005; Spilka, Hood, Hunsberger, & Gorsuch, 2003). For example, Zeidner and Hammer (1992) examined state anxiety and religion-related coping (e.g., engagement in religious activities). They found a significant positive relationship between religious coping and state anxiety such that more religious coping predicted higher levels of state anxiety. Harris, Schoneman, and Carrera (2002), on the other hand, found that multiple measures of religiosity were significantly negatively related to trait anxiety such that more religiosity predicted lower levels of anxiety. This literature is typical of the somewhat inconsistent findings of the relation between religion and anxiety (Koenig et al., 2001; Shreve-Neiger, & Edelstein, 2004).

Although there are likely multiple factors that lead to these inconsistent results (e.g., methodological issues, operationalization of the constructs; Shreve-Neiger, & Edelstein, 2004), one explanation for why religion might *decrease* anxiety could involve people's reaction to stress. A belief in God could allow people to better manage stressful situations (Oman & Thoresen, 2003). Several studies show that people turn to God and their religious beliefs as ways to deal with stressors (e.g., cancer or hurricanes; Koenig et al., 2001; Spilka et al., 2003). Religious thinking might be helpful when people face such stressors because it allows them to view God and their religion as a refuge, partner, or source of hope that provides some level of meaning and explanation to a situation (Moran, 1990; Paragament, 1996; Spilka et al., 2003). This possibility gains merit when considering that some people see God as a benevolent figure that is loving and caring (Kirkpatrick, 2005). Thus, people may better approach difficult situations by turning to a kind God, which might lead to a decrease in immediate and long-term anxiety.

As mentioned earlier, however, some studies reveal that religious beliefs can lead to an increase in anxiety. One reason for this increase

might be because religious beliefs or thoughts about God create a sense of being watched or controlled, which could create a concern for how an individual behaves in any given situation. Kirkpatrick (2005) contends that some people view God as a punishing and demanding figure that can see all. Bering (2006) and others (e.g., Shariff & Norenzayan, 2007) suggest that belief in a supernatural watcher can bias feelings, thoughts, and behaviors. If God is watching, people could be concerned about the type of behavior they engage in or the private thoughts they have, both of which could increase anxiousness.

Although there does not appear to be any direct evidence for the idea that a supernatural watcher can affect anxiety, there is evidence that reveals how a supernatural watcher can affect behavior. Bering, McLeod, and Shackelford (2005) found that participants were less likely to cheat when given the chance if they had first been told that people have reported the presence of a ghost in the laboratory room. More directly related to God and religion, Shariff and Norenzayan (2007) found that when participants had been primed with God-related concepts, they allocated more money to an anonymous stranger compared to participants who had been primed with neutral concepts. Although other explanations are possible (e.g., God is associated with prosocial behavior), they concluded that a God concept activated the feeling of being watched (Shariff & Norenzayan, 2007), which caused participants to allocate more money.

## THE PRESENT STUDY

We sought to use an experimental design to examine religion and anxiety. The anxiety research cited above used correlational designs, but we are unaware of any experimental research in this area. Furthermore, existing research has typically used designs that require retrospective reports of both religion and anxiety, but no research that we are aware of has examined religion's impact on anxious feelings in the moment as the result of a stressful laboratory task. In the current study, we asked participants to report their current level of anxiousness before and after performing an alleged verbal intelligence task, which was actually an unsolvable anagram task. Before this task, some participants were primed with God-related concepts. The scrambled-sentence paradigm of Srull and Wyer (1979) was used to prime God- (versus non-God) related concepts. This task requires participants to use four of five scrambled words

to form a complete English sentence. In the neutral prime condition, none of the scrambled words included God-related concepts, but in the God-related prime condition, half of the sentences contained a God-related word (e.g., God).

The scrambled sentence paradigm has been shown to be an effective way of determining how a cognitive representation primed in one situation (e.g., via scrambled sentences) affects behavior in a seemingly unrelated situation (e.g., anxiousness induced by a laboratory stressor; Bargh & Chartrand, 2000). The basic premise is that reading words related to a God-like (versus non-God-like) concept will prime or activate God-related representations or concepts in memory, which allows one to determine the effect such thoughts have on behavior. In the present study, this task enables us to determine the manner in which God-related thoughts affect anxiety and persistence when participants engage in a stressful task. In other words, we used this task to manipulate God-related thoughts. This task has been used extensively across a broad array of disciplines and research areas (e.g., Bargh, Chen, & Burrows, 1996; Fitzsimons & Shah, 2008; Meier & Robinson, 2004; Randolph-Seng & Nielson, 2007; Shariff & Norenzayan, 2007; Srull & Wyer, 1979).

If God-related thoughts allow individuals to better handle stressful situations, then participants primed with God-related (versus non-God related) concepts might persist longer on the anagram task and report feeling less anxious after completing it. However, if God-related thoughts intensify a stressful situation, then participants primed with God-related (versus non-God related) concepts might persist longer on the anagram task and report feeling more anxious after completing it.

We examined the effect of God-related primes on Christian and non-Christians (i.e., those who reported being an Atheist, an Agnostic, or having an Other religious affiliation). Religion and God are ubiquitous topics, which suggest that religious affiliation might not moderate the hypothesized effects. However, because Christians (vs. Atheists/Agnostics/Others) have a stronger and deeper identification with God, regardless of how God is represented, religious affiliation might moderate the effects, with Christian primed with God exhibiting a stronger effect on both persistence and anxiousness.

## METHOD

### Participants

Participants were 62 undergraduate (24 males and 38 females) ranging in age from 17 to 22 years ( $M = 19.60$ ;  $SD = 1.25$ ). The majority of participants were White (55), four participants were Asian, two were Hispanic, and one was an African American. Thirty-three participants reported that they were Christian and twenty-nine participants reported that they were non-Christian (Atheist = 12; Agnostic = 10; Other = 7; see below for a description of the creation of the "other" category).

### Procedure

Participants were gathered through a mass e-mail system. Interested participants were asked to respond to a questionnaire containing various demographics information (e.g., year in college, hometown, major, age, etc.). Embedded into this message was a subtle question asking if the potential participant was a Christian or Atheist. Because we were interested in the effect of priming God-related concepts in participants who did and did not believe in God, we only invited participants who reported being a Christian or an Atheist, Agnostic, or Other (a non-deity based religion like Buddhism).

Upon arrival at the laboratory, participants were told that they were taking part in a study on personality, emotion, and information processing. Participants were first asked to complete a series of pretest measures. These measures used a continuous scale and the mouse cursor. The scale was a white bar on a computer screen that measured 900 pixels in width using a screen resolution of 1024 x 768 pixels. This scale gave us a 900-point measurement. Participants were asked to use this scale to rate how relaxed (left endpoint) or anxious (right endpoint) they currently felt by clicking the mouse button while the cursor was somewhere on the white bar. This visual-analog measurement is often used when measuring state anxiety at multiple times in the same session. For example, MacLeod, Rutherford, Campbell, Ebsworthy, and Holker (2002) used an identical scale (including the same endpoints) to assess anxiousness in response to a cognitive training task. One-item measures of state anxiety have been shown to strongly correlate (.78) with the state

form of the Spielberger State Trait Anxiety Inventory, one of the most commonly used measures of state anxiety (Davey, Barratt, Butow, & Deeks, 2007). In order to mask the importance of anxious feelings, participants also completed questions that asked about their perception of the room temperature and their current level of sleepiness using this same response format.

After completing these measures, participants were given the priming task. They were asked to use four of five words to form a complete English sentence in 10 trials. In the neutral prime condition, none of the scrambled words included God-related concepts (e.g., "treat I today it bought" becomes "I bought it today"). In the God-related prime condition, half of the sentences contained a God concept (spirit, divine, God, sacred, prophets). For example, participants were asked to unscramble "dessert divine was fork the" into a complete four-word sentence, with the correct sentence being "the dessert was divine." These scrambled sentences were identical to the ones used by Shariff and Norenzayan (2007), who used them to examine God-related primes and prosocial behavior. The list of scrambled sentences is shown in the appendix.

After the priming task, participants completed a stressful anagram task. Participants were told they would be completing a verbal intelligence task, and that their scores would be compared to other students at Gettysburg College. This cover story was used to induce stress. The task involved ten anagrams, and participants were told that every anagram was solvable, however, only four of the ten were actually solvable (solvable: tnkoe/token, yncfa/fancy, ruchs/crush, drnba/brand; unsolvable: padus, alavt, dbhoc, vaofea, kylix, malae; taken from Smith, Kass, Rotunda, & Scheider, 2006). The unsolvable anagram paradigm has been used to examine participants' anxious response to and persistence on a difficult task (e.g., MacLeod et al., 2002; Muraven, Tice, & Baumeister, 1998). Participants were told they could take as much time as needed to complete the anagram task but could stop at any point to continue on to the remainder of the study. The maximum time given was 20 minutes (only one participant used the entire time available).

After the anagram task, participants completed posttest measures that were the same as the pretest measures (e.g., anxiousness, temperature, and sleepiness). They then completed two scales that we used to examine individual differences in belief in God and religious involvement. The first scale was the Nearness to God Scale, which has six items that tap a person's belief in God (e.g., God is very real

to me; God exists in all of us; Gorsuch & Smith, 1983). The items are answered using a four-point scale (1 = strong disagreement; 4 = strong agreement). The second scale was the personal faith subscale of the Religious Involvement Inventory (Hilty & Morgan, 1985). This scale has 14 items that tap a person's frequency of engaging in religious activities (e.g., How often do you pray privately in places other than church?; When you have a decision to make in your everyday life, how often do you try to find out what God wants you to do?). The items were answered using a five-point scale (1 = never; 2 = seldom; 3 = sometimes; 4 = frequently; 5 = always). We included these two scales to ensure that there was a difference in belief in God and religious involvement between participants that we categorized as Christians versus Atheists/Agnostics/Other. We also believed that scores on these scales could serve as another way to operationalize religious affiliation.

After completing these scales, participants reported their categorical religious affiliation, being able to choose between, Christian, Jewish, Islam, Atheist, Agnostic, or Other. This second report of religion (e-mail was the first report) was used in the analyses reported below as the measure of religious affiliation. None of the participants selected Jewish or Islam, and those reporting Atheist, Agnostic, and Other were grouped together. We grouped participants who selected other (seven participants) into the non-Christian category because we assumed these individuals did not practice a religion with a God-like figure (i.e., they may have been Buddhists). Participants were then probed for suspicion using a funneled procedure, in which they were first asked about their impression of the study, followed by what they thought was the purpose of the study, and then whether they thought any of the tasks were connected (and if so, how). Finally, participants were debriefed and given \$10 for their participation.

## RESULTS

One participant was deleted from the analysis due to a computer error (i.e., the computer program crashed during data collection). We also deleted one participant from the analysis due to suspicion. We defined suspicion as any mention that the priming task was meant to create religious or God-related thoughts or that the priming task

was meant to affect behavior on the anagram task. This left us with a total sample of 60 participants.

### Preliminary Analyses

We computed means for each participant for time spent on the anagram task (in minutes) and their reports of pre- and post-anxiousness. The time spent on the anagram task had a strong positive skew so we performed a square-root transformation on the raw times, which reduced the skew. We used these transformed means in our analyses, and we report the results in both raw and transformed formats.

We first sought to ensure that pre-anxiousness scores did not differ between participants randomly assigned to the two priming conditions. We used an independent samples *t*-test to examine pre-anxiety scores by prime type (God related or non-God related). The difference in pre-anxiousness was not significant,  $t(1, 58) = 1.26, p = .21$ .

Next, we sought to verify that participants believed the anagram task was stressful. We used a paired-samples *t*-test to determine if post-anxiousness scores were higher than pre-anxiousness scores. The anagram task did make participants feel more anxious as post-anxiousness scores were higher ( $M = 415.55; SD = 194.72$ ) than pre-anxiousness scores ( $M = 286.52; SD = 224.10$ ),  $t(59) = 4.42, p < .001, d = .57$ . Furthermore, the correlation between pre- and post-anxiousness scores was significant, as would be expected if the measure is reliable,  $r(58) = .42, p < .001$ .

To determine if the participants we assigned as Christians versus Atheists/Agnostics/Other differed in their belief in God, we computed the mean of the six belief-in-God items for each participant ( $\alpha = .93$ ). We then used an independent samples *t*-test to determine if these two groups differed in their belief in God. We found a significant difference,  $t(58) = 7.09, p < .001, d = 1.30$ , indicating that Christians reported a stronger belief in God ( $M = 3.07; SD = .72$ ) than Atheists/Agnostics/Others ( $M = 1.73; SD = .74$ ). We next computed the mean for the 14 items of the Religious Involvement Scale ( $\alpha = .94$ ). We then used an independent samples *t*-test to determine if these two groups differed in their religious involvement. We found a significant difference,  $t(58) = 4.11, p < .001, d = 1.40$ , indicating that Christians reported more frequent involvement in religious activities ( $M = 2.60; SD = .95$ ) than Atheists/Agnostics/Others ( $M = 1.76;$

$SD = .58$ ). Both of these effects confirm that participants we assigned to the religious affiliation categories had a strong difference (i.e., large effect sizes) in their belief in God and religious involvement.

### Main Analyses

The means and standard deviations for the dependent variables are shown in Table 1 and the results of the main analyses are shown in Table 2. To determine if prime type and religious affiliation affected task persistence, we performed a 2 (prime type: God-related or neutral)  $\times$  2 (religious affiliation: Christian or Atheist/Agnostic/Other) analysis of variance (ANOVA) on the transformed times spent on the anagram task. We found a significant main effect of prime type,  $F(1, 56) = 4.42, p = .04, \eta_p^2 = .07$ , which revealed that participants receiving the God-related prime spent more minutes on the anagram task (raw data:  $M = 9.18$  minutes;  $SD = 3.77$  minutes; transformed data:  $M = 2.97$ ;  $SD = .60$ ) than participants receiving the neutral prime (raw data:  $M = 7.28$  minutes;  $SD = 3.80$  minutes; transformed data:  $M = 2.61$ ;  $SD = .68$ ). The main effect of religious affiliation and the interaction between prime type and religious affiliation were not significant,  $F_s < 1$ .

To determine if prime type and religious affiliation affected anxiousness reports, we performed a 2 (prime type: God-related or neutral)  $\times$  2 (religious affiliation: Christian or Atheist/Agnostic/Other) analysis of covariance (ANCOVA) on post-anxiousness scores using the pre-anxiousness score as a covariate. A significant main effect of prime type was again found,  $F(1, 55) = 5.22, p = .026, \eta_p^2 = .09$ , which revealed that post-anxiousness scores (adjusted for pre-anxiousness scores) of participants receiving the God-related primes were higher ( $M = 469.15$ ;  $SD = 252.67$ ) than participants receiving the neutral primes ( $M = 364.76$ ;  $SD = 244.39$ ). Again, the main effect of religious affiliation and the interaction between prime type and religious affiliation were not significant,  $F_s < 1$ .

An alternative way of performing the main analyses is to use scores on the Nearness to God Scale and the Religious Involvement Scale as measures of religious affiliation instead of the categorical groups we created. These continuous measures might better tap individual differences in religiosity and belief in God. We performed identical analyses to what was described in the results section using Nearness to God and Religious Involvement as the religiosity measures. We performed one ANOVA (task persistence) and one

TABLE 1. Means and Standard Deviations for Time Spent on the Anagram Task and Post-Anxiousness (Adjusted for Pre-Anxiousness) as a Function of Prime Type

Prime Type	Anagram Task (Minutes)	Anagram Task (Transformed Means)	Post-Anxiousness (0 to 900 scale)
Neutral	7.28 (3.80)	2.61 (.68)	364.76 (244.39)
God-Related	9.18 (3.77)	2.97 (.60)	469.15 (252.67)

ANCOVA (anxiousness) with each measure. In all cases, we found identical results. That is, the main effect of prime type was significant, but the main effect of religiosity and the interaction between prime type and religiosity were nonsignificant (all  $F_s < 1$ ). Thus, religiosity, defined in multiple ways, did not affect task persistence or anxiousness as either a main effect or moderator.

Our final set of analyses was recommended by a reviewer. First, we correlated post-anxiousness scores with task persistence, and found a nonsignificant relationship,  $r(58) = .04, p = .79$ . Next, we determined if pre-anxiousness interacted with prime type and religious affiliation in predicting task persistence or post-anxiousness. We found that pre-anxiousness scores did not interact with prime type and/or religious affiliation in predicting post-anxiousness or task persistence, all interaction  $ps > .10$ .

## DISCUSSION

The current research used an experimental design to examine how God-related primes affect anxiety and task persistence in Christians and non-Christians. We hypothesized that if God-related thoughts decrease anxious feelings during a stressful situation, then participants primed with God-related (versus non-God related) concepts should persist longer on a stressful anagram task and report feeling less anxious after completing it. However, if thoughts about God increase anxious feelings during a stressful situation, then participants primed with God-related (versus non-God related) concepts should persist longer on a stressful anagram task and report feeling more anxious feelings after completing it. Furthermore, because Christians likely have a deeper understanding and relationship with God, regardless of how God is viewed, religious affiliation might moderate any effect of prime type.

TABLE 2. Results of the Main Analyses

Effect	Anagram Task (using Transformed Scores)	Post-Anxiousness (using Pre-Anxiousness as a Covariate)
God-Related Prime	$F(1,56) = 4.42, p = .04$	$F(1,55) = 5.22, p = .026$
Religious Affiliation	$F < 1$	$F < 1$
God-Related Prime by Religious Affiliation	$F < 1$	$F < 1$

Our results support the hypothesis that experimentally induced God-related thoughts seem to increase performance concerns and anxious feelings. We found that participants primed with God-related concepts spent more time on a stressful anagram task and reported feeling more anxious after completing it. We did not find a significant main effect of religious affiliation or an interaction between prime type and religious affiliation on either time spent on the anagram task or anxiousness scores. Below, we consider some implications of these findings.

#### GOD IS WATCHING?

The Religious Involvement Scale (Hilty & Morgan, 1985) and the Nearness to God scale (Gorsuch & Smith, 1983) indicated that Christians displayed a much higher religious involvement and belief in God compared to the Atheist/Agnostic/Other group. Thus, we conclude that the nonsignificant main effect of religious affiliation and its interaction with prime type cannot be due to a lack of difference between our predefined religious groups at least when considering belief in God and religious involvement.

What can be deduced is that while there was a difference in the two groups' beliefs, those beliefs did not play a role in their persistence on the anagram task or the anxiousness it created; God-related primes affected both groups in the same manner, a finding that mirrors research with similar designs (Randolph-Seng & Nielson, 2007; Shariff & Norenzayan, 2007). Past research on the relation between religion and anxiety has been somewhat mixed (Koenig et al., 2001; Shreve-Neiger & Edelstein, 2004), but our experimental design seems to suggest that God-related thoughts increase anxiety when participants engage in a stressful task. We note, though, that while one-item measures of anxiety like the one we used have been

shown to be valid (e.g., Davey et al., 2007), it is also the case that anxiety correlates with negative affect (Watson, Clark, & Tellegen, 1988). Although we contend that God-related primes increased anxiety, it would be useful to determine if such primes increase anxiety independently of more general forms of negative affect.

While our study does not offer a definitive mechanism for why God-related thoughts increased anxiousness, one possibility might be that such thoughts created a sense of being watched, which may have caused participants to work harder on the anagram task and feel more anxious about their performance. God can be viewed as an authority figure (Kirkpatrick, 2005), which could cause people to think and behave differently when being reminded of him/her. Our research adds to the small, but growing body of data that suggests supernatural primes affect the thoughts, feelings, and behaviors of individuals, at times regardless of their religious affiliation (Bering et al., 2005; Shariff & Norenzayan, 2007). We recognize, however, that people have different representations of God, with some people viewing God as a caring and benevolent figure while others view God as a dominant and punishing entity (Kirkpatrick, 2005; Spilka et al., 2003). Future research should consider this individual difference variable as a potential moderator of God-related priming.

Although a "watcher" explanation is possible, other explanations should be considered. Even if God-related primes caused participants to feel as though they were being watched, there might not be anything special about God. As already suggested, God can be viewed as an authoritarian figure (DesCamp & Sweetser, 2005; Kirkpatrick, 2005). Furthermore, people do believe that God is powerful (Meier, Hauser, Robinson, Friesen, & Schjeldahl, 2007). Therefore, it might be that our manipulation caused participants to have thoughts related to authority, which might have made them more anxious and persistent. If this was the case, we might expect similar findings when using primes related to father, boss, or professor. Future research will be necessary to examine this contention.

Another possible explanation might be that God-related primes affected participants' work ethic or more basic religious thoughts. In general terms, Christianity, God, and religion seem to be associated with an ideal that values hard work (Furnham, 1990). Thus, the God-related primes may have activated this type of work ethic or belief, causing participants to persist longer than participants primed with neutral concepts, but also to feel more anxious about the task (because many anagrams were unsolvable). This possibil-

ity could have been exaggerated because of the God-related primes we chose to use. We selected the same God-related primes used in past research (Shariff & Norenzayan, 2007), but we recognize that some of those primes (e.g., spirit) are related to religion in general rather than God per se. We used such primes because we believed that using only God-related words (e.g., God, Almighty, Creator, etc.) would have created an excessive level of suspicion in our participants. Although it would be quite difficult to activate or prime a God concept independent of a religion concept, future research could determine the extent to which God-related primes activate God versus religious thoughts, which would allow for a more precise determination of the mechanism involved. This work might consider more specific priming techniques (e.g., subliminal priming) that focus more clearly on a God concept.

Although the above caveats are apparent, and additional research will be necessary to determine the exact mechanism or mechanisms involved, the current study is significant as it shows that an experimental manipulation can be used to examine the relation between religiosity and anxiety and that God-related primes affect Christians and non-Christians in a similar manner.

## RELIGIOSITY AND ANXIETY

Our research suggests that priming God-related thoughts does not appear to have a beneficial effect upon Christians. If this had been the case, we should have found an effect of religious affiliation, and Christians' anxiousness scores would have decreased as opposed to increased when exposed to the God-related primes.

Why would religious affiliation fail to interact with prime type? One reason might be due to our reliance on an in-vivo design. Much of the past research on religiosity and anxiety has been correlational in nature with retrospective reports. The current study, however, used an experimental procedure to manipulate God-related thoughts before participants engaged in a stressful task. Thus, it is possible that a strong situation (i.e., the verbal intelligence task) diminished the effect of individual differences (i.e., religious involvement and belief in God).

It could also be the case that there is a significant difference between being primed with God-related concepts and engaging in more naturalistic religious-like behavior such as self-talk or prayer.

God-related thoughts may not be what initiates coping, but prayer might (Spilka et al., 2003). It would be telling to examine what effect self-talk or prayer might have on people's anxiousness after engaging in a stressful task. In this situation, it is possible that Atheists/Agnostics/Others would benefit less from the effect of prayer due to their lack of a belief in God. Interestingly, however, one might also predict, based on the current findings that Atheists/Agnostics/Others would benefit (in terms of anxiety reduction) from such prayer. After all, most people know that some individuals pray to God for help (Spilka et al., 2003). Thus, prayer, like God-related thoughts, could affect people in general, regardless of their religious beliefs.

## CONCLUSION

We used an experimental design to examine how God-related thoughts affect anxiousness and persistence. We found that God-related primes affected anxiousness and persistence, but those effects were independent of religious affiliation. When primed with God-related concepts, participants persisted longer on a task, but also felt more anxious afterwards, regardless of religious affiliation. One possible explanation suggests that such effects are due to participants feeling as though God is "watching," but alternative explanations are possible (e.g., the influence of authority-related concepts). While our study reveals that experimental examinations of religiosity and anxiety are viable, the important conclusion is that God-related thoughts, regardless of religious affiliation, seem to increase persistence and anxious feelings when participants are placed in a stressful situation. Thus, Christians and Atheists might have more in common than they think, even if their fundamental beliefs are different.

## APPENDIX

### God-Related Priming Sentences

1. felt she eradicate spirit the
2. dessert divine was fork the
3. appreciated presence was imagine her
4. more paper it once do
5. send I over it mailed
6. evil thanks give God to
7. yesterday it finished track he
8. sacred was book refer the
9. reveal the future simple prophets
10. prepared somewhat I was retired

### Neutral Priming Sentences

1. fall was worried she always
2. shoes give replace old the
3. retrace good have day a
4. more paper it once do
5. send I over it mailed
6. saw hammer he the train
7. yesterday it finished track he
8. sky the seamless blue is
9. treat I today it bought
10. prepared somewhat I was retired

## REFERENCES

- Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253-285). New York: Cambridge University Press.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230-244.
- Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy, 35*, 49-58.
- Beck, A. T., Emery, G., & Greenberg, R. L. (2005). *Anxiety disorders and phobias: A cognitive perspective*. New York: Basic Books.

- Bergin, A. E. (1985). Proposed values for guiding and evaluating counseling and psychotherapy. *Counseling and Values, 29*, 99-116.
- Bergin, A. E. (1991). Values and religious issues in psychotherapy and mental health. *American Psychologist, 46*, 394-403.
- Bering, J. M. (2006). The folk psychology of souls. *Behavioral and Brain Sciences, 29*, 453-498.
- Bering, J. M., McLeod, K., & Shackelford, T. K. (2005). Reasoning about dead agents reveals possible adaptive trends. *Human Nature, 16*, 360-381.
- Davey, H. M., Barratt, A. L., Butow, P. N., & Deeks, J. L. (2007). A one-item question with a Likert or visual analog scale adequately measured current anxiety. *Journal of Clinical Epidemiology, 60*, 356-360.
- DesCamp, M. T., & Sweetser, E. E. (2005). Metaphors for God: Why and how do our choices matter for humans? The application of contemporary cognitive linguistics research to the debate on God and metaphor. *Pastoral Psychology, 53*, 207-238.
- Fitzsimons, G. M., & Shah, J. Y. (2008). How goal instrumentality shapes relationship evaluations. *Journal of Personality and Social Psychology, 95*, 319-337.
- Furnham, A. (1990). *The Protestant work ethic: The psychology of work-related beliefs and behaviours*. London: Routledge.
- Gorsuch, R. L., & Smith, C. S. (1983). Attributions of responsibility to God: An interaction of religious beliefs and outcomes. *Journal for the Scientific Study of Religion, 22*, 340-352.
- Harris, J. L., Schoneman, S. W., & Carrera, S. R. (2002). Approaches to religiosity related to anxiety among college students. *Mental Health, Religion, & Culture, 5*, 253-265.
- Hilty, D. M., & Morgan, R. L. (1985). Construct validation of the religious involvement inventory: Replication. *Journal of the Scientific Study of Religion, 24*, 75-86.
- Kirkpatrick, L. A. (2005). *Attachment, evolution, and the psychology of religion*. New York: Guilford Press.
- Koenig, H. G., McCullough, M. E., & Larson, D. B. (2001). *Handbook of religion and health*. New York: Oxford University Press.
- MacLeod, C., Rutherford, E., Campbell, L., Ebsworthy, G., & Holker, L. (2002). Selective attention and emotional vulnerability: Assessing the causal basis of their association through the experimental manipulation of attentional bias. *Journal of Abnormal Psychology, 111*, 107-123.
- Meier, B. P., Hauser, D. J., Robinson, M. D., Friesen, C. K., & Schjeldahl, K. (2007). What's "up" with God?: Vertical space as a representation of the divine. *Journal of Personality and Social Psychology, 93*, 699-710.
- Meier, B. P., & Robinson, M. D. (2004). Does quick to blame mean quick to anger?: The role of agreeableness in dissociating blame and anger. *Personality and Social Psychology Bulletin, 30*, 856-867.
- Miller, L., & Kelley, B. S. (2005). Relationships of religiosity and spirituality with mental health and psychopathology. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (pp. 460-478). New York: Guilford Press.
- Moran, P. (1990). Children as victims of sexual abuse. In S. Rossetti (Ed.), *Player of the soul* (pp. 67-81). Mystic, CT: Twenty-Third Publication.

- Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*, 774-789.
- Oman D., & Thoresen C. E. (2003). Spiritual modeling: A key to spiritual and religious growth. *The International Journal for the Psychology of Religion, 13*, 149-165.
- Paragament, K. I. (1996). Religious methods of coping: Resources for the conservation and transformation of significance. In E. P. Shafranske (Ed.), *Religion and clinical practice of psychology* (pp. 215-239). Washington, DC: American Psychological Association.
- Randolph-Seng, B., & Nielson, M. E. (2007). Honesty: One effect of primed religious representations. *The International Journal for the Psychology of Religion, 17*, 303-315.
- Shariff, A. F., & Norenzayan, A. (2007). God is watching you: Priming God concepts increases prosocial behavior in an anonymous economic game. *Psychological Science, 18*, 803-809.
- Shreve-Neiger, A. K., & Edelstein, B. A. (2004). Religion and anxiety: A critical review of the literature. *Clinical Psychology Review, 24*, 379-397.
- Smith, S. A., Kass, S. J., Rotunda, R. J., & Schneider, S. K. (2006). If at first you don't succeed: Effects of failure on general and task-specific self-efficacy and performance. *North American Journal of Psychology, 8*, 171-182.
- Spilka, B., Hood, R. W., Jr., Hunsberger, B., & Gorsuch, R. (2003). *The psychology of religion: An empirical approach* (3rd ed.). New York: Guildford Press.
- Srull, T. K., & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology, 37*, 1660-1672.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS. *Journal of Personality and Social Psychology, 54*, 1063-1070.
- Watson, D., Clark, L. A., Weber, K., Smith Assenheimer, J., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: I. Evaluating the convergent and discriminant validity of anxiety and depression symptoms scales. *Journal of Abnormal Psychology, 104*, 3-14.