

2018

## Intellectual Humility's Links to Religion and Spirituality and the Role of Authoritarianism

Elizabeth J. Krumrei-Mancuso

*Pepperdine University*, [elizabeth.krumrei@pepperdine.edu](mailto:elizabeth.krumrei@pepperdine.edu)

Follow this and additional works at: [https://digitalcommons.pepperdine.edu/faculty\\_pubs](https://digitalcommons.pepperdine.edu/faculty_pubs)

---

### Recommended Citation

Krumrei-Mancuso, E. J. (2018). Intellectual humility's links to religion and spirituality and the role of authoritarianism. *Personality and Individual Differences*, 130, 65–75. <https://doi.org/10.1016/j.paid.2018.03.037>

This Article is brought to you for free and open access by the Faculty Open Access Scholarship at Pepperdine Digital Commons. It has been accepted for inclusion in All Faculty Open Access Publications by an authorized administrator of Pepperdine Digital Commons. For more information, please contact [bailey.berry@pepperdine.edu](mailto:bailey.berry@pepperdine.edu).

This paper was published as: Krumrei-Mancuso, E. J. (2018). Intellectual humility's links to religion and spirituality and the role of authoritarianism. *Personality and Individual Differences*, 130, 65-75. <https://doi.org/10.1016/j.paid.2018.03.037>

## Intellectual Humility's Links to Religion and Spirituality and the Role of Authoritarianism

Elizabeth J. Krumrei-Mancuso

Pepperdine University

### Author Note

Elizabeth J. Krumrei-Mancuso, Department of Psychology, Pepperdine University.

This publication was supported by a subaward agreement (Agreement 145506) from the University of Connecticut with funds provided by Grant 58942 from John Templeton Foundation. Its contents are solely the responsibility of the author and do not necessarily represent the official views of UConn or John Templeton Foundation. Portions of this paper were presented in a keynote at the Academic Conference for Humility, La Mirada, CA (May, 2017).

Correspondence concerning this article should be addressed to Elizabeth Krumrei Mancuso, Social Science Division, Pepperdine University, 24255 Pacific Coast Hwy, Malibu, CA 90263. Email: [Elizabeth.Mancuso@pepperdine.edu](mailto:Elizabeth.Mancuso@pepperdine.edu); Phone: (310) 506-4186.

### Abstract

A US community sample of 302 adults completed surveys suggesting small, negative links between intellectual humility and a variety of religious/spiritual variables as well as parabolic relationships with highest levels of intellectual humility occurring among those with low and high levels of religion/spirituality. Longitudinal analyses ( $N = 100$ ) indicated a number of religious/spiritual variables predicted less intellectual humility 3 years later. Right-wing authoritarianism accounted for most of the links between religion/spirituality and intellectual humility, suggesting that it is not religion/spirituality per se, but rather sociopolitical attitudes about authority that is associated with decreases in intellectual humility. After controlling right-wing authoritarianism, a small relationship remained between intellectual humility and religious participation.

*Keywords:* intellectual humility, religion, spirituality, conviction, longitudinal

## Intellectual Humility's Links to Religion and Spirituality and the Role of Authoritarianism

Most people hold convictions ranging across social, political, and cultural domains. Convictions involve firmly held beliefs or opinions that are often associated with behavioral commitments. The central question of this paper is how convictions and associated commitments relate to intellectual humility (IH). Specifically, this paper explores whether it is possible to be intellectually humble and simultaneously deeply committed to religious or spiritual beliefs. This question is critical given the longstanding suggestion in the field of psychology that the nature of people's religious beliefs - including their claims to absolute truth, their willingness to doubt, and their openness to changing beliefs - is closely tied to the way they view and treat others (Allport, 1954; James, 1902). The current study examines IH as a potential individual differences variable for understanding these important outcomes of religious beliefs.

IH is a form of humility related to the way people apply knowledge. IH can be defined as a nonthreatening awareness of one's intellectual fallibility (Krumrei-Mancuso & Rouse, 2016). This assumes the intellectually humble person understands that cognitive faculties are not perfect and that knowledge, judgment, and perceptions are sometimes incorrect. Additionally, the person does not feel threatened by this, meaning that mental fallibility is accepted without feelings of defensiveness. It is most fitting to study IH in the context of beliefs and opinions that are of greatest importance to people, making religion/spirituality a relevant domain in which to examine IH.

Here, religion and spirituality are defined as a range of beliefs, attitudes, and behaviors that individuals use to connect with the sacred or divine, either within or outside of institutional contexts (Miller-Perrin & Krumrei-Mancuso, 2015). The majority of individuals in the U.S. label

themselves as both religious and spiritual and there is evidence of overlap between the two constructs (Emmons & Paloutzian, 2003; Marler & Hadaway, 2002; Zinnbauer et al., 1997). Nevertheless, the general population tends to view the meaning of religion and spirituality differently (Zinnbauer et al., 1997). The current research assessed both religion and spirituality, but did not emphasize a strong conceptual distinction between the two.

Previous research has indicated that although IH is associated with greater tolerance toward others, it is unrelated to conformity, social confidence or low self-regard, and has small, positive links to self-confidence (Krumrei-Mancuso & Rouse, 2016). This suggests that IH is related to accepting people whose beliefs are different from one's own and not judging or rejecting those with different opinions, but that IH is not associated with being susceptible to social influence or modifying beliefs or behaviors to fit others' standards. This supports the idea that intellectual humility can co-occur with strong convictions. Yet, this has never been examined explicitly within the religious/spiritual domain.

### **The Value of Intellectual Humility**

IH allows people to grow in understanding. Individuals who accept that their knowledge is not perfect will be in a position to consider other viewpoints, add to their knowledge, and discover biases and errors in their thinking. In addition, IH benefits interpersonal relationships. A nonthreatening awareness of one's intellectual fallibility is likely to make one better at listening to and respecting others, even in the face of disagreements. Indeed, research shows that people who are perceived as intellectually humble are more likeable, trustworthy, and forgivable (Hook et al., 2015; McElroy et al., 2014; Zhang et al., 2015). Further, IH is associated with less aggressive behavioral intentions toward those who criticize one's beliefs (Van Tongeren et al., 2016).

A number of studies have examined the social benefits of IH with regard to religion, specifically. A growing body of literature indicates that religious IH, i.e., IH about one's religious beliefs, is associated with beneficial social attitudes and behaviors, including more acceptance and warmth for those who are religiously different (Hook et al., 2017; Van Tongeren et al., 2016), less extreme reactions toward others' religious viewpoints (Hopkin, Hoyle, & Toner, 2014), greater likelihood of deriving a sense of belonging and meaning from ideologically diverse religious groups (Zhang et al., 2016), and greater forgiveness of religious conflicts (Zhang et al., 2015). Similarly, the closely related construct of Quest orientation to religion (Batson & Schoenrade, 1991) - involving the ability to face existential questions without reducing their complexity, the ability to be self-critical, an openness to change in religious beliefs, and an appreciation for religious doubt – has been associated with greater openness, compassion, and kindness toward others, even in comparison to other positive religious orientations (Batson, Eidelman, Higley, & Russel, 2001; Batson, Floyd, Meyer, & Winner, 1999).

On this basis, the qualities that embody IH have clear implications for fruitful social bonds, collaboration, and public discourse. Due to these potential benefits, it is relevant to consider the personal characteristics or experiences that can promote or hinder IH. One such factor is religion/spirituality.

### **Empirical Links Between Religion/Spirituality and Intellectual Humility**

Although numerous studies focus on the benefits of IH, not many have examined the factors that promote or hinder IH, including religion/spirituality. Early research found links between religious orientation and constructs associated with IH, namely open versus closed-mindedness (Thompson, 1974). Specifically, Roman Catholic individuals who were anti-

religious, scoring low in both intrinsic and extrinsic religiosity, reported higher open-mindedness and lower closed-mindedness than those scoring higher in religiosity. Correspondingly, individuals scoring high in both intrinsic and extrinsic religiosity tended to report more closed-mindedness than those with lower levels of religiosity. These findings must be interpreted with caution, given some measurement confounds; nevertheless, this study hints that religiosity could be predictive of closed-mindedness and thereby, perhaps, a lack of IH.

Research specific to IH and religion/spirituality has been recent, but is a growing area of interest in personality and social psychology. Preston and Shin (2017) found that priming people to think about spiritual experiences neither increased nor decreased IH. They had participants recall strong feelings of spirituality and connection to the divine or a deep connection to the universe or world around them. Although this was associated with an increased sense of spiritual humility, it did not impact levels of IH. This offers an initial indication that Thompson's (1974) suggestion that religiosity is negatively related to open-mindedness does not extend to spirituality.

Further, Leary et al. (2017) found that IH was uncorrelated with general religiosity (religious activity and intrinsic religious motivation). However, they found that higher levels of religiosity were associated with greater expressed certainty that one's views about religion were correct. IH moderated this, as those with more IH expressed less extreme opinions about religion, less strong beliefs that their religious views were correct, and a preference for balanced arguments on the topic of religion.

Thus, there is some suggestion that religiosity may be associated with less open-mindedness, yet strong links between IH and religiosity/spirituality have not been observed. The limited number of studies available on this topic and the lack of consensus within the literature

points to the need for more research to draw stronger conclusions about the relationship between IH and religion/spirituality.

### **Study Goals**

There are strong theoretical and empirical bases to suggest IH offers a host of potential benefits, including positive social attitudes and behaviors. For this reason, it is relevant to consider religion/spirituality, a personal characteristics that may relate to IH. This may elucidate reasons that religion/spirituality has been associated with the way individuals view and treat others.

Given the paucity of information about how religion/spirituality relates to general levels of IH, the goal of the current research was to examine whether religion/spirituality is associated with more or less IH within a community sample of adults. Longitudinal analyses were used to examine whether levels of religion/spirituality could predict levels of IH over a three-year period, presumed to be sufficient time to observe individual change in the variables of interest without intervention. Another goal of the current research was to explore potential curvilinear relationships, given that previous research has observed curvilinear links between the strength of a person's religious beliefs and his/her religious IH (Hopkin et al., 2014).

Finally, given that IH can be viewed as multifaceted in nature, involving openness to revising one's viewpoint, respect for others' viewpoints, not taking intellectual differences personally, and lack of intellectual overconfidence (Krumrei-Mancuso & Rouse, 2016), a goal of this research was to examine if aspects of IH are impacted differently by religion/spirituality.

### **Theoretical Links and Hypotheses**

There are theoretical bases for arguing that religion/spirituality might increase as well as decrease IH. Sociocultural events offer vivid illustrations of religious adherents attempting to

force their beliefs on others. One reason religion/spirituality may challenge IH is the high importance placed on these values due to the benefits they offer, such as meaning, coping, and terror management. On social levels, religion can also be used to maintain power differentials. Given these influences, individuals may not be open to being wrong or considering other options. Further, some forms of religiosity—such as religious fundamentalism—may be motivated out of a need for cognitive closure (Brandt & Reyna, 2010), suggesting that these forms of religion may be associated with less IH. Most religions have some form of dogma or absolute teachings, and holding beliefs in a way that is not open to question could conflict with an intellectually humble stance. Some have even argued that epistemic modesty is not a viable option for individuals who view their beliefs as God-given truth (Fisch, 2003).

Others have argued that relying on religious authority is not necessarily inconsistent with IH (Gregg & Mahadevan, 2014). Moreover, many have emphasized a closed-minded approach to religion that promotes socio-political aggression or poor treatment of others is starkly inconsistent with the teachings of the world religions, and religion/spirituality can, in fact, promote IH (Woodruff et al., 2014). There are religious teachings that extoll IH as a form of wisdom (Gericke, 2011) and religious traditions that promote humility in both spiritual and intellectual domains (Cornille, 2008). For example, a number of theologians have argued that humility about epistemological claims stems from recognizing one's relative ignorance in relation to an all-knowing God (Pardue, 2011). It is in relation to an infinite God and the complex workings of creation that humans can realize their intellectual limits. In addition, Cornille (2008) argued that religious teachings facilitate IH because they can counteract intellectual pride. Along these lines, models of faith development suggest that greater spiritual maturity is associated with less black and white thinking and a greater appreciation for paradox

and mystery (Fowler, 1981), suggesting that religious/spiritual maturity may be associated with greater IH.

These conflicting theories about the relationship between IH and religion/spirituality speak to the fact that religion and spirituality are complex, multidimensional constructs. Gaining an understanding of the links between IH and religion/spirituality requires a rich assessment of each construct, going beyond simplistic or unidimensional understandings. On the basis of the reviewed theories, it was hypothesized that variables associated with religious dogma or exclusivist beliefs (religious fundamentalism) and surface-level religious characteristics (frequency of religious activities) would be associated with less IH, and that variables associated with greater integration of religion into life (religious belief salience) and greater depth of spiritual experiences (spiritual transcendence) would be associated with more IH.

An a priori decision was made to include gender, age, and social desirability as control variables, given that religious variables often differ between genders (Pargament, 1997), age can correlate with IH (Krumrei-Mancuso, 2017; Krumrei-Mancuso & Rouse, 2016), and social desirability is a relevant concern in self-report assessments. An a priori decision was also made to report findings with and without controlling right-wing authoritarianism (RWA), given that previous research has indicated that RWA accounts for links between religion and social outcome measures (Altemeyer & Hunsberger, 1993; Hall, Matz, and Wood 2010; Johnson et al., 2010). This mirrors previous research on religious IH that has controlled for a variety of religious or political orientations, such as orthodoxy of religious beliefs (Van Tongeren et al., 2016), political conservatism and religious commitment (Hook et al., 2017), or religious orientation (Zhang et al., 2016).

RWA can be defined as an emphasis on obedience to leaders (authoritarian submission), intolerance of deviance (authoritarian aggression), and conformity to norms (conventionalism; Altemeyer, 1996; Stellmacher & Petzel, 2005). Although authoritarianism is distinct from religion, both may emphasize obedience to authority, conformity to conventional norms, and in some cases, self-righteousness and superiority (Hunsburger, 1995). It should be noted that some previous research has indicated that combining RWA and religious fundamentalism as predictors results in problematic overlapping variance that can be removed by excluding the conventionalism items of the RWA scale (Mavor, Louis, & Sibley, 2010; Mavor, Louis, & Laythe, 2011). Therefore, analyses involving religious fundamentalism were controlled with the aggression and submission items of RWA only.

## **Method**

### **Participants**

A national US sample of 302 adults participated in an online survey via Amazon Mechanical Turk (MTurk; see Table 1). A subsample of these individuals ( $N = 100$ ) participated in another survey three years later. T-tests and chi-square analyses examined systematic differences in characteristics between those who did (coded as 1) and those who did not (coded as 2) complete the second survey. Those who completed Time 2 (T2) measures were significantly older than those who did not complete T2 measures by an average of 7 years ( $t = 5.28, p < .001$ ). The groups did not differ in any other assessed demographic factors, including gender ( $\chi^2 = .03, p = .87$ ), race ( $\chi^2 = 4.02, p = .68$ ), education ( $\chi^2 = .48, p = .79$ ), level of income ( $t = .25, p = .80$ ), or religious identification ( $\chi^2 = 10.90, p = .28$ ). The two groups also did not differ regarding any variables of interest, including IH ( $t = .12, p = .91$ ), belief in God ( $\chi^2 = .90, p = .64$ ), religious participation ( $t = -.21, p = .83$ ), religious belief salience ( $t = -.23, p = .82$ ),

prayer fulfillment ( $t = -1.25, p = .21$ ), connectedness ( $t = -.63, p = .53$ ), universality ( $t = -.84, p = .40$ ), religious fundamentalism ( $t = -.71, p = .48$ ), or RWA ( $t = -.72, p = .47$ ). Thus, there was no support for a self-selection bias for completing the second survey on the basis of participants' characteristics.

Table 1

*Participant Characteristics at Time 1*

<b>Gender in %</b>	
Female	56.7
Male	43.3
<b>Age in years</b>	
Range	18 - 74
Mean	34.41
SD	11.74
<b>Race in %</b>	
Caucasian	72.5
Asian	10.0
Black	6.9
Multi-racial	5.1
American-Indian	<1
No response	3.6
Unknown	<1
<b>Ethnicity in %</b>	
Hispanic or Latino	6.9
<b>Religion in %</b>	
Christian	45.2
Atheist	15.5
None	14.1
Agnostic	13.8
No response	3.7
Spiritual but not religious	2.5
Buddhist	1.7
Jewish	1.4
Hindu	1.4
Muslim	0.7

## Measures

Measures were selected with the goal of providing comprehensive and/or multidimensional assessments of each construct. The psychometric properties for each measure are displayed in Table 2. For all measures, higher scores indicate greater levels of each construct.

**Intellectual humility.** The Comprehensive Intellectual Humility Scale (Krumrei-Mancuso & Rouse, 2016) represents a higher order factor consisting of four factors: (1) independence of intellect and ego (e.g. “When someone contradicts my most important beliefs, it feels like a personal attack,” reverse scored), (2) openness to revising one’s viewpoint (e.g. “I’m willing to change my mind once it’s made up about an important topic”), (3) respect for others’ viewpoints (e.g. “I welcome different ways of thinking about important topics”), and (4) lack of intellectual overconfidence (e.g. “When I am really confident in a belief, there is very little chance that belief is wrong,” reverse scored). Subscales can be used independently or combined to generate an overall score for IH. Items were rated on a 5-point Likert scale ranging from (1) *strongly disagree* to (5) *strongly agree*.

**Religious participation.** Frequency of religious/spiritual activities in the past month was assessed, including praying or meditating, reading or watching religious material, thinking and talking about religious issues, and attending religious services (Exline, Yali, & Sanderson, 2000). Items were rated on a 6-point Likert scale, ranging from (0) *not at all* to (5) *more than once per day*.

**Religious fundamentalism.** The Religious Fundamentalism Scale assessed beliefs that: (1) there is one set of religious teachings that contains the inerrant truth about humanity and deity (2) this truth is fundamentally opposed by forces of evil that have to be fought (3) this truth must be followed in the present according to the unchangeable practices of the past, and (4) those who

believe and follow these teachings have a special relationship with the deity (Altemeyer & Hunsberger, 1992). A sample item is: "God will punish most severely those who abandon his true religion." The scale assesses fundamentalism in any religious beliefs. The scale was developed by identify the common psychological fundamentalist elements in Christian, Hindu, Jewish, and Muslim faiths and the scale has been validated in each of these groups (Altemyer, 2007). Items were rated on a 9-point Likert scale ranging from (-4) *strongly disagree* to (4) *strongly agree* (converted to a 1-9 scale for scoring).

**Religious belief salience.** The Religious Belief Salience Scale assessed importance of religion and its integration into life (e.g.: " My religious beliefs are what lie behind my whole approach to life;" Blaine & Crocker, 1995). One item of the original scale was deleted (i.e., "I am frequently aware of God in a personal way") to increase the applicability to a greater diversity of religious individuals. Items were rated on a 7-point Likert scale ranging from (1) *strongly disagree* to (7) *strongly agree*.

**Spiritual transcendence.** The Spiritual Transcendence Scale assessed the tendency of individuals to view life from a holistic and interconnected perspective (Piedmont, 1999). This scale assesses three components: (1) prayer fulfillment, i.e., feelings of joy, contentment, or focus in personal encounters with a transcendent reality (e.g., "I find inner strength and/or peace from my prayers or meditations."); (2) connectedness, i.e., the belief that one is part of a larger human orchestra essential for creating life's harmony (e.g., "I still have strong emotional ties with someone who has died."); and (3) universality, i.e., a belief in the unitive nature of life (e.g., "All life is interconnected."). Items were rated on a 5-point Likert scale ranging from (1) *strongly disagree* to (5) *strongly agree*.

**Right-wing authoritarianism.** The Right-Wing Authoritarianism Scale assessed the

combination of authoritarian submission, authoritarian aggression, and conventionalism (Altemeyer, 1996). A sample item is: “What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path.” Items were rated on a 9-point Likert scale ranging from (-4) *very strongly disagree* to (4) *very strongly agree* (converted to a 1-9 scale for scoring).

**Social desirability.** Ten items of the Social Desirability Scale, Form C (Reynolds, 1982), assessed the tendency to misrepresent oneself to appear to behave in ways deemed favorably by others (e.g., “I’m always willing to admit it when I make a mistake.”). Three items of the original scale were deleted due to potential confounding with IH (2 items) and RWA (1 item). Response options were true or false.

Table 2

*Psychometric Properties of the Measures at Time 1 (T1; N = 302) and Time 2 (T2; N = 100)*

	Number of items	Possible Range	T1 Actual Range	T1 Mean (SD)	T1 $\alpha$	T2 Actual Range	T2 Mean (SD)	T2 $\alpha$
Intellectual humility	22	22 - 110	51 - 101	80.54 (13.23)	.88	41 - 108	78.79 (12.23)	.91
Independence of intellect and ego	5	5 - 25	-	-	-	5 - 25	17.40 (4.93)	.91
Openness to revising one's viewpoint	5	5 - 25	-	-	-	6 - 25	19.19 (3.72)	.92
Respect for others' viewpoints	6	6 - 30	-	-	-	9 - 30	24.14 (3.75)	.89
Lack of intellectual overconfidence	6	6 - 30	-	-	-	9 - 30	18.06 (3.91)	.78
Religious Participation	5	0 - 25	0 - 25	7.43 (6.89)	.89	0 - 25	7.44 (6.78)	.91
Religious fundamentalism	20	20 - 180	20 - 180	70.81 (42.45)	.97	94 - 151	132.13 (14.05)	.69
Religious belief salience	4	4 - 28	4 - 28	13.23 (9.22)	.99	4 - 28	13.61 (9.60)	.99
Prayer fulfillment	9	9 - 45	9 - 45	24.08 (9.02)	.91	9 - 43	24.03 (8.68)	.90
Connectedness	6	6 - 30	6 - 30	20.92 (4.52)	.73	6 - 29	20.45 (4.49)	.72
Universality	9	9 - 45	9 - 45	30.73 (8.00)	.90	9 - 45	30.13 (8.28)	.91
Right-wing authoritarianism	30	30 - 270	30 - 260	109.19 (54.42)	.97	135 - 237	203.63 (23.95)	.86
Submission/ aggression items	18	18 - 162	18 - 160	67.77 (34.01)	.96	90 - 147	122.41 (9.30)	.60
Social desirability	10	0 - 10	0 - 10	4.50 (2.61)	.75	0 - 10	4.08 (2.92)	.82

## Procedure

Data were collected as part of a larger study of IH. An a priori power analysis indicated that a basic regression model examining predictors separately, with .9 power to detect an effect size as small as .15 with a .05 probability of a Type I error would require 73 participants for the longitudinal analyses.

Data were deleted listwise for participants who spent less than an average of 2.5 seconds per question, responded incorrectly to a factual question of attention, or were characterized as outliers on the basis of the outlier labeling rule (Hoaglin, Iglewicz, & Tukey, 1986).

## Results

### Cross-sectional Results

**Preliminary analyses.** Bivariate correlations (Pearson, Spearman rho, and Point Biserial) were conducted to examine whether demographic characteristics or social desirability were associated with variables of interest. Age was positively correlated with religious participation ( $r = .15, p < .05$ ), religious belief salience ( $r = .13, p < .05$ ), prayer fulfillment ( $r = .14, p < .05$ ), connectedness ( $r = .21, p < .001$ ), and universality ( $r = .19, p < .01$ ), and approached significance to IH ( $r = .11, p = .052$ ). Gender (1 = male, 2 = female) showed positive links to religious belief salience ( $r = .14, p < .05$ ), connectedness ( $r = .27, p < .001$ ), and universality ( $r = .14, p < .05$ ). Social desirability was positively correlated with IH ( $r = .25, p < .01$ ), religious participation ( $r = .18, p < .01$ ), religious belief salience ( $r = .27, p < .001$ ), prayer fulfillment ( $r = .16, p < .01$ ), connectedness ( $r = .13, p < .05$ ), and universality ( $r = .21, p < .001$ ). Finally, a Pearson correlation was used to examine links between IH and RWA ( $r = -.28, p < .001$ ).

Given the concern from previous research that RWA may contribute to a statistical artifact in the link between religious fundamentalism and social outcomes (Mavor et al., 2011),

preliminary analyses were conducted to assess potential suppression effects. First-order partial correlations between religious/spiritual variables and RWA, controlling IH, were compared to the bivariate correlations between the religious/spiritual variables and RWA. The variance shared between each religious/spiritual variable and RWA unrelated to IH was smaller than the variance shared by the religious/spiritual variables and RWA with IH included for all but one scale (universality). This minimized concerns about a suppression effect. However, because suppression is not the only possible indicator of a potential statistical artifact, analyses involving religious fundamentalism and RWA made use of submission and aggression items of RWA only, removing the conventionalism items that have previously created problematic shared variance between predictor variables (Mavor et al., 2011).

**Linear and curvilinear links between religious/spiritual predictors and intellectual humility.** Hierarchical linear regression analyses were conducted to examine linear and curvilinear links between religion/spirituality and IH. Separate hierarchical regressions were run for each predictor to examine each religious/spiritual variable without controlling the effects of the other religious/spiritual variables, as these measures included some overlapping content.

In Model 1, Step 1 contained control variables, including gender, age, and social desirability, Step 2 contained the religious/spiritual predictor, and Step 3 contained the quadratic religious/spiritual predictor to examine parabolic (one-curve) relationships. Step 3 of each regression analysis should be interpreted on the basis of the R-square change (the increase in variability in IH accounted for by the parabolic effect) and not the beta values of the quadratic effect. Model 2 was constructed similarly to Model 1, with the addition of RWA as a control in Step 1 (see Table 3).

In Model 1, religious fundamentalism displayed a negative linear relationship with IH, accounting for 10.1% of the variance in IH. An additional 2.9% of the variance in IH was accounted for by a U-shaped parabolic relationship with religious fundamentalism (see Figure 1A). In Model 2, when adding the submission and aggression items of the RWA scale (the conventionalism items were deleted due to previous research showing problematic shared variance between these items and the religious fundamentalism scale), there was no longer a linear relationship between religious fundamentalism and IH, but a small parabolic relationship remained, accounting for 2.2% of the variance in IH.

In Model 1, religious participation displayed a negative linear relationship with IH, accounting for 2.2% of the variance in IH. When adding RWA as a control in Model 2, the relationship between religious participation and IH was no longer significant.

In Model 1, religious belief salience demonstrated a negative linear relationship with IH, accounting for 4.9% of the variance in IH. A U-shaped parabolic relationship with religious belief salience approached significance at  $p = .053$ . When adding RWA as a control in Model 2, the linear relationship between religious belief salience and IH was no longer significant, however, the parabolic relationship was strengthened, accounting for 1.8% of the variance in IH (see Figure 1 B).

In Model 1, prayer fulfillment displayed a negative linear relationship with IH, accounting for 3.0% of the variance in IH. An additional 1.5% of the variance in IH was accounted for by a U-shaped parabolic relationship with prayer fulfillment (see Figure 1C). When adding RWA as a control in Model 2, the relationship between prayer fulfillment and IH was no longer significant.

Finally, neither connectedness nor universality of the spiritual transcendence scale displayed significant linear or curvilinear relationships to IH in Model 1 or Model 2.

Table 3

*Hierarchical Regressions of Linear and Curvilinear Relationships Between Religious Predictors and Intellectual Humility (N = 302)*

Intellectual humility	Model 1				Model 2			
	B (SE)	95% CI	$\beta$	$\Delta R^2$	B (SE)	95% CI	$\beta$	$\Delta R^2$
<b>Step 1</b>				.060**				.178***
Gender	.96 (2.37)	-1.18, 3.10	.05		1.32 (1.02)	-.69, 3.33	.07	
Age	.06 (.05)	-.03, .15	.07		.05 (.04)	-.04, .14	.06	
Social desirability	.76 (.20)	.35, 1.18	.21***		1.02 (.20)	.63, 1.42	.29***	
RWA submission and aggression items	-	-	-		-.10 (.02)	-.13, -.07	-.35***	
<b>Step 2</b>				.101***				.009
Religious fundamentalism	-.07 (.01)	-.10, -.05	-.32***		-.03 (.02)	-.07, .00	-.14	
<b>Step 3</b>				.029**				.022**
Quadratic religious fundamentalism	.00 (.00)	.00, .00	.75**		.00 (.00)	.00, .00	.66**	
<b>Step 1</b>				.060**				.178***
Gender	.96 (2.37)	-1.18, 3.10	.05		1.24 (1.02)	-.77, 3.25	.07	
Age	.06 (.05)	-.03, .15	.07		.07 (.04)	-.02, .15	.09	
Social desirability	.76 (.20)	.35, 1.18	.21***		1.03 (.20)	.63, 1.42	.29***	
RWA	-	-	-		-.06 (.01)	-.08, -.04	-.35***	
<b>Step 2</b>				.022*				.005
Religious participation	-.20 (.08)	-.36, -.05	-.15*		.12 (.09)	-.06, .30	.09	
<b>Step 3</b>				.006				.006
Quadratic religious participation	.02 (.01)	-.01, .04	.26		.02 (.01)	-.01, .04	.25	
<b>Step 1</b>				.060**				.178***
Gender	.96 (2.37)	-1.18, 3.10	.05		1.24 (1.02)	-.77, 3.25	.07	
Age	.06 (.05)	-.03, .15	.07		.07 (.04)	-.02, .15	.09	
Social desirability	.76 (.20)	.35, 1.18	.21***		1.03 (.20)	.63, 1.42	.29***	
RWA	-	-	-		-.06 (.01)	-.08, -.04	-.35***	
<b>Step 2</b>				.049***				.001
Religious belief salience	-.23 (.06)	-.35, -.12	-.23***		.04 (.08)	-.12, .20	.04	
<b>Step 3</b>				.012 <sup>1</sup>				.018*
Quadratic religious belief salience	.02 (.01)	.00, .04	.57 <sup>1</sup>		.02 (.01)	.01, .04	.71*	
<b>Step 1</b>				.060**				.178***
Gender	.96 (2.37)	-1.18, 3.10	.05		1.24 (1.02)	-.77, 3.25	.07	
Age	.06 (.05)	-.03, .15	.07		.07 (.04)	-.02, .15	.09	
Social desirability	.76 (.20)	.35, 1.18	.21***		1.03 (.20)	.63, 1.42	.29***	
RWA	-	-	-		-.06 (.01)	-.08, -.04	-.35***	
<b>Step 2</b>				.030**				.000
Prayer fulfillment	-.18 (.06)	-.30, -.07	-.18**		-.03 (.06)	-.15, .10	-.02	
<b>Step 3</b>				.015*				.007
Quadratic prayer fulfillment	.01 (.01)	.00, .03	.65*		.01 (.01)	-.00, .02	.45	
<b>Step 1</b>				.060**				.178***
Gender	.96 (2.37)	-1.18, 3.10	.05		1.24 (1.02)	-.77, 3.25	.07	
Age	.06 (.05)	-.03, .15	.07		.07 (.04)	-.02, .15	.09	
Social desirability	.76 (.20)	.35, 1.18	.21***		1.03 (.20)	.63, 1.42	.29***	
RWA	-	-	-		-.06 (.01)	-.08, -.04	-.35***	
<b>Step 2</b>				.01				.004
Spiritual connectedness	.16 (.13)	-.09, .41	.08		.15 (.12)	-.09, .38	.07	
<b>Step 3</b>				.00				.001
Quadratic spiritual connectedness	.02 (.02)	-.02, .06	.37		.01 (.02)	-.02, .05	.23	
<b>Step 1</b>				.060**				.178***
Gender	.96 (2.37)	-1.18, 3.10	.05		1.24 (1.02)	-.77, 3.25	.07	
Age	.06 (.05)	-.03, .15	.07		.07 (.04)	-.02, .15	.09	
Social desirability	.76 (.20)	.35, 1.18	.21***		1.03 (.20)	.63, 1.42	.29***	
RWA	-	-	-		-.06 (.01)	-.08, -.04	-.35***	
<b>Step 2</b>				.000				.008
Spiritual universality	.01 (.07)	-.13, .14	.00		.11 (.07)	-.02, .24	.10	
<b>Step 3</b>				.010				.010
Quadratic spiritual universality	.01 (.01)	-.00, .02	.57		.01 (.01)	-.00, .02	.56	

\*\*\*  $p < .001$  \*\*  $p < .01$  \*  $p < .05$  <sup>1</sup> Approaching significance at  $p = .053$ 

Note. Model 1 includes gender, age, and social desirability as control variables; Model 2 includes the same control variables in addition to right-wing authoritarianism (RWA); for gender, 1 = male and 2 = female.

## Longitudinal Results

**Preliminary analyses.** Bivariate correlations (Pearson, Spearman rho, and Point Biserial) were conducted to examine whether demographic characteristics or social desirability were associated with variables of interest. Age was positively correlated with IH ( $r = .25, p < .05$ ) and connectedness ( $r = .30, p < .01$ ). Gender (1 = male, 2 = female) showed positive links to religious belief salience ( $r = .20, p < .05$ ), religious participation ( $r = .27, p < .01$ ), and connectedness ( $r = .33, p < .01$ ). Social desirability was positively correlated with religious belief salience ( $r = .21, p < .05$ ) and connectedness ( $r = .20, p < .05$ ). Notably, at T2 IH was not significantly related to social desirability ( $r = .14, p = .18$ ). Finally, a Pearson correlation was used to examine links between IH and RWA ( $r = -.30, p < .01$ ).

**Religion/spirituality predicting intellectual humility three years later.** For the same rationale as the cross-sectional analyses, separate hierarchical regressions were conducted for each religious/spiritual variable to examine how each predicted levels of IH three years later. In Model 1, Step 1 contained control variables, including gender, age, and social desirability. Step 2 contained Time 1 (T1) IH as a control of pre-existing levels of IH. Finally, Step 3 contained T1 religious/spiritual variables. Model 2 was identical to Model 1, with the addition of RWA as a control in Step 1. To address previous research concerns about conventionalism creating problematic shared variance with religious fundamentalism (Mavor et al., 2011), analyses involving religious fundamentalism made use of the RWA scale without the conventionalism items (see Table 4).

Higher levels of religious fundamentalism predicted less IH three years later, after controlling demographic factors, social desirability, and pre-existing levels of IH. Religious fundamentalism accounted for 3.4% of the variance in future levels of IH. However, when RWA

(submission and aggression items) was controlled, religious fundamentalism was no longer predictive of future levels of IH.

Higher levels of religious belief salience, prayer fulfillment, and universality each also predicted less IH three years later, after controlling demographic factors, social desirability, and pre-existing levels of IH. With regards to the variance in future levels of IH, religious belief salience accounted for 5.3%, prayer fulfillment accounted for 2.2%, and universality accounted for 3.1%. However, when RWA was added as a control, none of these variables remained predictive of future levels of IH. After controlling RWA, universality approached significance as a predictor of future IH at  $p = .053$ .

Higher levels of religious participation also predicted less IH three years later, after controlling demographic factors, social desirability, and pre-existing levels of IH. Religious participation accounted for 6.8% of the variance in future levels of IH. When RWA was added as a control, religious participation remained a negative predictor of future IH, but the amount of variance accounted for dropped to 2.2%. Connectedness was the only religious/spiritual variable that was not predictive of levels of IH in Model 1 ( $p = .08$ ).

Analyses of parabolic relationships between each religious/spiritual variable and IH were also conducted. In the longitudinal models, no curvilinear relationships were significantly predictive beyond the linear relationships observed ( $p$ 's ranging from .15 to .97).

**Religious participation predicting change in intellectual humility subscales three years later.** As the only religious/spiritual predictor to remain significant after all control variables were included in the longitudinal analyses, religious participation was examined further with a multivariate regression to examine which aspects of IH changed in relation to increases in religious participation (see Table 5). Increase in religious participation was predictive of less

independence of intellect and ego after controlling demographic factors, social desirability, RWA, and pre-existing levels of IH, with a small effect size (Cohen, 1969). None of the other aspects of IH were impacted by changes in religious participation, including openness to revising one's beliefs, respect for others' viewpoints, or levels of intellectual overconfidence.

**Right-wing authoritarianism as a moderator of links between religious participation and intellectual humility three years later.** Given that religious participation was the only religious/spiritual predictor significantly related to future IH after controlling RWA, post hoc analyses were conducted to examine this relationship further with moderation analyses. PROCESS Model 1 was used with 5,000 bootstrap samples and 95% Confidence Intervals to examine if T1 RWA moderated links between T1 religious participation and T2 IH, while controlling gender, age, and T1 social desirability. The interaction term was not significant ( $B = .00$ ,  $SE = .00$ ,  $CI = -.00, .01$ ). Further, with the interaction term included, RWA was the only significant predictor of future IH beyond the control variables ( $B = -.09$ ,  $SE = .03$ ,  $CI = -.14, -.03$ ), reemphasizing that the link between RWA and IH is more pertinent than the link between religious participation and IH.

Table 4

*Hierarchical Regressions of T1 Religious Variables Predicting T2 Intellectual Humility (IH) While Controlling T1 Religious Variables (N = 100)*

Time 2 intellectual humility		Model 1			Model 2			
	<i>B</i> ( <i>SE</i> )	95% CI	$\beta$	$\Delta R^2$	<i>B</i> ( <i>SE</i> )	95% CI	$\beta$	$\Delta R^2$
<b>Step 1</b>				.145**				.312***
Gender	-2.03 (2.44)	-6.87, 2.82	-.08		-1.16 (2.21)	-5.54, 3.23	-.05	
Age	.19 (.10)	-.01, .38	.19		.14 (.09)	-.04, .31	.14	
T1 Social desirability	1.04 (.33)	.39, 1.69	.31**		1.36 (.30)	.76, 1.97	.41***	
T1 RWA submission and aggression items	-	-	-		-.15 (.03)	-.21, -.09	-.42***	
<b>Step 2</b>				.429***				.312***
T1 IH	.73 (.08)	.59, .88	.69***		.66 (.08)	.51, .80	.62***	
<b>Step 3</b>				.034**				.002
T1 religious fundamentalism	-.05 (.02)	-.09, -.02	-.20**		-.02 (.03)	-.07, .03	-.06	
	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$
<b>Step 1</b>				.145**				.331***
Gender	-2.03 (2.44)	-6.87, 2.82	-.08		-.84 (2.18)	-5.17, 3.50	-.03	
Age	.19 (.10)	-.01, .38	.19		.15 (.09)	-.02, .32	.15	
T1 Social desirability	1.04 (.33)	.39, 1.69	.31**		1.35 (.30)	.76, 1.94	.41***	
T1 RWA	-	-	-		-.10 (.02)	-.13, -.06	-.45***	
<b>Step 2</b>				.429***				.299***
T1 IH	.73 (.08)	.59, .88	.69***		.65 (.08)	.50, .79	.61***	
<b>Step 3</b>				.068***				.022*
T1 religious participation	-.49 (.12)	-.72, -.26	-.27***		-.35 (.14)	-.63, -.06	-.19*	
	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$
<b>Step 1</b>				.145**				.331***
Gender	-2.03 (2.44)	-6.87, 2.82	-.08		-.84 (2.18)	-5.17, 3.50	-.03	
Age	.19 (.10)	-.01, .38	.19		.15 (.09)	-.02, .32	.15	
T1 Social desirability	1.04 (.33)	.39, 1.69	.31**		1.35 (.30)	.76, 1.94	.41***	
T1 RWA	-	-	-		-.10 (.02)	-.13, -.06	-.45***	
<b>Step 2</b>				.429***				.299***
T1 IH	.73 (.08)	.59, .88	.69***		.65 (.08)	.50, .79	.61***	
<b>Step 3</b>				.053***				.010
T1 religious belief salience	-.32 (.09)	-.49, -.14	-.24***		-.18 (.11)	-.41, .04	-.14	
	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$
<b>Step 1</b>				.145**				.331***
Gender	-2.03 (2.44)	-6.87, 2.82	-.08		-.84 (2.18)	-5.17, 3.50	-.03	
Age	.19 (.10)	-.01, .38	.19		.15 (.09)	-.02, .32	.15	
T1 Social desirability	1.04 (.33)	.39, 1.69	.31**		1.35 (.30)	.76, 1.94	.41***	
T1 RWA	-	-	-		-.10 (.02)	-.13, -.06	-.45***	
<b>Step 2</b>				.429***				.299***
T1 IH	.73 (.08)	.59, .88	.69***		.65 (.08)	.50, .79	.61***	
<b>Step 3</b>				.022*				.003
T1 prayer fulfillment	-.21 (.10)	-.40, -.02	-.16*		-.08 (.10)	-.28, .12	-.06	
	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$
<b>Step 1</b>				.145**				.331***
Gender	-2.03 (2.44)	-6.87, 2.82	-.08		-.84 (2.18)	-5.17, 3.50	-.03	
Age	.19 (.10)	-.01, .38	.19		.15 (.09)	-.02, .32	.15	
T1 Social desirability	1.04 (.33)	.39, 1.69	.31**		1.35 (.30)	.76, 1.94	.41***	
T1 RWA	-	-	-		-.10 (.02)	-.13, -.06	-.45***	
<b>Step 2</b>				.429***				.299***
T1 IH	.73 (.08)	.59, .88	.69***		.65 (.08)	.50, .79	.61***	
<b>Step 3</b>				.011				.012
T1 spiritual connectedness	-.32 (.20)	-.72, .09	-.11		-.33 (.19)	-.71, .05	-.12	
	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$	<i>B</i> ( <i>SE</i> )		$\beta$	$\Delta R^2$
<b>Step 1</b>				.145**				.331***
Gender	-2.03 (2.44)	-6.87, 2.82	-.08		-.84 (2.18)	-5.17, 3.50	-.03	
Age	.19 (.10)	-.01, .38	.19		.15 (.09)	-.02, .32	.15	
T1 Social desirability	1.04 (.33)	.39, 1.69	.31**		1.35 (.30)	.76, 1.94	.41***	
T1 RWA	-	-	-		-.10 (.02)	-.13, -.06	-.45***	
<b>Step 2</b>				.429***				.299***
T1 IH	.73 (.08)	.59, .88	.69***		.65 (.08)	.50, .79	.61***	
<b>Step 3</b>				.031**				.015 <sup>1</sup>
T1 spiritual universality	-.30 (.11)	-.53, -.08	-.19**		-.22 (.11)	-.44, .00	-.13 <sup>1</sup>	

\*\*\*  $p < .001$  \*\*  $p < .01$  \*  $p < .05$  <sup>1</sup> Approaching significance at  $p = .053$

Note. Model 1 includes gender, age, and social desirability as control variables and Model 2 includes the same with right-wing authoritarianism (RWA); for gender, 1 = male and 2 = female.

Table 5

*Linear Multivariate Regression of Time 1 (T1) Religious Participation Predicting Time 2 (T2) Intellectual Humility Factors (N = 100)*

	T2 independence of intellect and ego				T2 openness to revising one's viewpoint				T2 respect for others' viewpoints				T2 lack of intellectual overconfidence			
	<i>B</i> ( <i>SE</i> )	<i>t</i>	95% CI	$\eta_p^2$	<i>B</i> ( <i>SE</i> )	<i>t</i>	95% CI	$\eta_p^2$	<i>B</i> ( <i>SE</i> )	<i>t</i>	95% CI	$\eta_p^2$	<i>B</i> ( <i>SE</i> )	<i>t</i>	95% CI	$\eta_p^2$
Gender (1 = male, 2 = female)	.40 (.78)	.51	-1.16, 1.95		-1.15 (.69)	-1.68	-2.5, .21		.04 (.57)	.08	-1.10, 1.19		.05 (.71)	.07	-1.35, 1.45	
Age	.02 (.03)	.71	-.04, .08		.02 (.03)	.73	-.03, .07		-.01 (.02)	-.25	-.05, .04		.00 (.03)	.11	-.05, .06	
T1 Social desirability	.30 (.11)	2.79**	.09, .52	.08	.16 (.10)	1.62	-.04, .35		.25 (.08)	3.09**	.09, .41	.10	.07 (.10)	.73	-.12, .27	
T1 Right-wing authoritarianism	-.01 (.01)	-1.01	-.02, .01		-.02 (.01)	-1.98 <sup>†</sup>	-.03, .00		.00 (.01)	.19	-.01, .01		-.01 (.01)	-.85	-.02, .01	
T1 independence of intellect and ego	.56 (.09)	6.19***	.38, .74	.22	.04 (.08)	.49	-.12, .20		.08 (.07)	1.23	-.05, .21		.18 (.08)	2.19*	.02, .34	.05
T1 openness to revising one's viewpoint	.02 (.20)	.10	-.37, .41		.37 (.17)	2.17*	.03, .72	.05	.18 (.14)	1.24	-.11, .47		.03 (.18)	.15	-.33, .38	
T1 respect for others' viewpoints	.04 (.17)	.26	-.29, .38		-.04 (.15)	-.30	-.34, .25		.48 (.12)	3.87***	.23, .72	.14	-.03 (.15)	-.21	-.33, .27	
T1 lack of intellectual overconfidence	.05 (.10)	.54	-.15, .25		.17 (.09)	1.90	-.01, .34		.07 (.07)	.96	-.08, .22		.49 (.09)	5.38***	.31, .66	.25
T1 religious participation	-.13 (.07)	-1.99*	-.27, -.00	.04	-.08 (.06)	-1.41	-.20, .03		-.08 (.05)	-1.59	-.18, .02		-.05 (.06)	-.87	-.17, .068	

\*\*\*  $p < .001$     \*\*  $p < .01$     \*  $p < .05$     <sup>†</sup>  $p = .051$

### Discussion

An oft-cited quotation from Allport (1954) is: “The role of religion is paradoxical. It makes prejudice and it unmakes prejudice” (p. 444). A parallel hypothesis was formed for this research: that some ways of being religious/spiritual would encourage IH and others would discourage IH. Limited support was provided for this hypothesis, and only in the direction of small, negative links between religion/spirituality and IH. Specifically, religious fundamentalism, religious participation, religious belief salience, prayer fulfillment, and universality were associated with less IH. This could suggest that religious/spiritual convictions/behaviors might form barriers to IH. This is consistent with theories suggesting religion/spirituality might impede IH. For example, a connection to the divine might instill beliefs in an absolute, God-given truth that decreases humility about knowledge (Fisch, 2003), people might lack humility about religious beliefs because of the benefits derived from these beliefs (Woodruff et al., 2014), or religion/spirituality may be pursued due to a need for cognitive closure (Brandt & Reyna, 2010).

This should be of interest to religious/spiritual individuals, who may experience a variety of benefits from IH. For example, Cornille (2008) has argued that when religious individuals realize the limitations of human insight, this paves the way for them to truly listen to and learn from others and grow in the truth. A lack of IH results not only in stunted growth in relation to other religious traditions, but also blocks growth within one's own religion. Thus, IH is likely to benefit interactions between different religious/spiritual groups as well as prevent fractures within religious/spiritual groups experiencing ideological differences. However, implications should be made with caution, given the small magnitude of the links between religion/spirituality and IH. That is, the vast majority of participants' levels of IH were determined by factors not

assessed in this research. In addition, generalizability is limited due to the lack of a random sample. Yet, if negative links between religion/spirituality and IH are confirmed by further research, an implication may be that religious/spiritual individuals would benefit from exploration of IH and in particular, how IH relates to religious/spiritual themes.

Cross-sectional parabolic relationships were also observed between IH and religious fundamentalism, religious belief salience, and prayer fulfillment. The associated figures show that extreme scores at low and high levels of religion/spirituality tend to be associated with higher levels of IH than moderate scores for religion/spirituality, although these curvilinear effects were not completely symmetrical, in that those scoring on the low end of these religious/spiritual variables displayed greater IH than those scoring on the high end of these religious/spiritual variables.

It is possible that these curvilinear relationships reflect that those with moderate levels of religion/spirituality are ambivalent about religion/spirituality and are masking their struggle with a façade of overconfidence that presents as a lack of IH (Gal & Rucker, 2010). Alternatively, the findings could reflect a faith development trend, whereby individuals who move no faith or very low faith to more substantial levels of faith may initially be encumbered by a more closed-minded approach with greater emphasis on rules and a rejection of anything outside of their faith, whereas individuals who continue to progress still further into faith may move toward greater IH as they shift away from black and white thinking, gain more appreciation for paradox and mystery, and experience greater acceptance of others (Fowler, 1981).

A number of previous studies have found conceptually similar curvilinear relationships with religious variables and other outcomes. For example, curvilinear relationships have been observed between religion and prejudice toward outgroup members, with the most prejudiced

individuals being those who attend church infrequently compared to non-attenders and frequent attenders (Batson, Schoenrade, & Ventis, 1993; Gorsuch & Aleshire, 1974). Similarly, a curvilinear relationship has been observed between religious belief certainty and mental wellbeing, with both the confidently religious and confidently atheist exhibiting greater well-being relative to those with low religious belief certainty (Galen & Kloet, 2011). Taken together, these findings suggest that individuals toward the middle of the continuum of religion/spirituality may fare the least well on a variety of outcomes, including that they exhibit less IH, more prejudice, and less mental well-being compared to those either high or low in religion/spirituality. Perhaps this is reflective of those in the middle with regard to religion/spirituality experiencing a lack of confidence in their worldview or experiencing cognitive dissonance about inconsistencies in their beliefs or behaviors. However, in contrast, previous research indicates that more moderate attitudes about religion are beneficial to humility about one's religious beliefs, given that strong religious and anti-religious beliefs are both associated with less religious IH (Hopkin et al., 2014).

The fact that the longitudinal data did not reveal curvilinear relationships when using religion/spirituality to predict levels of IH over a three-year period is worthy of reflection. There could be a statistical explanation, e.g., lower power within the smaller longitudinal sample to detect the already small curvilinear effects, or controlling for T1 IH may have had a statistical effect on the T2 analyses that could have obscured the curvilinear effect. These statistical explanations would be worth examining in future research. Alternatively, it may be that the curvilinear effects operate concurrently and not longitudinally. Although longitudinal data, like cross-sectional data, cannot speak to causation, they offer the advantage of illuminating potential

directionality among variables, which is meaningful given that a unique picture emerged from the longitudinal data compared to the cross-sectional data in this study.

Another key finding is that RWA seemed to account for most of the observed links between religion/spirituality and IH. RWA is characterized by obedience to authority, conformity to conventional norms, and intolerance of deviance. RWA differs within the population not only based on personal disposition, but also as a response to social context. In particular, RWA has been conceptualized as a mechanism for responding to group threat when a salient aspect of identity is under attack (Stellmacher & Petzel, 2005). This means individuals might take on RWA attitudes when they feel their religious identities or communities are being threatened. This is relevant given that the current research was conducted during a time of relatively high levels of global social hostility between faiths, sectarian violence, and religion-related terrorism (Pew Research Center, 2014).

Previous research has emphasized that RWA and certain forms of religiosity can promote one another through a mutual emphasis on obedience to authority, conventionalism, and feelings of self-righteousness or superiority (Hunsburger, 1995). Authoritarians tend to go to church, pray, and read scripture more often than others. They tend to submit to religious authorities and report very little doubt about their religion. The trend that authoritarians tend to be religious and take an unquestioning, perhaps closed-minded approach to life may help explain how RWA accounted for negative link between religion/spirituality and IH.

Despite these relations between RWA and religiosity, it is important to note that RWA itself is not religious/spiritual in nature. The suggestion of the current research is that it is not religion/spirituality per se that is associated with decreases in IH, but that sociopolitical attitudes about authority, defined as RWA, are associated with less IH. Interestingly, when controlling

RWA, even religious fundamentalism, which has been referred to as a militant conservative belief and a closed-minded, ethnocentric mindset (Altemeyer & Hunsberger, 1992; McFarland, 1989) was no longer a significant predictor of IH. This parallels other research findings that it is not necessarily the content of religious beliefs that relates to outcomes such as prejudice, but that it is RWA among religious individuals that contributes to intolerance toward others (Hunsberger, 1995). Therefore, it may be that education and intervention related to IH would be better targeted toward those high in RWA rather than those who are simply high in religiosity/spirituality. To this end, a positive note is that increasing self-awareness among authoritarians seems to increase motivation to change (Altemeyer, 1988, 1994).

After taking into account RWA, only one linear link remained between a religious/spiritual variable and IH. Specifically, religious participation remained a negative predictor of future IH. Upon examination of the subdomains of IH, the only aspect of IH that decreased on the basis of higher levels of religious participation was independence of intellect and ego. High levels of religious participation, involving frequently praying, meditating, attending religious services, consuming religious materials, and/or thinking and talking about religious issues could be a sign that individuals are within a religious minority in society. If these individuals are frequently defending their religious behaviors to others, this could explain the lower scores of independence between intellect and ego. That is, being a religious minority could be associated with developing an unhealthy sense of defensiveness about one's beliefs if individuals quickly feel attacked or threatened by those who disagree with them. It is also possible that these individuals experience genuine religious discrimination that encourages greater defensiveness about beliefs.

It is worth exploring why the observed links between religion/spirituality and IH were so small. One possibility is that IH functions mostly independently from markers of religion/spirituality. Having a deep faith commitment may not make a person more or less intellectually humble. It is possible that religious/spiritual beliefs and values co-occur with openness to improving knowledge, particularly for those who view truth seeking as a lifelong process. IH, involving an appreciation for the tentative nature of one's personal knowledge, need not conflict with religious/spiritual beliefs and behaviors. Perhaps a helpful distinction in this regard is whether individuals place their confidence and desire in the truth versus in themselves as knowers. Being more concerned about getting closer to the truth than about being right as a knower is what might allow IH and religious/spiritual commitments to coexist or even to strengthen one another.

Although attempts were made to include comprehensive assessments for each construct measured, future research would benefit from additional exploration of this topic with other-reported and objective data. In addition, more aspects of religion/spirituality are worth exploring that may uncover relationships to IH than were not observed in the current research. Practical theologians such as Duffy (1982) have proposed that spiritual maturity does not result from the *quantity* of participation in religion, but rather from the *quality* of participation in authentic religious/spiritual practices such as worship, prayer, and scripture reading. It may be that measures that better assess the quality of religious/spiritual experiences would show more robust links to IH than measures focusing more on the frequency of religious/spiritual experiences. Variables such as spiritual maturity, quality of worshipping a deity, allowing sacred scriptures to decenter the self, engaging in intercessory prayer for perceived others, and exposure to religious diversity have each been related to qualities loosely associated with IH, such as mutual respect

among diverse groups, increased love and humility towards perceived enemies, and religious tolerance toward others, mostly in theological writings (Bonhoeffer, 1996; Law, 1955; Thurman, 1996) but also in some empirical research (Hook et al., 2017). Therefore, these may be fruitful avenues for future exploration. Subsequently, the next step in this line of research would be to verify the expected downstream effects of religiosity and IH on social outcomes that have previously been examined in relation to IH, such as respect, acceptance, openness, trust, compassion, and forgiveness directed toward others, as well as outcomes that have yet to be studied in detail, such as the success of conflict resolution, collaboration, and public discourse.

## References

- Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison-Wesley.
- Allport, G. W., & Ross, J. M. (1967). Personal religious orientation and prejudice. *Journal of Personality and Social Psychology*, 5, 432-43. doi:10.1037/0022-3514.5.4.432
- Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*. San Francisco, CA: Jossey-Bass.
- Altemeyer, B. (1994). Reducing prejudice in right-wing authoritarians. In M. P. Zanna & J. M. Olson (Eds.), *The psychology of prejudice: The Ontario Symposium* (pp. 131-148). Hillsdale, NJ: Lawrence Erlbaum.
- Altemeyer, B. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.
- Altemeyer, B. (2007). *The Authoritarians*. Winnipeg, Canada: Bob Altemeyer.
- Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion*, 2, 113-133. doi:10.1207/s15327582ijpr0202\_5
- Altemeyer, B., & Hunsberger, B. (1993). Reply to Gorsuch. *The International Journal for the Psychology of Religion*, 3, 33-37. doi:10.1207/s15327582ijpr0301\_5
- Batson, C. D., Eidelman, S. H., Higley, S. L., & Russel, S. A. (2001). 'And who is my neighbor?' II: Quest religion as a source of universal compassion. *Journal for the Scientific Study of Religion*, 40(1), 39-50. doi:10.1111/0021-8294.00036
- Batson, C. D., Floyd, R. B., Meyer, J. M., & Winner, A. L. (1999). And who is my neighbor?: Intrinsic religion as a source of universal compassion. *Journal of the Scientific Study of Religion*, 38, 445-57. doi:10.2307/1387605

- Batson, C. D., & Schoenrade, P. A. (1991). Measuring religion as a quest: Reliability concerns. *Journal of Scientific Study of Religion*, 30, 430-447. doi:10.2307/1387278
- Batson, C. D., Schoenrade, P., & Ventis, W. L. (1993). *Religion and the individual: A social-psychological perspective*. New York, NY: Oxford University Press.
- Blaine, B., & Crocker, J. (1995). Religiousness, race, and psychological well-being: Exploring social psychological mediators. *Personality and Social Psychology Bulletin*, 21, 1031-1041. doi:10.1177/01461672952110004
- Bonhoeffer, D. (1996). *Life together: Prayerbook of the Bible*. Minneapolis: Fortress Press.
- Brandt, M. J., & Reyna, C. (2010). The role of prejudice and the need for closure in religious fundamentalism. *Personality and Social Psychology Bulletin*, 36, 715-725. doi:10.1177/0146167210366306
- Cohen, J. (1969). *Statistical power analysis for the behavioural sciences*. New York, NY: Academic Press.
- Cornille, C. (2008). *The im-possibility of interreligious dialogue*. New York, NY: Crossroad Publishing.
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of Clinical Psychology*, 38, 119-125.
- Duffy, R. A. (1982). *Real presence: Worship, sacraments, and commitment*. San Francisco, CA: Harper & Row.
- Emmons, R. A., & Paloutzian, R. F. (2003). The psychology of religion. *Annual Review of Psychology*, 54, 377-402. doi:10.1146/annurev.psych.54.101601.145024
- Exline, J. J., Yali, A. M., & Sanderson, W. C. (2000). Guilt, discord, and alienation: The role of religious strain in depression and suicidality. *Journal of Clinical Psychology*, 56, 1481-1496.

- doi:10.1002/1097-4679(200012)56:12<1481::AID-1>3.0.CO;2-A
- Fisch, M. (2003). A modest proposal: towards a religious politics of epistemic humility. *Journal of Human Rights*, 2, 49. doi:10.1080/1475483032000055229
- Fowler, J. W. (1981). *Stages of faith: The psychology of human development and the quest for meaning*. San Francisco: Harper & Row.
- Gal, D., & Rucker, D. D. (2010). When in doubt, shout! Paradoxical influences of doubt on proselytizing. *Psychological Science*, 21(11), 1701-1707.  
doi:10.1177/0956797610385953
- Galen, L. W., & Kloet, J. D. (2011). Mental well-being in the religious and the non-religious: evidence for a curvilinear relationship. *Mental Health, Religion & Culture*, 14(7), 673-689. doi:10.1080/13674676.2010.510829
- Gericke, J. W. (2011). The concept of wisdom in the Hebrew Bible - A comparative-philosophical analysis. *Verbum Et Ecclesia*, 32, 1-6. doi:10.4102/ve.v32i1.513
- Gorsuch, R. L., & Aleshire, D. (1974). Christian faith and ethnic prejudice: A review and interpretation of research. *Journal for the Scientific Study of Religion*, 13(3), 281-307.  
doi:10.2307/1384759
- Gregg, A. P., & Mahadevan, N. (2014). Intellectual arrogance and intellectual humility: An evolutionary-epistemological account. *Journal of Psychology and Theology*, 42, 7-18.
- Hall, D. L., Matz, D.C., & Wood, W. (2010). Why don't we practice what we preach? A meta-analytic review of religious racism. *Personality and Social Psychology Review* 14(1):126-39. doi:10.1177/1088868309352179
- Hoaglin, D. C., Iglewicz, B., & Tukey, J. W. (1986). Performance of some resistant rules for outlier labeling. *Journal of American Statistical Association*, 81, 991-999.

- Hook, J. N., Davis, D. E., Van Tongeren, D. R., Hill, P. C., Worthington, E. J., Farrell, J. E., & Dieke, P. (2015). Intellectual humility and forgiveness of religious leaders. *The Journal of Positive Psychology, 10*, 499-506. doi:10.1080/17439760.2015.1004554
- Hook, J. N., Farrell, J. E., Johnson, K. A., Van Tongeren, D. R., Davis, D. E., & Aten, J. D. (2017). Intellectual humility and religious tolerance. *The Journal of Positive Psychology, 12*, 29-35. doi:10.1080/17439760.2016.1167937
- Hopkin, C. R., Hoyle, R. H., & Toner, K. (2014). Intellectual Humility and Reactions to Opinions About Religious Beliefs. *Journal of Psychology & Theology, 42*, 50-61-61.
- Hunsburger, B. (1995). Religion and prejudice: The role of religious fundamentalism, quest, and right-wing authoritarianism. *Journal of Social Issues, 51*(2), 113-129. doi:10.1111/j.1540-4560.1995.tb01326.x
- James, W. (1902). *The varieties of religious experience: A study in human nature*. New York, NY: Random House.
- Johnson, M. K., Rowatt, W. C., Barnard-Brak, L. M., Patock-Peckham, J. A., LaBouff, J. P., & Carlisle, R. D. (2011). A mediational analysis of the role of right-wing authoritarianism and religious fundamentalism in the religiosity–prejudice link. *Personality and Individual Differences, 50*(6), 851-856. doi:10.1016/j.paid.2011.01.010
- Krumrei-Mancuso, E. J. (2017). Intellectual humility and prosocial values: Direct and mediated effects. *The Journal of Positive Psychology, 12*(1), 13-28. doi:10.1080/17439760.2016.1167938
- Krumrei-Mancuso, E. J., & Rouse, S. V. (2016). The development and validation of the Comprehensive Intellectual Humility Scale. *Journal of Personality Assessment, 98*, 209-221. doi:10.1080/00223891.2015.1068174

Law, W. (1955) *A serious call to a devout and holy life*. Louisville, KY: Westminster John Knox Press.

Leary, M. R., Diebels, K. J., Davisson, E. K., Jongman-Sereno, K. P., Isherwood, J. C., Raimi, K. T., & ... Hoyle, R. H. (2017). Cognitive and interpersonal features of intellectual humility. *Personality and Social Psychology Bulletin*, 43(6), 793-813.  
doi:10.1177/0146167217697695

Marler, P. L. & Hadaway, C. K. (2002). "Being religious" or "being spiritual" in America: A zero-sum proposition? *Journal for the Scientific Study of Religion*, 41, 289-300. doi: 10.1111/1468-5906.00117

Mavor, K. I., Louis, W. R., & Sibley, C. G. (2010). A bias-corrected exploratory and confirmatory factor analysis of right-wing authoritarianism: Support for a three-factor structure. *Personality and Individual Differences*, 48, 28-33.  
doi:10.1016/j.paid.2009.08.006

Mavor, K. I., Louis, W. R., & Laythe, B. (2011). Religion, prejudice, and authoritarianism: Is RWA a boon or bane to the psychology of religion?. *Journal for the Scientific Study of Religion*, 50, 22-43. doi:10.1111/j.1468-5906.2010.01550.x

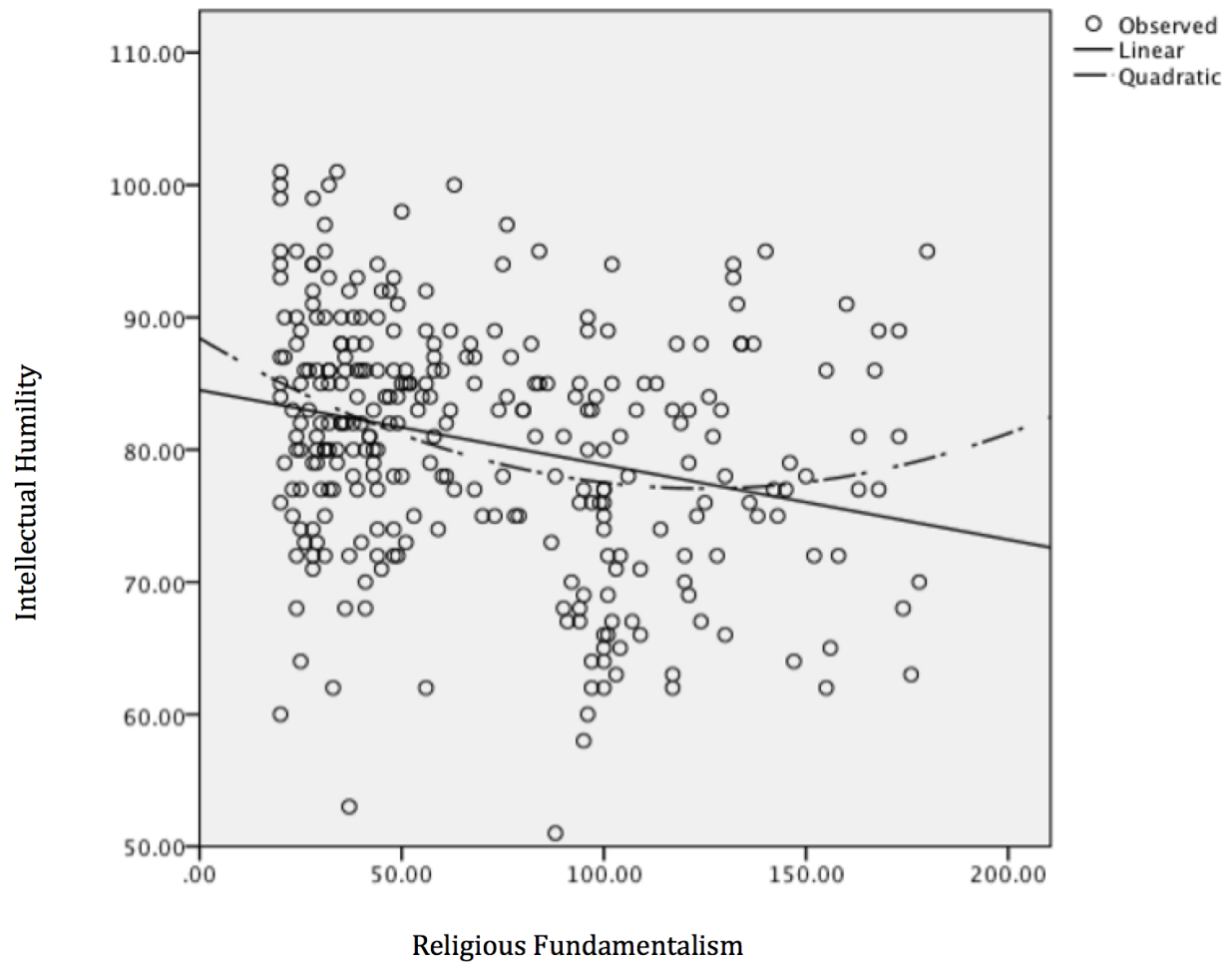
McElroy, S. E., Rice, K. G., Davis, D. E., Hook, J. N., Hill, P. C., Worthington Jr., E. L., & Van Tongeren, D. R. (2014). Intellectual Humility: Scale Development and Theoretical Elaborations in the Context of Religious Leadership. *Journal of Psychology & Theology*, 42, 19-30.

McFarland, S. G. (1989). Religious orientations and the targets of discrimination. *Journal for the Scientific Study of Religion*, 28(3), 324-336. doi:10.2307/1386743

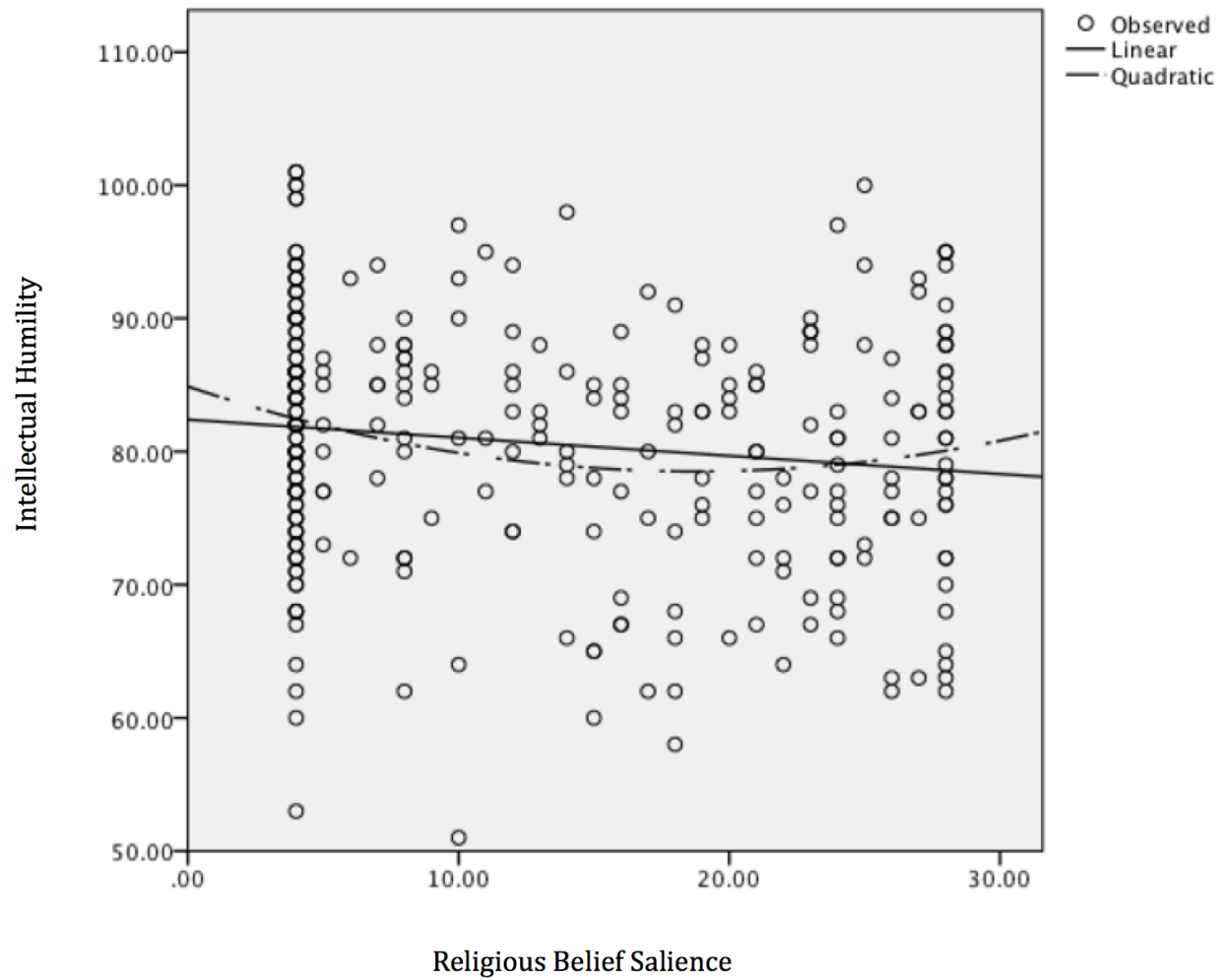
Miller-Perrin, C., & Krumrei-Mancuso, E. J., (2015). *Faith from a positive psychology*

- perspective*. Dordrecht: Springer. ISBN 978-94-017-9435-0
- Pardue, S. (2011). On faithfully knowing an infinite God: Humility as an intellectual virtue in Gregory of Nyssa's *Contra Eunomium II*. *International Journal of Systematic Theology*, 13, 62-76. doi:10.1111/j.1468-2400.2010.00524.x
- Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, practice*. New York, NY, US: Guilford Press.
- Pew Research Center (2014). Religious hostilities reach six-year high. Retrieved from <http://www.pewforum.org/files/2014/01/RestrictionsV-full-report.pdf>
- Piedmont, R. L. (1999). Does spirituality represent the sixth factor of personality? Spiritual transcendence and the five-factor model. *Journal of Personality and Social Psychology*, 54, 890-902. doi:10.1111/1467-6494.00080
- Preston, J. L., & Shin, F. (2017). Spiritual experiences evoke awe through the small self in both religious and non-religious individuals. *Journal of Experimental Social Psychology*, 702, 12-221. doi:10.1016/j.jesp.2016.11.006
- Stellmacher, J., & Petzel, T. (2005). Authoritarianism as a group phenomenon. *Political Psychology* 26(2), 245-274. doi:10.1111/j.1467-9221.2005.00417.x
- Thompson, A. D. (1974). Open-mindedness and indiscriminate antireligious orientation. *Journal for the Scientific Study of Religion*, 13, 471-477. doi:10.2307/1384610
- Thurman, H. (1996). *Jesus and the disinherited*. Boston, MA: Beacon Press.
- Van Tongeren, D. R., Stafford, J., Hook, J. N., Green, J. D., Davis, D. E., & Johnson, K. A. (2016). Humility attenuates negative attitudes and behaviors toward religious out-group members. *The Journal of Positive Psychology*, 11, 199-208. doi:10.1080/17439760.2015.1037861

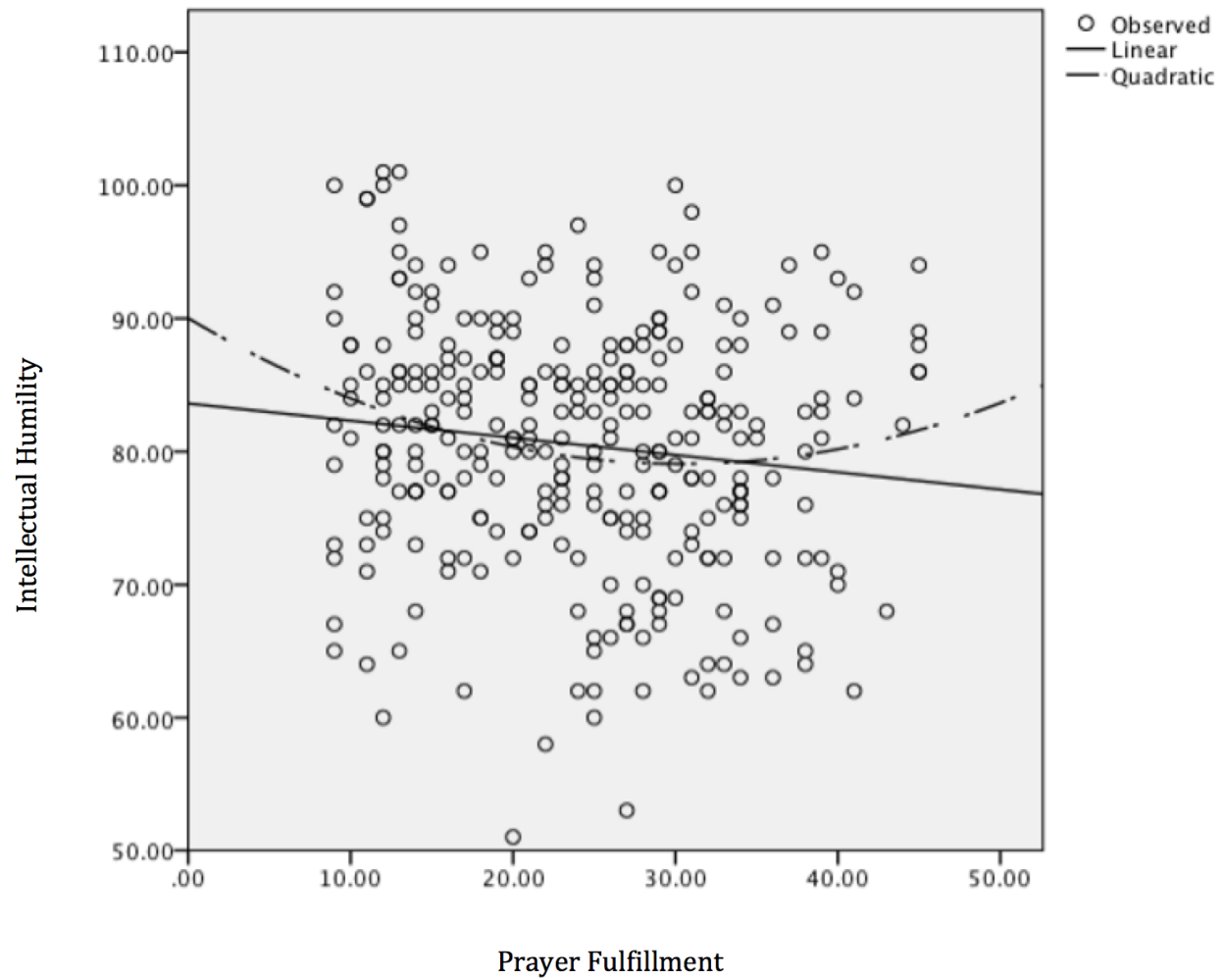
- Woodruff, E., Van Tongeren, D. R., McElroy, S., Davis, D. E., & Hook, J. N. (2014). Humility and religion: Benefits, difficulties, and a model of religious tolerance. In C. Kim-Prieto, C. Kim-Prieto (Eds.). *Religion and spirituality across cultures* (pp. 271-285). New York, NY, US: Springer Science + Business Media. doi:10.1007/978-94-017-8950-9\_14
- Zhang, H., Farrell, J. E., Hook, J. N., Davis, D. E., Van Tongeren, D. R., & Johnson, K. A. (2015). Intellectual humility and forgiveness of religious conflict. *Journal of Psychology & Theology*, 43, 255-262.
- Zhang, H., Hook, J. N., Farrell, J. E., Mosher, D. K., Van Tongeren, D. R., & Davis, D. E. (2016). The effect of religious diversity on religious belonging and meaning: The role of intellectual humility. *Psychology of Religion and Spirituality*. doi:10.1037/rel0000108
- Zinnbauer, B. J., Pargament, K. I., Cole, B., Rye, M. S., Butter, E. M., Belavich, T. G., & ... Kadar, J. L. (1997). Religion and spirituality: Unfuzzifying the fuzzy. *Journal for the Scientific Study of Religion*, 36(4), 549-564. doi:10.2307/1387689



(A)



(B)



(C)

Figure 1. Linear and curvilinear relationships of religious/spiritual variables and IH