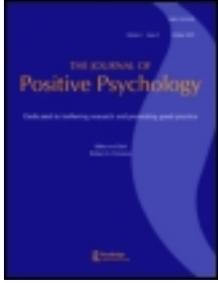


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Uncertainty avoidance moderates the link between faith and subjective well-being around the world

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Theorists have suggested that faith in God can play an important role in the relief of anxiety associated with uncertainty. Yet little is known about the impact of national differences in uncertainty avoidance – the degree to which uncertainty is threatening to members of a culture – on the relationship between faith and subjective well-being. In the present study, we investigated faith's relationships with psychological well-being in the World and European Values Surveys for nearly 240,000 people in 92 countries, and the role national uncertainty avoidance plays in modifying these relationships. We found that faith was positively related to subjective well-being around the world overall, but this relationship was moderated by uncertainty avoidance. In particular, the relationship between faith and well-being was strongest in nations characterized by the highest levels of uncertainty avoidance. Our results suggest that cultural norms of uncertainty avoidance play a role in determining faith's role in psychological functioning.

Keywords: religion; well-being; uncertainty avoidance

From what might happen tomorrow to how the universe functions, much about the world and our lives remains unknown and uncertain. Such uncertainty can cause individuals high levels of anxiety (Gray & McNaughton, 2000), leading them to turn to various personal and cultural sources to find greater understanding and certainty (Van den Bos, Poortvliet, Maas, Miedema, & Van den Ham, 2005). Theory suggests that faith in a higher power can function to relieve the anxieties of uncertainty – for some, providing answers to deeply rooted questions about human existence and offering a comforting reassurance that life's outcomes are in God's hands (Hofstede, Hofstede, & Minkov, 2010). We therefore reasoned that people within nations characterized by high levels of discomfort with uncertainty will especially benefit from faith. Using a cultural analysis in the present study, we examine how faith is related to subjective well-being depending on beliefs about uncertainty in the broader culture.

People's reactions to uncertainty vary as a function of culture (Sorrentino et al., 2008). In fact, national cultures can vary dramatically in uncertainty avoidance – the degree to which ambiguity and the unknown are threatening to members of a particular culture, typically resulting in anxiety (Hofstede et al., 2010). For instance,

Japan is characterized by much higher levels of uncertainty avoidance than Canada (Shuper & Sorrentino, 2004). These differences in uncertainty avoidance and subsequent anxiety often translate into variation across nations in the written and unwritten rules that provide structure and predictability to life. With respect to variation in religions, in nations that are high in uncertainty avoidance, Roman Catholicism – a denomination of Christianity that provides a broader set of rules and specific certainty about daily living than other denominations – is more prevalent than Protestantism, with its fewer rules and regulations (Hofstede, 2001). These findings suggest that uncertainty avoidance, as a dimension of cultural values, has important social and psychological consequences. In the present paper, we examine the role of such uncertainty avoidance at the national level in shaping the relationship between faith, a way in which individuals may cope with their anxiety associated with uncertainty, and subjective well-being.

The question of whether faith is related to subjective well-being has been of interest to researchers from a diverse set of fields (Ellison Christopher, Gay, & Glass, 1989; Pressman, Lyons, Larson, & Gartner, 1992; Witter, Stock, Okun, & Haring, 1985). In general, findings suggest that there is a positive relationship between faith

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and subjective well-being (Banthia, Moskowitz, Acree, & Folkman, 2007; Ellison, Boardman, Williams, & Jackson, 2001; Green & Elliott, 2010; Koenig, George, Meador, Blazer, & Dyck, 1994; Larson & Larson, 2003; Wink, 2005), though some studies have failed to find any relationship (see Lewis & Cruise, 2006 for review). Most studies, however, have not investigated the variations across nations in the association between faith and subjective well-being.

Recently, a select group of studies have begun to explore the link between faith and subjective well-being around the world. These studies have varied in scope, looking at many countries in a specific region of the world (Clark & Lelkes, 2009), a small set of countries from different cultures (Lavric & Flere, 2008; Sasaki, Kim, & Xu, 2011) or a broad set of nations around the world (Diener, Tay, & Myers, 2011; Okulicz-Kozaryn, 2010). Overall, the evidence from these studies suggests that there is a positive link between faith and subjective well-being at the global level, but critically, the strength of this link depends on the specific national context in which a person lives. Evidence from several studies suggests that the link between faith and subjective well-being is strongest in nations where a large portion of the population is religious (Clark & Lelkes, 2009; Diener et al., 2011; Okulicz-Kozaryn, 2010). One study also suggests that in poorer nations, there is a stronger relationship between faith and subjective well-being, whereas in more affluent nations, the link between faith and subjective well-being is not present (Diener et al., 2011). To date, however, few studies have examined how faith's link to subjective well-being systematically differs around the world as a function of a specific cultural value, such as uncertainty avoidance.

We reasoned that within nations high in uncertainty avoidance, faith provides one source of relief from anxiety associated with uncertainty by offering a source of control for the world's unknowns. Thus, in nations higher in uncertainty avoidance, faith should predict greater psychological well-being. In nations lower in uncertainty avoidance, this relief of anxiety is not as necessary since uncertainty about the unknown is not as great a concern as in nations characterized by higher uncertainty avoidance. Given that in nations with lower uncertainty avoidance, the anxiety relief function of faith is less central, we predicted that faith's link to subjective well-being would be weaker compared to higher uncertainty avoidance nations. Although we predicted that the strength of the faith and subjective well-being link would vary, we nevertheless predicted that faith would in general have a *positive* association with subjective well-being in low and high uncertainty avoidance cultures because faith promotes numerous other processes that lead to greater subjective well-being, such as facilitating closer communities and interpersonal ties (Barkan & Greenwood, 2003; Diener et al., 2011), and providing some practitioners with a sense of meaning in life

(Steger, Frazier, Oishi, & Kaler, 2006). We tested these predictions and evaluated the relationships between faith to subjective well-being in different nations around the world using data from the World Values Survey, European Values Survey, and Hofstede's uncertainty avoidance scores for different nations (Hofstede et al., 2010).

Method

Participants

We combined data from all waves of the World Values Survey and European Values Survey (2006) (<http://www.worldvaluessurvey.org>) for the present paper. All surveys were completed between 1981 and 2009. A total of 239,989 (51% female) individuals from 92 countries completed all measures of faith, life satisfaction, health, age, and income. The participants ranged in age from 14 to 99 ($M=40.82$, $SD=16.05$).

Measures

Faith

To indicate their level of faith, participants answered the question 'How important is God in your life? Please use this scale to indicate. 10 means "very important" and 1 means "not at all important."' We selected this question as our measure of faith since it captures religious values (Norris & Inglehart, 2004) rather than just religious participation.

Subjective well-being

Participants rated their life satisfaction using a single item, 'All things considered, how satisfied are you with your life as a whole these days? On this scale 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole?' In addition, participants rated their feelings of happiness by answering the question 'Taking all things together, would you say you are ...' on a scale from 1 (*not at all happy*) to 4 (*very happy*).

Income

Each participant indicated their level of income by answering the following item: 'Here is a scale of incomes on which 1 indicates the "lowest income decile" and 10 the "highest income decile" in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in.'

Health

Participants rated their health by respond to the question 'All in all, how would you describe your state of health

these days? Would you say it is ...' on a scale of 1 (*poor*) to 4 (*very good*).

National uncertainty avoidance

Data for national levels of uncertainty avoidance were available for 72 of the 98 countries in the present data from previous research (Hofstede et al., 2010). Scores ranged from 8 (Singapore), indicating very low uncertainty avoidance, to 112 (Greece), indicating very high uncertainty avoidance.

Results

Since individuals (level 1) were nested within nations (level 2), we employed two-level hierarchical linear modeling for all analyses (Raudenbush, Bryk, & Congdon, 2002). We analyzed our data using R, in particular employing the R packages lme4 (Bates & Maechler, 2009) and language R (Baayen, 2008). Throughout the paper, we present Markov-Chain Monte Carlo -estimated *p*-values with a 2000 simulations. In all our models, faith was group-mean centered; thus, all effects demonstrate the association between a person's faith and each outcome relative to the average faith of people in the *same country*. Through this approach, the effect of faith was unbiased by certain nations on average having a population that has greater faith than other nations. Finally, since the variables in the study were on different scales, we *z*-scored all variables in the study and used the *z*-scores in all models for ease of interpretability. In all our models, we controlled for age, income, and health at level-1. These controls were important since age, income, and health are related to faith, life satisfaction, and happiness (all *ps* < 0.001), and thus could be the actual sources of the relationships we observe.

We first examined the average associations of faith to subjective well-being around the world. Critically, these analyses focused on *general effects* across nations – we expected heterogeneity in both links from nation-to-nation. Consistent with previous research (Diener et al., 2011), we found that there was a *positive* relationship between faith and life satisfaction, $b = 0.092$, $CI_{95} (0.088, 0.097)$, $t = 39.48$, $p < 0.001$; similarly, faith also positively predicted feelings of happiness, $b = 0.083$, $CI_{95} (0.079, 0.088)$, $t = 34.39$, $p < 0.001$.

Then we tested our main prediction that uncertainty avoidance would provide part of the answer as to why faith appears to be associated differently with subjective well-being from nation-to-nation. Thus, we included uncertainty avoidance as a level-2 moderator. For these analyses, complete data for all variables and controls was available for 68 countries and 202,705 individuals. Consistent with our predictions (see Figure 1), national-level uncertainty avoidance was a significant moderator of the link between faith and life satisfaction, $b = 0.009$, $CI_{95} (0.005, 0.015)$, $t = 3.55$, $p < 0.001$. Specifically, faith

predicted greater life satisfaction more for nations high in uncertainty avoidance, $b = 0.108$, $CI_{95} (0.100, 0.115)$, $t = 28.75$, $p < 0.001$, than nations low in uncertainty avoidance, $b = 0.089$, $CI_{95} (0.082, 0.097)$, $t = 24.74$, $p < 0.001$, although the link was positive across both types of nations.

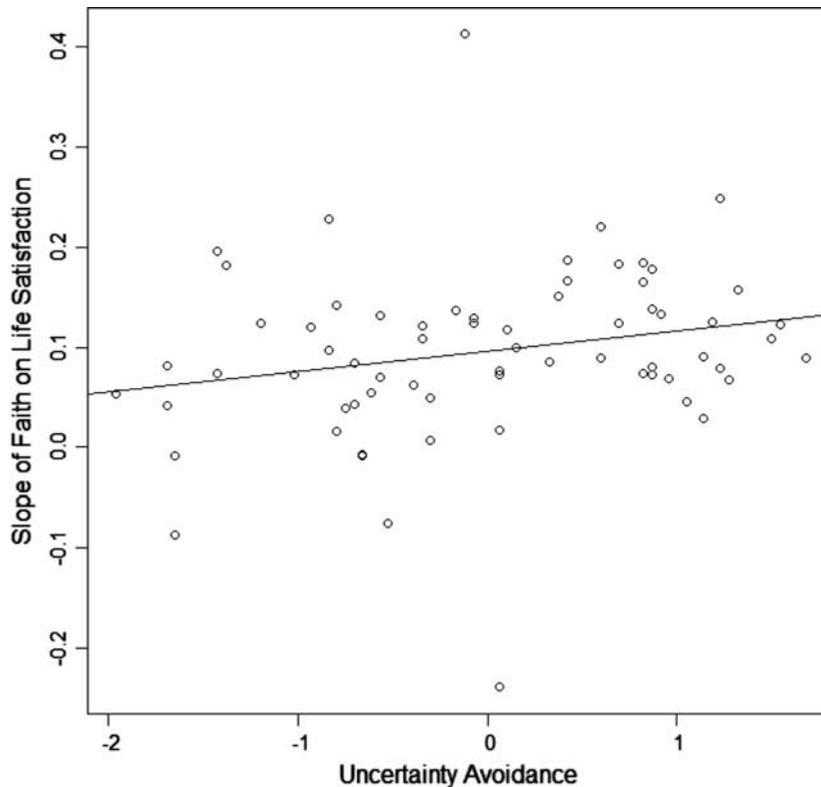
Similarly, uncertainty avoidance moderated the relationship between faith and feelings of happiness, $b = 0.010$, $CI_{95} (0.004, 0.015)$, $t = 3.51$, $p < 0.001$ (see Figure 2). In parallel to the results for life satisfaction, faith predicted greater feelings of happiness in nations high in uncertainty avoidance, $b = 0.100$, $CI_{95} (0.093, 0.108)$, $t = 25.68$, $p < 0.001$, than low uncertainty avoidance, $b = 0.081$, $CI_{95} (0.074, 0.088)$, $t = 21.66$, $p < 0.001$, though once again, the link between faith and feelings of happiness were positive in both low and high uncertainty avoidance nations.

In follow-up analyses, we included national faith (how important God is on average within a nation) as a second moderator in all analyses since previous research has shown that the link between faith and life satisfaction is more positive in nations where on average faith is stronger (Diener et al., 2011) and we aimed to ensure that the uncertainty avoidance effect was not merely a proxy for national faith. Even after including national faith as a second moderator, we found the same pattern of results for uncertainty avoidance.

Discussion

Nations can vary dramatically in their cultural environments, shaping and molding the effect of social structures that play important roles in subjective well-being. In the present paper, we examined how national differences in uncertainty avoidance modulate the relationship between faith and well-being. Consistent with previous research (Diener et al., 2011; Ellison et al., 1989; Okulicz-Kozaryn, 2010; Pressman et al., 1992), we found a generally positive, though small, relationship between faith and subjective well-being (life satisfaction, feelings of happiness) around the world. These global relationships of faith, however, obscure the differences from nation-to-nation in the relationships of faith to subjective well-being. For instance, China showed a negative relationship between faith and subjective well-being, whereas Thailand showed an unusually strong positive link between faith and subjective well-being.

We proposed that uncertainty avoidance at the national level provides one explanatory framework for understanding why differences exist in the relationship between faith and subjective well-being. In nations characterized by high levels of uncertainty avoidance, faith was more positively related to subjective well-being than in nations with low uncertainty avoidance. These results are consistent with the notion that in nations characterized by high levels of uncertainty, greater faith produces elevated subjective well-being, providing peace of mind



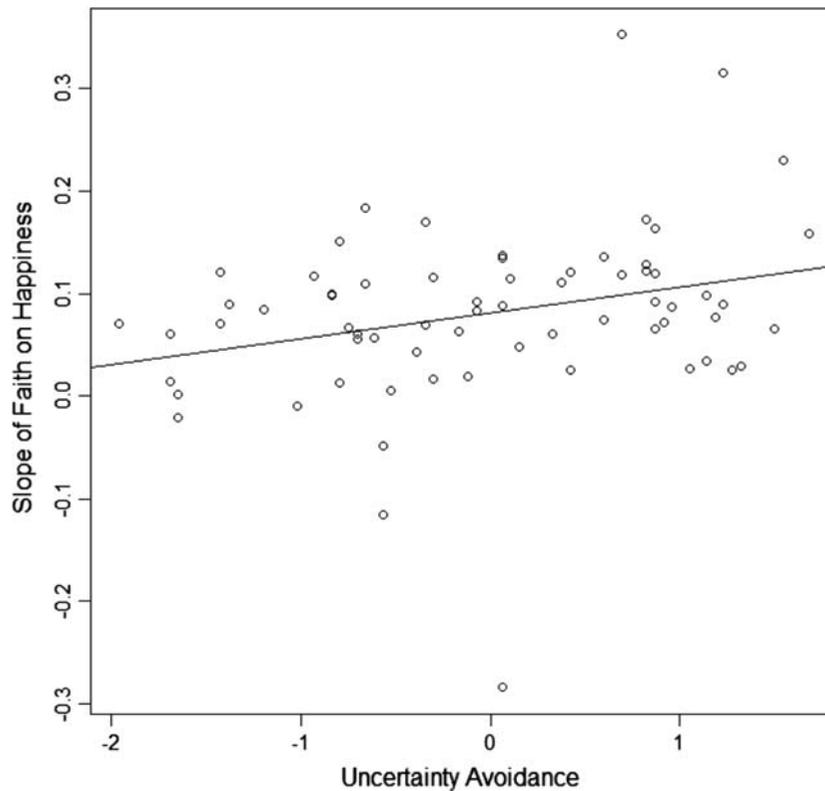
Note: To create the above figure, we extracted the slope of faith on life satisfaction in 68 separate regressions conducted for each country separately. In each of these regressions, we controlled for age, income, and health as in our main multi-level models. The above is a plot of uncertainty avoidance in each country and the slope of faith on life satisfaction extracted from these regressions.

Figure 1. Uncertainty avoidance and the slope of faith on life satisfaction.

over the uncertainties of life (Hofstede et al., 2010). In nations characterized by low uncertainty avoidance, however, there was a weaker, though still positive relationship between faith and subjective well-being. In such nations, we theorize, faith does not need to play the role of uncertainty explainer; thus, when people turn to faith, they are less likely to ascribe control over their lives to such an external source. The positive link between faith and subjective well-being still remains, however, since faith's link to subjective well-being is multifaceted. For instance, previous research suggests numerous factors that facilitate the positive link between faith and subjective well-being, including social support (Diener et al., 2011) and social capital (Okulicz-Kozaryn, 2010). These elements are likely still in place even in nations where uncertainty avoidance is low and faith does not function as an anxiety reduction agent.

Our findings raise several potential implications and questions for further research. First, the causal relationship between faith and uncertainty avoidance is unclear based on the present findings, and thus, there are a number of possible explanations for the findings. In the emergence of cultures and religion, it is possible that cultures paved the way for religion by generating an

aversion to uncertainty. However, it is also possible that as religions emerged, they infused a sense of uncertainty avoidance within their cultural milieus, which may have potentially led to a positive feedback loop of greater uncertainty creating an even greater need for religion. Investigations of historical records may shine some light on this question. Furthermore, experimental designs which allow for the emergence of groups may also serve as a powerful tool to probe this question (e.g. Efferson, Lalive, & Fehr, 2008). Second, our research also raises the interesting possibility that shifts in uncertainty avoidance may explain some of the reduction in religiosity in the world population (Diener et al., 2011). As societies develop and provide greater stability and security to their citizens, cultural uncertainty avoidance may decrease. Such reduction in uncertainty avoidance may remove one motivation for religious engagement, particularly as religion's link to subjective well-being decreases in these cultures. Consistent with this idea, research on religion and control shows that people who perceive greater personal control in their lives are less likely to believe in a controlling God than people who perceive a lack of personal control (Kay, Gaucher, Napier, Callan, & Laurin, 2008). Third, it is important to note that explaining



Note: To create the above figure, we extracted the slope of faith on happiness in 68 separate regressions conducted for each country separately. In each of these regressions, we controlled for age, income, and health as in our main multi-level models. The above is a plot of uncertainty avoidance in each country and the slope of faith on happiness extracted from these regressions.

Figure 2. Uncertainty avoidance and the slope of faith on happiness.

uncertainty is but one aspect of religion and is likely only one factor that influences the way religion is linked to subjective well-being. Thus, even in an increasingly certain world, religion may still play a role in promoting subjective well-being, and furthermore, our research suggests that the influence of religion on people's lives may not be the same everywhere. Our findings are in line with past research demonstrating that the broader cultural context can shape the way religion manifests itself in cultural products and impacts people's coping behaviors (Sasaki & Kim, 2011). The current research focused specifically on the level of uncertainty avoidance in different national cultures, yet there are likely numerous other factors that moderate the link between faith and subjective well-being. Some past work has already identified national faith and GDP as two moderating factors (Diener et al., 2011), and future research should explore other aspects of culture that may meaningfully shape religious experience.

It should be stressed, however, that care must be taken in interpreting our results, because of several important limitations. First, although the present data are consistent with our theoretical analysis, they are ultimately correlational, and therefore we must be careful

not to draw causal inferences without further cross-cultural experimental work that can establish the causal direction in our findings. In particular, experimental manipulation of uncertainty (e.g. Van den Bos, Van Ameijde, & Van Gorp, 2006) is necessary to further evaluate the causal aspects of our framework. Second, our measures of faith and subjective well-being consisted of single-item measures from large-scale surveys. Although this worldwide data allowed for greater generalizability beyond the North American student samples utilized in much of psychology research (Henrich, Heine, & Norenzayan, 2010), future work should employ more robust, multiple-item measures of these constructs to reduce potential error in the measurement. On a related note, since our faith measure was only a single item, we were unable to probe the multiple facets of faith. For instance, growing evidence suggests that the distinction between religious practice and spirituality is important for understanding's faith's relationship to well-being (Saslow et al., n.d), and other research shows that attendance at religious services is linked to extremist beliefs, whereas religious devotion in the form of prayer is not (Ginges, Hansen, & Norenzayan, 2009). Our single-item measure was unable to probe these distinctions, making

this a ripe avenue for future study. Fourth, the relationship between faith and subjective well-being was relatively small within our study. It should be noted that this relationship likely underestimates the true relationship between faith and subjective well-being within the population because of (a) potential error in the single-item measures, and (b) use of a global measure of faith rather than probing specific components. Likewise, the slope of faith on subjective well-being was roughly 20% larger for people from high as compared to low uncertainty avoidant countries. While this is not a trivial difference, subjective well-being has been shown to be affected by many processes, including numerous biological (Saphire-Bernstein, Way, Kim, Sherman, & Taylor, 2011), psychological (Le, Impett, Kogan, Webster, & Cheng, 2012), and socioeconomic (Diener, Ng, Harter, & Arora, 2010) factors, and so the link between faith and subjective well-being is likely one of many.

Nonetheless, our study provides a first glimpse at the broad cultural factors that moderate the link between faith and well-being. Future work should examine other cultural factors that contribute to the positive (and potentially negative) impact of faith on psychological functioning. Availability of large, cross-cultural datasets, such as the European and World Values surveys, are opening the doors for researchers to probe these questions with new scope. We believe such explorations can begin to provide refinement to our understanding of when, where, and for whom faith can play a positive, life-boosting role.

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