



# Auspicious or suspicious — Does religiosity really promote elder well-being? Examining the *belief-as-benefit effect* among older Japanese

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## ABSTRACT

Recent findings suggest that the *belief-as-benefit effect* (BABE) — the positive association between religiosity and health/well-being — is a spurious correlation voided by personality traits. The current paper investigates the cross-sectional relationships among personality, religiosity and psychological well-being in an older adult sample randomly-selected from Tokyo, Japan. Correlation and Hierarchical Regression Modelling (HRM)—with a *two one-sided test* (TOST) of equivalence—is utilized. The standard BABE correlation is reproduced. However, HRM utilizing a meaningful benchmark of effect ( $\beta \geq .15$ ) largely neutered the result after controlling for trait agreeableness and conscientiousness. Religiosity does remain statistically related to the *purpose in life* and *positive relationships* sub-scales; though it explains just a sliver of variance in both instances. Compared to religiosity, agreeableness, conscientiousness and education level were more substantial and consistent well-being predictors. Whether religiosity auspices the psychological health of older Japanese adults thus remains to be established.

... [O]f most interest to researchers will be what religious and spiritual scales *do not* share in common with other personality constructs. This nonoverlapping variance is what contains the value of R/S constructs: what they add to our understanding of individuals over and above any contributions from existing constructs. ... Science dislikes redundancy and seeks to identify the fewest elements necessary to explain an outcome. ...

Piedmont & Wilkins (2013, pp 302–303)

## 1. Introduction

Investigations into the psychosocial facilitators of well-being suggest religiosity is auspicious (AbdAleati, Zaharim, & Mydin, 2016; Löckenhoff, Ironson, O'Leirigh, & Costa, 2009) especially for older adults (Das & Nairn, 2016; Ysseldyk, Haslam, & Haslam, 2013); however, the effect size is typically small. Despite credible concerns regarding the over-reliance on North America samples, overly-simplistic study designs, restricted sampling and unsophisticated analyses, some theorists (e.g. Wood, 2017) posit that religiosity actively protects mental health and psychological well-being. However, evidence showing this *belief-as-benefit effect* (BABE) outside of the USA remains scarce. Furthermore, few past papers test whether religiosity is an incrementally valid predictor of well-being (see opening quote).

Against this background, the current paper whether religiosity is associated with well-being among older Japanese; a cultural cohort with a striking propensity for religious conversion (Miller, 2000). After conducting simple correlation analyses, sociodemographic and personality variables are added to establish whether the findings are incrementally valid.

### 1.1. Why claiming that religiosity causes psychological well-being remains contentious

Although belief in self-transcending/supernatural forces is common, the key psycho-social characteristics that demark sacred from more profane practices continue to be contested (Koenig, 2008; Oman, 2013). Nonetheless, theorists ostensibly agree that religiosity encapsulates a personal dedication to culturally-venerated beliefs in a “higher” immaterial realm. At its core, religiosity involves reverence for certain claims regarding the existence of unverifiable mystical forces (Schuurmans-Stekhoven, 2014) and a personal identification with sacred texts, symbols/sites, practices and rituals.

Despite the seemingly indefatigable debate over exactly what religiosity entails, faith-based devotion — especially religious practices such as attending services — appears to ward-off certain age-related illness (Das & Nairn, 2016; Ysseldyk et al., 2013) and to prolong life (Idler, Blevins, Kiser, & Hogue, 2017). Medical benefits previously

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associated with religiosity include higher observer-ratings of health status, physical functionality and lower illness severity among the elderly (Koenig, George, & Titus, 2004), better cardiovascular health (Das & Nairn, 2016) and better self-ratings of physical health by those diagnosed with cancer (Jim et al., 2015). In relation to treatment interventions, including religious content augments the efficacy of geriatric psychotherapy for anxiety and depression (Paukert et al., 2009). Faith and religious affiliation are also associated with less severe mood disorders among the diagnosed (Schettino et al., 2011) and greater resilience in the face of stressful events (Starnino, Gomi, & Canda, 2014).

Pondering such findings, some theorists hypothesize that religiosity offers a form of *socio-cultural inoculation* against traumatic events/loss (Das & Nairn, 2016; DeAngelis & Ellison, 2017) and interpersonal isolation (Hamren, Chungkham, & Hyde, 2015). Despite these ideas and the promising supportive research, others (e.g. Galen, 2017; Jim et al., 2015; Schuurmans-Stekhoven, 2017a) have resisted making causal claims, as more nuanced findings suggests that the association between religiosity and well-being differs by gender among the elderly (Das & Nairn) and omitted ‘third variables’ may confound past results (Schuurmans-Stekhoven, 2011; 2017b).

In a similar vein, Galen (2012, 2017) cautions that religiosity’s apparent effects are challenging to interpret meaningfully given that much of the previous research is marred by pervasive measurement and design flaws. For example, even though religiosity correlates with well-being, few study designs establish cause or remove confounding effects from competing explanations. It is even plausible that socially desirable bias may inflate the well-being reported by older believers (Fastame, Hitchcott, & Penna, 2017). Furthermore, the positive and emotive wording of items included within religiosity/spirituality questionnaires almost ensures a statistical correlation with well-being measures will be found due to overlapping content (Koenig, 2008). Others (Galen, 2017; Schuurmans-Stekhoven, 2017a) suggest that the BABE may reflect a reverse causation (i.e., prerequisite health combined with a desire for communal interaction may cause regular religious service attendance; see Burris, Batson, Altstaedten, & Stephens, 1994). Evidence that retail shopping frequency by older Taiwanese enhances longevity (Chang, Chen, Wahlqvist, & Lee, 2012) — by a magnitude similar to the effect as the frequency of church attendance by older US adults — provides some tantalizing albeit indirect support for this growing counterview. Among the elderly, a greater capacity for physical and social activity *in general* (i.e., including, but not only, religious activity) appears to be protective.

Despite such unresolved issues, some are now calling for medical interviews to routinely evaluate patients’ faith-status (Starnino et al., 2014) — a proposal of particular relevance to older adults. Yet such potentially invasive assessments may be misguided given that the BABE has rarely been validated utilizing multivariate designs that include competing secular explanations of well-being. Consequently, the claim that religiosity benefits the elderly remains *potentially plausible* at best.

## 1.2. Might personality account for the belief-as-benefit effect among older adults?

The five factor personality dimensions — long-established, partly heritable and enduring psychological traits — are known to explain variance in psychological well-being (DeNeve & Cooper, 1998). Although neuroticism and extraversion often explain the lion’s share of life satisfaction, at least one meta-analysis (Steel, Schmidt, & Shultz, 2008) reveals that conscientiousness and agreeableness also make consistent, albeit smaller, contributions. Given that religiosity correlates with both agreeableness and conscientiousness (Löckenhoff et al., 2009; Murray & Ciarrochi, 2007; Schuurmans-Stekhoven, 2017b; Wink, Ciciolla, Dillon, & Tracy, 2007) the possibility that the well-being variance currently attributed to religiosity could actually arise from these personality traits cannot be dismissed lightly. Furthermore, religiosity could be an emergent property that manifests in a particular

subset of individuals exhibiting such prosocial (i.e., agreeable and conscientious) traits (Kirkpatrick, 2006; Löckenhoff et al., 2009; Schuurmans-Stekhoven, 2011, 2017a, 2017b). Past confirmation of this alternative hypothesis illustrates the risk that the bi-variate association between religiosity and well-being might be illusory; a statistical by-product of confounding covariates.

It is clear from the preceding discussion that research capable of removing any contaminant trait effects is necessary in order to establish whether religiosity has an *incrementally valid* association with well-being. As implied in the opening quotation, assertions that religiosity facilitates healthy aging must be empirically demonstrated across diverse settings and samples while parsing out the effects of other known predictors. Thus far attempts to incrementally validate religiosity’s well-being association have produced equivocal findings.

Amongst male Catholic clergy spiritual maturity has been shown to incrementally predict life satisfaction after controlling for the Big Five personality traits (Froehlich, Fialkowski, Scheers, Wilcox, & Lawrence, 2006). However, given the restricted sample, this result — which explained 3.5% of outcome variation — cannot be generalized meaningfully. Moreover, the spiritual maturity measure used does not uniquely capture supernatural or faith-based belief — it encompasses virtues and civil tendencies which many nonbelievers also exhibit (Galen, 2012, 2017; Schuurmans-Stekhoven, 2011, 2017a), and only the intermediate  $R^2$ -change (but not the statistical significance of the final  $\beta$  coefficient) was published.

In a small sample ( $n = 119$ ), Löckenhoff et al. (2009; Table 4), after prioritizing personality traits, report that religiosity was statistically unrelated to the mental health of HIV patients (though uniquely explained 5 percent of the outcome variance). This small sample is again drawn from a specific sub-population; so the findings may not generalize. Similarly, in another small ( $N = 176$ ), possibly under-powered, US sample the effects of religious attendance and private spiritual practice on life satisfaction were rendered non-significant (both  $\beta$ s = .06) when personality traits were prioritized in hierarchical modelling (Murray & Ciarrochi, 2007). The latter paper only found an incrementally valid religiosity/spirituality association with positive affectivity. However, Saroglou, Buxant, and Tilquin, (2008) subsequently demonstrated that experimentally manipulating particular positive mood states enhances spirituality reports—that is, a reverse causal relationship. In a similar manner, others suggest that free-floating positive affectivity may actually predispose people to attribute otherwise inexplicable cognitive/perceptual disturbances to supernatural explanations (Claridge, 2010; Schuurmans-Stekhoven, 2013). Consequently, even interpreting Murray and Ciarrochi’s statistically significant finding is far from straightforward.

Using a larger Australian sample, Schuurmans-Stekhoven (2011) reports that although faith-based beliefs correlate positively with psychological well-being, these effects either lapse into non-significance or switch to become statistically significant *negative* effects when measures of civility and virtue (e.g. hope, kindness, etc) were simultaneously modelled. Consequently, Schuurmans-Stekhoven argues that the simple BABE might be little more than a *third variable bias*; arising only because past papers have omitted personality variables (i.e., effects are necessarily attributed to faith by poor design; see also Galen, 2017).

Parsimoniously summarizing these past findings suggests that agreeable and conscientious individuals appear to be happier and more satisfied with life (Steel et al., 2008; Wink et al., 2007). These same traits also correlate with religiosity (Heaven & Ciarrochi, 2007; Löckenhoff et al., 2009; Schuurmans-Stekhoven, 2017a; Wink et al., 2007). Thus even though religiosity and well-being tend to co-vary, this association could be a by-product from agreeableness and/or conscientiousness (Saroglou et al., 2008; Schuurmans-Stekhoven, 2011).

Counter to this interpretation, Wood (2017) suggests that religiosity actively shapes agreeableness and conscientiousness. Although possible, few high-calibre studies support such a conclusion. Contrarily, longitudinal research showing that prosocial personality traits precede

(i.e., seem to be pre-conditions for) the subsequent emergence of religiosity is available (Heaven & Ciarrochi, 2007; Wink et al., 2007). Moreover, even if religiosity occurs prior to the development of prosocial traits, it is unlikely to be the sole cause (i.e., these traits are partly heritable; Bergeman et al., 1993) and such prosocial tendencies might be adaptively shaped by participating in *any* collectives (religious or non-religious). As others (Galen, 2012; Ysseldyk et al., 2013) note, being in *any* group — including, but not exclusively, religious collectives — comprised of prosocial members probably aids both personal socialization and well-being. Civil affiliates tend to be helpful and this probably enhances perceptions of the psychological warmth of such social bonds. Additionally, since groups comprised of anti- and asocial types are naturally at more risk of disbanding, civil collectives offer members greater confidence that the interpersonal support they provide will be ongoing. Furthermore, since prosocial contagion can spontaneously occur within groups — for example, new entrant adolescent primates are socialized to emulate *prototypic* communal acts (e.g. grooming) to their own benefit (Sapolsky & Share, 2004) — perhaps the social dynamics of grouping into any collective sufficiently explain the psychosocial effects that some currently attribute to religiosity (Galen, 2017).

Accepting the premise that religiosity may be a specific expression of overarching agreeableness and conscientiousness (Löckenhoff et al., 2009; Murray & Ciarrochi, 2007; Wink et al., 2007), the question as to whether religiosity might simply be approximating the effects of these same traits on well-being remains under-explored. Furthermore, even where this has previously been investigated, deficient samples have typically been employed. Few prior studies have utilized large, randomly-selected, non-US samples comprised of elderly respondents. I address these concerns.

## 2. Research design

### 2.1. Sample

The current study utilizes data from *Survey of Midlife Development in Japan* (MIDJA 2), May–October 2012 (ICPSR 36427; Ryff et al., 2012). Adults 30 years or older from Tokyo, Japan were probability sampled ( $N = 657$  see the original study for method and ethics clearance). Here a minimum cut-off age of 50 is utilized; giving a final sample of 398 participants aged 50 to 85 years ( $M_{age} = 65.13$ ,  $SD_{age} = 9.40$ ) who provided responses to all items used in this analysis. The modal respondent was male (51%). Consistent with syncretism, which is very common in Japan (Kaneko, 1990), most respondents did not specify a religious affiliation (69%) however, 89% did report some degree of religiosity on a continuous measure (see details below). Although using a specific religious affiliation is inappropriate within syncretic cultures, of those prepared to publicly disclose a solitary affiliation, Buddhism was the predominant faith tradition (26% of the entire sample).

### 2.2. Instruments and measures

#### 2.2.1. Religiosity

A 6-item measure of religiosity covering self-reported beliefs and practices was utilized. Items (which used an anchored 4-point Likert-type response scale) include “How religious are you?”, “To what extent do you believe in God/Buddha?”, “Do you pray/worship at a home altar?”

#### 2.2.2. Psychological well-being

The 42-item (7 items per subscale) version of the Ryff (1989) Psychological Well-being Scale was employed as the dependent variable (see Table 1).

#### 2.2.3. Personality dimensions

Agreeableness and conscientiousness traits were measured using

brief adjective lists selected from several previously published inventories and each item had a 4-point Likert-style response option. Agreeableness was comprised of five adjectives (e.g. warm, helpful, soft-hearted, etc.). Conscientiousness was originally measured using four adjectives (e.g. organized, thorough, responsible, and hard-working) however the internal reliability of this latter scale was unacceptably low so two items (“I rarely give up on something I am doing, even when things get tough” and “Even when I feel I have too much to do, I find a way to get it all done”) — both with 4-point response bins — collected in the survey were added.

### 2.3. Setting the practically meaningful effect size

To utilize the two one-sided test (TOST) equivalence approach,  $\beta = .15$  is preselected as a benchmark of noticeable effect. This was derived from Norman, Sloan, and Wyrwich's (2003) — who suggest that people seem to consistently rate an improvement of half a standard deviation as practically meaningful. Their result thus implies that a  $\beta = .24$  (which is equivalent to a Cohen's  $d = .50$  assuming approximately equal group sizes) is a reasonable benchmark. However, Norman et al. also report that this *just noticeable* effect size varied such that 4.8% of their sampled effect sizes were noticeable at  $d = .30$ . For this reason a very conservative  $\beta = .15$  (equivalent to a  $d = .30$ ), which favours classifying effects as meaningful, will be utilized.

Considered from the perspective that genuine religiosity involves a major personal undertaking with substantial and ongoing investment of time and effort — in pray, ritual, attendance and related behaviours — the  $\beta = .15$  benchmark again seems especially conservative. Comparatively speaking, both physical exercise and interpersonal socializing are known to correlate more strongly than  $r = .15$  with well-being (see for example Chang et al., 2012). Since these latter activities probably involve less devotion than does religious activity,  $\beta = .15$  again seems a fairly low bar. Finally, since the specified multivariate model to be estimated here is non-exhaustive — i.e., it excludes numerous known well-being predictors (e.g. extraversion, emotional stability, social support, exercise, diet, etc.) for pragmatic reasons — the preselected benchmark arguably favours the incumbent view. This is because variance actually due to such omitted predictors remains available to be misallocated to included predictors (including religiosity). Consequently small effects, even if statistically significant, could potentially disappear utilizing more complex models.

## 3. Results

### 3.1. Descriptive statistics and preliminary checks

Prior to regression modelling, a power sensitivity check (using G\*Power 3.1.9.2) was undertaken. The desired power level was set at the stringent .95 level (above the conventional .80) as several previous multivariate studies have failed to find significant religiosity effects and the aim here was to minimize Type II error (i.e., to increase confidence that any null results are *true* nulls). Given the sample size ( $N = 398$ ) and a predictive model containing seven IVs, setting the probability of both Type I and Type II error at .05, the data are sufficient to detect small effects ( $f^2 = .056$ ; i.e.  $R^2 = .05$ ) overall and also small  $R^2$  increases for any step containing a single variable ( $f^2 = .032$ ).

Table 1 shows the descriptive statistics, internal consistency ( $\alpha$ ) and the inter-correlation among the utilized measures. All multi-item scales appear reliable ( $\alpha > .70$ ) and, where applicable (e.g. PWB), correlate with their related subscales as expected. Religiosity, agreeableness and conscientiousness are also positively interrelated as expected. Although the magnitude of these latter correlations are generally small, they are within the range reported in related meta-analyses.

Preliminary screening revealed that relative to females, males on average were marginally older (65.74 vs 64.50,  $p = .189$ ,  $d = 0.13$ ), more educated (5.15 vs 4.07,  $p < .001$ ,  $d = 0.53$ ) and had higher

**Table 1**Correlation coefficients, reliability ( $\alpha$ ) and descriptive statistics: N = 398.

|                      | 2.    | 3.      | 4.      | 5.      | 6.     | 7.     | 8.     | 8a.    | 8b.    | 8c.    | 8d.    | 8e.    | 8f.               | M     | SD   |
|----------------------|-------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|-------|------|
| 1. Female            | -.066 | -.258** | -.480** | .132**  | .046   | -.017  | .088   | -.044  | .106*  | .064   | .104*  | .108*  | .073              | .49   | .50  |
| 2. Age               | na    | -.281** | -.216** | .215**  | .012   | .125*  | .013   | .108*  | -.030  | .006   | -.025  | -.002  | .012 <sup>a</sup> | 65.13 | 9.40 |
| 3. Education         |       | na      | .388**  | -.129** | -.001  | .029   | .165** | .097   | .142** | .142** | .111*  | .131** | .160**            | 4.62  | 2.11 |
| 4. Income            |       |         | na      | -.166** | .063   | .160** | .128** | .104*  | .139** | .127*  | .070   | .073   | .102*             | 2.66  | 1.14 |
| 5. Religiosity       |       |         |         | .840    | .176** | .209** | .182** | .045   | .121*  | .183** | .153** | .203** | .152**            | 1.86  | .63  |
| 6. Agreeable         |       |         |         |         | .858   | .596** | .501** | .212** | .397** | .356** | .417** | .554** | .412**            | 2.65  | .58  |
| 7. Conscientious     |       |         |         |         |        | .744   | .516** | .266** | .453** | .452** | .431** | .450** | .393**            | 2.55  | .55  |
| 8. Psych. Well-being |       |         |         |         |        |        | .931   | .634** | .836** | .765** | .850** | .796** | .847**            | 4.62  | .58  |
| 8a. Autonomy         |       |         |         |         |        |        |        | .732   | .515** | .322** | .381** | .288** | .526**            | 4.45  | .71  |
| 8b. Enviro. Mastery  |       |         |         |         |        |        |        |        | .742   | .563** | .624** | .567** | .704**            | 4.64  | .70  |
| 8c. Purpose in life  |       |         |         |         |        |        |        |        |        | .708   | .660** | .590** | .514**            | 4.78  | .81  |
| 8d. Person Growth    |       |         |         |         |        |        |        |        |        |        | .808   | .669** | .647**            | 4.82  | .78  |
| 8e. Positive Relate  |       |         |         |         |        |        |        |        |        |        |        | .774   | .613**            | 4.52  | .66  |
| 8f. Self-Acceptance  |       |         |         |         |        |        |        |        |        |        |        |        | .746              | 4.48  | .72  |

\*  $p < .05$ ; \*\*  $p < .01$ ;Notes: If  $|r| > .068$ ; 90% Confidence Interval includes  $|.15|$ .

personal incomes (3.20 vs 2.11,  $p < .001$ ,  $d = 1.09$ ). These socio-demographic differences together with their inter-correlation with the well-being and religiosity measures (see Table 1) motivated their inclusion as statistical controls in planned multivariate analyses.

The simple correlations (Table 1) reveal religiosity is significantly positively associated with PWB and all PWB subscales other than autonomy—the latter result has been previously reported in collectivist cultures (Rudy, Sheldon, Awong, & Tan, 2007) where, relative to individualist cultures, autonomy does not consistently indicate well-being. The estimated size of the coefficients are also unremarkable; displaying the routine magnitude of effect ( $R^2 \leq .05$ ) reported in prior research.

### 3.2. Planned hierarchical multivariate analyses

After controlling for socio-demographic variables, in hierarchical regression modelling (HRM), religiosity remains a significant predictor of PWB and all subscales other than autonomy and environmental mastery (see Step 2, in Table 2). However, even where statistically significant, after removing socio-demographic effects, religiosity shares a small per cent of variance in common with the outcome measure ( $\Delta R^2 \leq .04$ ).

More importantly, for the current purposes, the final step of the HRM adds agreeableness and conscientiousness as further predictors. These inclusions almost always nullify religiosity's predictive contribution — religiosity only remains a significant predictor of *purpose in life* and *positive relationships*. Recall further that both agreeableness and conscientiousness were only faintly related with religiosity in this sample (see Table 1) — the maximum overlap of variance between these IVs being just 4.4 per cent. Despite this, including agreeableness and conscientiousness in Step 3 of the model greatly increases the total explanatory power ( $.06 \leq \Delta R^2_{\text{Step 3}} \leq .22$ ). Statistical checks also confirmed that the full model was unaffected by multi-collinearity (condition indices  $< 30$ ; see also correlation coefficients for variables 1–7, in Table 1).

Undertaking two one-sided tests of equivalence—which contrast each estimated  $\beta_{\text{religiosity}}$  with the a priori benchmark  $\beta = .15$ —we cannot reject that religiosity is association with the *purpose in life* ( $\beta = .105$ ,  $CI_{90} [.028: .182]$ ) and the *personal relationships* ( $\beta = .100$ ,  $CI_{90} [.029: .170]$ ) subscales with noticeable effect. The respective probabilities that  $\beta \geq .15$  are  $p = .161$  and  $p = .123$ . The Total PWB scale ( $\beta = .076$ ,  $CI_{90} [.006: .146]$ ) and the autonomy ( $\beta = -.018$ ,  $CI_{90} [-.102: .067]$ ), environmental mastery ( $\beta = .036$ ,  $CI_{90} [-.040: .111]$ ), personal growth ( $\beta = .064$ ,  $CI_{90} [-.013: .140]$ ) and self-acceptance ( $\beta = .071$ ,  $CI_{90} [-.006: .148]$ ) subscales did not pass the TOST benchmark. No effect passed the  $\beta = .24$  cut-off derived from Norman

et al. (2003).

Finally, swapping around the final two steps of the HRM to prioritize the personality traits unmasked the miniscule amount of variance in well-being that religiosity uniquely explains — for Total PWB ( $\Delta R^2 = .005$ ,  $p = .076$ ), autonomy ( $\Delta R^2 = .000$ ,  $p = .729$ ), environmental mastery ( $\Delta R^2 = .001$ ,  $p = .434$ ), purpose in life ( $\Delta R^2 = .010$ ,  $p = .024$ ), personal growth ( $\Delta R^2 = .004$ ,  $p = .170$ ), positive relationships ( $\Delta R^2 = .009$ ,  $p = .020$ ) and self-acceptance ( $\Delta R^2 = .004$ ,  $p = .129$ ). Even when religiosity's unique predictive contribution is statistically significant different from zero, most of the variance in well-being is due to non-religiosity factors.

## 4. Discussion

The current paper raised and tested the suspicion that the cross-sectional association between religiosity and psychological well-being among the elderly might be nullified by co-varying personality traits. By using a randomly-selected older adult sample from Tokyo, Japan this study also redresses the criticism that previous related research has largely been limited to U.S. Christians. The simple positive correlation between religiosity and psychological well-being replicates cross-culturally with a magnitude not dissimilar to those reported in Western meta-analytic results. The current finding also replicates Roemer (2010) who found a BABE using a community sample from Japan. These convergent findings, together with the random sampling method and full range of religiosity observed among participants, suggests little reason to question the quality of the current data.

Given the weak internal validity of survey designs, multivariate analyses controlling for two personality traits known to predict both well-being and religiosity were conducted. These more complex analyses demonstrate the degree to which simple correlations overstated the benefits of belief — often the magnitude of the  $\beta$ -coefficients was less than half the size of the respective  $r$ -coefficients. Furthermore, religiosity was not statistically significant in five of seven hierarchical models. Even when the effects differed from zero they were small, the unique variance explained by religiosity was consistently insubstantial ( $R^2 \leq .01$ ) and the TOSTs equivalence results (i.e. checking the confidence intervals) suggests religiosity's true effect on well-being is unlikely to be  $\beta = 0.24$  (i.e., equivalent to Cohen's  $d = .50$ ). Given that religiosity correlates weakly with the two co-variables (i.e., agreeableness and conscientiousness were mostly secularly determined) this negligible unique effect is particularly noteworthy. Speculatively speaking, perhaps in cultures where personality and faith overlap to a greater extent than in Japan, the diminution of the BABE once these covariate effects are removed might even be larger? This remains to be explored.

**Table 2**  
Standardized regression analyses—slope ( $\beta$ ), standard error (s.e.  $\beta$ ), probability ( $p$ ) and explained variance ( $R^2$ ):  $N = 398$ .

|                      | PWB total |            |      |              | Autonomy |            |      |              | Environmental Mastery |            |      |              | Purpose in life |            |      |              | Personal Growth |            |      |              | Positive Relationships |            |      |              | Self Acceptance |            |      |              |  |
|----------------------|-----------|------------|------|--------------|----------|------------|------|--------------|-----------------------|------------|------|--------------|-----------------|------------|------|--------------|-----------------|------------|------|--------------|------------------------|------------|------|--------------|-----------------|------------|------|--------------|--|
|                      |           |            |      |              |          |            |      |              |                       |            |      |              |                 |            |      |              |                 |            |      |              |                        |            |      |              |                 |            |      |              |  |
|                      | $\beta$   | se $\beta$ | p    | $\Delta R^2$ | $\beta$  | se $\beta$ | p    | $\Delta R^2$ | $\beta$               | se $\beta$ | p    | $\Delta R^2$ | $\beta$         | se $\beta$ | p    | $\Delta R^2$ | $\beta$         | se $\beta$ | p    | $\Delta R^2$ | $\beta$                | se $\beta$ | p    | $\Delta R^2$ | $\beta$         | se $\beta$ | p    | $\Delta R^2$ |  |
| Step 1               |           |            |      |              |          |            |      |              |                       |            |      |              |                 |            |      |              |                 |            |      |              |                        |            |      |              |                 |            |      |              |  |
| (Constant)           | .000      | .048       | .000 | .08          | .000     | .048       | .000 | .04          | .000                  | .049       | .000 | .06          | .000            | .049       | .000 | .04          | .000            | .049       | .000 | .05          | .000                   | .049       | .000 | .049         | .000            | .049       | .000 | .06          |  |
| Female               | .239**    | .057       | .000 |              | .055     | .058       | .346 |              | .253**                | .057       | .000 |              | .198*           | .057       | .001 |              | .202**          | .058       | .000 |              | .220**                 | .058       | .000 |              | .199*           | .057       | .001 |              |  |
| Age                  | .124*     | .052       | .018 |              | .169**   | .053       | .002 |              | .075                  | .052       | .153 |              | .101*           | .053       | .057 |              | .052            | .048       | .331 |              | .087                   | .053       | .100 |              | .110*           | .053       | .038 |              |  |
| Education            | .184**    | .054       | .001 |              | .110*    | .056       | .048 |              | .143**                | .054       | .009 |              | .149**          | .055       | .007 |              | .128*           | .054       | .021 |              | .159**                 | .055       | .004 |              | .185**          | .055       | .001 |              |  |
| Income               | .197**    | .059       | .001 |              | .124*    | .061       | .041 |              | .221**                | .059       | .000 |              | .186**          | .060       | .002 |              | .129*           | .057       | .034 |              | .136*                  | .060       | .024 |              | .149**          | .060       | .013 |              |  |
| Step 2               |           |            |      |              |          |            |      |              |                       |            |      |              |                 |            |      |              |                 |            |      |              |                        |            |      |              |                 |            |      |              |  |
| (Constant)           | .000      | .047       | .000 | .03          | .000     | .049       | .000 | .00          | .000                  | .048       | .000 | .04          | .000            | .048       | .000 | .04          | .000            | .049       | .000 | .03          | .000                   | .048       | .000 | .048         | .000            | .048       | .000 | .03          |  |
| Female               | .217**    | .056       | .002 |              | .050     | .058       | .388 |              | .238**                | .050       | .000 |              | .176*           | .057       | .001 |              | .184**          | .058       | .002 |              | .197**                 | .057       | .001 |              | .181*           | .057       | .000 |              |  |
| Age                  | .084      | .052       | .108 |              | .161**   | .054       | .003 |              | .047                  | .049       | .375 |              | .060            | .053       | .255 |              | .018            | .054       | .736 |              | .044                   | .053       | .409 |              | .076            | .053       | .151 |              |  |
| Education            | .188**    | .053       | .000 |              | .111     | .056       | .046 |              | .146**                | .054       | .007 |              | .153**          | .054       | .005 |              | .131*           | .055       | .017 |              | .164**                 | .054       | .003 |              | .188**          | .054       | .001 |              |  |
| Income               | .209**    | .058       | .000 |              | .126**   | .061       | .038 |              | .229**                | .059       | .000 |              | .199**          | .059       | .001 |              | .139*           | .060       | .021 |              | .149*                  | .059       | .012 |              | .159**          | .059       | .008 |              |  |
| Religiosity          | .194**    | .049       | .000 |              | .039     | .051       | .450 |              | .137**                | .050       | .006 |              | .199**          | .050       | .000 |              | .165**          | .051       | .001 |              | .213**                 | .050       | .000 |              | .163*           | .050       | .001 |              |  |
| Step 3               |           |            |      |              |          |            |      |              |                       |            |      |              |                 |            |      |              |                 |            |      |              |                        |            |      |              |                 |            |      |              |  |
| (Constant)           | .000      | .040       | .000 | .26          | .000     | .048       | .000 | .06          | .000                  | .043       | .000 | .16          | .000            | .044       | .000 | .19          | .000            | .040       | .000 | .27          | .000                   | .040       | .000 | .040         | .000            | .044       | .000 | .16          |  |
| Female               | .162**    | .047       | .001 |              | .024     | .057       | .657 |              | .191**                | .051       | .000 |              | .132*           | .052       | .022 |              | .136            | .052       | .009 |              | .143**                 | .048       | .003 |              | .138**          | .052       | .008 |              |  |
| Age                  | .037      | .045       | .410 |              | .134*    | .054       | .013 |              | -.001                 | .048       | .984 |              | .009            | .049       | .983 |              | -.024           | .049       | .198 |              | .017                   | .045       | .697 |              | .045            | .049       | .354 |              |  |
| Education            | .184**    | .045       | .000 |              | .108     | .053       | .570 |              | .141**                | .048       | .004 |              | .147**          | .049       | .003 |              | .128**          | .049       | .002 |              | .164**                 | .045       | .000 |              | .186**          | .049       | .000 |              |  |
| Income               | .087      | .050       | .086 |              | .064     | .061       | .289 |              | .119*                 | .054       | .029 |              | .091            | .055       | .100 |              | .033            | .055       | .230 |              | .046                   | .051       | .914 |              | .069            | .055       | .214 |              |  |
| Religiosity          | .076      | .043       | .076 |              | -.018    | .051       | .729 |              | .076                  | .046       | .784 |              | .105*           | .046       | .024 |              | .064            | .046       | .170 |              | .100*                  | .043       | .020 |              | .071            | .047       | .129 |              |  |
| Agreeable            | .292**    | .050       | .000 |              | .103     | .060       | .090 |              | .188**                | .054       | .001 |              | .125*           | .053       | .023 |              | .235**          | .055       | .000 |              | .433**                 | .050       | .000 |              | .271**          | .055       | .000 |              |  |
| Conscient.           | .305**    | .052       | .000 |              | .178**   | .062       | .004 |              | .313**                | .056       | .000 |              | .338**          | .055       | .000 |              | .273**          | .057       | .000 |              | .159**                 | .052       | .002 |              | .197**          | .057       | .001 |              |  |
| Total R <sup>2</sup> |           |            |      | .37          |          |            |      | .10          |                       |            |      | .26          |                 |            |      | .18          |                 |            |      | .26          |                        |            |      | .36          |                 |            |      | .25          |  |
| C195%                |           |            |      | [.30: .45]   |          |            |      | [.04: .15]   |                       |            |      | [.20: .35]   |                 |            |      | [.18: .33]   |                 |            |      | [.18: .33]   |                        |            |      | [.29: .43]   |                 |            |      | [.18: .32]   |  |

Considered in the context of the considerable personal outlay associated with genuinely adopting religiosity, the apparent well-being returns from such efforts are unimpressive. In contrast, education (which also requires substantial investment) appears to have more sizeable and robust well-being associations once personality effects are removed. In light of this evidence, recent calls to modify medical intake procedures to screen patients (potentially invasively) for religiosity seem contentious. It is arguably more appropriate to assess the personality and educational status of older patients.

The largely trivial religiosity results unveiled here closely mirror earlier multivariate findings using Western samples (Löckenhoff et al., 2009; Murray & Ciarrochi, 2007; Schuurmans-Stekhoven, 2011); however most of these previous studies were under-powered. A similar pattern of results occurs in two Australian studies; one that investigated the link between spirituality and social support (Schuurmans-Stekhoven, 2017b) and another exploring religiosity effects net of character strengths that also used the Psychological Well-being Scale (Schuurmans-Stekhoven, 2011).

Relative to religiosity, agreeable and conscientious traits explain substantially more well-being variance (with TOSTS revealing the population effect for personality traits  $\beta \geq .15$  is plausible for all outcomes examined). That is, among older residents of Tokyo, agreeableness and conscientiousness appear to be more meaningful predictors of well-being than is religiosity. If this result generalizes, it suggests that gerontologists interested in what promotes successful aging may be better-off focusing their attention upon broader prosocial tendencies rather than prioritizing religiosity constructs. Moreover, future gerontology investigations into what predicts elder well-being might consider controlling for prosocial traits. Perhaps studies that remove the effects of pre-existing personality traits will greatly assist gerontologists to ascertain the incremental contribution of other positive psychology variables (e.g., optimism, social support, generativity, volunteering, etc.) on successful aging.

Of course quasi-experimental longitudinal research designs explicitly testing these competing explanations are needed to shed greater light on the matter. Yet inter-temporal evidence indicating that prosocial traits are precursors to religiosity is already available (Heaven & Ciarrochi, 2007; Wink et al., 2007). As such, gerontologists can reasonably entertain the notion that prosocial traits may act as ‘third variables’ inclining the elderly towards religiosity on the one hand and enhancing their well-being on the other. That is, religious individuals may be a particular subtype from within the larger pool of prosocial individuals and it may be these broader traits, not religiosity, that explain the psychological well-being of the numinous. Thus it remains to be established whether religiosity uniquely predicts the psychological well-being of older adults.

As alluded to by Piedmont and Wilkins (2013) in the opening quotation, investigations into the BABE will necessarily be confounded unless researchers explicitly control for the accompanying yet distinct psychological traits and states. This is arguably the most important empirical insight to arise from the current paper. Second, the present results also neatly concur with the recent suggestion that agreeableness and conscientiousness are *necessary but not sufficient* antecedents of heightened propensity for religious belief and practice (see Schuurmans-Stekhoven, 2017b). If this interpretation is correct, then a vital future question is “What other factors parse prosocial/civil individuals into these religious and non-religious varieties?” Past papers hinting that spirituality/religiosity may be a benign form of schizotypy (Claridge, 2010; Schuurmans-Stekhoven, 2013) clearly suggest a susceptibility to peculiar perceptions and bizarre intrapsychic experiences as one possible moderator. Differences in education and IQ (Razmyar & Reeve, 2013; see also Table 1 above) appear to be two other variables that might distinguish the religious from other civilly-minded individuals.

Despite the general disconfirmation observed here, religiosity remained statistically related to purpose in life and positive relationships

(with an effect size of  $\beta \geq .15$  being plausible). However, it must be recalled that the two personality traits explain four-times or more variance in these outcomes than does religiosity; accounting for the vast bulk of the variance initially attributed to religiosity (e.g., the variance in purpose explained by religiosity declines from .04 to .01 if personality traits are prioritized). Furthermore, the debate regarding the causal direction underlying these associations (if indeed there is any causation) is as yet unresolved. A pre-existing belief that life has innate purpose could easily predispose individuals to religiosity. Similarly, lonely people and those desiring positive relationships are known to engage more with religion (Burriss et al., 1994).

#### 4.1. Limitations and matters to be clarified

The analyses conducted here utilized cross-sectional data; thus causal claims are not possible. Although this would be problematic if the aim was to establish cause, the data is sufficient to test the robustness of the oft-reported cross-sectional association (as was the central purpose of this paper). Plainly put, if multivariate analyses of cross-sectional data nullify previously seen simple associations, then establishing cause becomes redundant.

Some readers might be concerned that the data were from older Japanese respondents; this clearly lowers the generalizability of the findings to younger and non-Japanese populations. It remains completely plausible that the diminishment and nullification of the BABE observed here is a uniquely Japanese phenomenon. However similar findings have been reported for well-being using a rural Australian sample (Schuurmans-Stekhoven, 2011) and for social support among the elderly religious in Norway (Kvande, Reidunsdatter, Løhre, Nielsen, & Espnes, 2015). Moreover, the internal consistency and the correlation with other variables in the study seem to fit closely with those typically found in Western cultures. Still, given the potential for sample-specific and cultural-specific factors to influence the estimates (and covariates such as age to moderate relationships), further research into the incremental validity of the BABE among the elderly remains necessary. Ideally such research would involve large samples drawn from diverse cultural settings (and ensure that participants exhibiting the full spectrum of religiosity are included). Future research might also consider including other (non-trait) competing explanations of well-being alongside religiosity.

#### 5. Conclusion

Religiosity is positively correlated with psychological well-being among Japanese adults aged 50 years and over — a routine replication of past findings from both Western and Japanese research. As with previous studies and meta-analytic results, religiosity was also found to overlap, albeit weakly, with the personality dimensions of agreeableness and conscientiousness. Although these personality traits shared minimal variance with religiosity, when included in models predicting well-being, the religiosity effect diminished markedly and was often statistically annulled. Furthermore, these personality traits consistently displayed a greater association with wellbeing than did religiosity (the magnitude being up to ten times larger). Succinctly put, although correlation analyses produced the routine findings, more rigorous multivariate analyses unveiled the triviality of these simple associations; the effects of education, agreeableness and conscientiousness are typically larger than the religiosity effect. Based on this sample, claims that the BABE may be a statistical aberration due to omitting rival secular predictors cannot be refuted easily.

The current trivial results pose a challenge to gerontologists who assert that faith is an important facilitator of well-being among older adults. From the *just-noticeable effect* perspective, the current results suggest changes in religiosity will typically have a non-discernible impact on individual's well-being. The burden of proof remains with BABE proponents to credibly rebut these multivariate findings and

substantiate a subjectively meaningful religiosity effect using similar, ideally longitudinal, designs on representative data. As demonstrated, drawing conclusions based upon bi-variate correlations and known-group studies that exclude rival well-being explanations could be highly misleading. At a minimum, such methods can never establish incremental validity. The current results suggest that gerontologists interested in facilitating well-being among older adults are probably better-off exploring the potential effects of prosocial and socio-demographic factors. On their own, agreeableness, conscientiousness, income and education level each had more sizeable and persistent effects on the well-being than did religiosity.

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