



# Religion, deprivation and subjective wellbeing: Testing a religious buffering hypothesis

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**Abstract:** The buffering effect of religion upon wellbeing has been well demonstrated; however, the question of whether this buffering effect also extends to protecting the religious against material hardship still requires investigation. We present a Bayesian linear regression model showing that religious affiliation provides a protective buffer against the corrosive effects on subjective wellbeing of living in impoverished conditions. Results from a national probability sample tested with an objective indicator of the deprivation of participants' local neighbourhood, derived from census data, indicated that religious people living in deprived neighbourhoods were higher in subjective wellbeing than their non-religious counterparts living in those same neighbourhoods (N = 5,984 New Zealanders). It was in impoverished conditions that the difference in wellbeing between religious and non-religious people was apparent; those living in affluent neighbourhoods showed comparably high levels of subjective wellbeing regardless of whether or not they were religious. Our results explore new ground by showing for the first time that the buffering effect of religion is readily apparent within New Zealand.

**Keywords:** religion, subjective wellbeing, deprivation, poverty, New Zealand

## 1. Introduction

Religion was famously described by Karl Marx, as the "opium of the people" (Marx & Engels, 1964). Marx's critique of capitalism implies that one modern function of religion is to protect and insulate the religious believer's wellbeing from some of the stark realities of capitalism. In the World Happiness Report (Helliwell, Layard & Sachs, 2012), religion was modelled as an external factor (community-based factor, rather than lifestyle) which can have a positive effect upon wellbeing and provide a *buffering function* (protective mechanism for personal wellbeing) in the face of stressful life events. Yet the World Happiness Report does not explicitly consider the possibility that the link between religion and wellbeing may be moderated by deprivation (relative material disadvantage within a society). Currently, in terms of method, most studies have concentrated on relating religious affiliation with, either, solely wellbeing measures or solely measures of deprivation. Indeed, most studies of deprivation and religious affiliation, or of wellbeing and religion, do not statistically adjust for other demographics at a national level. When deprivation is examined, it has often been constructed from a collected set of variables involving income and education, rather than from robust national measures (Smith & Faris, 2005), such as the New Zealand Deprivation Index. For example, Dolan, Peasegood and White (2008), in their review of wellbeing literature, indicate that religious affiliation is positively related to wellbeing and then, in other sections of their article, note that deprivation relates to lower wellbeing. The possible interactive effect of these variables, which is central to a



buffering hypothesis, is inferred by much of the literature; however, direct empirical tests of this link remain scarce.

Diener, Tay and Myers (2011) documented a reliable relationship between religious affiliation, wellbeing and deprivation across different nations and American states. They found that people living in poorer nations or poorer American states tended to be more religious than those living in affluent nations or affluent American states. Thus, in nations with higher religiosity, this religiousness appeared to create forms of social support which buffered wellbeing, indicating support for the argument that religious affiliation protects individual wellbeing from deprivation within poorer countries (Diener et al., 2011). Diener et al. (2011) offer a macro-level analysis of religious buffering occurring across poorer nations and a micro-level analysis of the effect occurring within relatively impoverished American states. Diener et al. (2011) argued that this effect occurs for three primary reasons: Firstly, religion offers social support; secondly, religion offers an alternate explanatory frame which offers unique meaning for one's life; and thirdly, religion teaches respect for others regardless of personal circumstances. Their model indicated that these three mechanisms combine to explain why religious affiliation buffers wellbeing against material hardship; that is, it mediates the effect. Diener et al. (2011) analysed wellbeing and religiosity compared across nations and across American states. We seek to replicate the buffering effect that they find at the micro level in poorer American states at the neighbourhood level in the nation of New Zealand.

### *1.1 Religious affiliation and wellbeing*

The link between religion and wellbeing has been a topic of substantial sociological interest over the past three decades. The link between religious group affiliation and greater wellbeing has been demonstrated in numerous studies, across a variety of contexts (e.g., Blaine & Crocker, 1995; Bradshaw, Ellison & Marcum, 2010; Ellison, 1991; Fabricatore, Handal, Rubio & Gilner 2004; Fiorito & Ryan, 2007; Hackney & Sanders, 2003). Most of the research in the field indicates that religious affiliation has a positive effect upon an individual's wellbeing. The seminal work of Ellison (1991, p. 80), in his review of the pre-1990s' literature on religion and wellbeing, found that religion may affect wellbeing in four ways: "1) through social integration and support; 2) through the establishment of personal relationships with a divine other; 3) through the provision of systems of meaning and existential coherence; and 4) through the promotion of more specific patterns of religious organization and personal lifestyle."

From the 1990s, this relationship between religious affiliation and wellbeing has been extensively documented as occurring across a variety of Western Christian groups (Cohen-Zada & Sander, 2011; Ellison, 1991; Mochon, Norton & Ariely, 2008; Strawbridge, Shema, Cohen, Roberts & Kaplan, 1998). However, the exact nature of how the relationship between religious affiliation and wellbeing functions is not yet fully understood (Mochon, Norton & Ariely, 2011; Pargament, 2002). There exists minor variation between certain Christian denominations (Tix & Frazier, 1998). There are also clear gender differences in this relationship (Chamberlain & Zika, 1988; Cohen-Zada & Sander, 2011; Steenwyk, Atkins, Bedics & Whitley Jr, 2010). In addition, the relationship between religion and subjective wellbeing includes both positive and negative effects upon wellbeing which still require further exploration (Ano & Vasconcelles 2005; Ellison, Bradshaw, Kuyel & Marcum, 2012; Strawbridge et al., 1998).

The positive relationship seems to occur cross-culturally among Christians (Clarke & Lelkes, 2009) and also other religious groups (Ellison & Taylor, 1996), with the effect recently being found amongst studies of various Muslim groups (Ahmad & Pevalin 2012; Ahmed, 2010; Abolfathi, Yadollah & Nuriza, 2009). It has also been argued that a positive relationship

between religious affiliation and wellbeing can be found across most religious groups worldwide (Diener et al., 2011; Dolan et al., 2008; Kim, 2003), as long as there is adjustment for the various contextual influences, and specific theological worldviews of individual religious groups.

The positive benefits of the relationship between religious affiliation and subjective wellbeing extend to mental coping and health (Bradshaw et al., 2010; Fabricatore et al., 2004; Fiorito & Ryan 2007; Hackney & Sanders, 2003; Smith, McCullough & Poll, 2002). In addition, evidence exists showing that general physical health (Homan & Boyatzis, 2010) and exercise rates (Mochon et al., 2008) can be positively affected by the positive relationship between religion and wellbeing. The wellbeing benefits derived from religious affiliation stem from belief giving hope, structure and meaning to people's everyday lives (Wnuk & Marcinkowski, 2012).

In sum, the extant research indicates that there is a general, positive relationship for wellbeing which exists for those affiliated with a religious group, and that, on average, religious people have greater personal wellbeing than non-religious people. Moreover, the literature suggests that this relationship is cross-cultural and can be found across a variety of religious groups. Thus, this literature suggests that religious affiliation, which is positively related to wellbeing, offers a coping mechanism or a buffering effect to protect believers against both physical and social hardship.

### *1.2 Deprivation and wellbeing*

Decades of research by economists and psychologists suggests that the relationship between deprivation and wellbeing is far from straightforward (see Diener & Seligman, 2004; Fischer & Boer, 2011, for discussion). In a massive representative US sample, Kahneman and Deaton (2010) reported that earning more was linked to higher life-satisfaction (general positive evaluations of one's life overall). However, they also found that once a certain level of income was reached (approximately USD 75,000), no further gains in emotional happiness accrued. Conversely, a study of a large sample of US and European populations (Alesina, Di Tella & McCullough, 2004) has found that social inequality, in both America and Europe, is correlated with lower rates of happiness. The general literature indicates that deprivation is reliably related to decreased wellbeing (Dolan et al., 2008; Helliwell, Layard & Sachs 2012).

This general body of research shows conclusively that poverty does predict decreased wellbeing, and that, conversely, money does 'buy' happiness, but only up to a point. Similar effects have also been observed in national probability samples conducted in New Zealand. For instance, Sengupta et al. (2012) analyzed data from more than 5,000 New Zealanders, and reported that those people who earned less tended to be less happy, less satisfied with their lives overall and more stressed in general. Thus, we can conclude that, on average, increased deprivation is likely to lead to decreases in personal wellbeing.

## **2. Overview of the present study**

We model the extent to which religious affiliation (the comparison of religious and non-religious people) buffers the effect of poverty on subjective wellbeing, using nationally representative data in one Western nation: New Zealand. New Zealand functions as a superb testing ground for our hypothesis because of its small size, its religious diversity, and because it provides the opportunity to integrate nationally representative data regarding wellbeing, deprivation, and religious affiliation. Moreover, New Zealand offers a fresh, relatively understudied Western population to test for the existence of the relationship between religion,

wellbeing and deprivation. Outside of the work of Waldegrave (2009; 2010), who offers evidence to suggest that a general positive relationship between religion and wellbeing exists within older groups of New Zealanders, there has been no study of religious affiliation and wellbeing in the New Zealand population. There has been only a single study of the relationship between deprivation and religious affiliation in New Zealand (Hoverd, Bulbulia & Sibley, In Press), which found that religious affiliation did not correlate with deprivation.

New Zealand's population has been historically predominantly Christian (Oliver, 1966). Since the 1960s, immigration from Southeast Asia, the Pacific and the Middle East has changed the ethnic and religious demographics of the nation (Crothers, 2005; Wilson, 1993). New Zealand's population should be understood to be religiously plural including various Christian affiliations, Muslims, Buddhists, Hindus and many other smaller religious groups (Hoverd, 2008; Statistics NZ, 2006.) Increasingly, the New Zealand Government (Morris, 2007) and the scholarly community (Hoverd & Sibley, 2010; Nachowitz, 2007; Vaccarino, Kavan & Gendall, 2011) discuss New Zealand religious affiliation by employing the term *diverse* to explain the variety of religious groups within the nation.

Because of this religious diversity and the generally accepted cross-cultural applicability of the relationship between religious affiliation and wellbeing, we measure our data across all religious people regardless of religious group differences. We employ the measure of *religious affiliation*. Our study utilizes the measures found in Hoverd, Atkinson and Sibley (2012), where self-reported affiliations with a religious group are called *religious affiliation*. This clarification of terminology is essential because other studies of religious demographics (Kosmin & Keysar, 2009; Kosmin, Mayer & Keysar, 2001) use the term 'religious identification' to describe the number of individuals who affiliate with various religious groups. Following Diener et al. (2011), we theorised that religious affiliation should provide a protective buffer against the potentially deleterious effects on subjective wellbeing and social capital from living in impoverished conditions.

### 2.1 Hypothesis

We outline our hypothesis as follows: Religious people living in deprived neighbourhoods should be higher in subjective wellbeing than their non-religious counterparts living in the same neighbourhoods. Moreover, it will be in impoverished conditions that the difference in wellbeing between religious and non-religious people will be most apparent; whereas, those living in affluent neighbourhoods should show comparatively high levels of subjective wellbeing regardless of whether or not they are religious.

## 3. Method

We present a Bayesian regression model testing whether being religious insulates one's wellbeing against economic hardship in a large-scale New Zealand national probability sample. We test this enduring hypothesis using data on religious affiliation drawn from the nationally representative and longitudinal New Zealand Attitudes and Values Survey (NZAVS). The NZAVS also utilizes a measure of subjective wellbeing, the *Personal Wellbeing Index*, originally developed by Cummins, Eckersley, Pallant, Van Vugt, & Misajon (2003). (2003). In addition, we capitalize on a novel and highly robust measure of regional deprivation in New Zealand: the *New Zealand Deprivation Index 2006* (NZDep; Salmond, Crampton & Atkinson, 2007).

The NZDep2006 is a census-based measure of deprivation derived from a principle components analysis of nine variables linked with socio-economic status, which are calibrated for each neighbourhood/small area unit of New Zealand in which participants are located. We



used the percentile deprivation index, which gives an ordinal score from 1 (most affluent) to 10 (most deprived) for each mesh block area unit based on 2006 census data. The index measures relative deprivation within the nation. As a consequence, when we employ the term “deprivation,” “impoverished,” and/or “poverty” within this manuscript we are referring to those people who are rated as living in the most deprived geographic meshblock units of New Zealand.<sup>1</sup> Conversely, when we use the terms “affluent” or “wealthy” we are referring to those people who are rated as living in the least deprived geographic meshblock units of New Zealand. Thus, we formally model the extent to which religious affiliation (the comparison of religious and non-religious people) acts as an ‘opiate’ which buffers the effects of deprivation on subjective wellbeing through comparison of NZAVS religious affiliation data with the *Personal Wellbeing Index* and the *New Zealand Deprivation Index 2006*.

This research offers important insight because it documents the hypothesized buffering effect of religion in a large national sample (N = 5,984) and uses a robust measure of religious affiliation, deprivation and wellbeing. It offers the first analysis of its type conducted in the New Zealand context, and the first of which we are aware to employ Bayesian estimation methods and statistically control for a wide range of other demographic covariates. This research also offers strong evidence for the existence of a relationship between the three variables of religious affiliation, wellbeing and deprivation within a single nation.

### 3.1 Sampling procedure

The NZAVS-2009 questionnaire was posted to 40,500 participants randomly selected from the 2009 NZ electoral roll. The publicly available version of the roll contained 2,986,546 registered voters. This represented all citizens over 18 years of age who were eligible to vote regardless of whether or not they chose to vote, barring people who had their contact details removed due to specific case-by-case concerns about privacy. In sum, roughly 1.36% of all people registered to vote in New Zealand were contacted and invited to participate.

### 3.2 Participant details

The NZAVS-2009 sampled a total of 6,518 participants. The overall response rate (adjusting for address accuracy of the electoral roll and including anonymous responses) was 16.6%. The low response rate was likely due to people’s unwillingness to sign up to a 20-year study. Complete data for the measures analyzed here were provided by 5,984 participants (the majority of missing data was for residential location, which means that regional deprivation indices could not be assigned to those participants).

Of the 5,984 participants analyzed here, 2,657 (44.4%) of the sample identified as religious, and the remaining 3,327 (55.6%) were not religious. The sample comprised 3,574 (59.7%) women and 2,410 (40.3%) men. The mean age of the sample was 47.71 years (SD = 15.53). In terms of ethnicity, 4,305 (71.8%) of participants identified as New Zealand European and the remaining 28.2% identified with another ethnic group (primarily Maori, Pacific, and Asian peoples). The sample was broadly comparable to the population proportion of different ethnic

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<sup>1</sup> The Index ratings are discussed in greater detail later in the methodology section. This index is based on census data including the level of poverty and affluence, access to transport, and household crowding, of different small neighbourhood units (around 100 persons on average) across the entire country. As such, it is an index of deprivation that is not based solely on reported household income or education, but is arguably more robust as an indicator of the level of poverty in each participant’s immediate residential location (Salmond, Crampton & Atkinson, 2007.)

groups based on 2006 census data; however, the NZAVS did oversample women relative to men.

In terms of education, 1342 (22.4%) had no formal qualification, 1757 (29.4%) had a secondary school qualification, 974 (16.3%) had a tertiary diploma or trade certificate, 1359 (22.7%) had an undergraduate university degree or were studying toward one, and 552 (9.2%) had a post-graduate qualification. In terms of relationship status, 4296 (71.8%) of participants were in a romantic relationship or married, and the remaining 1688 (28.2%) were single. In terms of employment, 4499 (75.2%) of participants were in full or part-time employment, and the remaining 1485 (24.8%) were not.

### 3.3 Deprivation index

Participants provided their postal address, and we used this information to identify the level of economic deprivation (NZDep2006) of the immediate area in which each participant resided (for a full discussion of NZDep2006 see: Salmond et al., 2007). The NZDep2006 allocates a deprivation score to each meshblock based on a principal components analysis of nine variables using census data. These are (in weighted order): proportion of adults received a means-tested Government supplied welfare benefit, household income, proportion not owning their own home, proportion single-parent families, proportion unemployed, proportion lacking qualifications, proportion household crowding, proportion with no telephone access, and proportion with no car access. The NZDep2006 thus reflects the average level of deprivation of different small neighbourhoods or community areas across the country (Salmond et al., 2007). We used the percentile deprivation index, which gives an ordinal score from 1 (most affluent) to 10 (most deprived) for each mesh block area unit based on 2006 census data. The mean percentile NZDep2006 score for our sample was 5.00 (SD = 2.84). The NZDep2006 is commonly used in medical-related studies of the New Zealand population in order to investigate potential associations between certain illnesses, health risks and deprivation (e.g., McKenzie, Ellison-Loschmann & Jefferys 2010; Salmond, Crampton, King & Waldegrave 2006; Utter et al., 2010). NZDep2006 is also used as a tool to develop national social policy for the New Zealand Government (Salmond & Crampton, 2012). As such, NZDep2006 offers a nationally consistent measure of deprivation for the New Zealand context.

### 3.4 Questionnaire measures

Consistent with the method used in the NZ Census, we assessed religious affiliation by asking "Do you identify with a religion and/or spiritual group?" The 2,657 participants who answered 'yes' were asked to complete an open-ended field specifying their religious denomination or group membership.

Personal Wellbeing was measured using four items from the Personal Wellbeing Index (PWI) developed by Cummins et al. (2003). The PWI measures satisfaction with the following aspects of life: *standard of living, health, what you are achieving in life, personal relationships, safety, feeling part of a community and future security*. Participants rated their level of satisfaction with four aspects of their life on a scale from 0 (completely dissatisfied) to 10 (completely satisfied), and ratings were then averaged to give an overall mean score. The mean scale score was 6.61 (SD = 1.79), and the scale had good internal reliability (Cronbach's alpha = .73). These items, and this item format, have been previously validated for use in the New Zealand context with different populations and provide a good general measure of social capital (Manuela & Sibley, in press; Sibley, Harré, Hoverd & Houkamau, 2011). The four items included in the scale were:

- “Your standard of living.”
- “Your health.”
- “Your future security.”
- “Your personal relationships.”

### 3.5 Data analysis

To test our predictions, we conducted a Bayesian regression model predicting subjective wellbeing using data from a national probability sample conducted in New Zealand, and matched these data for each participant with census indicators of the level of deprivation versus affluence of each participant’s immediate neighbourhood. Our measure of deprivation is thus highly reliable, as it is based on census data from the immediate community region (see the method for further details). Our model tested regression-based interactions that examined the extent to which (a) religious affiliation (religious or not religious) moderated the link between deprivation and subjective wellbeing. Moreover, we adjusted other demographic factors that might also relate to subjective wellbeing. These other demographic factors were not the focus of the present study, and were included as control variables in order to adjust for their main effect on wellbeing.

**Table 1. Descriptive statistics and frequencies for all measures and demographics.**

	<b>N</b>	<b>%</b>	<b>M</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Meshblock deprivation index	5984		5.00	2.84	1	10
Age	5984		47.71	15.53	18	95
Subjective wellbeing	5984		6.61	1.79	0	10
<b>Gender</b>						
Men	2410	40.3%				
Women	3574	59.7%				
<b>Religious affiliation</b>						
Religious	2657	44.4%				
Non-Religious	3327	55.6%				
<b>Romantic involvement</b>						
Involved	4296	71.8%				
Single	1688	28.2%				
<b>Employment</b>						
Employed	4499	75.2%				
Unemployed	1688	24.8%				
<b>Ethnicity</b>						
Majority group	4305	71.7%				
Minority group	1679	28.3%				
<b>Education</b>						
No formal qualification	1342	22.4%				
Secondary school qualification	1757	29.4%				
Tertiary diploma or trade certificate	974	16.3%				
Undergraduate university degree	1359	22.7%				
Post-graduate qualification	552	9.2%				

A Bayesian linear regression model tested whether deprivation moderated the association between religion and subjective wellbeing. We tested for the significant interaction between deprivation and affiliation by creating product (interaction) terms between religious affiliation and centered scores on the New Zealand Deprivation Index. The model used diffuse priors and was conducted in Mplus 7.0. Bayesian analysis is superior to frequentist estimation methods for a number of reasons (see Gelman, Carlin, Stern & Rubin, 2003). For our purposes, this approach allowed us to calculate the probability that our effects were significant based on credibility intervals. Yuan and MacKinnon (2009) put it nicely when discussing the difference between Bayesian credibility intervals relative to more well-known frequentist intervals when they commented that “Bayesian credible intervals have more natural probability interpretations than CIs. A 95% credible interval means that there is a 95% chance that the credible interval contains the true value of the parameter on the basis of the observed data” (p. 304). In terms of interpretation, b coefficients from our analysis may be interpreted in much the same way as in a standard regression model, in that they represent the line of best fit for that parameter within the model.<sup>2</sup>

#### 4. Results

As reported in Table 2, our regression model indicated that those who were religious were significantly higher in personal wellbeing relative to those who were non-religious ( $b = .144$ ).

**Table 2: Bayesian linear regression model testing the effect of deprivation on subjective wellbeing depending upon religious affiliation (non-religious versus religious).**

	b	Posterior SD	$\beta$	95% Credibility Interval		P
				Lower 2.5%	Upper 2.5%	
Constant	5.468	.111				
Religious affiliation (0 no, 1 yes)	.144	.046	.041	.053	.234	.001
Meshblock deprivation index (1-10)	-.103	.011	-.167	-.124	-.082	.000
Deprivation x affiliation	.035	.016	.036	.004	.065	.014
Gender (0 women, 1 men)	-.138	.046	-.038	-.227	-.049	.001
Age	.006	.002	.050	.003	.009	.000
Romantic involvement (0 no, 1 yes)	.817	.050	.205	.718	.915	.000
Employment (0 no, 1 yes)	.133	.056	.031	.024	.243	.009
Ethnicity (0 minority, 1 majority)	.237	.061	.050	.116	.356	.000
Education (ordinal coded)	.095	.018	.068	.060	.130	.000

Note: N = 5984. Model used diffuse priors; p-values were one-tailed and give the proportion of the posterior distribution below or above 0 (for positive and negative estimates, respectively). 95% Confidence Interval for difference between observed and the replicated  $\chi^2$  values = [-13.096, 13.356]. Bayesian Information Criterion = 23437.03, Posterior Predictive P-value = .496.

People who lived in more deprived conditions also tended to be significantly lower in personal wellbeing ( $b = -.103$ ). Critically, these two effects interacted. This is shown in the significant effect for the religion by deprivation interaction term ( $b = .035$ ). This indicates that neither the effect of religion nor that of deprivation can be considered in isolation. The difference between

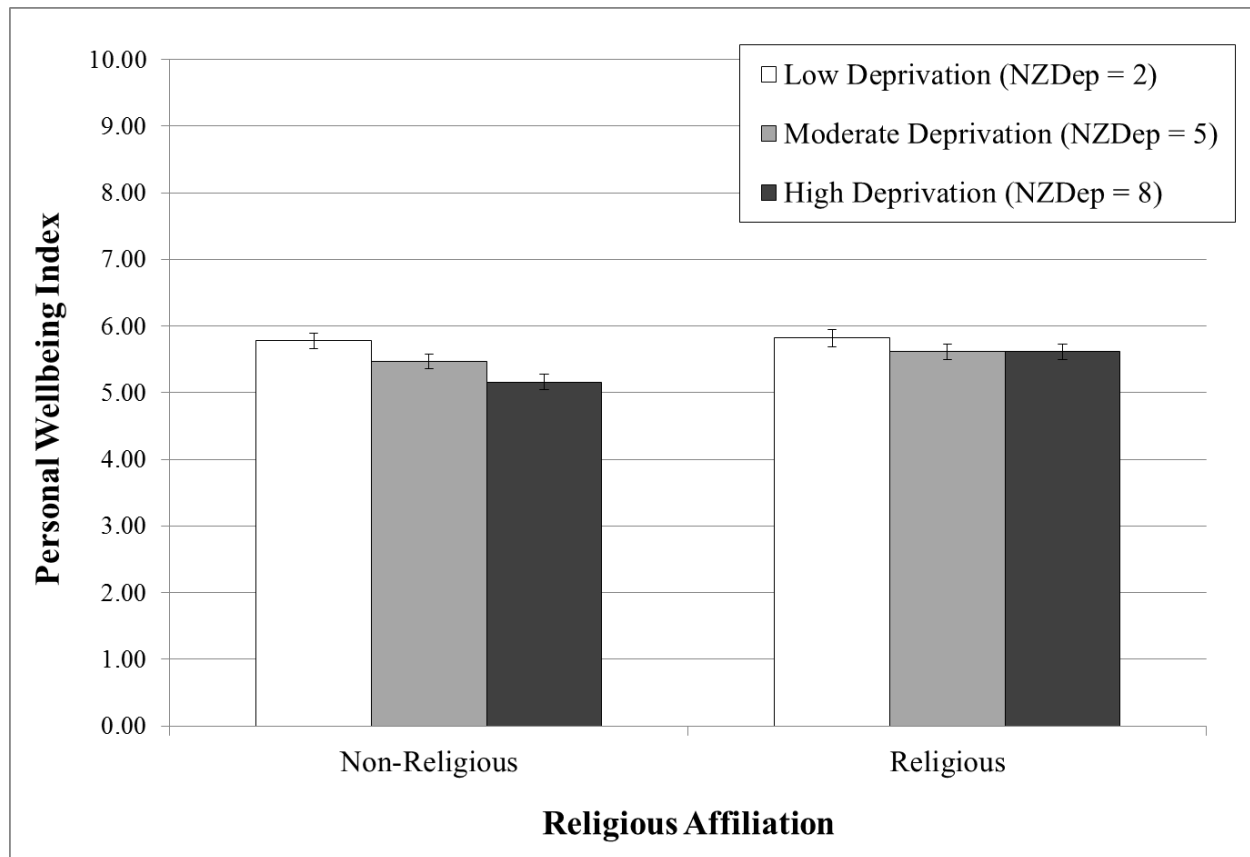
<sup>2</sup> All results were comparable when a more widely used, frequentist-based Maximum Likelihood method of estimation was used.



religious and non-religious people in personal wellbeing depended upon people’s relative level of deprivation. Moreover, as can also be seen in Table 2, this interaction occurred when adjusting for the main effects of various other demographic factors, including gender, age, relationship status, employment status, ethnicity and education.

Differences in wellbeing for religious and non-religious people living in low, moderate and high levels of deprivation are presented in Figure 1.

**Figure 1. Estimated mean levels of subjective wellbeing (measured using the Personal Wellbeing Index) for religious and non-religious people who were low, moderate and high in deprivation (measured using the NZ Deprivation Index).**



Note: Error bars represent the posterior SD of the estimate.

As can be seen, the difference in personal wellbeing was between religious and non-religious people who were high in deprivation—the poorer people in society. We tested this regression interaction by calculating predicted mean values at low, moderate and high values of deprivation (values of NZDep = 2, 5, and 8, respectively) for religious and non-religious people based on the parameters in our Bayesian regression model. Point difference tests indicated that people who lived in affluent regions (NZDep = 2) showed similar, and high, levels of personal wellbeing regardless of whether or not they were religious; they did not differ significantly from one another ( $b = .039$ , posterior SD = .066, 95% CIs = [-.089, .199],  $p = .066$ ). A different pattern emerged, however, for those high in deprivation (NZDep = 8). Here, people who were religious and poor, fared significantly better than those who were non-religious and poor. This difference was significant ( $b = .248$ , posterior SD = .066, 95% CIs = [.119, .376],  $p < .001$ ). These findings indicate that religious people living in deprived neighbourhoods were higher in

subjective wellbeing than their non-religious counterparts living in those same neighbourhoods.

## 5. Discussion

Religion has long been recognised as having a positive link with psychological wellbeing (Ellison, 1991). However, robust empirical evidence has been lacking when it comes to considering whether the relationship between religion and wellbeing could be extended to buffering against the effects of economic deprivation. We modelled the proposed associations using data from a large nationally representative New Zealand sample using Bayesian linear regression. As hypothesised, our analyses indicated that religious people living in deprived neighbourhoods were higher in subjective wellbeing than their non-religious counterparts living in the same neighbourhoods. These effects were reasonably subtle and fairly small in effect size, but they were reliable and held when adjusting for a number of demographic covariates, including gender, age, and education. For those people who are religious and living in impoverished neighbourhoods, religion seems to provide a protective buffer upon wellbeing.

A key strength of our study is that we estimated our models using a Bayesian approach, which arguably provides more reliable, and practically interpretable, probability estimates as compared to more well-known frequentist estimation methods used in many regression models (see Gelman et al., 2003). Another key strength of our research is that it used a highly robust measure of deprivation based on neighbourhood characteristics and derived from census data on the level of average income, household crowding, access to transport and other key features at the neighbourhood-unit level. Our findings regarding religious buffering show that the effect occurs when one indexes poverty based on the characteristics of people's immediate location (in roughly 100-person units).

Diener et al. (2011) noted that in wealthy nations non-religious people tend to have higher subjective wellbeing than they do in poorer nations. Our findings replicate this result but in a different manner. We find a religious buffering effect for religious people living in the deprived neighbourhoods of New Zealand, in that religious people have higher subjective wellbeing than do non-religious people. Thus, if you are non-religious in New Zealand your subjective wellbeing is likely to be related to your level of personal wealth (Sengupta et al., 2012). Currently, one of the limitations of these results is that while they find evidence for the effect, they do not explain why this buffering function exists. Diener et al. (2011) explain that religious affiliation provides this buffering effect because it offers social support, an alternative explanatory framework which offers unique meaning to life and that religion teaches respect for others regardless of personal circumstances. In future periods of data collection, the NZAVS will be able to explore and unpack the unique roles that social support, life satisfaction and community belonging might each contribute to this buffering effect.

This study is also important in the New Zealand context, as it provides the first nationally representative evidence that the general effects of the relationship between religious affiliation and wellbeing exist within the nation. While other studies investigated income by religious group (Hoeverd & Sibley, 2010) or provided a measure of the relationship between religion and wellbeing in older population segments (Waldegrave, 2009; 2010), this study supplies a much-needed representative measure of the relationship between religious affiliation, wellbeing and deprivation within and across a nationally representative New Zealand sample. Our results confirm that a beneficial relationship between religious affiliation and wellbeing exists, at a general level, in the religiously diverse New Zealand context. And when extended to

deprivation, the paper provides important practical and social outcomes by showing that religious New Zealanders are better psychologically buffered against economic stress than are non-religious people. Interestingly, it is the New Zealand Churches with growing membership that tend to have congregations with lower average incomes, than churches experiencing a decline in affiliation (Hoverd & Sibley, 2010). We expect to be able to explore and publish further results investigating these relationships as we collect data and add measures to the NZAVS. Since our dataset is longitudinal, eventually the NZAVS will allow us to measure changes over time in affiliation, wellbeing and deprivation in New Zealand. Elsewhere (Sibley & Bulbulia, 2012), the NZAVS dataset has been able to successfully measure the longitudinal changes in perceived health amongst religious people in Christchurch, New Zealand, both before and after the 2011 earthquake which killed over one hundred people and left thousands of people homeless.

When it comes to the global data which relates to religious affiliation, wellbeing and deprivation, together, our study sampled a religiously diverse (New Zealand) population, whereas much of the existing research relating deprivation to strength of religious identification has centred upon North American, Christian or Muslim populations, or research across nations. When it comes to developing a working hypothesis or theory about the relationship between religious affiliation, wellbeing and deprivation, we want to stress that measuring deprived material conditions and contexts in relation to wealthy contexts is central for isolating this effect. Micro-level neighbourhood comparisons within a nation are needed to supplement cross-national macro data. The macro-level global research comparisons offered by Diener et al. (2011) and a recent Gallup poll (Crabtree, 2010) show the effect amongst poorer nations.

Using a national neighbourhood deprivation measure, we show that the buffering effect of religion on subjective wellbeing also occurs at the micro level within deprived neighbourhoods in wealthy nations, amongst religious people regardless of their specific religious affiliation. Thus, the comparison between poor and wealthy nations made by Diener et al. (2011) produces evidence for an effect which our results indicate also holds in comparisons between wealthy and poor neighbourhoods *within* New Zealand. As a consequence, the effect that the subjective wellbeing of religious people is buffered against material hardship holds both at a macro level among nations and at a micro level within nations. Finally, our neighbourhood-based data supports Diener et al.'s (2011) conclusion that, in less religious societies with favourable circumstances, higher subjective wellbeing is achieved by most people whether they be religious or non-religious. Understandably, more research will be required to further pursue the applicability of such an argument. Further analysis of cross-national and national datasets will be required. Moreover, it is likely that there is variation to be found among different religious groups and within particular subsets of these groups when it comes to future studies of the relationship between religion, deprivation and wellbeing.

## 6. Conclusion

We present a Bayesian linear regression model showing that religious affiliation provides a protective buffer against the corrosive effects on subjective wellbeing and social capital of living in impoverished conditions. Results from a national probability sample of N=5984 New Zealanders indicated that religious people living in deprived neighbourhoods were higher in subjective wellbeing than their non-religious counterparts living in the same neighbourhoods. It is in impoverished conditions that the difference in wellbeing between religious and non-religious people is apparent; those living in affluent neighbourhoods showed comparably high

levels of subjective wellbeing regardless of whether or not they were religious. Our results demonstrate that the effect by which religious people who live in impoverished conditions are buffered against material hardship occurs at the neighbourhood level. We show that the religious buffering effect occurs both at a macro (across nations) and a micro level (within a nation's neighbourhoods). Our results also forge new ground by showing for the first time that this effect is readily apparent in New Zealand.

To return to Marx then, in the New Zealand context, our data indicate that the so-called "opium of the people" has its effects primarily when people are hurting due to poverty and deprivation, and that simply belonging to or affiliating with a religious group is enough to experience the palliative effect of religion. Moreover, our data supplement existing cross-national research to suggest that this opiate effect occurs both at the macro level across nations and at the micro level within nations.

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