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Brief Report

The longitudinal relationships between adolescent religious values and personality

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ABSTRACT

This research examined the longitudinal relationships between personality and religious values. High school students in Grades 10 (381 males, 384 females; mean age = 15.40 yrs) and Grade 12 (195 males, 215 females; mean age = 17.02 yrs) completed personality and religious measures as part of the *Wollongong Youth Study*. Structural equation modelling (SEM) indicated that religious values at Time 1 predicted an increase in Agreeableness and a decrease in Psychoticism at Time 2. These effects were confirmed to be independent of each other when the SEMs included both Agreeableness and Psychoticism. Results are discussed with reference to the implications of religious values for the development of personality.

1. Introduction

The aim of this study was to examine the extent to which religious values are related to longitudinal changes in personality traits during adolescence. Existing findings suggest that Agreeableness, Conscientiousness, and low Psychoticism underlie positive religious sentiment (Saroglou, 2010), yet very few studies have examined these relationships using a longitudinal design. Especially during the teenage years, it is not clear whether personality precedes the development of religious sentiment, or *vice versa*.

The dearth of psychological research on the development of religious sentiment during this challenging period of the life span is surprising, as findings on adolescent religiousness are suggestive of personal changes characteristic of this period. For example, whilst many adolescents become more religious, and most conversions occur during this period (Levenson, Aldwin, & D'Mello, 2005), declines in religiousness are generally also seen (King, Elder, & Whitbeck, 1997). The extent to which such shifts in religious sentiment are implicated with personality development and change has not been made clear.

Some researchers have suggested that religious sentiment has important implications for psychological well-being. For example, it has been suggested that religiosity provides a framework that facilitates the development of identity by encouraging believers to search for meaning and belonging (Hill & Pargament, 2003). The religious context also provides answers to "larger issues of life" (King & Benson, 2006, p. 387), and may allow adolescent believers to resolve potential "identity confusions" (Erikson, 1968, p. 12). Heaven and Ciarrochi (2007) described religious teenagers as "better equipped to meet life's experiences and challenges" (p. 691) when compared with non-religious youth. Given the importance of religious sentiment in shaping the beliefs, goals, and emotions of believers (Silberman, 2005), it is therefore essential to understand its possible effects on personality development. This has hitherto been the subject of very little research amongst adolescent samples.

1.1. Longitudinal research

The small number of longitudinal studies that have been conducted suggest that personality is more likely to influence the development of religiosity than *vice versa*. For instance, findings from the Terman longitudinal study showed Agreeableness to predict the development of adult religious preference and consumption (McCullough, Enders, Brion, & Jain, 2005). McCullough, Tsang, and Brion (2003) focused on internal and overt expressions of religion and found that adolescent Conscientiousness predicted religiousness in early adulthood. These findings were replicated with a cross-lagged panel design showing that adolescent Conscientiousness predicted religiousness in late adulthood, over and above adolescent religiousness (Wink, Ciciolla, Dillon, & Tracy, 2007). Adolescent Openness also predicted spiritual seeking in late adulthood, which reflects an emphasis on a "sacred connectedness with God, a Higher Power, or nature" (Wink et al., 2007, p. 1058).

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The authors also found a significant bi-directional relationship for Agreeableness in females, the only study to do so.

Whilst the direction of this finding is contrary to other longitudinal studies, it is in line with suggestions that the degree to which individuals are invested in social roles – such as committing to a religion – can lead to personality change (Lodi-Smith & Roberts, 2007). Such studies have demonstrated that social investment in work and relationships predicts changes in personality (e.g., Clausen & Gilens, 1990; Robins, Caspi, & Moffitt, 2002). Indeed, religious conversion may "result in profound, life transforming changes in mid-level functions such as goals, feelings, attitudes, and behaviours, and in the more self-defining personality functions such as identity and life meaning" (Paloutzian, Richardson, & Rambo, 1999, p. 1047).

In the only study to examine the links between personality changes and religious values *during* adolescence, Heaven and Ciarrochi (2007) found that increases in Psychoticism predicted low religious values in boys, whilst increases in Conscientiousness predicted elevated religious values in girls. Although this particular study was conducted using the same participant pool as the present study at a younger age (modal age of 13), a number of limitations hinder the applicability of their findings. First, the authors focused only on the effects of Psychoticism and Conscientiousness, and did not measure the other major personality dimensions. Second, their two waves of data were only 12 months apart; thus, it is worth considering whether different effects might be obtained over a longer time period. Third, religious values were assessed at one time point only, making it impossible to control for prior religious sentiment and reciprocal influence.

1.2. Aims and rationale of the present study

Our focus in the present study was on religious values. Values are generally understood as being "conceptions of the desirable that guide the way persons select actions, evaluate people and events" (Roccas, 2005, p. 748) and emerge from the degree of importance that individuals place on personality-congruent behaviours (Roccas, Sagiv, Schwartz, & Knafo, 2002). This is in line with contemporary views of religiousness being a "characteristic adaptation of basic personality traits" (Saroglou, 2010, p. 108).

We thus tested a reciprocal influence model in which we estimated the extent that personality influences the development of religious values and *vice versa*. For example, we tested whether someone high in religious values was likely to experience increases in Agreeableness, relative to someone with low religious values with the same baseline (Time 1) levels of Agreeableness. This design allows us to examine the extent that personality and religious values contribute to reciprocal change. The only previous study to examine this reciprocal relationship was Wink et al. (2007).

Given the largely exploratory nature of this design any hypotheses regarding the temporal precedence of personality over religious values must be made with a degree of caution. Though limited, existing longitudinal findings are equivocal in suggesting that personality predicts changes in religious sentiment. Thus we expected that Conscientiousness, Agreeableness, and low Psychoticism would predict the development of religious values. As noted however, Wink et al. (2007) found evidence of a reciprocal relationship for Agreeableness amongst females, supporting the idea that religious sentiment might predict changes in personality. Following this finding it was hypothesised that, among adolescents, religious values would predict changes in Agreeableness.

We focused on the Big Five factors and Eysenckian Psychoticism, as these appear to provide comprehensive coverage of personality domains (McCrae & Costa, 2008) and are reliably related to religious sentiment (Heaven & Ciarrochi, 2007; Saroglou, 2010). Cross-sectional relationships have been demonstrated between Extraversion, Neuroticism, Openness, and religiousness, but these findings were reliant on different expressions of religious sentiment (Saroglou, 2002). We also decided to test for gender differences, with previous studies revealing gender to be related to differences in magnitude of effect size in the personality/religion relationship (Saroglou, 2002), as well as variability in the longitudinal outcomes of religious change (Heaven & Ciarrochi, 2007; Wink et al., 2007).

2. Method

2.1. Sample and procedure

Participants attended five schools located in a Catholic Diocese in New South Wales, Australia. The Diocese is centred on the city of Wollongong, but also reaches into south-western Sydney ensuring a heterogeneous sample (more detailed information on our sample can be found in Heaven & Ciarrochi, 2007). At Time 1, 86.5% of our sample indicated that they were Catholic, which dropped to 81.8% at Time 2.

Administration of questionnaires was approved by the university ethics committee and schools authority. Appropriate consent was obtained, and students were given sufficient time to complete questionnaires in the presence of either one of the authors or a teacher. Students were debriefed following completion.

Data used for the present analyses were obtained when students were in Grade 10 (Time 1) and Grade 12 (Time 2) respectively. A total of 765 students (Mean age = 15.40 yr, SD = 0.52) completed relevant measures at Time 1 (males = 381, females = 384), whilst 410 students (mean age = 17.02 yr, SD = 0.36) provided data at Time 2 (males = 195, females = 215). Many students exit school at the end of Grade 10 to enter other schools, embark on different forms of education and training, or enter the workforce. The follow-up rate for the second wave of data was only 52.59%, but no differences were found between those who completed both waves, and those who were only present at Time 1 (results can be found in Appendix B). Amos 7.0 (Arbuckle, 2006) and Full information maximum likelihood (FIML) was utilised to estimate missing data points (Little & Rubin, 2002).

2.2. Materials

2.2.1. Big Five personality factors

The 10-item International Personality Item Pool was used to measure the Big Five dimensions (IPIP; Goldberg, 1999). This scale has been shown to correlate highly with the NEO-PI-R inventory and to possess good internal validity (Gow, Whiteman, Pattie, & Deary, 2005). At Times 1 and 2, alpha coefficients for the Big Five were respectively: .76, .82 (Agreeableness); .74, .77 (Conscientiousness); .79, .85 (Neuroticism); .76, .80 (Openness); and .82, .85 (Extraversion).

2.2.2. Psychoticism

In Grades 10 and 12 participants completed a revision of Eysenck and Eysenck's (1976) junior Psychoticism scale (Corulla, 1990). The inclusion of this scale accords with research findings suggesting that Psychoticism predicts religious sentiment independently of dimensions such as Conscientiousness (Heaven & Ciarrochi, 2007). Internal consistency coefficients for this measure were .71 (Time 1) and .75 (Time 2).

2.2.3. Religious values

We used the three-item, 7-point religious values scale derived from the Social Values Inventory of Braithwaite and Law (1985) which was developed using Australian participants. The religious

values items included in this study assess intrinsic religious values by asking participants to indicate the extent to which they adhere to three guiding principles in their life. These are "Being saved from your sins and at peace with God"; "Being at one with God or the universe" (Goal values); and "Following your religious faith conscientiously" (Mode value). Internal consistency of the scale was excellent for both waves: .94 (Grade 10), and .94 (Grade 12).

3. Results

3.1. Preliminary analyses

A one-way between groups ANOVA was performed to test for differences between participants who only completed measures at Time 1 and those who completed both waves. As all effect sizes were non-significant we thought it appropriate to employ FIML to estimate missing data points.

Before proceeding with the main analyses, we tested for gender differences. Fisher's *z*-tests were used to compare Pearson correlation coefficients between males and females for personality and religious values at Times 1 and 2. No significant differences were found. Further, gender invariance for each personality factor was examined by comparing fit for two separate cross-lagged models. Model 1 assumed differences in cross-lagged regression weights between males and females, and model 2 assumed no differences. For the purpose of the present analyses, chi squared (χ^2), chi squared/degrees of freedom (χ^2/df), normed fit index (NFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) were deemed to be the most appropriate measures. For all of the personality factors, Model 2 showed better fit, indicating no need to conduct separate analyses for males and females.

Pearson's correlation coefficients (r) were calculated to examine the relationships between the Big Five, Psychoticism, and religious values at Times 1 and 2. Before conducting analyses, normality and linearity were assessed. Normality was not assumed for any of the factors except for Neuroticism; however, an inspection of normal *Q*–*Q* plots confirmed that sample data were normally distributed. Linearity was also assumed.

A number of correlations were found to be statistically significant at an alpha level of .01. Religious values correlated positively with Agreeableness and Conscientiousness at both time points. Psychoticism was found to be negatively correlated with religious values at Times 1 and 2. Openness positively correlated with Religious Values at Time 1, and Neuroticism correlated negatively with Religious Values at Time 2. Full correlation matrices can be found in Appendix A.

3.2. Structural equation models

Structural equation models were used in a two-wave panel design (AMOS 7.0; Arbuckle, 2006). The model includes correlated measurement error at Times 1 and 2, correlated disturbances at Time 2, and employs three item parcels as manifest variables. Parcelling simplifies analyses by combining the 10 items representing each of the IPIP Big Five factors, and the 12 Psychoticism items into a smaller number of variables, bypassing issues common to item-level data, improving fit of the overall model, and increasing power (see Little, Cunningham, Shahar, & Widaman, 2002). Though there is a danger of applying parcelling indiscriminately to circumvent issues primarily regarding parameter stability, normality, and sample size (Bandalos & Finney, 2001), the parcelling employed in the present analysis was minimal.

3.3. Predicting personality and religious values

We assessed the extent that personality predicted changes in religious values and *vice versa*. As shown in Table 1, all indices of model fit were adequate, with χ^2/df less than 2.5, NFI above .90, CFI above .95 and RMSEA below .05. No personality variables at Time 1 predicted either increases or decreases in Religious Values at Time 2. However, there were two significant effects for the inverse relationship: religious values at Time 1 were found to predict increases in Agreeableness ($\beta = .10$, $p < .05$) and decreases in Psychoticism ($\beta = -.08$, $p < .05$) at Time 2 whilst controlling for concurrent levels of Agreeableness and Psychoticism. Fig. 1 illustrates these relationships for both of these significantpersonality variables.

Given the significant effects seen for Agreeableness and Psychoticism, we examined whether religious values predicted unique variance in Psychoticism or Agreeableness by entering both variables into an identical structural equation model and having each act as a control for the other. Thus, Psychoticism and Agreeableness at Time 2 were predicted by both of these variables at Time 1, and the errors between Time 2 Agreeableness and Psychoticism were correlated. Cross-lagged path coefficients were still significant, with Time 1 religious values predicting decreases in Psychoticism ($\beta = -.10$, $p < .05$) and increases in Agreeableness ($\beta = .09$, $p < .05$) independently of either personality factor.

4. Discussion

We examined the cross-lagged relationships between the major personality domains and religious values in youth. This is the first study to demonstrate that religious values predict later Agreeableness and Psychoticism during adolescence after controlling for baseline scores, providing an understanding of the idiosyncratic features of the adolescent social and developmental experience.

Cross-sectional results replicated previous findings (Saroglou, 2002, 2010), demonstrating that Agreeableness, Conscientiousness, and low Psychoticism were related to religiousness (see Appendix A). Whilst the majority of prior longitudinal studies has found that both Agreeableness and Conscientiousness predict changes in religiousness (Heaven & Ciarrochi, 2007; McCullough et al., 2003; Wink et al., 2007) our structural equation models demonstrated the inverse relationship. We found that religious values preceded an increase in Agreeableness and a decrease in Psychoticism over a 2-year period, with small effect sizes. Additionally, significant

Table 1
Model fit indices and cross-lagged effects between personality and religious values at Time 1 and Time 2.

Model	χ^2	χ^2/df	CFI	RMSEA	Personality Time 1 → religious values Time 2	Religious values Time 1 → personality Time 2
Agreeableness	153.650	1.787	.986	.030	−.09	.10*
Conscientiousness	112.379	1.307	.994	.019	.07	−.01
Extraversion	135.283	1.573	.991	.025	.01	.07
Neuroticism	128.416	1.493	.992	.024	−.03	−.08
Openness	128.169	1.490	.992	.023	−.08	−.07
Psychoticism	137.367	1.597	.988	.026	−.02	−.08*

Note. Sample size = 765; degrees of freedom = 86.
* $p < .05$.

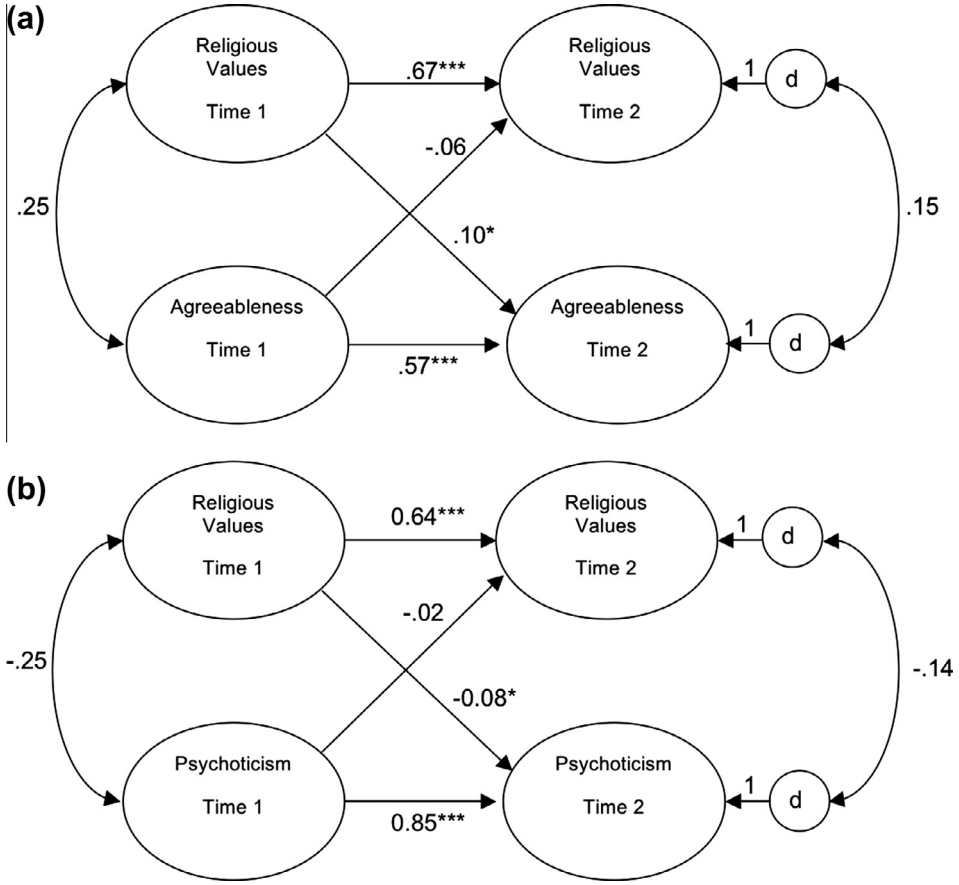

Fig. 1. SEM showing correlations and cross-tagged effects between Agreeableness (a), Psychoticism (b), and religious values over two waves.

results were maintained when we included both Agreeableness and Psychoticism in a single model, indicating that the influence of religious values on these traits is unique and not related to characteristics shared by either personality factor. This model also revealed Time 1 Psychoticism to predict a decrease in Time 2 Agreeableness.

Our findings are in line with suggestions that religion is a meaning–making system that provides a frame of reference for interpreting the world (Silberman, 2005) capable of shaping individual behaviour (Park, 2005). Indeed, individuals have been found to modify behaviours in a manner consistent with their values (Rokeach, 1973), which could be associated with personality change, as demonstrated in this study.

How does one interpret results suggesting that religious values only affect the development of Agreeableness and Psychoticism? One interpretation is that Agreeableness could be especially susceptible to the influence of religious values, given the high levels of compliance, trust, and emphasis on others' feelings associated with this trait. Religious values tend to reflect unique facets of Agreeableness such as altruism, compliance and tender-mindedness (McCrae & Costa, 2008), potentially making this trait malleable under the influence of religious values. Furthermore, Agreeableness reflects a tendency to avoid interpersonal conflict (Asendorpf & Wilpers, 1998). Lodi-Smith and Roberts (2007) argued that "once individuals commit to a religious institution and system, the expectations of this community to be more agreeable will be incorporated into the individual's existing identity structure" (p. 72).

Similarly, it is plausible that, through the teaching of morals, religious environments reduce the likelihood of expressing facets of Psychoticism. Baumeister (2005) describes ongoing moral behaviour as being linked to self-control, the low pole of Psychoticism (McCrae & Costa, 2008). This requires further replication however, as one would also expect to see a change in Conscientiousness, which reflects the ability to engage in self-control. Further, the departure of our findings from those of previous longitudinal studies indicates a need for further understanding of the idiosyncrasies of the adolescent developmental context.

4.1. Conclusion and limitations

It is clear that the relationships between these variables over time are not only complex but may be affected by one's developmental stage and the generational context within which the individual is placed. Results obtained from particular generations (e.g., McCullough et al., 2003; Wink et al., 2007) may not be applicable to those with different social experiences as demonstrated by our study. Although our sample was predominantly Catholic, the results of the cross-sectional analyses do not contradict those obtained with other predominantly Protestant samples. Problems inherent in the use of two waves of data in a panel design (see Rogosa, 1980) could be addressed by examining three (or more) waves of data. This calls for further study using a variety of denominations and faiths, in different cultures, to fully understand the complexity of these relationships.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jrp.2013.04.010.

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