

Mental Health, Religion & Culture

ISSN: 1367-4676 (Print) 1469-9737 (Online) Journal homepage: www.tandfonline.com/journals/cmhr20

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To cite this article: Leslie J. Francis, Celeste Y. M. Yuen & Ursula McKenna (2024) Christian affiliation and personality among secondary students in religious schools in Hong Kong: testing the Chinese Junior Personality Scales in Three Dimensions (JPS3D), Mental Health, Religion & Culture, 27:9, 929-936, DOI: 10.1080/13674676.2025.2516578

To link to this article: https://doi.org/10.1080/13674676.2025.2516578

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Published online: 08 Sep 2025.

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MENTAL HEALTH, RELIGION & CULTURE
2024, VOL. 27, NO. 9, 929–936
https://doi.org/10.1080/13674676.2025.2516578

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Christian affiliation and personality among secondary students in religious schools in Hong Kong: testing the Chinese Junior Personality Scales in Three Dimensions (JPS3D)

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ABSTRACT

Data provided by 4468 12- to 18-year-old students enrolled in 10 religious secondary schools in Hong Kong are employed to address two research aims. First, the data support the three factor structure of the Chinese Junior Personality Scales in Three Dimensions, and document the internal consistency reliability and construct validity of these three scales (measuring extraversion, anxiety, and toughmindedness). Second, the data support the hypothesis that there is no significant association between scores recorded on these three scales and Christian religious affiliation among 12- to 18-year-old students attending religious secondary schools in Hong Kong.

ARTICLE HISTORY
Received 29 April 2024
Accepted 1 June 2025

KEYWORDS
Extraversion; anxiety; toughmindedness; psychometrics; psychology of religion; Chinese

Introduction

The connections between religion and personality have been of interest within the empirical approach to the psychology of religion from the early development of that field of study. When Argyle (1958) undertook his first systematic review of the developing body of knowledge in this field, he concluded that insufficient consistent research has been conducted to establish reliable findings between religion and personality. The problem that Argyle faced in reviewing the literature at that stage arose in part from the variety of definitions of religion and of personality that underpinned the early development of the field. Over 60 years later, when there is a much more substantial literature, the field still remains fragmented by different conceptualisations and operationalisations of those two core constructs: religion and personality. Within this fragmented literature two emerging streams of research have explored connections between various measures of religion and the big five factor model of personality (see reviews by Saroglou, 2002, 2010) and the three major dimensions model of personality (see reviews by Francis, 2009; Francis et al., 2024). The present study is concerned with the three major dimensions model.

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Three major dimensions of personality

The three major dimensions model of personality is grounded in the work of Hans Eysenck and associates and distinguishes between the three dimensions of extraversion, neuroticism, and psychoticism. As the names assigned to these dimensions suggest, the Eysenckian model proposes continuity between normal personality and psychological disorders. These three major dimensions of personality have been operationalised through the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975), the Eysenck Personality Questionnaire Revised (Eysenck et al., 1985), and the Eysenck Personality Scales (Eysenck & Eysenck, 1991). Within this three-dimensional model of personality the Extraversion Scale assesses the continuum from introversion (low scores), through ambiversion, to extraversion (high scores). The Neuroticism Scale assesses the continuum from emotional stability (low scores), through emotional instability, to incipient neurotic disorders (high scores). The Psychoticism Scale assesses the continuum from tendermindedness (low scores), through toughmindedness, to incipient psychotic disorders (high scores). These three major dimensions of personality have also been conceptualised and operationalised in instruments designed for use among children: the Junior Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975), the Abbreviated Junior Eysenck Personality Questionnaire (Francis & Pearson, 1988), the Junior Eysenck Personality Questionnaire Revised (Corulla, 1990), and the Abbreviated Junior Eysenck Personality Questionnaire Revised (Francis, 1996).

There remain, however, fundamental conceptual and operational problems with the Eysenckian measures, especially as applied among children (see Francis, 1996; Francis & Pearson, 1988). Conceptually the linkage between emotionality and neurotic disorders nuances emotionality in a particular way. Similarly, the linkage between toughmindedness and psychotic disorders nuances toughmindedness in a particular way. Conceptually the requirement that extraversion, neuroticism and psychoticism are considered as orthogonal factors may limit the width and richness of the three dimensions. Operationally the construct of psychoticism has proved difficult and elusive to operationalise among children. Operationally the design of items for assessment on the dichotomous choice of "yes" and "no" may fail to capture thoughtful reflection. Additionally, the inclusion of reverse-coded items within the scales may detract from maximising internal consistency reliability (see for example Barnette, 2000, 2001; Roszkowski & Soven, 2010; Suárez-Alvarez et al., 2018).

In light of these recognised problems, Francis et al. (2024) proposed a fresh set of items to operationalise, among 10- to 13-year-old students, the three constructs of extraversion, anxiety, and toughmindedness, and tested the performance of these items on a five-point response scale from agree strongly (5), through not certain (3), to disagree strongly (1). Data provided by 3171 students attending 92 Church of Ireland (Anglican) primary schools in the Republic of Ireland confirmed the clear factor structure of the fresh set of 18 items with six items loading on each of the three factors identified by a varimax rotated solution. The three proposed scales demonstrated satisfactory internal consistency reliability with the following alpha coefficients (Cronbach, 1951): extraversion, $\alpha = .71$; anxiety, $\alpha = .78$; and toughmindedness, $\alpha = .76$. The three sets of items displayed good face validity. Construct validity was established by recording the expected sex differences generally found in the Eysenckian measures (Eysenck & Eysenck, 1975, 1991): males

recorded higher scores than females on the measure of toughmindedness, while females recorded higher scores than males on the measure of anxiety.

Religious affiliation

The social scientific study of religion has routinely differentiated among different markers of religion, including religious affiliation, religious belief, religious practice, and religious affect (see further Francis, 2016). The literatures concerned with the connections between religion and personality have engaged with all of those markers. The present study is grounded in the notion of religious affiliation as an important social marker in Hong Kong society and especially within the religious schooling sector. Within this sector the two streams of no religion and Christian affiliation remain highly visible. Previous research has indicated that religious affiliation is less likely than other markers of religion (like belief, practice, and affect) to predict individual differences in personality (see D'Onofrio et al., 1999; Taylor & MacDonald, 1999).

Research question

Against this background, the present study has two core research aims. The first aim is to test the Chinese translation of the Junior Personality Scales in Three Dimensions (JPS3D; Francis et al., 2024) in terms of its factor structure, internal consistency reliability, and construct validity. The second aim is to test the hypothesis that there are no significant differences in personality profile among the two groups of students who identify in terms of religious affiliation as: no religion and Christian. In view of the expected sex differences in scores of toughmindedness and in scores of anxiety, the two religious affiliation groups will be examined separately for males and for females.

Method

Procedure

The study employed a purposive convenience sampling method. An introductory email was dispatched to the principals of various religious-affiliated schools, and subsequent communication was initiated with those expressing interest in participation. Prior to the survey administration, all participating schools disseminated a notice to secure parental or legal guardian consent for their children's participation in the study. Only students with parental consent were eligible to partake in the survey. Students had the option to withdraw from the survey at any point during the study. Thoroughly completed surveys were received from 4468 students between the ages of 12 and 18.

Participants

Of the 4468 participants, 2426 identified as no religion and 1395 identified as Christian. Other religious groups were less visible within the participants: 284 Buddhist, 105 Taoist, and 94 Muslim, with 40 identifying with other religious groups and 124 preferring not to self-identify. The proportion of Christian students within the sample mirrors the

distribution of religious secondary schools in Hong Kong. For instance, out of the 358 government-aided secondary schools, 125 (34.9%) are administered by Christian sponsoring bodies, 82 (22.9%) by Catholic, 18 (5%) by Buddhists, and 13 (3.6%) by other religious sponsoring bodies.

Overall 2283 participants were male, 2167 were female, and 18 preferred not to say; 981 were in grade 1, 857 in grade 2, 1043 in grade 3, 836 in grade 4, 656 in grade 5, and 78 in grade 6, with 17 not identifying their grade. The majority of the participants had been born in Hong Kong (92%).

Measure

Personality was assessed by a Chinese translation of the JPS3D (Francis et al., 2024). This instrument comprises three six-item scales designed to operationalise the three constructs of extraversion (e.g., I enjoy going to parties, I make friends easily), anxiety (e.g., I stay awake at night worrying about things, My feelings are easily hurt), and toughmindedness (e.g., I like playing tricks on people, I somethings like being rude to people). Each item was rated on a five-point Likert scale: disagree strongly (1), disagree (2), not certain (3), agree (4), and agree strongly (5). In their foundation paper, Francis et al. (2024) reported the following alpha coefficients (Cronbach, 1951): extraversion, $\alpha = .71$; anxiety, $\alpha = .78$; toughmindedness, $\alpha = .76$.

Analysis

The data were analysed by the SPSS statistical package, employing the frequency, reliability, factor, correlation, and *t*-test routines.

Results

The first step in data analysis was designed to confirm the factor structure of the Chinese translation of the JPS3D. Table 1 demonstrates that the three-factor structure was clearly recovered by confirmatory factor analysis, using varimax rotation with Kaiser normalisation constrained to a three-factor solution. Together these three factors accounted for 57% of the variance.

The second step in data analysis was designed to explore the performance of the six items within each of the three scales in terms of the correlation with the sum of the other five items and the item endorsement as the sum of the agree and agree strongly responses. Table 2 demonstrates that every item was correlated at .50 or above with the sum of the other five items, confirming that each item was contributing well to a homogeneous scale. The item endorsement showed satisfactory variation in item discrimination, from 9% to 35% in the scale of toughmindedness, from 33% to 58% in the scale of anxiety, and from 36% to 52% in the scale of extraversion.

The third step in data analysis was designed to test for sex differences in the three measures. Table 3 demonstrates that males recorded significantly higher scores than females on toughmindedness, and the females recorded significantly higher scores than males on anxiety. These findings are consistent with the performance of the Eysenckian measure that report higher psychoticism scores among men and higher neuroticism scores among women (Eysenck & Eysenck, 1975, 1991).

Table 1. Factor analysis: Varimax rotation.

	1 *f*	2 *f*	3 *f*
Toughmindedness			
I like making fun of people	.80		
I like playing tricks on people	.66		
I like saying mean things to people	.83		
I like hurting people I like	.75		
I sometimes like being rude to people	.78		
I sometimes like to tease animals	.67		
Anxiety			
I stay awake at night worrying about things		.72	
I often feel unhappy		.79	
My feelings are easily hurt		.74	
I often feel life is very dull		.66	
I often feel tired for no reason		.75	
I worry a lot about things that might happen		.76	
Extraversion			
I would rather be with others than by myself			.61
I like to do things with a crowd			.78
I enjoy going to parties			.82
I make friends easily			.67
I am good fun to be with at parties			.81
I like going out a lot			.66

Note: *f* = factor loading.
All factor loadings below .30 have been suppressed.

The fourth step in data analysis was designed to test the association between personality and Christian affiliation among female students (Table 4) and among male students (Table 5). These data show that three of the six associations tested were non-significant and the other three associations were only significant at the five or one per cent level, reflecting a trivial difference in mean scale score.

Table 2. Reliability and percentage endorsements.

	r	Yes %
Toughmindedness		
I like making fun of people	.71	17
I like playing tricks on people	.59	35
I like saying mean things to people	.74	13
I like hurting people I like	.63	9
I sometimes like being rude to people	.69	17
I sometimes like to tease animals	.55	12
Anxiety		
I stay awake at night worrying about things	.58	54
I often feel unhappy	.70	33
My feelings are easily hurt	.63	40
I often feel life is very dull	.57	36
I often feel tired for no reason	.64	55
I worry a lot about things that might happen	.62	58
Extraversion		
I would rather be with others than by myself	.50	36
I like to do things with a crowd	.65	52
I enjoy going to parties	.71	43
I make friends easily	.52	44
I am good fun to be with at parties	.69	40
I like going out a lot	.51	46

Table 3. Mean scale scores by sex.

	α	Male		Female		t	p <
		Mean	SD	Mean	SD		
Toughmindedness	.86	14.89	5.33	13.00	4.90	12.07	.001
Anxiety	.84	18.94	5.44	20.40	5.28	8.90	.001
Extraversion	.83	19.57	5.14	19.49	5.10	.51	NS

Note: *N* (males) = 2214/2226; *N* (females) = 2071/2078.

Table 4. Mean scale score by Christian affiliation (female).

	Christian		No religion		F	p <
	Mean	SD	Mean	SD		
Toughmindedness	13.13	4.98	12.94	4.87	.81	NS
Anxiety	20.04	5.32	20.14	5.30	1.97	.05
Extraversion	19.97	4.93	19.34	5.18	2.56	.01

Note: *N* (Christian) = 700; *N* (no religion) = 1098.

Table 5. Mean scale score by Christian affiliation (male).

	Christian		No religion		t	p <
	Mean	SD	Mean	SD		
Toughmindedness	14.90	4.94	14.90	5.45	.01	NS
Anxiety	19.02	5.20	18.92	5.54	.41	NS
Extraversion	20.01	4.61	19.32	5.39	2.74	.01

Note: *N* (Christian) = 646; *N* (no religion) = 1250.

Conclusion

The present study was designed to address two core research aims. The first aim of this study was to test the Chinese translation of the JPS3D in terms of its factor structure, internal consistency reliability, and construct validity. Data provided by 4468 students between the ages of 12 and 18 enrolled in ten religious secondary schools in Hong Kong confirmed the satisfactory performance of this measure. The clear three factor structure of the instrument was recovered by confirmatory factor analysis, using varimax rotation with Kaiser normalisation constrained to a three factor solution. Reliability analyses recorded good levels of internal consistency reliability with the following alpha coefficients: extraversion, $\alpha = .83$; anxiety, $\alpha = .84$; toughmindedness, $\alpha = .86$. Construct validity was confirmed by the toughmindedness scale and the anxiety scale recording the sex differences consistent with the established consensus concerning sex differences in the Eysenckian measures of psychoticism and neuroticism (see Eysenck & Eysenck, 1975, 1991). Females recorded significantly higher scores on the anxiety scale, and males recorded significantly higher scores on the toughmindedness scale.

On the basis of these findings the Chinese translation of the JPS3D can be commended for further use among 12–18-year-old students in Hong Kong. Further research would now be useful to test the performance of this instrument among younger students in Hong Kong, since the original instrument was developed and tested among students

in the Republic of Ireland from the age of nine years. Further research would be useful to test the instrument among Chinese-speaking students in other parts of China.

The second aim of this study was to test the hypothesis that there are no significant differences in personality profiles among two groups of students who identify in terms of religious affiliation as: no religion and Christian. Drawing on the same database of 4468 students between the ages of 12 and 18 years, this hypothesis was tested by comparing the personality profiles of 1250 males and 1098 females who identified as having no religion, and 646 males and 700 females who identified as Christian. In light of the expected (and confirmed) sex differences in anxiety scores and toughmindedness scores, this hypothesis was tested separately among males and among females. In terms of toughmindedness, the data demonstrated there were no significant differences recorded by religious affiliation among either males or females. In terms of anxiety, there was no significant difference recorded by religious affiliation among males, while among females there were slightly higher scores among the no religion group ($p < .01$). In terms of extraversion, there were slightly higher scores recorded among the Christian females ($p < .01$) and the Christian males ($p < .01$). Given both the sample size and the concurrent testing of six associations, the difference may be regarded as trivial.

On the basis of these findings, the conclusion may be drawn that, employing the measures of personality proposed by the Chinese translation of the JPS3D, there is no connection between Christian affiliation and personality among young people between the ages of 12 and 18 attending religious schools in Hong Kong. Further research is now needed to test this hypothesis employing the JPS3D among a wider and more diverse sample of young people in Hong Kong.

Acknowledgements

The authors thank all the project school personnel and student participants for their generous support of the study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was partially supported by the second author's Departmental Research Fund.

Ethical approval

The study obtained ethical approval from the Survey and Behavioural Research Ethics Committee of the Chinese University of Hong Kong.

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