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Abrahamic Religiosity Scale: development and initial validation

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ABSTRACT

There are a large number of commonly used measures of religiosity, yet these measures have been developed within a specific culture or religion. Based on the commonality of Abrahamic religions (i.e., Judaism, Christianity and Islam), the present study aimed to develop an initial cross-cultural validation of the Abrahamic Religiosity Scale (ARS). The data were collected from 12 countries from Asia, Europe, Africa and America, and exploratory factor analysis resulted in a 35-item, one-dimensional scale. Confirmatory factor analysis yielded a 28-item with one factor. The scale showed sufficient internal consistency with an adequate alpha coefficient ($\alpha = .95$). Moreover, the correlation coefficients between items and the total score of ARS ranged between .36 and .70. Therefore, the ARS may be used as a psychometrically robust measure in cross-cultural studies on religiosity. Validation of the ARS is strongly recommended within specific cultures and languages.

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Introduction

Study of religion has gained momentum in the last few decades. According to previous literature, it has become one of the most innovating and interesting research fields in academic settings. There is a diverse spectrum of writings with various ideas regarding religion and its functions (Argyle & Beit-Hallahmi, 1975; Beit-Hallahmi & Argyle, 1997; Bergin, 1983; Kirkpatrick, 1999; Pargament, 1997; Shariff & Norenzayan, 2007). Moreover, human beings are well known as “religious seekers”.

Religion has been studied by psychologists, resulting in a well-developed literature on various aspects of religion, such as the function of religion, evolution of religion, the importance of religion, religion’s effects on physical and mental health, religion and coping with

stress, implementing religious problem solving in social settings, etc. (Argyle & Beit-Hallahmi, 1975; Bergin, 1983; Hill, 2005). Religion is an important phenomenon with an essential role in many cultures and societies (Haque, 1998). It is also a complex phenomenon consisting of a variety of multiple incidences and realities. Therefore, some intellectuals identify religion as a basic and multidimensional phenomenon that has impressed humans for thousands of years (Parboteeah, Hoegl, & Cullen, 2008; Stenmark, 2004).

While religiousness has been discussed in psychology, its subject and development were influenced by two major advancements (Ivanhoe, Flanagan, Harrison, Schwitzgebel, & Sarkissian, 2017; Schnitker, Houlberg, Dyrness, & Redmond, 2017). On one hand, theoretical advancements have changed the psychologists' views on the definition of religion and its impacts on psychological manifestations; hence, the theoretical advancements have profoundly changed the conceptualisation of religion (Ivanhoe et al., 2017; Schnitker et al., 2017). On the other hand, parallel with theoretical advancements, the method of research in religious psychological practice has witnessed a revolution, i.e., the development of a proper scientific method in research has led to valid findings, which are relatively free of methodological and logical errors that cause inappropriate assumptions about religiousness, religiosity and religious concepts (Khodayarifard et al., 2006; 2009). Gorsuch (1984) proposed that existing measures of religious studies need to show improvements in their psychometric properties; despite the fact that they were, to some extent, effective and accessible in many fields related to religious studies. Ever since, many journal articles, book chapters and independent books have been written in order to overcome the methodological shortcomings of previous measures (e.g., Hill & Pargament, 2003; Paloutzian & Park, 2005; Spilka, Hood, Hunsberger, & Gorsuch, 2003; Zinnbauer & Pargament, 2005).

A review of the literature showed that the most common instruments have been constructed based on Christianity. Hill and Hood (1999) gathered more than a hundred religious scales, most of which are Christianity-based with few exceptions of Jewish-based instruments. There was no Islam-based scale in that literature review (see Afhami, Mohammadi-Zarghan, & Atari, 2017). Moreover, no instrument based on the common aspects or similarities among Abrahamic religions has been yet reported. Therefore, constructing a religious scale, according to the Abrahamic common similarities seems to be necessary and needed. The present study aimed to develop and validate such a scale based on major similarities among the Abrahamic religions.

Developing such a scale for measuring religiosity is inevitably required for cross-cultural studies and inter-religion comparisons. As a result, developing this measure would aid researchers in understanding commonalities among different religions. Another potential advantage of the development of such a measurement tool is to detect commonalities among religions, societies and civilisations. In order to reach a common ground and subsequently a comprehensive scale of religiosity, a cross-cultural approach was adopted.

Method

Study 1: item generation of Abrahamic religions

The purpose of this study was to identify common elements of Abrahamic religions based on their holy books. To make this first stage operational, six experts from three religions of

Judaism, Christianity and Islam (two experts per religion) separately examined these texts in depth. The components extracted by this group of experts were integrated at a joint meeting among these individuals and were presented to another independent three-person group of experts (one expert per religion) for final synthesis. Furthermore, in this seminar, several modifications were applied to these components. The results of this stage led to the development of 113 items, which were determined as comparative documents of religiosity structure based on holy books of Judaism, Christianity and Islam. A six-point Likert Scale was employed for assessing religiosity from 0 “lowest agreement” to 6 “highest agreement”.

Study 2: evaluation process

This stage of the study was carried out to examine psychometric properties of the items of the preliminary version of the Abrahamic Religiosity Scale (ARS). The sample of this empirical stage consisted of students of a university in the city of Tehran, Iran, who were recruited using the convenience-sampling method. The first step was to investigate the content validity of this instrument. Theoretical and conceptual study by experts of the three religions, psychologists and also measurement specialists highlighted problems in the first version of the preliminary version. Overcoming issues and performing the suggested modifications in the first version of the preliminary scale led to a reduction in the number of items (57 items) and formation of the second version of the preliminary scale. Endorsement of this version by religious scientists, psychologists and psychometrics experts indicated the content validity of this version. Therefore, the second version of ARS with 57 items was prepared for the preliminary empirical study.

The next step was to examine face validity of the scale according to the participants and target population of the study. A group discussion with participation of 30 students, who followed three religions, to evaluate clarity, eloquence and relevance of the items regarding the structure of religiosity, suggested the need for doing minor modifications in the items' wordings. These modifications formed the third version of the preliminary version of the scale.

The third step of this stage was the implementation of the preliminary scale for a group of 97 students, who were followers of one of the three religions. This step was taken to evaluate psychometric characteristics (such as difficulty index, discrimination index and reliability coefficients) of this version of the preliminary scale. Results of the analysis of these data led to the development of the first version of the scale with 57 items.

Study 3: International implementation of the scale

This study was conducted to investigate psychometric properties of the ARS at an international level. The sample of the current study consisted 1212 students from universities of Iran, Turkey, Malaysia, the United States, Canada, Australia, England, Germany, France, Austria and Italy ($M_{\text{age}} = 28.41$; $SD = 6.18$). The demographic details of the sample group are summarised in Table 1. Of note, the response option was provided on a six-point Likert-type scale ranging from “completely disagree” (coded as 0) to “completely agree” (coded as 5).

It is evident that international studies require coordination among countries and researchers. Thus, for better implementation of this research, a professional academic

Table 1. Demographic statistics of the sample of international students ($n = 1212$).

Variables	Levels of variables	Frequency percentage	Variables	Levels of variables	Frequency percentage
Gender	Male	53.3	Religion	Christian	6.1
	Female	46.7		Jewish	.3
Education				Muslim	90.7
	BA/BS	81.7	Marital status	Single	62.7
	MA/MS	16.3		Married	27.8
	Medical	.3a		Divorced	2.4
	Doctor	1.7		Common law	7.1
	PhD				

Note: BA: Bachelor of Arts; BS: Bachelor of Science; MA: Master of Arts; MS: Master of Science.

relationship was established with some of the researchers of the mentioned countries. To provide equal conditions, attract maximum participation and enable direct and fast access to the data, an electronic format was designed and placed on the Internet.

To make good use of the World Wide Web and enable fast access for students, coordination was made with one of the websites active in the field of international survey studies to provide the necessary space for uploading the English version of the scale. It is worth noting that this website had access to electronic addresses of most of the students and thus sent the scale to these students and asked them to respond.

Data were analysed using the Statistical Package for Social Sciences (Version 23) for exploratory data analysis, and the Structural Equation Modelling (AMOS Version 23) was used for confirmatory factor analysis (CFA).

Results

The analyses were carried out at both exploratory and confirmatory levels of analyses.

Exploratory data analysis

Investigating accuracy of the responses

Reviewing percentage bar graph of responses to items and considering rules of member exclusion (severe tendency to presenting response in extremes and severe skewness of the responses) showed that 42 out of 1212 people had responses with these situations. Therefore, their responses were eliminated.

Missing data analysis

Results of this part of the analysis indicated that less than 1% of total responses for each item were missing and no regular relationship was found between the content of the items with a pattern of missing responses. Therefore, the missing data were replaced using the linear interpolation method.

Item analysis

Two series of analysis were conducted according to classical and modern (Item response theory (IRT)) measurement theories. By compounding the results of these two series, the final state of items was assessed and these items were then entered into a CFA (Table 2).

Table 2. Descriptive features of omitting criteria in candidate items.

Omitting status	IRT			CT						Nu.	Omitting status	IRT			CT						Nu.
	IF	SL	SE	CAID	SMC	CTC	KU	SK	IF			SL	SE	CAID	SMC	CTC	KU	SK			
—	—	—	—	—	—	—	+	+	29	—	+	+	—	—	—	—	+	+	1		
+	—	+	—	+	—	—	+	+	30	—	—	—	+	—	—	—	+	+	2		
—	+	+	+	—	—	—	—	+	31	—	—	—	+	—	—	—	+	+	3		
—	+	—	—	—	—	+	—	+	34	—	+	—	—	—	—	+	—	+	6		
—	—	—	—	—	—	—	—	+	38	—	+	—	—	—	—	—	+	+	7		
—	+	+	—	—	—	+	—	—	41	+	+	—	—	+	—	—	+	+	8		
—	+	+	—	—	—	+	—	—	44	—	+	+	—	—	—	+	—	—	9		
+	—	+	+	—	—	—	+	+	45	—	+	+	—	—	—	—	—	+	11		
+	+	+	+	—	—	—	+	+	46	—	+	+	—	—	—	+	—	—	13		
+	—	+	+	—	—	—	+	+	48	+	+	+	—	—	—	—	+	+	14		
+	+	—	+	—	—	—	+	+	50	—	+	—	—	—	—	—	+	+	18		
—	—	—	—	—	—	—	—	+	51	—	+	+	—	—	—	+	—	—	21		
+	+	+	—	—	+	+	—	—	52	—	+	+	—	—	—	+	—	—	24		
+	+	—	+	—	—	—	+	+	53	—	—	—	+	—	—	—	+	+	25		
+	—	+	+	—	—	—	—	+	55	—	—	—	+	—	—	—	—	+	26		
+	—	—	+	+	—	—	+	+	56	+	+	+	—	—	—	+	+	+	28		

Notes: Level at .05 for all bold values. +: Agree with omitting; –: disagree with omitting; M: mean; SD: standard deviation; SK: skewness; Ku: kurtosis; CTC: corrected item-total correlation; SMC: squared multiple correlation; CAID: Cronbach's alpha if item deleted; SE: Sensitivity; SL: Slop; IF: information function.

The results of the item analysis, according to Classical Theory (CT), were assessed using mean, standard deviation, skewness, kurtosis, standard score of skewness and kurtosis, Corrected Item-Total Correlation (CTC), Squared Multiple Correlation (SMC), Cronbach's Alpha if Item Deleted (CAID) and conceptual analysis of items.

IRT statistics were also computed and assessed using graded response model due to the administration of the Likert rating scale. Unidimensionality and local independence are two assumptions that should be examined before referring to item response model results. Graded response model calculates two types of slope parameters, severity and information for each question.

Slope parameter shows the accuracy and reliability of items in order to measure the construct. The steeper the slope, the larger the size of the corrected item-total correlation coefficient. In other words, the slope represents the discrimination of the item. Severity index indicates the probability that a person with a special amount of the construct has a 50% chance of giving a specific response to the item. Hence, severity index represents the difficulty level of the item. The graded response model for each question, as one number less than the scale points, indicated the severity coefficients. Because the International Religiosity Scale has a six-point Likert Scale, five severity parameters were assessed for each question. In the current study, maximum marginal likelihood estimation method was used to calculate the question parameters. The item discrimination index ranged from -1.03 (item 42) to 2.77 (item 57). In other words, discrimination index of some items is negative or near zero. Such items cannot separate respondents with high religiosity from those with low religiosity. Therefore, it is better to delete these items. The item severity (difficulty) index had a broad range from -3.16 (item 49) to 6.95 (item 3). For interpreting these indexes in IRT, it should be noted that when these indexes are positive and their size is large, it is hard to answer the question.

Information function of items showed that some items had a low level of information in the range of scores. There was an inverse correlation between the amount of scale information and standard errors of items in each level of the construct. Moreover, the larger the standard error, the higher the reliability. Therefore, there was a direct relationship between information and reliability in each level of the construct. This type of reliability is different from reliability coefficients in CT. In the current study, items with negative or near zero information coefficients were candidates to be omitted.

In total, 12 of 57 items were omitted using multiple statistical and theoretical criteria. The 45 remaining items after these analyses were subjected to exploratory factor analysis (EFA). Omitting these items led to the development of a 45-item measure of International Religiosity Scale. After recoding in three stages and aligning the items, the final version of the scale had a Cronbach's alpha of .92, which represents sufficient internal consistency.

Data analysis

In this stage, necessary studies were done on psychometric properties of international data of a 45-item scale. The following measures were taken.

Forming validation and calibration of samples

For making calibration and validation groups, total samples were randomly divided into two equal-size subsamples ($1170/2 = 585$).

EFA on calibration sample

Running EFA on the polychoric correlation matrix, obtained from data of calibration sub-sample, using principal components and promax rotation ($KMO = .93$, Bartlett's test of sphericity $\chi^2 = 10933.73$, $df = 630$, $p < .001$) resulted in maximum agreement with the theoretical structure of ARS.

During several steps, a total of 10 items were removed because they did not contribute to a simple factor structure and failed to meet a minimum criterion of having a primary factor loading of .3 or above, and no cross-loading of .3 or above. A principle-components factor analysis of the remaining 35 items, using direct oblimin rotations was conducted, with one factor explained 60.17% of total variance. The results of the EFA are presented in Table 3.

Table 3. Results of the exploratory factor analysis.

	Items	Factor loading values	Mean	Standard deviation
1	Being good to others is important to my faith	.35	4.31	.96
2	When I attend sacred places, I feel close to God	.64	4.02	1.45
3	Religion would guide human prosperity and happiness in life	.69	4.03	1.39
4	I participate in religious gatherings and ceremonies	.48	3.39	1.48
5	Rationality can substantiate the legitimacy of religions	.47	3.85	1.22
6	I am content with what I have been given by God	.55	4.64	1.07
7	Religious instructions offer quintessential guidance for human beings	.75	4.30	1.17
8	I believe in religious principles	.64	3.90	1.33
9	Religious instructions need to be implemented in every aspect of human life	.69	3.78	1.44
10	Religion has had a positive personal impact in my life	.53	3.90	1.37
11	Religious beliefs produce genuine peace and real happiness	.66	3.79	1.50
12	Faith protects one in the face of worries and anxieties	.47	4.45	1.18
13	Worshiping God will give rise to joy	.68	4.32	1.37
14	Religious instructions need to be followed in various stages of life	.76	3.90	1.45
15	Performing religious duties increases the sense of personal faith	.65	4.12	1.39
16	Anger self-control is a sign of faith	.68	3.77	1.46
17	One tolerates life's hardships because of God's grace	.69	3.96	1.33
18	To study one's Holy Scripture is a religious duty	.44	3.29	1.63
19	Human beings experience prosperity once they practice the prophet's instructions	.56	3.23	1.58
20	Getting along with people is a religious counsel	.59	3.66	1.44
21	There is wisdom behind every religious act	.63	3.79	1.59
22	A religious life is characterised by inner security, composure and happiness	.70	3.83	1.47
23	Religiousness brings meaning to life	.54	4.07	1.33
24	The historical narratives of the Holy Scriptures are real	.37	3.45	1.67
25	Human destiny is influenced by God's will	.63	4.02	1.60
26	Helping an injured animal is a religious duty	.53	3.68	1.45
27	Belief in the Day of Judgment is a sign of faith	.61	4.27	1.34
28	One's success requires one's belief in spiritual realities	.56	3.70	1.37
29	God renders justice to the oppressed	.72	4.19	1.41
30	The miracles cited in the Holy Scriptures are real events	.70	4.00	1.48
31	Prayer is a sign of faith	.50	4.29	1.35
32	A weak faith may give rise to moral corruption	.46	3.93	1.50
33	The fundamental religious instructions apply to all places and to all times	.72	4.14	1.33
34	Religious instructions would lead and illuminate one's life	.76	4.09	1.32
35	Ignoring religious values in the society is upsetting	.63	3.83	1.45

Notes: Scoring and interpretation: total scores were calculated by reverse coding items 9 and 18, and afterwards summing all items. A higher score in ARS associated with greater levels of religiosity.

CFA on the validation sample

To check the validity of the factorial structure obtained from EFA, a CFA was performed on the data from the validation group. In order to assess the fitness of the models, the following indices were used: Chi-square statistic (χ^2), comparative fit index (CFI), goodness-of-fit index (GFI) and root-mean square error of approximation (RMSEA). A rule of thumb for the fit indices is that values equal or greater than .90 are acceptable fit (Kline, 2010). Furthermore, the model may be classified as an acceptable, if the root-mean squared error of approximation (RMSEA) is between .03 and .08 (Kline, 2010).

In order to get an acceptable model fit, item a1 (.33), item a4 (.46), item a5 (.44), item a25 (.45), item a34 (.41), item a54 (.44) and item 44 (.38) that the factor loading values were less than .5 were removed (Kline, 2010), and 28 remaining items' factor loading values were more than .5 (see Figure 1). The model fit indices indicated an acceptable model fit (χ^2 : 1740/346: 5, $p > .01$, GFI: .90, CFI: .91 and RMSEA: .08).

Average variance-extracted (AVE) construct reliability (CR) was used to evaluate the convergent validity and internal consistency. The convergent validity refers to the degree of the variance shared by items designated to evaluate the particular latent construct, which means that items must be strongly interrelated to each other, and constitute only one factor (Hair et al., 2006). For assessing the convergent validity, the size of factor loading for each item must be more than .5, and average variance extracted (AVE) equal or more than .5 shows high convergent validity (Fornell & Larcker, 1981). CR is similar to Cronbach alpha value, and it should be more than .7 to indicate high internal consistency (Hair et al., 2010). The findings indicated that this construct has an acceptable convergent validity (AVE: .62) and an appropriate reliability (CR: .74). In addition, the value of Cronbach's alpha displayed satisfactory internal consistency α .95.

Discussion

The present research aimed to develop and validate the Abrahamic Religiosity Scale (ARS), based on commonalities between Abrahamic religions of Judaism, Christianity and Islam. The process of implementation was designed through six steps: (1) Theoretical studies and extracting shared principles of Abrahamic religions; (2) Preparing an initial item pool and the preliminary version of the scale; (3) Empirical evaluation; (4) Exploratory factor analysis; and (5) Confirmatory factor analysis.

In fact, the first five studies were designed to prepare a psychometrically sound scale in order to be implemented on an international sample in a large-scale study. The international implementation aimed to investigate the psychometric properties of the ARS at international level. Data were gathered from 11 countries with a different distribution of the studied religions. For providing identical conditions, attracting greater participation and obtaining fast and direct access to data, an electronic format was provided and made available online. The CFA showed a one-factor structure with 28 items for. Internal consistency and convergent validity of measure were highly satisfactory.

Generally, test practicality may be reflected by its completion time, implementation method and scoring simplicity. The ARS may be completed in less than 10 minutes. It may also be implemented on individual and group levels. Moreover, the scoring instructions are quite easy. Therefore, the ARS may be considered a practical test of religiosity to be used in research settings. Additionally, the ARS is already validated across a

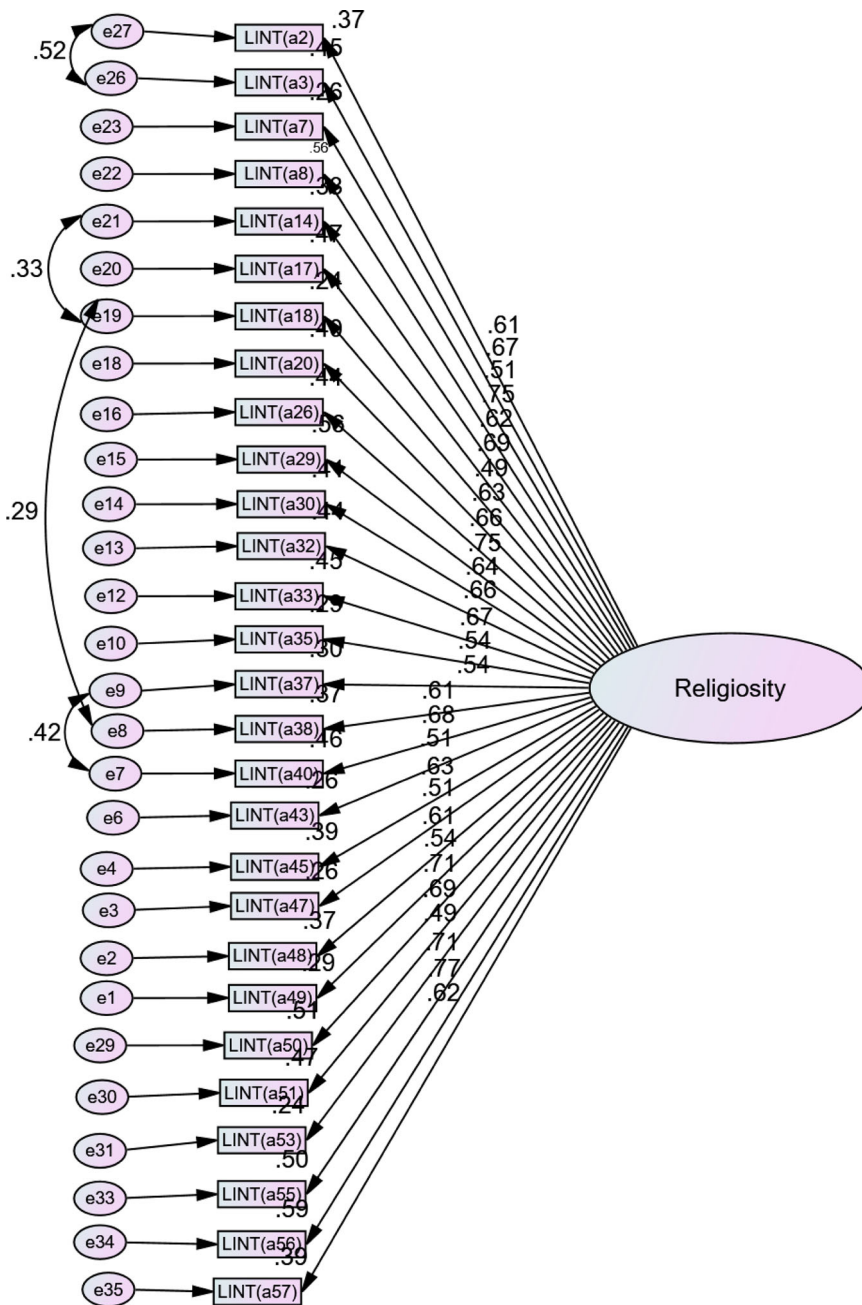


Figure 1. The measurement model for ARS.

number of languages; thus, it can confidently be used in cross-cultural research, as well as national studies regarding religiosity. Finally, the development of the ARS adheres to criteria by Gorsuch (1990).

It is worth noting that ARS was developed solely on the basis of common aspects of Abrahamic religions. Indeed, there are considerable differences among these religions.

The ARS is not intended to measure an intra-religion degree of religiosity. On the contrary, it is designed to highlight the significant commonality of these three religions; as well as providing a psychometrically robust measure of religiosity, which can be used between cultures and countries. Undoubtedly, ARS is designed to capture the common aspects of religious behaviour.

The limitations of the present research are worth noting. First, several steps of the preliminary preparation of the ARS were performed in a single country. Practically, it was almost impossible to perform all six studies in a large-scale cross-cultural scope. Second, many countries and languages were not included in this study. Therefore, standardisation of ARS in different cultural contexts is strongly recommended. Third, the data from the sixth study were gathered online. Fourth, almost all studies were done on student samples. Replicating these studies on different age groups and socio-economic levels may strengthen the generalisability of the findings.

Conclusion

In conclusion, the present research developed and validated ARS using common facets of Abrahamic religions following a cross-cultural approach. Different aspects of reliability and validity were checked in different settings and countries. As a result, the 28-item ARS may be used as a reliable and valid measure of religiosity across cultures.

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No potential conflict of interest was reported by the authors.

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