Structural Equivalence of an Attitude Toward Religion Scale in Mexico, Nicaragua and China*

Equivalencia estructural de una escala de actitud hacia la religión en México, Nicaragua y China

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ABSTRACT

The Attitude toward Catholicism, Judaism, Hinduism, and Islam scales (Francis & Enger, 2002; Francis & Katz, 2007; Francis, Santosh, Robbins, & Vij, 2008; Sahin & Francis, 2002) were adapted for this study into a single scale that measures overall attitudes towards religion. The resulting Attitude toward Religion (ATR) Scale was adapted into both Spanish and Chinese and administered in Mexico (n = 265), Nicaragua (n = 296), and China (n = 460) to a total of 1,021 individuals (59% women, 41% men; M_{age} = 22.4 years, SD = 7.01 years). The scale's structural equivalence (i.e. Does the instrument measure the same construct in each country?) was assessed using Exploratory Factor Analyses and pairwise comparisons. Strong evidence for structural equivalence was provided by the analyses' results, as we obtained a one-dimensional solution (labeled Attitude Toward Religion, ATR) in all three countries and Tucker's Phi test was very close to 1. These findings support the unidimensional solution for attitudes toward religions obtained in previous scales and broaden the scope for these studies in several cultural contexts. Further implications are discussed.

Keywords

religiosity; structural equivalence; cross-cultural psychology; psychometrics

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RESUMEN

Las Escalas de Actitudes hacia el Catolicismo, Judaísmo, Hinduismo e Islam (Francis & Enger, 2002; Francis & Katz, 2007; Francis, Santosh, Robbins, & Vij, 2008; Sahin & Francis, 2002) fueron adaptadas en este estudio a una sola escala que evalúa actitudes globales hacia la religión. La escala resultante de Actitudes Hacia la Religión (AHR) fue adaptada a español y chino y fue administrada en México (n=265), Nicaragua (n=296) y China (n=460) a una muestra total de 1021 individuos (59% mujeres, 41% hombres; Medad=22.4 años, DE=7.01 años). La equivalencia estructural de la escala (¿El instrumento mide el mismo constructo en cada país?) fue evaluada utilizando Análisis Factoriales Exploratorios y comparaciones por pares. Los resultados muestran evidencia sólida de equivalencia estructural, ya que se obtuvo una solución unidimensional (a la que se llamó Actitud Hacia la Religión) en los tres países y el valor de Phi de Tucker fue muy cercano a 1. Estos hallazgos apoyan la solución unidimensional de actitudes hacia la religión obtenida por investigaciones previas y amplían el alcance de estos estudios en diferentes contextos culturales. Otras implicaciones también se discuten a profundidad.

Palabras clave

religiosidad; equivalencia estructural; psicología trans-cultural; psicometría

Religiosity is a complex multidimensional construct. Attempts to assess it have resulted in conflicting models and a wide range of instruments measuring different dimensions of religiosity (Hill & Hood, 1999). In regards with this problem, Francis and Katz (2007) proposed that the attitudinal dimension of religiosity is preferable to others (e.g. affiliation, practice, or beliefs) for constructing an integrated series of studies. The attitudinal dimension is capable of making comparisons both within and between communities, and of appropriate comparisons across wide age ranges. Besides, it is more stable and deep-seated within an individual, less likely to be contaminated by personal or contextual factors, and adequately assessed by Likert scales (Francis et al., 2008).

As well as being multidimensional, religiosity is multifaceted in the sense of including many different doctrines (e.g. Christianity, Hinduism, etc.). Francis (1978) argued that the attitudinal dimension of religion can be best assessed through the specific tradition by which it is expressed. He thus created a scale measuring attitude toward Christianity and, later, one for attitudes toward Judaism (Francis & Katz, 2007), towards Islam (Francis et al., 2008), and towards Hinduism (Sahin & Francis, 2002). We merged these scales into a single one in order to test the liability of a general scale of attitude toward religion (i.e. not doctrine-specific) which would render empirical cross-cultural studies of religiosity possible.

Cross-cultural studies are non-experimental in nature, since participants cannot be randomly assigned to cultures, nor can the compared groups be matched on background variables (Van de Vijver & Leung, 2011). As a consequence, comparing measurements across cultural groups is prone to bias. Van de Vijver and Leung (2011) therefore argued that a main concern of cross-cultural research should be maximizing the validity of its inferences, and that establishing cross-cultural equivalence and suppressing bias are crucial to such task.

The main objective of the present study is to establish whether the Attitude toward Religion Scale has equivalence of measure at a structural level. In other words, the goal is to find whether the construct measured by this scale is the same across the cultural groups studied, or whether it only overlaps partially.

Evidence for such equivalence was assessed across a group from Mexico, one from Nicaragua, and another from China. In Mexico, 82.7% of the population is Catholic, 9.7% is protestant, and 4.7% is atheist (Instituto Nacional de Estadística y Geografía, 2010). As for Nicaragua, 73% of the population is Catholic, while 25% is protestant, and 8.4% is atheist (Instituto Nacional de Información de Desarrollo, 2005). China has no nationally representative surveys regarding the religious affiliation of its population. However, a survey (The Pew Global Attitudes Project and the Committee of 100, 2007) carried out in urban populations reports 14% of Chinese adults are religiously affiliated (12% Buddhist, 1% Catholic, 1% Christian, < 1% Muslim, < 1% Taoist). Such demographical data suggests that Mexico and Nicaragua may have similar religious backgrounds, whereas China's is markedly dissimilar. Comparing samples from these three groups is thus relevant for assessing the universality of the attitude toward religion construct.

Given the satisfactory psychometric properties of L. J. Francis' doctrine-specific measures of religiosity (Francis & Enger, 2002), our hypothesis is that the Attitude toward Religion Scale will achieve to provide evidence of structural equivalence across the three cultural groups studied.

Method

Participants

The total convenience sample comprised 1,021 subjects (59% women, 41% men) from México (n = 265), Nicaragua (n = 296) and China (n = 460). The ages ranged from 16 to 69 years and the mean was 22.4 years (SD = 7.01), which reflects an overrepresentation of students (75.9% of the sample). In terms of educational level, 72.3% reported having finished or currently studying university, 9.0% middle school, 7.5% high school, 7.1% trade school, 2.6% postgraduate school, 0.4% elementary school, and 0.4% no formal education.

Instruments

Attitude toward Religion Scale. Adapted from the Attitude toward Christianity, Judaism, Hinduism, and Islam scales (Francis & Enger, 2002; Francis & Katz, 2007; Francis et al., 2008; Sahin & Francis, 2002). Based on common dimensions from previous scales (e.g. God, bible, prayers, church, synagogues, religion, church attendance, among others), the Attitude toward Religion Scale consists of 17 items that evaluate an affective response toward God (e.g. God helps me carry on a better life), toward religious practices or symbols (e.g. I think the religious scripts are antiquated), and toward religious beliefs in general (e.g. My religious beliefs truly shape the global scope of my life). The scale was structured in a five point Likert scale format (1 = strongly disagree to 5 = strongly agree), and was adapted to both Spanish and Chinese using the back-translation method proposed by Brislin (1970) and Willgerodt, Kataoka-Yahiro, Kim, and Ceria (2005). Francis and Enger (2002), Francis and Katz (2007), Francis et al. (2008), and Sahin and Francis (2002) have previously reported good psychometric properties for each of their unidimensional scales, with Cronbach's Alpha values above 0.85 and within a range of 30-60% of total explained variance.

Procedure

With an auto-applicable format, the instrument was handed out throughout schools, work offices and homes, either in individual or group sessions. It was administered within a battery containing other psychological scales, intended for different studies. The respondents agreed to participate voluntarily, anonymously, and received no economical compensation for doing so. The average time for completion was approximately 10 minutes.

Statistical Analyses

All analyses were conducted using the SPSS statistical program (2010). The descriptive statistics and reliability coefficients were calculated in order to gain insights regarding the components of the instrument. As for assessing structural equivalence, Exploratory Factor Analyses (EFA) and the Tucker's congruence coefficient were conducted. Structures found in the factorial matrices were target rotated and Tucker's congruence coefficients per scale and per factor were carried out to evaluate their similarity by pairwise comparisons.

Results

The descriptive statistics and Cronbach's Alpha (α) are shown in Table 1. The mean of the full samples was 55.49 (SD= 15.77). A one-way ANOVA was conducted to test the differences between the group's means and its results show a statistically significant difference (F [2, 949] = 304.55; p < 0), being Nicaragua the highest (M = 6.6, SD = 13.31) and China de lowest (M = 46.28, SD = 10.6).

The Alpha coefficient for the total sample was 0.94. According to Cohen (1988), J. Gliem and R. Gliem (2003), and George and Mallery (2003), reliability coefficients of 0.60 or higher are satisfactory for comparisons within groups. All three group's alpha coefficients were therefore satisfactory.

Table 2 shows the factor loadings for the EFA carried out. The EFA was fixed to look for one fac-

TABLE 1
Descriptive statistics and Cronbach's Alpa for the ATR Scale

Group	n	M	SD	Skewness	Kurtosis	a
Mexico	244	56.49	14.16	-0.17	-0.09	0.94
Nicaragua	269	69.60	13.31	-1.03	0.81	0.92
China	439	46.28	10.60	0.33	1.13	0.88

Note: ATR= Attitude toward Religion; α = Cronbach Alpha.

Source: own work

Table 2

Exploratory Factor Analysis for the Attitude Toward Religion (ATR) Scale, separated by group

	Group		
Item	Mexico	Nicaragua	China
God helps me carry on a better life	0. 851	0. 792	0. 677
I enjoy learning about God	0. 811	0. 777	0. 718
God means nothing to me	0. 674	0. 541	0. 467
I think God helps people	0. 810	0. 723	0. 738
Prayers help me a lot	0. 805	0. 743	0. 759
I think prayers are a good thing	0. 850	0. 754	0. 606
I think the religious scripts are antiquated	0. 458	0. 630	0. 424
God is very real for me	0. 827	0. 748	0. 713
I think praying is useless	0. 731	0. 684	0. 348
Religion helps me carry on a better life	0. 685	0. 594	0. 698
I find it difficult to believe in God	0. 724	0. 692	0. 543
I think religious rituals are a waste of time	0. 558	0. 613	0. 360
It is important for me to practice my religion/spiritual beliefs	0. 715	0. 628	0. 656
Religion is relevant in modern world	0. 506	0. 520	0. 483
I think attending a temple (Church, Synagogue, Mesquite) is a waste of time	0. 654	0. 666	0. 390
My religious beliefs truly shape the global scope of my life	0. 662	0. 625	0. 601
Spirituality is important in my life	0.554	0.737	0.710
% explained variance	50.24%	46.12%	35.78%

Note: All items were adapted from the Attitude toward Christianity (Francis & Enger, 2002), Attitude toward Judaism (Francis & Katz, 2007), Attitude toward Hinduism (Francis et al., 2008), and the Attitude toward Islam (Sahin & Francis, 2002) into the ATR Scale in order to measure overall attitudes toward religion.

Source: Own work

tor, because the attitudinal dimension of religiosity is unidimensional. The group's factor analyses also need to have the same number of factors in order to be target rotated and subjected to the Tucker's congruence test. The results of the EFA support the decision to fix for one factor, since all but three factor loadings (items 9, 12, and 15 for China's group) were under 0.40 and therefore non-significant.

In regards with Tucker's congruence coefficient, as seen on Table 3, the values ranged from 0.98 to 0.99. Values that are higher than 0.95 indicate factorial similarity, and values lower than 0.90 correspond to non-negligible differences in factorial structure (Lorenzo-Seva & ten Berge, 2005; Van de Vijver & Poortinga, 1994). This means the analyses' results provide strong evidence of structural equivalence for the ATR scale.

Table 3

Tucker's Phi Test

Pairwise Comparison	Tucker's Phi Coefficient
Mexico-Nicaragua	0.99
Mexico-China	0.98
Nicaragua-China	0.99

Note: ATR= Attitudes toward Religion.

Source: own work

Conclusion

In conclusion, the Attitude toward Religion Scale that we built from previous scales can be regarded as a structurally equivalent measure of religiosity across cultures as different as Mexico, Nicaragua, and China. This implies that the construct of religiosity that the ATR scale targets appears to be universal, and cross-cultural. This is important because in cross-cultural studies the construct measured must be equivalent for the comparison to be meaningful (Van de Vijver & Poortinga, 1997; Van de Vijver & Tanzer, 2004), and specifically about religious assessments, measures have remained culturally specific (Francis & Katz, 2007); therefore, our findings broaden the scope for religious studies.

Francis (1978, 2009) argued that the attitudinal dimension of religiosity is best measured using scales specific to the doctrine in which it is expressed, and she therefore created different scales toward different religions. Our goal was to develop a scale that evaluated an overall attitude towards religion, and although it was developed considering Mexico and Nicaragua's Catholic background, our construct remained stable even in a totally different religious-cultural context such as China. Our findings propose that this construct of Attitude Toward Religion may be adequately assessed throughout diverse cultures without the need for the measuring instrument to be adapted to the specific religious doctrine of the studied group.

Our psychometric evidence shows that the ATR Scale maintains certain stability within different cultural contexts; these psychometric properties enhance the scale's usefulness and its attractiveness to students and scholars worldwide, as suggested by Karam, Sekaja, and Geldenhuys (2016). However, although Tucker's congruence coefficient provided evidence for the structural equivalence of the instrument, it is important to note that before valid cross-cultural comparisons can be made, this instrument needs to be tested for the highest level of equivalence: scalar equivalence. Only then can the scores obtained in different cultures be directly compared with one another.

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