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Internal consistency reliability and construct validity of the Astley-Francis Scale of Attitude
toward Theistic Faith Revised among Muslim, Christian, and religiously unaffiliated
secondary school students in England

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Abstract

This paper explores the psychometric properties of the seven-item Astley-Francis Scale of Attitude toward Theistic Faith among Muslim secondary school students (N = 1,146) in England, surveyed alongside Christian (N = 575) and religiously unaffiliated (N = 361) students, in a sample in which Muslim students comprise the majority. The data demonstrated a satisfactory level of internal consistency reliability among all three groups, although less good among the Muslim students: Muslim ($\alpha = .79$), Christian ($\alpha = .92$), and religiously unaffiliated ($\alpha = .86$). The shorter five-item Astley-Francis Scale of Attitude toward Theistic Faith Revised provided a higher level of internal consistency reliability across all three groups (Muslim ($\alpha = .85$), Christian ($\alpha = .94$), and religiously unaffiliated ($\alpha = .95$) and is commended for further use.

Key words: Religious affect, Muslim students, psychometrics, Astley-Francis Scale of Attitude toward Theistic Faith

Introduction

Francis (1978a, 1978b) set out a research agenda designed to position the affective dimension of religion at the heart of a programme of research concerned with establishing the correlates, antecedents and consequences of individual differences in religiosity during childhood and adolescence. Initially the scope of the research programme was limited by the two constraints imposed by the measure of the affective dimension of religion proposed by Francis (1978a, 1978b), namely the Francis Scale of Attitude toward Christianity. These constraints limited the research to Christian and post-Christian English-speaking societies. During the 1980s and 1990s research using the Francis Scale of Attitude toward Christianity became well established in the UK, the USA and Australia (see Francis, Lewis, Philipchalk, Brown, & Lester, 1995) and had begun to establish a body of knowledge linked by the same operationalisation of the affective dimension of religion (see Kay & Francis, 1996). Subsequently, this body of research was extended by the translation of the Francis scale of Attitude toward Christianity into a number of other languages, including: Arabic (Munayer, 2000), Chinese (Francis, Lewis, & Ng, 2002; Tiliopoulos, Francis, & Jiang, 2013), Czech (Francis, Quesnell, & Lewis, 2010), Dutch (Francis & Hermans, 2000), Estonian (Elken, Francis, & Robbins, 2010), French (Lewis & Francis, 2003, 2004), German (Francis & Kwiran, 1999; Francis, Ziebertz, & Lewis, 2002), Greek (Youtika, Joseph, & Diduca, 1999), Italian (Crea, Baiocco, Ioverno, Buzzi, & Francis, 2014), Norwegian (Francis & Enger, 2002), Portuguese (Ferreira & Neto, 2002), Romanian (Francis, Ispas, Robbins, Ilie, & Iliescu, 2009), Serbian (Flere, Francis, & Robbins, 2011), Slovakian (Lewis, Adamovová, & Francis, 2008), Slovenian (Flere, Klanjsek, Francis, & Robbins, 2008), Spanish (Campo-Arias, Oviedo, Dtaz, & Cogollo, 2006), Swedish (Eek, 2001), and Welsh (Evans & Francis, 1996; Francis & Thomas, 2003).

In order to extend this research tradition within Islamic contexts Sahin and Francis

(2002) reported the development of the Sahin-Francis Scale of Attitude toward Islam. The items of the Francis Scale of Attitude toward Christianity were carefully scrutinised and debated by several Muslim scholars of Islam until agreement was reached on 23 Islam-related items which mapped closely onto the area assessed by the parent instrument. The psychometric properties of the new instrument of the Sahin-Francis Scale of Attitude toward Islam were assessed on 381 Muslim adolescents in England. Subsequently the instrument was tested among 1,199 adolescents in Kuwait (Francis, Sahin, & Al-Ansari, 2006; Francis, Sahin, & Al-Failakawi, 2008), among 150 students in Pakistan (Khan & Watson, 2006), among 174 students in Pakistan (Musharraf, Lewis, & Sultan, 2014), among 729 students in Pakistan (Hamid, Robbins, Nadeem, & Khan, 2016), among 189 students in Malaysia (Francis, Tekke, & Robbins, 2016), and among 293 students in Turkey (Öztürk, Meral, & Yilmaz, 2017).

While the Sahin-Francis Scale of Attitude toward Islam offers a good strategy for exploring the correlates, antecedents and consequences of individual differences in religious affect among Muslim adolescents within Muslim-majority cultures, it is not ideal for researching Muslim secondary school students in England when these students are being surveyed alongside Christian and religiously-unaffiliated students within the same classrooms. It is in such contexts that the Astley-Francis Scale of Attitude toward Theistic Faith (Astley, Francis, & Robbins, 2012) may prove useful since the same instrument should be accessible equally to Muslim, Christian and religiously-unaffiliated students.

In the foundation paper for the Astley-Francis Scale of Attitude toward Theistic Faith, Astley, Francis, and Robbins (2012) suggested that the same set of items should make it possible to access the attitudinal dimension of religion across the major theistic faith traditions. Building on the short seven-item form of the Francis Scale of Attitude toward Christianity, Astley, Francis, and Robbins (2012) identified seven items concerned with

affective responses to God, places of worship, and prayer that they regarded as conceptually appropriate within a Christian context, an Islamic context, and a post-Christian context. The psychometric properties of the new instruments were assessed on a sample of 284 16- to 18-year-old students in England. The seven items generated an alpha coefficient of .95.

In a second study, Francis, Brockett, and Village (2013) undertook a more rigorous testing of the Astley-Francis Scale of Attitude toward Theistic Faith among separate samples of Christian, Muslim, and religiously unaffiliated students by administering the instrument in areas of England in which these three groups were clearly visible. In this study data were provided by 4,353 students between the ages of 11 and 16 years attending schools in three areas of northern England: Blackburn, Kirklees, and York, among whom 1,367 self-identified as religiously unaffiliated, 1,984 as Christian, 817 as Muslim, 126 as belonging to another religion, and the remaining 59 had failed to answer the religious affiliation question. Francis, Brockett, and Village (2013) reported three separate analyses among the religiously unaffiliated, the Christian, and the Muslim participants. The instrument performed well among all three groups, reporting alpha coefficients of .93 among the Christians, .88 among the religiously unaffiliated, and .77 among the Muslims. The lower alpha coefficient among the Muslims was largely a consequence of the two negatively phrased items.

In a third study, Francis and Lewis (2016) examined the psychometric properties of the Astley-Francis Scale of Attitude toward Theistic Faith among a sample of 10,678 13- to 15-year-old students from across the United Kingdom, exploring the performance of the scale independently among three groups: 3,711 religiously unaffiliated students, 6,649 Christian students, and 318 Muslim students. The instrument performed well among all three groups, reporting alpha coefficients of .92 among the Christians, .88 among the religiously-unaffiliated, and .91 among the Muslims.

Research question

While Francis, Brockett, and Village (2013) reported a lower level of internal consistency reliability for the Astley-Francis Scale of Attitude toward Theistic Faith among Muslim students ($\alpha = .77$), Francis and Lewis (2016) reported a high level of internal consistency reliability consistent with Christian students ($\alpha = .91$). This discrepancy deserves further investigation. This discrepancy may be related to the different sampling strategies employed by the two studies. Francis, Brockett, and Village (2013) targeted schools in which there were relatively high concentration of Muslim students, a context in which it may be easier for Muslim students to maintain a high level of religiosity and sensitivity to religious issues. The data used by Francis and Lewis (2016) was derived from schools in which Muslim students were a small minority, a context in which it may be less easy for Muslim students to maintain a high level of religiosity and sensitivity to religious issues. The discrepancy between the two alpha coefficients could be accounted for by the poorer performance of the two negatively voiced items within the instrument and the reluctance of devout Muslim students to agree with statements that may seem disrespectful of religion.

Against this background the aim of the present study is to replicate and extend the situation described by Francis, Brockett, and Village (2013) and to explore the psychometric properties of the Astley-Francis Scale of Attitude toward Theistic Faith in a context in which Muslim students were in the majority, alongside Christian and religiously-unaffiliated students.

Method

Procedure

Secondary schools in several parts of England with significant proportions of Muslim students were invited to take part in the project (from Gloucestershire, Greater Manchester, Lancashire, London, Warwickshire, and West Midlands). Within the participating schools questionnaires were administered by teachers under examination conditions to students

throughout the year-seven, year-eight, and year-nine classes (between the ages of 11 and 14 years). Students were assured of anonymity and confidentiality and given the opportunity not to participate in the project. A total of 2,388 students participated in the study.

Measures

Religious attitude was assessed by the Astley-Francis Scale of Attitude toward Theistic Faith (Astley, Francis, & Robbins, 2012). This scale comprises the following seven items: 'I find it hard to believe in God'; 'Prayer helps me a lot'; 'I think going to a place of worship is a waste of my time'; 'I know that God is very close to me'; 'God helps me to lead a better life'; 'I know that God helps me'; and 'God means a lot to me'. Responses to each item were recorded on a five-point scale: disagree strongly (1), disagree (2), not certain (3), agree (4), and agree strongly (5). Negative items were reverse coded to compute the attitude scale score. Scores can range between 5 and 35, with higher scores indicating a more positive attitude to theistic faith.

Sex was recorded on a dichotomous variable: male (1) and female (2).

Age was recorded in terms of school year: year seven (1), year eight (2), and year nine (3).

Religious practice was assessed by the question, 'How often do you pray?' recorded on a five-point scale: never (1), occasionally (2), at least once a month (3), at least once a week (4), and nearly every day (5).

Participants

Of the 2,388 students who participated in the study, full data were provided by 1,146 who self-identified as Muslim, 575 who self-identified as Christian, and 361 who self-identified as religious unaffiliated. Among the Muslims, 25% were male and 75% female; 41% were in year seven, 31% in year eight, and 28% in year nine; 70% prayed nearly every day, 9% at least once a week, 1% at least once a month, and 16% less often than once a

month, leaving 4% who never prayed. Among the Christians, 44% were male and 56% female; 37% were in year seven, 31% in year eight, and 32% in year nine; 31% prayed nearly every day, 17% at least once a week, 6% at least once a month, and 30% less often than once a month, leaving 16% who never prayed. Among the religiously unaffiliated, 45% were male and 55% female; 37% were in year seven, 22% in year eight, and 41% in year nine; 1% prayed at least once a week, 1% at least once a month, and 5% less often than once a month, leaving 93% who never prayed.

Results

- insert tables 1 and 2 about here -

The first stage in exploring the properties of the seven-item Astley-Francis Scale of Attitude toward Theistic Faith was to report the internal consistency reliability (alpha), the factor structure, and the mean scale score and standard deviation for the three groups of students separately (Muslim, Christian, and religiously unaffiliated). The data presented in table 1 demonstrate higher levels of religious affect among Muslim students than among Christian students, and the lowest level of religious affect among religiously-unaffiliated students. These findings support the construct validity of the instrument. These data also report a lower level of internal consistency reliability among the Muslim students. The reason underpinning these poorer alpha coefficients is illuminated by the factor structure of the instruments (see table 2). While among the Christian students, one strong principle component emerged (accounting for 68% of the variance), among the Muslim students a second factor emerged, attracting loadings from the two negatively phrased items, leaving the first principle component accounting for 50% of the variance, and the second component accounting for 21% of the variance. Table 2 also demonstrates that the negatively voiced items were identified by the second factor among religious unaffiliated students, where the first and second factors accounted for 64% and 16% of the variance respectively.

- insert tables 3 and 4 about here -

In order to generate further insight into the performance of the seven items comprising the Astley-Francis Scale of Attitude toward Theistic Faith, table 3 examines the correlations between the individual items and the sum of the other six items among the three groups of students, and table 4 examines the item endorsement (presented in terms of the sum of the agree and agree strongly responses). The correlations between the individual items and the sum of the other items also draw attention to the poorer performance of the negatively voiced items among both the Muslim students and the religiously unaffiliated students. The item endorsements draw attention to the way in which the individual items contribute to the overall scale scores recorded by the three groups of students. For example, while 86% of the Muslim students report that prayer helps them a lot, the proportions fall to 50% among the Christian students and to 5% among the religiously-unaffiliated students.

- insert table 5 about here -

In order to explore further the construct validity of the Astley-Francis Scale of Attitude toward Theistic Faith, table 5 presents the correlations between the scale scores and three variables that are generally reported as correlated with religious affect, namely sex (Francis & Penny, 2014), age (Kay & Francis, 1996), and personal prayer (Francis & Lewis, 2016). The data presented in table 5 support the significant decline in religious affect scores with age, as predicted by Kay and Francis (1996), and support the significant positive association between personal prayer and religious affect, as predicted by Francis and Lewis (2016), but do not support the view that females record significantly higher scores of religious affect than males, as predicted by Francis and Penny (2014).

- insert table 6 about here -

Given the clear evidence that the two negative items within the seven-item **Astley-Francis** Scale of Attitude toward Theistic Faith fail to behave consistently among the three

groups of Muslim students, Christian students, and religiously-unaffiliated students, table 6 recalculated the internal consistency reliability (alpha) and the correlations between the individual items and the sum of the other four items for a shorter five-item form of the Astley-Francis Scale of Attitude toward Theistic Faith comprising only the positively voiced items. These data demonstrate improved alpha coefficients among all three groups of students (Muslim, Christian, and religiously unaffiliated) and higher correlations between the individual items and the sum of the other four items. On the basis of these findings the shorter five-item Astley-Francis Scale of Attitude toward Theistic Faith Revised may be commended for future research in which it is intended to sample Muslim students in England in classrooms alongside Christian students and religiously-unaffiliated students.

Conclusion

Building on a research tradition established by Francis (1978a, 1978b) designed to stimulate a body of research concerned with the correlates, antecedents and consequences of individual differences in religious affect in Christian and post-Christian societies, and measured by the Francis Scale of Attitude toward Christianity (Francis, Lewis, Philipchalk, Brown, & Lester, 1995) and extended to Islamic societies by Sahin and Francis (2002) through the Sahin-Francis Scale of Attitude toward Islam and extended to Jewish societies by Francis and Katz (2007) through the Katz-Francis Scale of Attitude toward Judaism, Astley, Francis, and Robbins (2012) developed the Astley-Francis Scale of Attitude toward Theistic Faith designed to function across the three Abrahamic religions. The present study was designed to test the psychometric properties of the Astley-Francis Scale of Attitude toward Theistic Faith among religiously active Muslim students attending schools in England alongside Christian students and religiously unaffiliated students, a context in which the Sahin-Francis Scale of Attitude toward Islam may have been unhelpful.

Previous research on the psychometric properties of the Astley-Francis Scale of Attitude toward Theistic Faith among Muslim students in England (Francis, Brockett, & Village, 2013) and in the UK (Francis & Lewis, 2016) had produced conflicting findings with the former study reporting less satisfactory psychometric properties among Muslim students and the latter study reporting comparable psychometric properties among Muslim students. The theory advanced to account for this discrepancy suggested that the instrument may perform less well among religiously devout Muslim students who may be particularly reluctant to agree with negatively voiced items on the grounds that such items may be offensive to religion. The present study that included a high number of religiously devout young Muslim, as indicated by the high mean score of religious affect, provides support for this theory, as demonstrated by the factor solution showing the two negatively-voiced items performing somewhat independently of the five positively-voiced items by loading on a second factor.

The finding that negatively-voiced items may be problematic within Likert scales is by no means new. The classic wisdom of scale construction was that negatively-voiced items were important to guard against acquiescent behaviour and against response setting (see Anastasi, 1982; Mehrens & Lehmann, 1983; Nunnally, 1978; Rossi, Wright, & Anderson, 1983). Other approaches to scale construction have both questioned the need to guard against such behaviours and documented the potentially damaging consequences of including negatively-voiced items (Barnette, 1996, 2000, 2001; Knight, Chisholm, Marsh, & Godfrey, 1988; Melnick & Gable, 1990; Pilotte & Gable, 1990; Roszkowski & Soven, 2010; Schriesheim, Eisenbach, & Hill, 1991; Schriesheim & Hill, 1981; Suárez-Alvarez et al, 2018). More specifically, other relatively recent studies have questioned the functioning of the negatively-voiced items within the Sahin-Francis Scale of Attitude toward Islam among students in Pakistan (Lewis & Musharraf, 2016; Musharraf & Lewis, 2016; Musharraf,

Lewis, & Sultan, 2014) and the Francis Scale of Attitude toward Christianity among students in Columbia (Campo-Arias & Ceballos-Ospino, 2020; Ceballos, Suescun, Oviedo, Herazo, & Campo-Arias, 2015).

The recommendation that emerges from the data presented in the present study is that the shorter five-item Astley-Francis Scale of Attitude toward Theistic Faith Revised may offer a more reliable measure of religious affect for use in research among Muslim students when these students are being studied within classrooms or other contexts that comprise not only religiously devout Muslim students, but also Christian students and religiously unaffiliated students.

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Table 1

Scale properties among Muslim, Christian, and religiously-unaffiliated students

Group	N	Alpha	Factor %	Mean	SD
Muslim	1146	.79	50.0	31.7	3.9
Christian	575	.92	68.2	26.3	6.7
No religion	361	.88	64.0	14.0	5.8

Table 2

Factor analysis (unrotated)

	Muslim		Christian		No religion	
	F1	F2	F1	F2	F1	F2
I find it hard to believe in God*		.77	.69			.69
Prayer helps me a lot	.73		.84		.84	
I think going to a place of worship is a waste of my time*		.77	.61			.74
I know that God is very close to me	.68		.89		.90	
God helps me to lead a better life	.85		.89		.94	
I know that God helps me	.84		.91		.94	
God means a lot to me	.80		.91		.91	
% of variance	49.7%	20.9%	68.2%		64.0%	16.1%

Note: * these items are reverse coded

Table 3

Item rest of scale correlations among Muslim, Christian, and religiously-unaffiliated students

	Muslim	Christian	No religion
I find it hard to believe in God*	.42	.62	.41
Prayer helps me a lot	.55	.76	.72
I think going to a place of worship is a waste of my time*	.43	.53	.37
I know that God is very close to me	.46	.81	.80
God helps me to lead a better life	.67	.82	.85
I know that God helps me	.65	.85	.86
God means a lot to me	.63	.85	.82

Note: * these items are reverse coded

Table 4

Item endorsement among Muslim, Christian, and religiously-unaffiliated students

	Muslim %	Christian %	No religion %
I find it hard to believe in God	10	25	67
Prayer helps me a lot	86	50	5
I think going to a place of worship is a waste of my time	8	17	47
I know that God is very close to me	77	64	6
God helps me to lead a better life	93	66	8
I know that God helps me	92	67	7
God means a lot to me	96	70	7

Note: % percentage of students agreeing or agreeing strongly with the item

Table 5

Scale score correlations with sex, age and religious practice among Muslim, Christian and religiously unaffiliated students

	Sex	Age	Prayer
Muslim	.01	-.15***	.29***
Christian	.08	-.19***	.52***
No religion	.07	-.20***	.25***

Note: *** $p < .001$

Table 6

Astley-Francis Scale of Attitude toward Theistic Faith Revised: Item rest of scale correlations

	Muslim	Christian	No religion
Prayer helps me a lot	.60	.78	.78
I know that God is very close to me	.59	.86	.87
God helps me to lead a better life	.76	.86	.91
I know that God helps me	.75	.88	.91
God means a lot to me	.67	.85	.87
alpha	.85	.94	.95
