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Questioning the use in a Muslim society of an IPIP measure of the Big Five Factors: a problem with reverse-coded items?

Nafees Akhtar [a,b,c], Leslie J. Francis [d,e], Alison B. Sailer [f], Ursula McKenna [e] and Syeda Salma Hasan [g]

[a]Centre for Education Studies, University of Warwick, Coventry, UK; [b]Department of Psychology, Government College University, Lahore, Pakistan; [c]Department of Applied Psychology, Islamia University Bahawalpur, Bahawalpur, Pakistan; [d]Centre for Educational Development, Appraisal and Research (CEDAR), University of Warwick, Coventry, UK; [e]World Religions and Education Research Unit, Bishop Grosseteste University, Lincoln, UK; [f]College of Life and Health Sciences, Brunel University, London, UK; [g]Department of Psychology, Government College University, Lahore, Pakistan

ABSTRACT

This paper examines within a Muslim society the internal consistency reliability of an established IPIP measure of the Five Factor Model of personality drawing on the International Personality Item Pool. The specific hypothesis under investigation concerned the performance of the negatively-voiced items included within the measure, testing whether these items (that may imply disrespect for self) detract from the unidimensionality of the five factors. Data provided by 370 young adults between the ages of 18 and 26 years who were born in Punjab and who had lived there since their birth supported this hypothesis. The recommendation is that further work is now required to revisit the IPIP to source items to construct and test a new IPIP measure of the Five Factor Model of personality specifically designed for use in Muslim societies.

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Introduction

Classic texts on the construction of psychological tests routinely commended the inclusion of negatively-voiced items to guard against response setting against acquiescence, and against careless responses (see for example, Anastasi, 1982; Edwards, 1970; Mehrens & Lehmann, 1983; Nunnally, 1978; Rossi et al., 1983). More recently this advice has been questioned and close attention given to the performance of negatively-voiced items within established psychological tests (see for example, Barnette, 2000, 2001; Roszkowski & Soven, 2010; Suárez-Alvarez et al., 2018). Negatively-voiced items have been found to be problematic in two ways: the correlation between individual items and the sum of the other items within a given scale tend to be lower for negatively-voiced items than is the case for positively-voiced items; factor analysis tends to draw negatively-voiced items together as a distinctive factor. Both of these characteristics are problematic since they undermine the homogeneity and unidimensionality of the proposed measure. In other

CONTACT Leslie J. Francis leslie.francis@warwick.ac.uk

words the reliability of the measure is reduced and in line with generally accepted psychometric theory an unreliable measure cannot be regarded as a valid measure.

Within this context, one specific strand of research has focused on the performance of negatively-voiced items within measures of religiosity employed in predominantly Muslim societies. For example, one set of studies has given attention to the negatively-voiced items within the Sahin-Francis Scale of Attitude toward Islam, as proposed by Sahin and Francis (2002), and found those items to be problematic among religiously engaged Muslim participants (Francis et al., 2006, 2016, 2022; Musharraf et al., 2014). A second set of studies has given attention to the negatively-voiced items within the Astley-Francis Scale of Attitude toward Theistic Faith (Astley et al., 2012) and found these items to be problematic among religiously engaged Muslim participants (Erken & Francis, 2021; Francis & Lewis, 2016; Francis et al., 2013).

A second strand of research has begun to explore the performance of negatively-voiced items within psychometric assessment of perceptions of other people within Muslim societies, in which the criticism of others may be seen to be disrespectful and religiously offensive. In an initial study, Akhtar et al. (2023) examined the performance of negatively-voiced items within the Parental Attachment Questionnaire proposed by Kenny (1987). These items were found to be problematic among a sample of Muslim university students in Pakistan.

A third strand of research has begun to explore the performance of negatively-voiced items within psychometric assessment of perceptions of the self within Muslim societies, in which the criticism of the self may be seen to be disrespectful and religiously offensive. In an initial study, Akhtar et al. (2022) examined the performance of negatively-voiced items within the 18-item measure of psychological wellbeing proposed by Ryff and Keyes (1995). These items were found to be problematic among a sample of Muslim students in Pakistan.

It is against this background that the present study was designed to explore the performance in a predominantly Muslim society of the negatively-voiced items in the 50-item measure of the Five Factor Model of personality proposed by the International Personality Item Pool and intended to map onto the constructs defined by Goldberg (1992) and Johnson (2014).

Introducing the Five Factor Model

The Five Factor Model (FFM) of personality or the Five Factor Approach (FFA), proposes the existence of a handful of core personality traits linked to behavioural patterns which vary between individuals while remaining relatively stable across the lifespan (McCrae & Costa, 1987). Although early research on personality suggested approximately five primary traits (McDougall, 1932), an initial semblance of the Five Factor Model was advanced by Tupes and Christal (1961). During the early 1990s growing consensus emerged on accepting the five orthogonal trait dimensions as constituting an adequate taxonomy of personality characteristics (Digman, 1990). This growing consensus was consolidated by Goldberg (1992) in the publication of markers for the five factors and by Costa and McCrae (1992) in the publication of *The NEO PI-R Professional Manual*. Costa and McCrae (1992, p. 9) characterised the five factors of extraversion, openness, agreeableness, conscientiousness, and neuroticism in the following ways:

- High scorers on extraversion are outgoing, active, and high-spirited. They prefer to be around people most of the time. Low scorers on extraversion are introverted, reserved and serious. They prefer to be alone or with a few close friends.
- High scorers on openness are open to new experiences. They have broad interests and are imaginative. Low scorers on openness are down-to-earth, practical and traditional. They tend to be pretty much set in their ways.
- High scorers on agreeableness are compassionate, good-natured and eager to cooperate. They tend to avoid conflict. Low scorers on agreeableness are hard-hearted, sceptical, proud and competitive. They tend to express anger directly.
- High scorers on conscientiousness are well-organised. They have high standards and strive to achieve their goals. Low scorers on agreeableness are not well-organised, and sometimes careless. They prefer not to plan ahead.
- High scorers on neuroticism are sensitive and emotional. They tend to experience feelings that are upsetting. Low scorers on neuroticism are secure and hardy. They tend to be relaxed, even under stressful conditions.

In an alternative conceptualisation of the Five Factor Model, Costa and McCrae (1992, p. 2) capture each of the five constructs in terms of six facets associated with the high scoring pole. For extraversion the facets are warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotions. For openness the facets are fantasy, aesthetics, feelings, actions, ideas, and values. For agreeableness the facets are trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. For conscientiousness the facets are competence, order, dutifulness, achievement striving, self-discipline, and deliberation. For neuroticism the facets are anxiety, angry hostility, depression, self-consciousness, impulsiveness, and vulnerability.

The Five Factor Model remains a widespread approach to personality and has been employed across a broad range of issues including academic performance (Mammadov, 2021), job performance (Peral & Geldenhuys, 2020), birth order (Black et al., 2018), children of veterans (Stein et al., 2018), pathological personality assessments (Collison et al., 2018), entrepreneurism (Şahin et al., 2019), parenting (Prinzie et al., 2009), loneliness (Buecker et al., 2020), health behaviours (Raynor & Levine, 2009), and financial decision-making (Brown & Taylor, 2014). Despite its ubiquity, however, some researchers criticise the Five Factor Model as being atheoretical in that it has not been linked to any particular theory or explanation of why these five dimensions are present in personality (Block, 2010). Others have noted that the Five Factor Model misses important factors such as honesty or humility (Ashton et al., 2004), converges into a general factor of personality (Van der Linden et al., 2010), is deficient in biological evidence (Power & Pluess, 2015), fails to account for human development and fluctuation over time (Branje et al., 2007), and inadequately explains abnormal personality (Boyle, 2008).

Introducing the International Personality Item Pool (IPIP)

Launching the IPIP, Goldberg (1999) argued that this was a response to address the problem that "the science of personality assessment had progressed at a dismally slow pace since the first personality inventories were developed over 75 years ago" (p. 7). The response placed a set of personality items in the public domain that might free

researchers from the constraints imposed by copyrighted personality inventories. By the mid-2000s, the IPIP was home to over 2,000 items (Goldberg et al., 2006) and already included translations into Arabic, Bulgarian, Chinese, Croatian, Danish, Dutch, Estonian, Finnish, French, German, Hebrew, Hmong, Hungarian, Italian, Korean, Latvian, Norwegian, Persian, Polish, Romanian, Russian, Serbian, Slovene, Spanish, Swedish, Turkish, Vietnamese, and Welsh. The format chosen for IPIP items is a short verbal phrase, more contextualised than a single trait adjective, but more compact than items found in many published personality inventories. By 2022 the number of items in the pool exceeded 3,000 and had been translated into over forty languages (International Personality Item Pool, 2022).

Drawing on this wide bank of items, some IPIP scales have been designed to serve as proxies for the constructs measured in commercial inventories, and as public-domain alternatives to these inventories. Goldberg et al. (2006, p. 88) outlines the four steps by which these proxy scales are developed. In step one, all available IPIP items are correlated with each of the original inventory scales. In step two, the items are selected that record the highest positive and the highest negative correlations with the criterion scale. The ideal for equal numbers of positively-voiced and negatively-voiced items is relaxed if the correlations are not equally strong. In step three, the selected items are scrutinised to reduce redundancy and to eliminate items that fail face validity with the hypothesised construct. In step four, reliability analysis is used to maximise internal consistency reliability. Although this procedure is designed to map the IPIP instruments closely onto the parent measures, the literature remains cautious about claiming equivalency (see Buchanan et al., 2005).

Drawing on the IPIP, a number of different measures have been proposed to map onto the Five Factor Model of personality, including measures that have employed 120 items (Khan et al., 2019), 50 items (Goldberg, 1992), 44 items (Benet-Martínez & John, 1998), 40 items (Saucier, 1994; Thompson, 2008), 30 items (Vermulst & Gerris, 2005), 20 items (Donnellan et al., 2006), and 10 items (Gosling et al., 2003). The particular measure adopted for the present study employed the 50 items presented in table 1. Each of the five scales combined positively-voiced and negatively-voiced items.

The IPIP personality markers mapping onto the Five Factor Model have been employed in more than 70 studies to date (International Personality Item Pool, 2022). These IPIP studies have involved diverse samples including New Zealand call centre employees (Guenole & Chernyshenko, 2005), university faculty, staff, and students in the United States (Ehrhart et al., 2009; Lim & Ployhart, 2006; Socha et al., 2010), Polish adults (Fronczyk, 2019), Croatian female students (Križanić et al., 2015), undergraduate students in the UK and Ireland (Corcoran & O'Flaherty, 2016; Finn et al., 2015), Romanian students (Constantinescu & Constantinescu, 2016; Rusu et al., 2012), Polish adolescents and adults (Strus et al., 2014), Indonesian late adolescents and adults (Akhtar & Azwar, 2019), Chinese homosexual and heterosexual samples (Zheng et al., 2008), and Greek adults (Ypofanti et al., 2015). While a systematic analysis of the psychometric properties of the 50-item IPIP measure of the Five Factor Model is needed, a preliminary review of the studies which have reported psychometrics indicates that the 50-item questionnaire has sustained an overall reasonably good factor structure and reliability, albeit with the alpha coefficients for "agreeableness" and "openness" often scoring slightly below the rest (Akhtar & Azwar, 2019; Bešenić

Table 1. 50-item measure of the Big Five Factors drawn from IPIP.

Extraversion
Am the life of the party (+)
Feel comfortable around people (+)
Start conversations (+)
Talk to a lot of different people at parties (+)
Don't mind being the centre of attention (+)
Don't talk a lot (−)
Keep in the background (−)
Have little to say (−)
Don't like to draw attention to myself (−)
Am quiet around strangers (−)
Openness
Have a rich vocabulary (+)
Have a varied imagination (+)
Have excellent ideas (+)
Am quick to understand things (+)
Spend time reflecting on things (+)
Am full of ideas (+)
Use difficult words (+)
Have difficulty understanding abstract ideas (−)
Am not interested in abstract (−)
Do not have good imagination (−)
Agreeableness
Am interested in people (+)
Sympathise with others' feelings (+)
Have a soft heart (+)
Take time out for others (+)
Feel others' emotions (+)
Make people feel at ease (+)
Feel little concern for others (−)
Insult people (−)
Am not interested in other people's problems (−)
Am not really interested in others (−)
Conscientiousness
Am always prepared (+)
Pay attention to detail (+)
Get chores done right away (+)
Like order (+)
Follow a schedule (+)
Am exacting in my work (+)
Leave my belongings around (−)
Make a mess of things (−)
Often forget to put things back in their proper place (−)
Shirk my duties (−)
Neuroticism
Am relaxed most of the time (+)
Seldom feel blue (+)
Get stressed out easily (−)
Worry about things (−)
Am easily disturbed (−)
Get upset easily (−)
Change my mood a lot (−)
Have frequent mood swings (−)
Get irritated easily (−)
Often feel blue (−)

Note: + positively-voiced items.
− negatively-voiced items.

et al., 2021; Corcoran & O'Flaherty, 2016; Ehrhart et al., 2008; Fronczyk, 2019; Križanić et al., 2015; Mlacic & Goldberg, 2007; Rusu et al., 2012; Socha et al., 2010; Strus et al., 2014; Ypofanti et al., 2015; Zheng et al., 2008).

Using the IPIP measures in Muslim societies

Various IPIP measures of the Five Factor Model, including the 120-item, 44-item, 50-item, 30-item and 20-item versions, have been used in a handful of Muslim society samples including from Pakistan, Iran, Turkey, Indonesia, and Malaysia. Morsunbul (2014) and Akhtar and Azwar (2019) both reported good model fit and internal consistency reliability for the 30-item measure tested on students in Turkey and in Indonesia. However, Kırkağaç and Öz's (2017) study on university teachers in Turkey, Aghababaei's (2013) study on university students in Iran, and Ghorbani et al.'s (2015) study on Iranian married couples reflected alpha coefficients below .70 for "agreeableness" in their 30-item measure. Furthermore, Hee's (2014) 44-item measure employed in Malaysia did not recover the "agreeableness" factor in the FFM, and Aghababaei's (2013) findings suggested a general factor of personality. Factor structures were not reported by Kırkağaç and Öz (2017) and Ghorbani et al. (2015). Additionally, no data regarding factor structure or item properties were reported for Khan et al.'s (2019) 120-item measure distributed to university students in Pakistan, Aghababaei and Tabik's (2013) 20-item measure distributed to Iranian students, and Biderman et al.'s (2011) 50-item measure distributed to an Iranian sub-sample. Due to mixed findings and incomplete data reporting in some of these studies, more research is needed on the performance of the IPIP measure of the Five Factor Model in Muslim samples.

Research problem

The present study aimed to explore within a Muslim society the internal consistency reliability of an established 50-item measure of the Five Factor Model of personality drawing on the International Personality Item Pool. The specific hypothesis under investigation concerns the performance of the negatively-voiced items included within this measure, testing whether these items (that may imply disrespect for self) detract from the unidimensional five factors proposed by the measure.

Method

Procedure

The Five Factor Model of personality was included in the original English language form as part of the *online* survey *Parental Attachment and Life*. This survey was designed for completion by young adults between the ages of 18 and 26 who were born in Punjab and had lived there all their life. Participants were assured of confidentiality. The project was approved by the Research Ethics Committee of the Advanced Studies Research Board Government College University, Lahore.

Instrument

The five factors of personality were each assessed by ten items recommended by the International Personality Item Pool (http://ipip.ori.org/) to map onto the constructs proposed by Goldberg (1992) and Johnson (2014). These recommended items comprised: an equal number of five positively-voiced and five negatively-voiced items for extraversion; six positively-voiced items and four negatively-voiced items for both agreeableness

and conscientiousness; seven positively-voiced items and three negatively-voiced items for openness; and two positively-voiced items and eight negatively-voiced items for emotional stability (reflecting the original formulation of this factor within the Five Factor Model as neuroticism). Each item was presented for rating on a five-point scale: very inaccurate (1), moderately inaccurate (2), neither accurate nor inaccurate (3), moderately accurate (4), very accurate (5). The items were introduced by the following invitation:

> Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence.

Participants

The *Parental Attachment and Life* survey was fully completed by 370 participants who met the profile of young adults between the ages of 18 and 26 who were born in Punjab and had lived there since their birth. The participants comprised 151 males, 217 females, and 2 who preferred not to say: 45 were aged 18 or 19, 131 were aged 20 or 21, 116 were aged 22 or 23, 65 were aged 24, 25, or 26, and 13 preferred not to say.

Analysis

The data were analysed by SPSS using the frequency, correlation, factor, and reliability routines.

Results

Table 2 presents the three stages by which the ten-item scales were reduced to five-items each. At each stage, this table presents the total number of items, differentiating between

Table 2. Testing the Big Five Factor Scales.

	Items				Item range	
	N	+	–	*α*	Low	High
Extraversion						
Stage 1	10	5	5	.56	.14	.33
Stage 2	6	5	1	.59	.12	.49
Stage 3	5	5	0	.63	.26	.49
Agreeableness						
Stage 1	10	6	4	.64	.05	.52
Stage 2	6	5	1	.75	.28	.64
Stage 3	5	5	0	.77	.49	.61
Conscientiousness						
Stage 1	10	6	4	.53	.18	.33
Stage 2	6	6	0	.62	.31	.46
Stage 3	5	5	0	.60	.32	.45
Emotional stability						
Stage 1	10	2	8	.69	.13	.55
Stage 2	8	0	8	.79	.40	.57
Stage 3	5	0	5	.74	.39	.59
Openness						
Stage 1	10	7	3	.62	.13	.52
Stage 2	6	6	0	.70	.35	.55
Stage 3	5	5	0	.69	.36	.55

items with positive valency (+) and items with negative valency (-), the alpha coefficient (Cronbach, 1951), and the range of correlations between individual items and the sum of the other items in the scale. Stage 1 represents the solution when all ten of the original items were tested for reliability. In each case there are some low item correlations that indicated the need for closer investigation. For stage 2, the original items were subjected to principal components analysis and the items were selected that loaded strongly on the first factor proposed by the unrotated solution. In respect of all five scales, the first factor failed to attract many of the negatively-voiced items. These five sets of items that loaded on the first factor were tested for reliability. In each case, the alpha coefficient was improved. For stage 3, the item(s) with the lowest correlation with the sum of the other items were removed in order to generate a uniform set of five-item scales.

Table 3 presents the five individual items selected for each of the five-item scales, together with the correlation between the individual item and the sum of the other four items.

Table 4 presents the mean scale scores for the five scales (extraversion, agreeableness, conscientiousness, emotional stability, and openness) for male and for female participants separately. These data demonstrate no significant sex differences in terms of conscientiousness and openness. Male participants recorded significantly higher scores on both

Table 3. Presenting the five five-item scales.

	r
Extraversion	
I am the life of the party	.26
I feel comfortable around people	.44
I start conversations	.42
I talk a lot to different people at parties	.49
I don't mind being the centre of attention	.30
Agreeableness	
I sympathise with others' feelings	.56
I have a soft heart	.61
I take time out for others	.49
I feel others' emotions	.59
I make people feel at ease	.49
Conscientiousness	
I pay attention to details	.33
I get chores done right away	.33
I like order	.32
I follow a schedule	.35
I am exacting in my work	.45
Emotional stability	
I worry about things *	.39
I am easily disturbed *	.57
I get upset easily *	.59
I have frequent mood swings *	.44
I get irritated easily *	.52
Openness	
I have a vivid imagination	.38
I have excellent ideas	.49
I am quick to understand things	.56
I spend time reflecting on things	.36
I am full of ideas	.55

Note: *These items are reverse coded.
r = the correlation between the individual item and the other five items within the same scale.

Table 4. Mean scale scores by sex.

		Male		Female			
	α	Mean	SD	Mean	SD	*t*	*p*<
Extraversion	.63	15.90	4.00	14.71	3.85	2.88	.01
Agreeableness	.77	18.31	3.83	19.38	4.02	−2.56	.01
Conscientiousness	.60	17.04	3.60	17.08	3.56	−0.11	NS
Emotional stability	.74	14.21	3.99	12.12	4.17	4.81	.001
Openness	.69	17.53	3.66	17.94	3.59	−1.06	NS

Note: males, $n = 151$; females, $n = 217$.

extraversion and emotional stability. Female participants recorded significantly higher scores on agreeableness.

Conclusion

This paper set out to explore within a Muslim society the internal consistency reliability of an established 50-item measure of the Five Factor Model of personality drawing on the International Personality Item Pool. The specific hypothesis under investigation concerned the performance of the negatively-voiced items included within this measure, testing whether these items (that may imply disrespect for self) detract from the unidimensional five factors proposed by the measure. This hypothesis concerning the performance of negatively-voiced items within a personality measure employed within a Muslim society was grounded in previous research that had detected problems with negatively-voiced items included within measures of religiosity, such as attitude toward Islam (implying disrespect for the divine), measures of assessing other people such as attitude toward parents (implying disrespect for others), and measure of self, such as wellbeing (implying disrespect for the self). Respect is a core virtue within Islam. Because everyone is created by God Almighty, the maker of all, humans must treat one another with full honour, respect, and loving-kindness (Qur'an 17: 70), and must treat themselves with similar respect. This includes not giving agreement to potentially critical evaluations of self or of others. For example, an item like "I do not have good imagination" may carry with it an implied criticism of self, since the word "good" is highly evaluative.

The data from the present study supported this hypothesis. Initial exploratory factor analysis identified the negatively-voiced items as generally performing independently of the positively-voiced items. Reliability analyses designed to identify the best set of items within each factor resulted in five sets of items that failed to include any reverse-coded items. The first conclusion to emerge from the present study is that it would be prudent to design measures of the Five Factor Model of personality for use in Muslim societies that did not include reverse coded items.

The attempt to rescue a short-form measure of the Five Factor Model of personality from the original set of 50 items after removing the reverse-coded items was not entirely satisfactory. While two factors achieved satisfactory alpha coefficients (agreeableness and emotional stability), the other three factors fell below the threshold of .70 (extraversion, conscientiousness, and openness). The second conclusion to emerge from the present study is that further work is now required to revisit the IPIP to source items to construct and test a new IPIP measure of the Five Factor Model of personality specifically designed for use in Muslim societies designed specifically to function in that cultural context.

Intentionally, this new set of items would not include negatively-voiced items, and within this new instrument the factor of neuroticism would be replaced by a factor of emotional stability.

The general limitation with the present study is that it is subject to the caveats associated with online surveys of this nature. The specific limitation with the present study is that the two conclusions and recommendation for further research is based on a single study exploring the application of an established 50-item measure of the Five Factor Model of personality drawing on the IPIP within a Muslim society. This single study was restricted to a sample of young adults between the ages of l8 and 26 who were born in Punjab. The findings, however, are of sufficient worth to commend replication and extension within other age groups within Punjab, and within other predominantly Muslim societies.

Disclosure statement

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

ORCID

Nafees Akhtar http://orcid.org/0000-0002-7604-9412
Leslie J. Francis http://orcid.org/0000-0003-2946-9980
Alison B. Sailer http://orcid.org/0000-0002-9120-1080
Ursula McKenna http://orcid.org/0000-0002-2625-7731
Syeda Salma Hasan http://orcid.org/0000-0002-6811-0068

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