

The five-factor model and individualism and collectivism in South Africa: Implications for personality assessment



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The five-factor model (FFM) of personality is one of the prominent models in contemporary psychology and defines personality in terms of five broad factors, namely Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. Recent research, however, questions the applicability of the FFM in non-Western cultures, suggesting that it is not exhaustive enough and that it does not account for some other personality factors, most notably Individualism and Collectivism. Yet, it remains the gold standard against which all personality instruments are compared. This study investigated whether the FFM of personality is related to Individualism and/or Collectivism in a sample of 272 South Africans from the general Johannesburg area. Individuals completed a questionnaire consisting of a demographic section, the Horizontal–Vertical Individualism/Collectivism scale and the NEO-PI-3. Exploratory factor analysis was used to analyse the data. The results indicated support for an Individualism–Collectivism dimension. These results are discussed within the context of the universal applicability of the FFM.

Keywords: collectivism; five-factor model; individualism; NEO-PI-3; personality assessment

Introduction

The five-factor model (FFM) of personality that the NEO Personality Inventory (NEO-PI-3) is based upon has dominated personality theory and assessment over the last decade (Laher, 2013). According to the FFM, human personality can be described by five personality traits, namely Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. Research into the cross-cultural applicability of the FFM has shown differences between Asian and Western cultures with the five factors not replicating clearly in these cultures (see Cheung et al., 2008; Laher, 2013; McCrae et al., 2005b; Valchev et al., 2014). In some cultures, evidence has also been found for a sixth factor. For example, Ashton and Lee (2005) found evidence for an honesty and humility factor in addition to the five factors. Studies in China have found that interpersonal relatedness can be regarded as a potential sixth dimension in describing Asian personality (Cheung et al., 2008). In South Africa, Nel et al. (2012) found evidence for nine personality clusters, namely Extraversion, Soft-Heartedness, Conscientiousness, Emotional Stability, Intellect, Openness, Integrity, Relationship Harmony and Facilitating. It is evident that the first six clusters are more closely related to the FFM and the last three represent more indigenous personality constructs.

Two arguments may be noted from the literature. The first stems from the argument for the universality of the FFM in that if the five factors are universal and vary only in the intensity of presentation across cultures and individuals, it is possible that collectivist expressions of the five factors may need to be incorporated into the current FFM. The second argument suggests that there may be a sixth domain to the five factors of personality, and this sixth domain is best defined by some social or interpersonal relatedness factor. Thus, this study explores the relationship between personality and the individualism and collectivism dimensions using the NEO-PI-3. The NEO-PI-3 is the most recent version of the NEO inventories with McCrae, Costa and Martin (2005a) arguing for its greater applicability given the removal of problematic items and the simplification of language. This relationship between personality, individualism and collectivism is explored with a view of contributing to the debate on the role of the individualism and collectivism dimensions in relation to the FFM of personality.

Understanding individualism and collectivism

Individualism and collectivism were chosen in this study as representations of the social relational dimension as presently they are amongst the most widely used constructs in research about

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cultural differences (Taras et al., 2014). According to Hofstede's model (1980), individualism–collectivism can be viewed as opposite poles representing an independent position from groups on the one hand, to a dependence on groups on the other. Within an individualistic society, people are viewed as independent from the group, and personal goals are given preference over shared ones; behaviour is thus based on personal attitudes rather than group norms. Collectivist societies, on the other hand, emphasise interdependence within the group (as seen in the Chinese model), and peoples' behaviours are controlled depending on group norms rather than personal attitudes. This results in people in collectivist societies seeking to avoid conflict and maintain relationships (Laher, 2013).

According to Triandis (2001), although individualism and collectivism are useful in terms of analysis, it would be gross stereotyping to assume that every individual within a certain culture would have all the characteristics of that culture. As a result, a distinction can be drawn between different types of individualistic and collectivist societies. This difference is because of the degree of emphasis placed on what have been termed horizontal and vertical social relationships. The former (horizontal) describes equality amongst individuals and the latter (vertical) describes a hierarchical structure where individuals differ in status. Using these two dimensions, four distinct patterns within cultures have been identified, namely horizontal individualism (HI), vertical individualism (VI), horizontal collectivism (HC) and vertical collectivism (VC) (Triandis & Gelfand, 1998).

Horizontal individualism describes a society with people who want to be distinct from the group, and are highly self-reliant but not interested in the acquisition of status. With VI, people are competitive with others for the purpose of acquiring status. Vertical individualism recognises and accepts inequality amongst individuals (Triandis & Gelfand, 1998). In collectivist societies, HC can be observed when individuals emphasise interdependence, sociability and sharing common goals but do not necessarily submit to authority easily. In VC, individuals are greatly concerned with the integrity of the in-group. They are willing to sacrifice their own desires and goals for the betterment of the in-group and promote competition between the out-group and the in-group. Inequality and hierarchy within the collective is accepted (Triandis, 2001; Triandis & Gelfand, 1998). For this study, this more nuanced understanding of individualism and collectivism was adopted.

Research on personality and individualism and/or collectivism

Markus and Kitayama (1998) contrast the interdependent view of the person in collectivist cultures with the independent, self-contained, autonomous being in individualistic cultures and refer to the collective construction of personality in Asia that fosters relationality. Furthermore, Cross and Markus (1999, cited in McCrae et al., 2004) argue that:

personality traits, as distinctive and enduring aspects of individuals are essentially a Western phenomenon; in non-Western, collectivist societies, personality characteristics are fluid, determined more by transient interpersonal situations than by enduring traits. (p. 180)

This is supported by research in the Indian, Chinese and African contexts (see Cheung et al., 2008; Laungani, 1999; Lodhi, Deo & Belhekar, 2002; Ma & Schoeneman, 1997; Mpofu, 2001; Mwamwenda, 2004).

In the South African context, Eaton and Louw (2002) found that compared to English speakers, African-language speakers tended to use more interdependent and concrete descriptions characteristic of the collectivist dimension. Vogt and Laher (2009) provided support for individualism and collectivism as a separate factor to be considered in personality psychology. Laher (2010a) argued that this collectivist dimension in South Africa is best captured by the indigenous term 'Ubuntu' [humanness]. Ubuntu originates from an African aphorism, *umuntu ngumuntu ngabantu* (isiZulu version) or *motho ke motho ka batho* (Sesotho version), which translates as, 'a person is a person through persons'. Ubuntu as it is concerned with relationships towards others is defined by reverence, respect, sympathy, tolerance, loyalty, courtesy, patience, generosity, hospitality and co-operativeness (Louw, 2001). This argument is supported by Valchev et al. (2014) who present findings using the South African Personality Inventory (SAPI) that support agentic versus communal dimensions to personality. Valchev et al. (2014) also make reference to Ubuntu in understanding the communal aspects found in the SAPI.

This exposition of Ubuntu is important for a number of reasons. Firstly, it clearly brings across the collectivist understanding of the individual in community. Secondly, the use of indigenous languages to explain the essence of Ubuntu suggests that the FFM by virtue of its location in the English lexicon may well have not considered these traits. Thirdly, it could be argued that the description of traits associated with Ubuntu (generous, hospitable, friendly, caring, compassionate, open and available to others, affirming of others, does not feel threatened that others are able and good) are traits that are linked to Extraversion and Agreeableness in the FFM. Hence, it may be argued that these are subsumed in the FFM. However, we would like to argue that the presentation of Extraversion and Agreeableness in the FFM is more individualist and therefore cannot subsume the communal aspects of generosity, caring, etc. Furthermore, Ubuntu encapsulates an openness and availability to others that is not captured in the FFM, not even in the Openness to Experience domain. All of the domains measure personality as an expression of individual traits and behaviours. Items on the NEO-PI-R are also phrased at that level.

To conclude, there is sufficient evidence to suggest that an Individualism–Collectivism distinction in personality, particularly in the FFM, is necessary. However, the arguments

presented above indicate that aspects of this collectivist dimension might be tapped in the domains of Agreeableness, Extraversion and Openness to Experience but in an individualistic way. It is unclear both from the literature presented and the current conceptualisation as to whether the Individualism–Collectivism dimension should be a separate factor measured across individuals or whether it is an underlying cultural mechanism that needs to be incorporated into items, scales and factors in the FFM.

Thus, this study explores the relationship between personality and the individualism and collectivism dimensions in a sample of South African individuals in Johannesburg and surrounding areas.

Methods

Sample

A non-probability, convenience sample of 272 people from the communities in Johannesburg and surrounding areas voluntarily completed the questionnaire. Individuals in the sample were aged between 14 and 90 years ($M = 36.52$, $SD = 14.53$). From Table 1, it is evident that the majority of the sample were female ($n = 85$, 66.9%). In terms of race, 39.7% were black people ($n = 108$), 8.8% were mixed race people ($n = 24$), 23.2% were Indian people ($n = 63$) and 27.6% were white people ($n = 75$). A total of 153 (56.3%) individuals spoke English, while 115 (42.2%) spoke a language other than English. Two questions were included in the questionnaire that requested participants whose home language was not English to rate their English reading skills and English comprehension skills from 1 to 5, with 1 being 'not so good' and 5 being 'excellent'. For individuals who had English as a second language ($n = 115$), the majority of the sample ($n = 88$; 76.5%) reported excellent to good English reading and English comprehension ability, while 20% reported a

satisfactory English reading and English comprehension ability ($n = 23$), thus controlling for issues of language proficiency in the study.

Instruments

A questionnaire consisting of three sections was distributed to participants, namely a section on demographics, the NEO-PI-3 and the Horizontal–Vertical Individualism/Collectivism scale. Demographic variables collected included gender, education, occupation, race, language, English reading ability, English comprehension ability and test familiarity. Demographic variables were used for descriptive purposes only.

NEO-PI-3

The NEO-PI-3 consists of 240 items and measures the five domains and 30 facets of personality, as proposed by the FFM. The NEO-PI-3 is a revised version of the NEO-PI-R. The test can be used with adolescents aged 14 years and above (McCrae & Costa, 2010). Internal consistency reliabilities for the five domains in the NEO-PI-3 ranged from 0.85 to 0.89 for Form S (self-rating phrased in the first person) and from 0.84 to 0.93 for Form R (other-rating phrased in the third person) (McCrae et al., 2005a). The revised instrument retained the proposed factor structure and showed slightly improved internal consistency, 'cross-observer agreement' and readability (McCrae et al., 2005a, p. 261). Evidence suggests that the NEO-PI-3 scales have convergent and discriminant validity when used in an adolescent population. For the general population, the psychometric properties remained fairly similar to that of the NEO-PI-R's generally good performance, with slight improvements (McCrae et al., 2005a). Internal consistency reliability coefficients for the five domains ranged from 0.78 to 0.92 in this study, while facet reliability coefficients were all above 0.60 except for actions ($\alpha = 0.53$), values ($\alpha = 0.52$), straightforwardness ($\alpha = 0.49$), modesty ($\alpha = 0.58$) and tender-mindedness ($\alpha = 0.53$).

Horizontal–Vertical Individualism/Collectivism scale

Triandis and Gelfand (1998) designed a 16-item scale to measure four dimensions of Individualism and Collectivism. The four dimensions are as follows: VC, VI, HC and HI (further description of each discussed in literature review). All items are answered on a 9-point scale ranging from 1, which represents never or definitely no, to 9, representing always or definitely yes. Each dimension's items are summed up separately to create a VC, VI, HC and HI score. Internal consistency reliability scores, using Cronbach's alpha, range from 0.73 to 0.82 for the four dimensions described above (Triandis & Gelfand, 1998). Good convergent and divergent validity for this scale was found. A strong relation to other individualism–collectivism scales was also found (Triandis & Gelfand, 1998). Cronbach's alpha coefficients for the four scales ranged from 0.60 to 0.66 in this study.

TABLE 1: Descriptive statistics for the sample.

Variable	Characteristics	Frequency	Percentage	Cumulative (%)
Gender	Male	85	31.3	31.3
	Female	182	66.9	98.2
	Missing	5	1.8	100.0
Race	Black people	108	39.7	39.7
	Mixed race people	24	8.8	48.5
	Indian people	63	23.2	71.7
	White people	75	27.6	99.3
	Missing people	2	0.7	100.0
Home language	English	153	56.3	56.3
	Afrikaans	7	2.7	59.0
	Ndebele	3	1.1	60.1
	Pedi	12	4.4	64.5
	Swati	3	1.1	65.6
	Sotho	7	2.6	68.2
	Tsonga	5	1.8	70.0
	Tswana	15	5.9	75.9
	Venda	4	1.5	77.4
	Xhosa	12	4.4	81.8
	Zulu	36	13.2	95.0
	Other	11	4.0	99.0
	Missing	4	1.5	100.0

Research design

Located in the quantitative paradigm, this study used a non-experimental, cross-sectional design where participants completed a questionnaire at one point in time. There was no control group or manipulation of variables and the study was largely exploratory. Hence, a non-experimental design was suitable for this study.

Research procedure

A group of postgraduate psychology students collected data by administering the questionnaire to volunteers in the community. Once all data had been collected, they were captured and scored as per the test developer specifications. Thereafter, the data were analysed using the SPSS computer program (Version 23, IBM, 2015).

Data analysis

All data were first analysed using descriptive statistics. The nominal variables, namely gender, race and home language, were examined using frequencies, while for the interval variable, namely NEO-PI-3 scale, means, standard deviations, minimum and maximum values and skewness coefficients were calculated. An exploratory factor analysis was run to determine the independence between the NEO-PI-3 scales and the Horizontal–Vertical Individualism/Collectivism scale. Principal component analysis was the method selected as it is a simple but effective method of determining factors that explain all the variance including the error variance in any particular correlation matrix (Huck, 2012). Varimax rotation was utilised as it aims to maximise the sum of variances of squared loadings in the columns of the factor matrix. This produces in each column loadings that are either high or near zero, thereby assisting interpretation (Laher, 2010b).

Ethical considerations

Ethical clearance to conduct the research was obtained from the Human Research Ethics Committee (HREC) at the University of the Witwatersrand (Protocol number: H16/02/14).

Results

Table 2 presents the means, standard deviations, minimum and maximum values, and skewness coefficients for the domain and facet scales of the NEO-PI-3. It is evident that all the domains and facets are normally distributed as the skewness coefficients were within the range of +1 to -1 (Huck, 2012).

The relationship between the NEO-PI-3 and Horizontal–Vertical I/C scale

Results for the independence of the NEO-PI-3 scales and that of the Horizontal–Vertical I/C (HVIC) scale are presented below, using factor analyses. In this study, both empirical and

theoretical techniques were used to determine the number of factors to extract. Theoretically, the NEO-PI-3 proposes five factors and individualism–collectivism would be an additional factor if it loads as a single sixth factor, and it proposes two factors if it loads as two separate constructs, that is, individualism as one factor and collectivism as another factor. As indicated in Table 3, according to the Guttman–Kaiser greater-than-one (K1) rule, eight factors should have been extracted. According to the scree plot (see Figure 1) and parallel analysis (see Table 3), six factors should be extracted. Hence, five-, six- and eight-factor solutions were explored using Varimax rotation.

TABLE 2: Descriptive statistics for the NEO-PI-3.

Scale	Mean	Standard deviation	Minimum	Maximum	Skewness
Neuroticism	84.599	20.9881	12	151	0.016
Anxiety	16.754	4.8530	4	31	0.226
Angry hostility	14.706	4.6930	0	26	0.065
Depression	14.70	5.2160	1	28	0.057
Self-consciousness	14.77	4.9860	0	29	0.136
Impulsivity	16.32	4.4750	0	31	-0.011
Vulnerability	11.68	4.7290	0	25	0.221
Extraversion	109.73	20.3990	44	158	-0.232
Warmth	21.28	4.5070	9	31	-0.309
Gregariousness	16.08	5.6490	-17	32	-0.854
Assertiveness	16.66	4.6820	2	28	0.020
Activity	17.21	4.4050	4	32	0.108
Excitement-seeking	18.02	5.1850	5	31	-0.209
Positive emotions	20.70	5.0740	4	32	-0.366
Openness to experience	110.99	18.5150	54	162	0.159
Fantasy	17.19	4.5530	5	32	0.227
Aesthetics	18.49	5.7710	0	32	-0.310
Feelings	17.60	3.7680	8	27	0.023
Actions	16.06	3.8900	5	26	0.004
Ideas	19.50	5.1840	5	32	-0.134
Values	19.48	4.0750	6	30	-0.042
Agreeableness	117.71	15.3160	71	157	-0.131
Trust	16.35	4.3230	7	27	0.013
Straightforwardness	19.80	4.0490	8	29	-0.225
Altruism	22.79	4.0730	11	32	-0.225
Compliance	17.08	4.9450	4	31	-0.143
Modesty	18.97	5.0920	5	49	0.542
Tender-mindedness	22.72	4.0180	11	32	-0.288
Conscientiousness	123.2	21.504	52	177	0.040
Competence	20.64	4.010	10	32	-0.069
Order	20.26	4.827	5	32	-0.194
Dutifulness	22.00	4.058	7	31	-0.089
Achievement-striving	21.11	5.165	5	32	-0.112
Self-discipline	20.38	4.962	7	32	-0.120
Deliberation	18.81	4.691	2	32	-0.149

TABLE 3: Eigenvalues and parallel analysis results.

Factor	Eigenvalue	Percentage of variance explained (%)	Cumulative (%)	Parallel analysis	
				Mean	Percentile
1	7.791	22.915	22.915	1.73510	1.83149
2	3.669	10.791	33.706	1.63782	1.70633
3	3.040	8.941	42.647	1.56516	1.62367
4	2.507	7.374	50.021	1.50365	1.55661
5	1.921	5.649	55.670	1.44855	1.49639
6	1.423	4.186	59.856	1.39803	1.44238
7	1.083	3.184	63.040	1.35077	1.39256
8	1.018	2.995	66.034	1.30621	1.34522

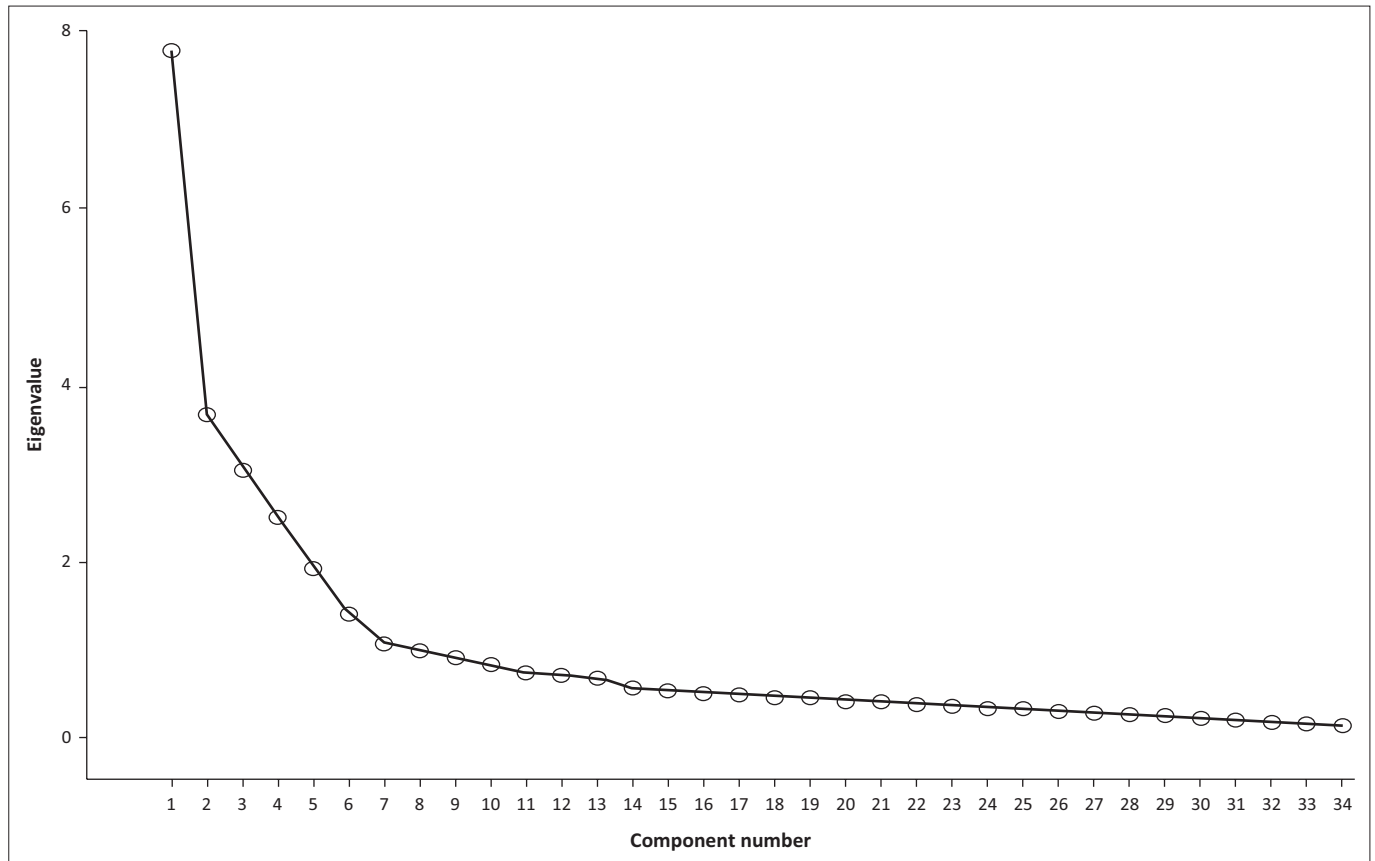


FIGURE 1: Cattell's scree plot for the NEO-PI-3 and Horizontal-Vertical I/C scale.

The five-factor solution explored whether the Individualism–Collectivism dimension could be subsumed by the NEO-PI-3 as McCrae and Costa (2003) argue. The six-factor model addressed whether individualism–collectivism can be considered as an additional construct. And finally the eight-factor solution addressed whether individualism and collectivism are in fact separate constructs, in line with the empirical conclusion using the Guttman–Kaiser greater-than-one rule. These results are presented here. All loadings above 0.40 or below -0.40 were considered as a loading on that particular factor or each analysis and are represented in bold font in the relevant tables.

Five-factor solution for the NEO-PI-3 and the Horizontal-Vertical I/C scale

Table 4 presents the results for the five-factor solution. Factor 1 loads as the Conscientiousness factor as all six facets of this domain load positively on this factor. In addition, Impulsiveness and Vulnerability both load on this factor. However impulsiveness only has its secondary negative loading on this factor, whereas vulnerability's highest loading appears on factor 1. Factor 2 loads all of the Openness facets and five of the six Extraversion facets (excluding values which do not load on any factor). Altruism also loads on factor 2 (0.465), but this is the secondary loading for altruism. Its primary loading appears on factor 4 with the rest of the Agreeableness facets. All six of the Neuroticism facets load on factor 3, with moderate-to-high loadings of above 0.5. In addition, gregariousness has a primary loading on this factor of -0.441. Factor 4 is characterised as the Agreeableness facet,

with all six of the facets loading above 0.4. Vertical individualism also has a secondary negative loading on this fourth factor of -0.521. The fifth factor is in fact the individualism–collectivism dimension, consisting of the four subscales. All four subscales, HI, VI, HC and VC, have positive and moderate-to-high loadings on factor 5. Horizontal individualism has a loading of 0.614, VI 0.570, HC 0.768 and VC 0.808.

Six-factor solution for the NEO-PI-3 and the Horizontal-Vertical I/C scale

Table 5 presents the six-factor solution. Given that Openness and Extraversion loaded on the same factor in the five-factor solution, it was concluded that this was not tenable. In this solution, the five factors of the NEO-PI-3 now load as five separate factors, as the theory indicates. Extraversion and Openness no longer load on the same factor as seen in Table 4. Factor 1 continues as the Conscientiousness factor, with Impulsiveness and Vulnerability loading negatively as before. Factor 2 is now characterised by the Neuroticism domain. All six Neuroticism facets load moderately to high on factor 2. Assertiveness (-0.431) now loads negatively on factor 2 as well as actions (-0.422). All six of the Openness facets have small to high positive loadings on factor 3. Factor 4 is characterised by small to high positive loadings for five of the six Extraversion facets. Assertiveness, the sixth facet of Extraversion, loads positively on factor 6, which is the individualism–collectivism domain. It also has a small negative loading on factor 2.

TABLE 4: Five-factor solution for the joint factor analysis of the NEO-PI-3 and the individualism and collectivism dimensions.

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Neuroticism					
Anxiety	-0.210	0.040	0.772	0.074	-0.009
Angry hostility	-0.070	-0.148	0.601	-0.368	0.112
Depression	-0.389	-0.133	0.695	0.075	0.050
Self-consciousness	-0.263	-0.224	0.756	0.006	0.000
Impulsiveness	-0.418	0.330	0.533	-0.126	0.052
Vulnerability	-0.635	-0.143	0.541	-0.067	-0.061
Extraversion					
Warmth	0.034	0.551	-0.309	0.389	0.381
Gregariousness	-0.270	0.430	-0.441	0.158	0.172
Assertiveness	0.416	0.422	-0.336	-0.211	0.090
Activity	0.317	0.477	-0.072	-0.160	0.280
Excitement-seeking	-0.108	0.620	-0.120	-0.247	0.163
Positive emotions	0.108	0.586	-0.385	0.147	0.214
Openness					
Fantasy	-0.212	0.684	0.044	-0.115	-0.158
Aesthetics	0.124	0.643	-0.016	0.032	0.044
Feelings	0.081	0.636	0.274	0.096	0.076
Actions	0.045	0.590	-0.319	0.007	-0.158
Ideas	0.355	0.583	-0.108	-0.093	-0.102
Values	0.156	0.386	-0.089	0.159	-0.249
Agreeableness					
Trust	0.100	0.162	-0.256	0.455	0.192
Straightforwardness	0.124	-0.119	-0.037	0.642	-0.017
Altruism	0.309	0.465	-0.038	0.568	0.215
Compliance	-0.165	-0.276	-0.246	0.479	-0.091
Modesty	0.077	-0.131	0.225	0.584	-0.157
Tender-mindedness	0.304	0.330	0.204	0.478	0.230
Conscientiousness					
Competence	0.770	0.181	-0.248	0.007	0.149
Order	0.717	-0.077	-0.043	0.084	-0.012
Dutifulness	0.698	0.172	-0.056	0.239	0.207
Achievement-striving	0.771	0.288	-0.048	-0.086	0.153
Self-discipline	0.795	0.014	-0.189	0.064	0.024
Deliberation	0.593	-0.093	-0.264	0.195	0.034
Horizontal individualism	0.282	-0.021	0.114	-0.336	0.614
Vertical individualism	0.132	-0.049	0.132	-0.521	0.570
Horizontal collectivism	0.022	0.189	-0.156	0.191	0.768
Vertical collectivism	0.116	-0.071	0.059	0.069	0.808

Note: Bold data indicates all loadings above 0.40 and below -0.40.

Factor 5 can be considered the Agreeableness factor. Five of the six facets load positively, with small-to-moderate loadings. Factor 6 finally is primarily the Individualism–Collectivism factor. All four dimensions of the Individualism–Collectivism dimension have positive, moderate-to-high loadings on this factor. In addition, Impulsiveness loads primarily on this factor. Both Assertiveness and Activity have small secondary, positive loadings on factor 6. Compliance, which does not have a significant positive loading on any other factor has a high negative loading of -0.761 on factor 6.

Eight-factor solution for the NEO-PI-3 and the Horizontal–Vertical I/C scale

Table 6 presents the eight-factor solution for the joint factor analysis of the NEO-PI-3 and the Individualism–Collectivism dimension. Factor 1 remains the same, loading as the Conscientiousness factor with Impulsiveness and Vulnerability negatively loading as well. Factor 2 loads just as Table 4, characterised by the Neuroticism domain. Factor 3

TABLE 5: Six-factor solution for the joint factor analysis of the NEO-PI-3 and the individualism and collectivism dimensions.

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Neuroticism						
Anxiety	-0.190	0.733	0.110	-0.171	0.140	0.140
Angry hostility	-0.006	0.607	-0.238	-0.090	-0.323	0.361
Depression	-0.315	0.765	-0.051	-0.091	0.033	-0.056
Self-consciousness	-0.232	0.750	-0.078	-0.287	0.028	0.007
Impulsiveness	-0.424	0.464	0.162	0.121	0.026	0.487
Vulnerability	-0.595	0.592	-0.093	-0.097	-0.096	0.007
Extraversion						
Warmth	0.133	-0.171	0.201	0.763	0.308	0.085
Gregariousness	-0.158	-0.239	0.077	0.755	-0.020	0.000
Assertiveness	0.382	-0.431	0.207	0.214	-0.096	0.419
Activity	0.379	-0.055	0.147	0.458	-0.124	0.444
Excitement-seeking	-0.001	0.007	0.491	0.471	-0.358	0.075
Positive emotions	0.180	-0.284	0.397	0.557	0.060	0.002
Openness						
Fantasy	-0.220	0.014	0.705	0.153	-0.118	0.097
Aesthetics	0.187	0.049	0.706	0.261	-0.066	-0.142
Feelings	0.046	0.159	0.564	0.151	0.261	0.329
Actions	-0.027	-0.422	0.530	0.154	0.055	0.163
Ideas	0.332	-0.175	0.721	-0.008	-0.078	-0.027
Values	-0.032	-0.356	0.481	-0.230	0.413	0.191
Agreeableness						
Trust	0.114	-0.213	0.010	0.344	0.446	-0.062
Straightforwardness	0.100	-0.044	-0.217	0.110	0.608	-0.122
Altruism	0.351	-0.002	0.284	0.450	0.543	0.005
Compliance	-0.113	-0.067	-0.061	0.025	0.240	-0.761
Modesty	0.013	0.143	-0.050	-0.177	0.595	-0.153
Tender-mindedness	0.3058	0.229	0.236	0.279	0.462	0.012
Conscientiousness						
Competence	0.755	-0.314	0.119	0.063	0.080	0.125
Order	0.722	-0.064	-0.083	-0.057	0.057	-0.043
Dutifulness	0.726	-0.070	0.048	0.180	0.258	0.094
Achievement-striving	0.800	-0.079	0.211	0.113	-0.054	0.164
Self-discipline	0.761	-0.267	-0.033	-0.035	0.119	0.078
Deliberation	0.643	-0.180	0.009	0.019	0.052	-0.383
Horizontal individualism	0.226	0.036	0.077	-0.149	-0.274	0.739
Vertical individualism	0.128	0.134	-0.047	-0.047	-0.470	0.631
Horizontal collectivism	0.012	-0.120	0.097	0.309	0.207	0.746
Vertical collectivism	0.094	0.041	-0.114	0.088	0.118	0.812

Note: Bold data indicates all loadings above 0.40 and below -0.40.

is characterised as the Openness factor, with all six facets loading positively. In addition, Excitement-seeking and Positive Emotions both have positive, secondary loading on factor 3. Factor 4 is characterised by five of the six Extraversion facets, excluding Assertiveness, with positive loadings of moderate to high. Activity (0.52) and Assertiveness (0.47) both have positive primary loadings on factor 6 instead. Factor 5 is seen as the Agreeableness factor, with five of the six facets loading positively on this factor. The sixth facet, compliance, loads negatively on the sixth factor with a loading of -0.784. The sixth factor is not characterised by any of the other factors or scales. As discussed, activity, assertiveness and compliance all load on this factor, with a positive secondary loading for impulsiveness (0.478). The seventh factor is the individualism factor, where HI and VI load positively. Finally, the eighth factor is characterised as the collectivism factor, with HC and VC both loading positively. No other cross-loadings are evident for these two factors.

TABLE 6: Eight-factor solution for the joint factor analysis of the NEO-PI-3 and the individualism and collectivism dimensions.

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Neuroticism								
Anxiety	-0.198	0.727	0.133	-0.182	0.135	0.086	-0.112	0.106
Angry hostility	-0.025	0.594	-0.231	-0.054	-0.278	0.388	0.091	-0.057
Depression	-0.298	0.789	-0.033	-0.066	0.033	-0.092	-0.056	-0.021
Self-consciousness	-0.222	0.760	-0.065	-0.274	0.009	0.001	-0.027	-0.072
Impulsiveness	-0.428	0.460	0.162	0.075	0.046	0.478	-0.135	0.064
Vulnerability	-0.595	0.588	-0.085	-0.048	-0.110	-0.038	0.011	0.103
Extraversion								
Warmth	0.152	-0.168	0.243	0.705	0.379	0.114	-0.007	0.033
Gregariousness	-0.154	-0.207	0.054	0.761	0.051	-0.021	0.009	-0.133
Assertiveness	0.323	-0.344	0.277	0.320	-0.071	0.466	-0.028	-0.068
Activity	0.358	-0.056	-0.139	0.421	-0.035	0.517	0.046	0.006
Excitement-seeking	0.013	0.033	0.485	0.490	-0.291	0.105	0.057	-0.104
Positive emotions	0.163	-0.336	0.412	0.507	0.103	0.084	-0.012	0.025
Openness								
Fantasy	-0.247	-0.006	0.690	0.125	-0.146	0.118	-0.027	0.089
Aesthetics	0.190	0.032	0.708	0.248	-0.045	-0.088	0.081	-0.048
Feelings	0.080	0.145	0.577	0.122	0.314	0.284	-0.093	-0.007
Actions	0.003	-0.379	0.428	0.110	0.109	0.094	0.376	-0.355
Ideas	0.315	-0.183	0.720	0.004	-0.127	-0.022	0.013	-0.080
Values	-0.100	-0.388	0.478	-0.308	0.326	0.123	-0.172	-0.024
Agreeableness								
Trust	0.121	-0.210	0.062	0.328	0.490	-0.058	-0.028	0.131
Straightforwardness	0.069	-0.071	-0.207	0.047	0.599	-0.151	0.007	-0.084
Altruism	0.361	-0.025	0.313	0.342	0.592	0.057	0.019	0.018
Compliance	-0.069	-0.058	-0.049	0.042	0.185	-0.784	-0.104	0.082
Modesty	-0.042	0.136	-0.157	-0.169	0.600	-0.114	0.102	-0.069
Tender-mindedness	0.373	0.229	0.289	0.187	0.468	0.038	-0.065	-0.074
Conscientiousness								
Competence	0.736	-0.355	0.125	0.013	0.093	0.177	0.039	0.078
Order	0.666	-0.117	-0.108	-0.078	0.028	-0.014	0.060	-0.001
Dutifulness	0.713	-0.050	0.074	0.127	0.278	0.100	0.050	-0.105
Achievement-striving	0.790	-0.071	0.161	0.133	0.028	0.148	0.018	-0.088
Self-discipline	0.717	-0.140	0.074	0.015	-0.030	0.086	-0.075	-0.116
Deliberation	0.680	-0.185	-0.008	-0.003	0.064	-0.306	-0.018	0.039
Horizontal individualism	0.015	-0.086	0.049	-0.073	0.057	0.162	0.740	0.147
Vertical individualism	0.036	0.008	-0.053	0.083	-0.006	-0.074	0.809	0.015
Horizontal collectivism	-0.105	0.054	-0.046	-0.046	0.007	-0.088	-0.044	0.852
Vertical collectivism	-0.095	-0.061	-0.006	-0.042	-0.102	0.021	0.373	0.684

Note: Bold data indicates all loadings above 0.40 and below -0.40.

Discussion

This study sought to examine the relationship between the FFM and individualism and collectivism. This was done by examining five-, six- and eight-factor solutions for data obtained from the NEO-PI-3 and the HVIC scale. In the five-factor solution, we set out to test if the Individualism–Collectivism dimension is subsumed by the NEO-PI-3 as McCrae and Costa (2003) argue. What was found was that Neuroticism, Agreeableness and Conscientiousness all loaded on separate factors; however, Extraversion and Openness loaded on the same factor. The fifth factor could be labelled as the Individualism–Collectivism factor as all four constructs for Individualism and Collectivism had loaded strongly on this factor (HI, VI, HC and VC). Vertical individualism also had a negative and moderate secondary loading on factor 4: the Agreeableness factor. Vertical individualism is reflected in the desire for individuals to compete with other individuals, therefore recognising and

accepting inequality amongst individuals, and a concern with becoming distinguished and acquiring status is evident (Triandis & Gelfand, 1998). This can be said to be rather contrary to facets such as Compliance, Altruism and Tender-mindedness. These are all facets constituting the Agreeableness domain. Thus, this negative loading appears justified. Aside from the VI cross loading, no other Individualism–Collectivism dimensions loaded with the five factors, suggesting that Individualism and Collectivism are not subsumed in the five factors of the NEO-PI-3. This is in keeping with prior research in the field (Cheung et al., 2001; Laher, 2014; Vogt & Laher, 2009).

The six-factor solution that followed aimed to test if the FFM would load as five separate factors, and the Individualism–Collectivism dimension would load on the sixth factor as a separate construct. In this solution, the five factors of the NEO-PI-3 loaded as five separate factors, as the theory indicates with a sixth separate

Individualism–Collectivism dimension. This result concurs with other research. Cheung et al. (2008) confirmed that a six-factor solution is ideal: including a Collectivism dimension via the inclusion of an Interpersonal Relatedness factor. Similarly, Valchev et al. (2014) found support for separate communal personality traits.

The results of the eight-factor solution are the most interesting of the factor solutions as they suggest a new way of defining the Individualism–Collectivism dimension. It suggests a separation of the construct into two distinct constructs that can be *individually* explored further. Overall though, the five-, six- and eight-factor solutions echo the need for the Individualism and Collectivism dimensions to be included in the understanding of personality as they are not subsumed in the FFM of personality as operationalised by the NEO-PI-3. These results provide further empirical support to the arguments calling for an expansion of the FFM that are in line with previous research in the field (Cheung et al., 2008; Laher, 2013).

While these findings suggest the expansion of the FFM, it is necessary to note the limitations of the sample used in terms of sample size and representivity. The use of etic instruments also needs to be noted (Laher & Cockcroft, 2014). It is recommended that further research with larger and more representative samples is needed. The use of several measures of Individualism and Collectivism would be important, as literature has shown that the use of a single measure might provide too simplistic a view for these complex variables (see Taras et al., 2014). Further, the development of an emic tool that can account for South African definitions of Individualism and Collectivism may be very useful to such a study within the South African context. As discussed in the literature review, further understandings and exploration of ‘Ubuntu’ as a useful way of defining a specifically South African Collectivism would prove very useful for better appreciation and accommodation of the unique South African context.

Conclusion

It is evident from the findings that Individualism and Collectivism were not found to be subsumed in the FFM as operationalised by the NEO-PI-3. The six-factor solution, for the inclusion of the five factors of the NEO-PI-3 and the Individualism–Collectivism dimension, is the most informative in supporting calls for the inclusion of a sixth factor, while the eight-factor solution provided an interesting finding by splitting the dimension into Individualism as one construct and Collectivism as another. This finding contributes to debates on the understanding of the IC construct as either a single construct on a continuum or separate bipolar constructs (see Taras et al., 2014). Overall, the findings provide support for the need to reconsider the universality of the FFM in its current form. This finding has implications for personality assessment where the majority of the instruments still utilise the FFM as the gold standard for understanding the measurement of personality.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

S.L. conceptualised the question, supervised the project and wrote the article. S.D. collected the data and contributed to the write-up of the literature review, methods and results in the article.

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