Comparing the Horizontal and Vertical Individualism and Collectivism Scale and the Auckland Individualism and Collectivism Scale in Two Cultures: Switzerland and South Africa

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Abstract

This study investigated the psychometric properties of the Horizontal and Vertical Individualism and Collectivism Scale (HVIC) and the Auckland Individualism and Collectivism Scale (AICS). The sample consisted of 1,403 working individuals from Switzerland (*N* = 585) and from South Africa (*N* = 818). Principal component factor analyses indicated that a two-factor structure replicated well across the two countries for both scales. In addition,

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the HVIC four-factor structure replicated well across countries, whereas the responsibility dimension of individualism of the AICS replicated poorly. Confirmatory factor analyses provided satisfactory support to the original theoretical models for both the HVIC and the AICS. Equivalence measurement indices indicated that the cross-cultural replicability properties of both instruments are generally acceptable. However, canonical correlations and correlations between the HVIC and AICS dimensions confirm that these two instruments differ in their underlying meaning of the individualism and collectivism constructs, suggesting that these two instruments assess individualism and collectivism differently.

Keywords

culture assessment, Horizontal and Vertical Collectivism and Individualism Scale, Auckland Individualism and Collectivism Scale, cross-language replicability, psychometric study

In general, individualism, as opposed to collectivism, is defined as an individual's tendency to value personal goals rather than one's in-group goals (Triandis & Gelfand, 1998). Since Hofstede's (1981) introduction of the individualism measure, the study of cultural differences has generated growing empirical interests. Several instruments were developed from then on to assess individualism and collectivism (e.g., Hui, 1988; Shulruf, Hattie, & Dixon, 2007; Triandis & Gelfand, 1998). However, the measures of individualism and collectivism have been subjected to theoretical and measure controversies and ambiguity around the matter still remains. For instance, whether individualism is a one-dimensional construct and collectivism the implicit opposite, as suggested by Hofstede, is still not a matter of consensus. In fact, various authors stipulate that individualism and collectivism are best represented as "separate constructs with multiple dimensions" (Li & Aksoy, 2007, p. 320; Shulruf et al., 2007; Triandis, 1995). Furthermore, whether individualism and collectivism is best operationalized as an orthogonal or a two-dimensional concept with underlying subscales is still not clear. The main objective of this study was to examine the psychometric properties of two individualism and collectivism measures. Specifically, we investigated the orthogonal structure of the Horizontal and Vertical Individualism and Collectivism Scale (HVIC; Triandis & Gelfand, 1998) and the more recent two-dimensional structure of the Auckland Individualism and Collectivism Scale (AICS) containing five subscales (Shulruf et al., 2007) in Switzerland

and in South Africa. One central difference between these two instruments concerns the conceptual foundations on which they were built. Whereas the HVIC was designed with a theory-based approach, the AICS was designed using an empirical-based approach. Indeed, Triandis and Gelfand (1998) empirically tested the idea that a distinction between individualism and collectivism was necessary to expand the construct into a four-attribute construct. In a different vein, Shulruf and colleagues (2007) developed the AICS based on five main dimensions that emerged from a meta-analysis of 253 studies examining either solely individualism and collectivism or their psychological outcomes (Oyserman, Coon, & Kemmelmeier, 2002). Hence, a second objective of this study is to evaluate the theoretical value on which these instruments were designed.

Triandis (1995) introduced a multidimensional construct of individualism and collectivism by distinguishing it in horizontal (preference for equality) and vertical (preference for hierarchy) terms: Horizontal Individualism (HI), Vertical Individualism (VI), Horizontal Collectivism (HC), and Vertical Collectivism (VC). According to Triandis and Gelfand (1998), HI corresponds to individuals who care about being distinct from their groups and who are very self-sufficient. However, the need for high status is not a priority in HI. VI corresponds to individuals who will pursue a higher status, commonly through competition. HC corresponds to individuals who consider themselves alike others and that value interdependence, sociability, and similar goals with groups. However, complying easily with the authority in HC is not typically observed. VC corresponds to individuals who value the goals of the in-group above all and who will engage in competition only with outgroups. Sacrificing one's ideals for the benefit of the group as a whole is characteristic of VC, along with complete submission toward authority figures within the in-group. Triandis (1995) further developed 31 scenarios corresponding to the HVIC behaviors to complement the HVIC attitudes items. However, these scenario measures of the HVIC behaviors do not seem to correlate well with the HVIC attitudes items (Okoro, Cardon, & Marshall, 2008). The HVIC has been validated in various countries and different versions exist (e.g., 32 items, 27 items, 16 items, 14 items). Commonly, samples from the United States were examined in the HVIC validity studies, but samples originating from Singapore (Soh & Leong, 2002), Korea (Triandis & Gelfand, 1998), as well as China, Denmark, and India (Sivadas, Bruvold, & Nelson, 2008) were also examined. For instance, Sivadas et al. found evidence for a 14-item version of the scale that outperformed Triandis and Gelfand's 16-version scale, on the basis of a comparison of six samples in four countries (China, Denmark, India, the United States). For this study, we

focused on the 16 attitudes items of the HVIC taken from Triandis and Gelfand, which seems to be the most frequently used version.

The AICS (Shulruf et al., 2007) is a new tool for assessing individualism and collectivism, which is based on the main dimensions that Oyserman et al. identified in their meta-analyses. According to these authors, the individualism and collectivism framework's main asset is its "theoretical parsimony" (Oyserman et al., 2002, p. 44). However, they maintain that the need to define the construct clearly is imperative for operationalization, assessment, and manipulation purposes. They further argue that, only when meeting these conditions can this construct have scientific worth. In sum, for future research on individualism and collectivism, these authors conclude from their meta-analysis that the fundamental components of individualism are independence and uniqueness, while those of collectivism are "duty to in-group and, cross-nationally, maintaining harmony." In addition, they suggest to study "relationality" and "enjoyment of belonging to the groups or seeking other's advice" distinctly, given their weak congruence with the other elements of the construct (Oyserman et al., 2002, p. 44). The AICS is comprised of five underlying dimensions. Individualism includes three scales (responsibility, uniqueness, and competitiveness), whereas collectivism includes two scales (advice and harmony). As part of the individualism dimension, responsibility is defined as recognizing one's responsibility for one's behavior. Uniqueness is the tendency to define oneself as separate from others. Competitiveness is described as the tendency to pursue one's own goals above all. Furthermore, in the collectivism dimension, advice is the tendency to obtain advice from others prior to making decisions. Harmony is the tendency to avoid situations of conflict.

Initially, the original version of the AICS consisted of 30 items and the reliability for each scale was between .78 and .71. When first developed, the AICS included an additional dimension of closeness ($\alpha = .62$) as part of the collectivism scale. However, Shulruf and colleagues (2011) have further excluded it from the scale given that it did not load in the final model. Few studies were conducted thus far to investigate the psychometric properties of the AICS. For example, Shulruf and colleagues (2011) found adequate goodness-of-fit levels with confirmatory factor analyses (CFAs) in five countries: New Zealand, Portugal, People's Republic of China, Romania, and Italy. Indeed, these authors postulate that the AICS is a superior measure of individualism and collectivism. They claim that the focus on behaviors rather than on values and attitudes of individualism and collectivism is an important and a valuable innovation of this instrument. In addition, Ciochina and Faria (2009) confirmed the internal consistency and validity of the AICS in a study comparing Romanian and Portuguese

samples. However, more studies are needed to examine the measurement equivalence across cultures and also to examine the validity of this scale in other less studied countries, such as the African cultural context.

From an individual's perspective, culture-driven differences have largely been studied. According to Oyserman and colleagues (2002), various differences across countries and ethnic groups exist regarding individualism and collectivism. For instance, results from their meta-analysis confirm the popular belief that Americans are both higher in individualism and lower in collectivism than people from other regions of the world. Nonetheless, their results also showed that American and other Anglophone countries are not significantly different regarding both individualism and collectivism (e.g., Australia, New Zealand, and White South Africa). In a different vein, Americans are lower on collectivism but show no difference in individualism compared with South or Latin Americans. To describe all the differences among individualism and collectivism found in Oyserman and colleagues' (2002) meta-analyses go beyond the scope of this study. However, their results seem to suggest that there is not a single psychology but rather several psychologies. In addition, numerous outcomes related to individualism and collectivism have been studied. For example, after comparing 46 countries in their study, Kuppens, Realo, and Diener (2008) found that the experience of negative emotions has a more negative effect on life satisfaction in individualistic countries than in collectivistic ones. There are few studies addressing the South African or Swiss context specifically in relation to culture-driven individual differences. However, one study found that in South Africa, the *ubuntu* concept defined as "communality, openness, cooperation, and sharing" is an essential characteristic of their culture, which diverges from the Occidental health models on which most psychotherapy interventions are commonly based upon (Van Dyk & Nefale, 2005, p. 48). These authors claim that the Western style of therapy is inadequate for South Africans and that adapting the type of therapy is crucial to address these singular *ubuntu* South African values. To better understand the similarities and particularities of South Africa with Western countries, the study of culture-driven individual differences using culturally robust instruments is fundamental.

The main goal of this study was to evaluate the psychometric properties of two individualism and collectivism scales through internal consistency, exploratory factor analyses (EFA), confirmatory factor analyses (CFA), and invariance equivalence (configural, metric, and scalar). Specifically, we aimed at validating the French versions in Switzerland of both the HVIC and the AICS and to verify the cross-cultural replicability of these instruments in South Africa and Switzerland. We also addressed four identified limitations

of cross-cultural research advanced by Oyserman and colleagues (2002). First, we used samples originating from the working population rather than samples of students most researchers have used to date. Thus, we addressed the generalizability limitation issue. Furthermore, few cross-national studies have actually looked at individual-level differences (culture-driven individual differences in the same culture) along with individual difference across groups (cross-cultural differences). Thus, by addressing both levels of analysis, we limit the risks of making ambiguous cultural comparisons. Moreover, in this study the conceptualization of individualism and collectivism is based on two original, widely used and robust constructs (HVIC and AICS), which limit the heterogeneity of the results. Finally, a large number of studies compared U.S. samples with minorities of East Asian students from Japan, Hong Kong, China, or Korea from the American population. Our study examined samples taken from Switzerland and South Africa, which have been less studied. In fact, the study of culture-driven individual differences is less common in the African context and our study will surely help in gaining more generalizable conclusions for both the HVIC and AICS scales.

Method

Subjects

The sample consisted of 1,403 working individuals from Switzerland (N = 585) and from South Africa (N = 818). In Switzerland, 48.4% were men and 51.5% were women (0.2% unknown), aged from 18 to 65 (mean age = 39.92, SD = 12.88) and 63.1% were Swiss natives while 36.8% originated from foreign countries (0.2% were unknown). In South Africa, 41% were men and 58.8% were women (0.2% unknown), aged from 16 to 64 (mean age = 33.51, SD = 10.74) and 93.4% were South African natives (50.7% "White," 32.1% "Black," 6.5% "Asian," 8.6% "colored," 2.1% "Other"[1]) while 6.6% were foreigners. Participants from both countries completed a minimum of 12 years of education. The education level for 35.9% of the Swiss sample was at the bachelor level or higher while this proportion was of 41.4% in the South African sample.

Instruments

Horizontal and Vertical Individualism and Collectivism Scale (HVIC). The HVIC is a widely used measure of individualism and collectivism developed by Triandis and Gelfand (1998). The short 16-item HVIC Scale used for this

study is a selection of items made on the basis of the loading of 32 original items (Singelis, Triandis, Bhawuk, & Gelfand, 1995). Each of the four dimensions comprises four items. For example, an item from the HI dimension is, "I'd rather depend on myself than others"; an item from the VI dimensions is "Winning is everything." An example of the HC dimension is, "If a coworker gets a prize, I would feel proud"; an item from the VC dimension is "Parents and children must stay together as much as possible." The response rate of the HVIC is based on a 9-point Likert-type scale (1 = *highly disagree*, 9 = *highly agree*).

Auckland Individualism and Collectivism Scale (AICS). Shulruf et al. (2007) developed the AICS. It includes 26 items derived from a review and meta-analysis of 83 studies by Oyserman et al. (2002). Individualism is measured with three dimensions: Responsibility (four items), Compete (seven items), and Unique (four items). Such items include: "I consult with superiors on work-related matters" (Responsibility dimension); "I define myself as a competitive person" (Compete dimension); "I enjoy being unique and different from others" (Unique dimension). Collectivism consists of two dimensions: advice (seven items) and harmony (four items). These items include: "I consult my family before making an important decision" (Advice dimension); "I sacrifice my self-interest for the benefit of my group" (Harmony dimension). The items ask "frequency of behaviors" on a 6-point Likert-type scale (1 = *never*, 6 = *always*).

Translation

Items of the HVIC and the AICS were translated from English to French by our research team and further back-translated into English by an English language professional. Finally, refinements and corrections were made according to and in agreement with the authors of the two original scales. The French-translated versions of the two scales were administered in Switzerland while the original English versions were administered in South Africa.

Procedure

As part of a larger ongoing research study, participants were asked to fill out a questionnaire containing 13 different measures on work stress, health, personality, and culture. In Switzerland, participants were recruited with the help of bachelor's and master's psychology students from the University of Lausanne who each found between three and six participants in their circle

of acquaintances. In South Africa, participants were recruited with the help of master's students in work and organizational psychology. No compensation was given for participating in the study. Criteria to participate were working for at least 1 year (between 80% and 100%), 12 years of education minimum, and at least 18 years old.

Results

Descriptive Statistics

The means, standard deviations, kurtosis, skewness, and Cronbach's alphas of both instruments are presented in Table 1 for the Swiss and South African samples. Internal reliability in Switzerland for the global scales of HVIC individualism and collectivism was .75 and .73, respectively; in South Africa, these values were .78 and .84, respectively. For the four facets, internal reliability was satisfactory in both samples (ranging from .83 to .64). Generally, kurtosis and skewness values for the HVIC were below 1, which indicated normal and symmetrical distributions, except for the collectivism general scale in both countries, the VC facet in South Africa, and the HC facet in Switzerland indicating values slightly above 1. Correlations among some dimensions of the HVIC were found, namely VI correlated with HI (r = .28), HC (r = –.16), and VC (r = .15), whereas HC correlated with VC (r = .23) in Switzerland. The general individualism and collectivism dimensions were not correlated in Switzerland. In South Africa, HI correlated with VI (r = .38), HC (r = .18), and VC (r = .33); VI correlated with VC (r = .19); and HC correlated with VC (r = .52). Furthermore, the general individualism and collectivism scales were positively correlated (r = .27) in South Africa.

Internal reliability in Switzerland for the global AICS individualism and the collectivism scales was .84 and .77, respectively; in South Africa, these values are .86 and .80, respectively. For the five facets, internal reliability was generally satisfactory in both samples (ranging from .89 to .61). However, reliability of the responsibility and the harmony facets were weak in Switzerland, with values of .48 and .55, respectively. All kurtosis and skewness values for the AICS were below 1 in both samples, which indicated normal and symmetrical distributions. Correlations among some dimensions of the AICS were found in Switzerland, namely advice correlated with: harmony (r = .28), compete (r = .17), unique (r = .13), and responsibility (r = .16); compete correlated with unique (r = .32) and responsibility (r = .15); and finally, unique correlated with responsibility (r = .41). Moreover, the general individualism and collectivism scales were positively correlated (r = .19) in

Table 1. Descriptives, Cronbach's Alphas, Means, *SD*, Kurtosis, and Skewness Coefficients

	Switzerland					South Africa				
	α	*M*	*SD*	*k*	*s*	α	*M*	*SD*	*k*	*s*
Horizontal and Vertical Individualism and Collectivism Scale										
Individualism	.75	45.50	9.49	−0.25	−0.20	.78	48.53	10.37	0.01	−0.30
HI	.64	27.14	4.69	0.78	−0.76	.78	26.78	6.08	0.23	−0.59
VI	.80	18.36	7.03	−0.85	−0.03	.75	21.74	6.51	−0.40	−0.17
Collectivism	.73	55.97	7.20	1.09	−0.57	.84	57.15	9.87	1.8	−1.00
HC	.76	28.01	4.32	1.51	−0.91	.77	27.99	5.43	0.65	−0.72
VC	.72	27.97	4.83	0.84	−0.77	.83	29.16	5.88	1.43	−1.14
Auckland Individualism and Collectivism Scale										
Individualism	.84	54.22	10.05	0.07	0.35	.86	63.19	11.00	−0.13	0.20
C	.89	20.38	7.04	−0.30	0.33	.88	25.95	7.50	−0.51	0.09
U	.78	15.84	3.85	−0.06	−0.04	.73	18.21	3.60	−0.12	−0.36
R	.48	18.05	2.52	−0.31	0.23	.61	19.03	2.90	0.08	−0.38
Collectivism	.77	37.91	6.87	0.16	0.17	.80	39.87	8.38	0.25	0.25
A	.81	24.65	5.47	0.36	0.08	.82	25.95	6.45	−0.11	0.06
H	.55	13.26	2.89	0.31	0.29	.62	13.92	3.49	0.26	0.36

Note: Switzerland sample, $n = 585$; South African sample, $n = 818$; C = collectivism; U = unique; R = responsibility; A = advice; H = harmony; HI = horizontal individualism; VI = vertical individualism; HC = horizontal collectivism; VC = vertical collectivism.

Switzerland. In South Africa, considerably strong and numerous correlations were found among some of the dimensions. Advice correlated with Harmony ($r = .37$), Compete ($r = .31$), Unique ($r = .17$), and Responsibility ($r = .28$); Harmony correlated with Compete ($r = .23$), Unique ($r = .09$), and Responsibility ($r = .18$); Compete correlated with Unique ($r = .31$) and Responsibility ($r = .31$); and finally, Unique correlated with Responsibility ($r = .56$). In addition, the general individualism and collectivism scales were positively correlated ($r = .36$) in South Africa.

Principal Component Analysis

The structure underlying the 16 HVIC items was studied in Switzerland and South Africa using principal components analysis (PCA) with varimax rotation (see Table 2). First, a four-component model was considered. In Switzerland, these four components explained a total of 59.14% of the variance and the five

Table 2. Principal Component Analysis Results for the HVIC, in South Africa and Switzerland, and Congruence Coefficients After Procrustes Rotation

	Four-component model									Two-component model				
	South African matrix				Swiss matrix					South African matrix		Swiss matrix		
Items	1	2	3	4	1	2	3	4	CCs	1	2	1	2	CCs
1	–.01	.05	.83	.08	–.21	.06	.77	.04	.97	.08	.63	–.14	.45	.91
2	.02	.12	.84	.09	–.29	.07	.78	.09	.93	.15	.66	–.19	.51	.83
3	.03	.16	.78	.12	.28	–.06	.56	.12	.87	.18	.64	.19	.27	.94
4	.25	.14	.52	.24	.26	–.09	.56	.22	.94	.29	.52	.16	.36	1.00
5	.23	.14	.38	.60	.02	.11	.23	.77	.92	.22	.68	.08	.75	.98
6	.05	.11	.12	.80	–.11	.12	.17	.82	.98	.02	.66	–.02	.80	1.00
7	.03	.11	.10	.82	–.00	.11	.15	.77	1.00	–.00	.65	.06	.73	1.00
8	–.21	–.10	.05	.69	–.12	–.05	–.06	.70	.98	–.31	.52	–.13	.55	.95
9	.70	.14	.10	–.12	.60	.07	.20	–.33	.93	.64	–.06	.52	–.29	.91
10	.81	.12	.13	–.02	.76	.06	.12	–.18	.98	.70	.02	.65	–.23	.93
11	.67	.20	–.09	.10	.77	.08	–.15	.08	.98	.62	–.02	.67	–.14	.97
12	.76	.27	.08	.03	.78	.16	–.16	.02	.95	.75	.05	.72	–.18	.95
13	.21	.78	.10	.05	.09	.65	–.08	.21	.94	.66	.20	.46	.30	.96
14	.19	.81	.18	.04	.01	.85	.02	–.04	.95	.67	.26	.51	.22	1.00
15	.16	.84	.15	.10	.04	.84	.03	.08	.98	.66	.29	.53	.31	.99
16	.46	.58	.09	.07	.36	.53	.03	–.03	.99	.72	.16	.61	.07	.99
CCs	—	—	—	—	.93	.97	.95	.97	.95	—	—	.96	.93	.94

Note: South African, n = 818; Switzerland, n = 585. CCs = congruence coefficients.

first eigenvalues were 3.18, 2.88, 1.84, 1.56, and 0.85. The first component was associated with VI (r = .97), Component 2 with HC (r = .96), Component 3 with VC (r = .97), and Component 4 with HI (r = .97). In South Africa, the four components explained a total of 63.00% of the variance and the five first eigenvalues were 4.74, 2.58, 1.55, 1.22, and 0.78. The first component was associated with HC (r = .96), Component 2 with VC (r = .93), Component 3 with HI (r = .96), and Component 4 with VI (r = .97). We compared the Swiss and South African loading matrices by computing congruence coefficients (CCs) after an orthogonal Procrustes rotation using the South African loadings as the target. Items' CCs ranged from .84 to .99 (*median* = .97). The CCs of the four components ranged from .94 to .97, while the total CC was .96, indicating that this four-component structure replicates very well across the two studied countries.

We also examined a two-component structure for the HVIC Scale in both countries. In Switzerland, these two components explained a total of 37.89% of the variance and the three first eigenvalues were 3.18, 2.88, and 1.84. The first component was closely associated with the Individualism dimension (r = .95)

and the second component was closely associated with the Collectivism dimension (r = .98). In South Africa, the two components explained a total of 45.72% of the variance and the first three eigenvalues were 4.74, 2.58, and 1.55. The first component was associated with the Collectivism dimension (r = .98), and the second component was associated with the Individualism dimension (r = .99). Again, we compared the Swiss and South African loading matrices by computing CCs after an orthogonal Procrustes rotation, using the South African loadings as the target. The items' CCs ranged from .82 to 1.00 (*median* = .97). The CCs of the two components were .96 and .93, and the total CC was .95. The CCs clearly indicate that the two- and four-component structures replicate well across the two studied countries.

We also examined the structure underlying the AICS in both countries using PCA with varimax rotation (see Table 3). In Switzerland, a PCA with varimax rotation of the 26 items allowed for extracting five components, to be compared with five subscales of the AICS. These five components explained a total of 55.54% of the variance, and the first six eigenvalues were 5.35, 3.45, 2.56, 1.56, 1.52, and 1.03. Component 1 was associated with the Compete subscale (r = .99), Component 2 with Advice subscale (r = .97), Component 3 with Unique subscale (r = .95), Component 4 with Responsibility subscale (r = .74), and Component 5 with Harmony subscale (r = .94). In South Africa, the five extracted components explained a total of 54.97% of the variance, and the first six eigenvalues were 6.19, 3.00, 2.36, 1.50, 1.25, and 1.06. The one-to-one association between subscales and components was not as clear in South Africa. Component 1 was associated with Compete (r = .97), Component 2 with Unique (r = .92), Component 3 with Advice (r = .81), Component 4 with Responsibility (r = .47), and Component 5 with Harmony (r = .94). Furthermore, we compared the Swiss and South African loading matrices by computing CCs after an orthogonal Procrustes rotation using the South African loadings as the target. Items' CCs ranged from .76 to .99 (*median* = .98), whereas CCs for the five components ranged from .91 to .98 (*median* = .97). The total CC was .96, indicating a similar structure in both countries. A series of PCAs with oblique rotation were also conducted and did not improve these results.

Using the same methods described for the five-component model, we also examined the two-component structure of the 26 items in both countries (Table 3). These two components should correspond to the two higher-order individualism and collectivism dimensions. In Switzerland, the two factors explained a total of 33.83% of the variance and the three first eigenvalues were 5.35, 3.45, and 2.56. In Switzerland, Component 1 was closely associated with the Individualism dimension (r = .98), and Component 2 was

Table 3. Principal Component Analysis Results for the AICS, in South Africa and Switzerland, and Congruence Coefficients After Procrustes Rotation

	Five-component model											Two-component model				
	South African matrix					Swiss matrix						SA matrix		Swiss matrix		
Items	1	2	3	4	5	1	2	3	4	5	CCs	1	2	1	2	CCs
1	.75	.15	.06	.12	−.00	.78	.11	.03	.15	−.06	.99	.65	.21	.74	.06	.97
2	.23	.69	.07	−.06	.03	.19	.79	.16	−.06	−.01	.99	.61	−.00	.56	.08	.99
3	.07	.10	.41	.60	.09	.01	.05	.62	.32	.15	.88	.16	.59	.08	.64	.99
4	.02	−.02	.06	.20	.73	−.09	−.03	−.01	.15	.71	.98	.03	.40	−.10	.24	.89
5	.09	.24	.07	.48	.27	−.06	.05	.16	.30	.39	.84	.29	.32	.01	.29	.76
6	.79	.14	.11	.01	.04	.79	.15	.03	.01	.04	.99	.64	.23	.74	.08	.97
7	.82	.12	.06	.10	.02	.75	.01	.05	.02	−.03	.99	.68	.23	.64	.09	.98
8	.18	−.03	.75	.15	.12	.12	.04	.70	−.21	.13	.88	.05	.75	.07	.69	1.00
9	.11	.07	.39	.11	.42	.13	−.20	.29	.12	.32	.86	.10	.53	.01	.41	.99
10	.11	.03	.75	.22	.09	.00	−.05	.78	.11	.07	.97	.04	.75	−.02	.76	1.00
11	.04	.56	.06	.31	−.02	.10	.11	.08	.65	.12	.62	.45	.09	.24	.15	1.00
12	.06	.74	.13	−.07	.00	.12	.82	.15	−.08	.01	1.00	.52	−.00	.50	.07	.54
13	.09	.04	.84	.18	.09	.09	.08	.81	−.06	.09	.96	.02	.80	.10	.78	.99
14	.63	.13	.19	−.08	.13	.77	−.00	.07	−.05	.05	.95	.51	.28	.64	.13	.96
15	.10	.02	.79	.02	.08	.08	.04	.74	−.22	.06	.95	−.00	.70	.05	.69	1.00
16	.13	−.05	.26	−.07	.64	.06	.03	.18	−.37	.64	.90	−.03	.45	−.02	.37	.99
17	.14	.65	−.05	.10	.11	.12	.62	−.15	.32	.01	.93	.56	−.02	.48	−.16	.96
18	.07	.11	.10	.72	.02	.06	.08	.50	.43	−.02	.76	.20	.36	.16	.48	.98
19	.05	.50	−.07	.39	−.03	.02	.29	−.06	.69	−.04	.87	.43	.02	.28	−.06	.97
20	.05	.09	.01	.01	.76	.10	.01	.09	−.02	.74	.99	.10	.29	.05	.34	.98
21	.55	.26	−.02	.23	.15	.71	.23	.15	.06	.06	.92	.61	.19	.72	.19	1.00
22	.21	.65	.03	.09	.04	.21	.73	−.01	.17	−.03	.99	.59	.03	.58	−.06	.99
23	.82	.14	.10	.09	.05	.82	.18	.06	−.04	−.00	.98	.68	.26	.77	.10	.97
24	.13	.01	.31	.67	.02	.05	−.08	.54	.36	.03	.84	.15	.53	.06	.55	.98
25	.79	.04	.12	.04	.06	.78	.08	.03	.05	.03	.99	.58	.27	.70	.09	.95
26	.11	.66	−.06	.09	−.02	.04	.59	−.09	.30	−.02	.94	.54	−.09	.39	−.12	.99
CCs	—	—	—	—	—	.98	.92	.94	.75	.98	.93	—	—	.97	.90	.94

Note: South African, n = 818; Switzerland, n = 585; CCs = congruence coefficients.

closely associated with the Collectivism dimension (r = .97). In South Africa, these two components explained a total variance of 35.33%, and the three first eigenvalues were 6.19, 3.00, and 2.36. Component 1 was associated with the Individualism dimension (r = .97), and Component 2 was associated with the Collectivism dimension (r = .96). Furthermore, we compared the Swiss and South African loading matrices by computing CCs after an orthogonal Procrustes rotation using the South African loadings as the target. Items' CCs ranged from .54 to 1.00 (*median* = .98). The CCs for the two dimensions and

Table 4. Goodness-of-Fit Indices for the HVIC and AICS Models, in South Africa and Switzerland

	χ^2	*df*	*p*	χ^2/df	CFI	TLI	RMSEA
Horizontal and Vertical Individualism and Collectivism Scale							
South Africa							
Theoretical model	566.63	98	<.001	5.78	.90	.88	.08
Adjusted model[b]	249.76	93	<.001	2.69	.97	.96	.05
Switzerland							
Theoretical model	471.85	98	<.001	4.82	.86	.83	.08
Adjusted model[b]	284.20	94	<.001	3.02	.93	.91	.06
Auckland Individualism and Collectivism Scale							
South Africa							
Theoretical model	1256.38	269	<.001	4.67	.86	.84	.07
Adjusted model[a]	966.21	266	<.001	3.63	.90	.89	.06
Switzerland							
Theoretical model	1023.44	269	<.001	3.81	.85	.83	.07
Adjusted model[a]	879.18	267	<.001	3.29	.88	.86	.06

Note: *n* = 818; Switzerland, *n* = 585; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation.
[a]Covariations between error terms associated with a modification index above 40 were taken into account.
[b]Covariations between error terms and secondary loadings associated with a modification index above 20 were taken into account.

the total CC ranged from .90 to .97, indicating that this two-component structure replicates well across the two studied countries. In sum, these results show that the five-component structure of the AICS is less stable across both countries than the two-component structure.

Confirmatory Factor Analysis

We performed confirmatory factor analyses (CFA) to examine the construct validity of the French version of the HVIC in Switzerland in comparison to the original English version in South Africa. Table 4 shows the results of four oblique models. The theoretical model showed a relatively acceptable but not perfect fit given that the comparative fit index (CFI) and Tucker-Lewis Index (TLI) values were between .86 and .90, whereas the RMSEA was .08 in both countries. To improve the fit, we adjusted the theoretical models for each country by allowing three pairs of errors to covariate for South Africa and two pairs of errors to covariate for Switzerland. For Switzerland, we also took into account three secondary loadings: Item 8 on HC, Item 5 on HI, and Item 16 on HC. All these adjustments were associated with a modification

Table 5. Invariance Indices Across South Africa and Switzerland

	χ^2	*df*	*p*	CFI	TLI	RMSEA	SRMR
Horizontal and Vertical Individualism and Collectivism Scale							
Individualism							
Configural invariance	1004.35	40	<.001	0.69	0.57	.19	.11
Metric invariance	1212.08	47	<.001	0.63	0.56	.19	.13
Scalar invariance	1434.92	54	<.001	0.56	0.54	.19	.15
Horizontal individualism							
Configural invariance	41.23	4	<.001	0.97	0.92	.12	.03
Metric invariance	92.14	7	<.001	0.94	0.89	.13	.07
Scalar invariance	203.91	10	<.001	0.86	0.83	.17	.08
Vertical individualism							
Configural invariance	9.70	4	<.05	1.00	0.99	.05	.01
Metric invariance	21.11	7	<.01	0.99	0.98	.05	.03
Scalar invariance	100.07	10	<.001	0.94	0.93	.11	.06
Collectivism							
Configural invariance	1175.77	40	<.001	0.70	0.58	.20	.11
Metric invariance	1260.55	47	<.001	0.68	0.62	.19	.11
Scalar invariance	1325.16	54	<.001	0.66	0.65	.18	.11
Horizontal collectivism							
Configural invariance	179.56	4	<.001	0.89	0.67	.25	.06
Metric invariance	207.41	7	<.001	0.88	0.79	.20	.07
Scalar invariance	219.22	10	<.001	0.87	0.84	.17	.07
Vertical collectivism							
Configural invariance	2.89	4	>.50	1.00	1.00	.00	.01
Metric invariance	19.49	7	<.01	0.99	0.99	.01	.04
Scalar invariance	48.84	10	<.001	0.98	0.97	.07	.05
Auckland Individualism and Collectivism Scale							
Individualism							
Configural invariance	2562.54	180	<.001	0.69	0.64	.14	.12
Metric invariance	2628.61	194	<.001	0.68	0.65	.13	.12
Scalar invariance	2904.17	208	<.001	0.65	0.64	.14	.13
Compete							
Configural invariance	162.62	28	<.001	0.97	0.96	.08	.03
Metric invariance	202.43	34	<.001	0.96	0.96	.08	.05
Scalar invariance	380.31	40	<.001	0.93	0.92	.11	.08
Unique							
Configural invariance	71.23	4	<.001	0.95	0.86	.16	.04
Metric invariance	86.08	7	<.001	0.94	0.90	.13	.05
Scalar invariance	106.22	10	<.001	0.93	0.92	.12	.06
Responsibility							
Configural invariance	15.76	4	<.01	0.98	0.94	.07	.02
Metric invariance	32.35	7	<.001	0.96	0.93	.07	.04
Scalar invariance	76.02	10	<.001	0.89	0.86	.10	.06
Collectivism							
Configural invariance	947.12	88	<.001	0.79	0.74	.12	.08
Metric invariance	968.41	98	<.001	0.79	0.77	.11	.08
Scalar invariance	1117.14	108	<.001	0.76	0.75	.12	.09

(continued)

Table 5. (continued)

	χ^2	*df*	*p*	CFI	TLI	RMSEA	SRMR
Advice							
Configural invariance	455.16	28	<.001	0.87	0.81	.15	.07
Metric invariance	465.63	34	<.001	0.87	0.84	.14	.08
Scalar invariance	559.84	40	<.001	0.84	0.84	.14	.08
Harmony							
Configural invariance	12.67	4	<.05	0.98	0.95	.06	.02
Metric invariance	29.08	7	<.001	0.96	0.93	.07	.04
Scalar invariance	91.14	10	<.001	0.85	0.82	.11	.06

Note: Switzerland sample, *n* = 585; South African sample, *n* = 818. CFI = comparative fit index; TLI = Tuker-Lewis Index; RMSEA = root mean square error of approximation.

index equal or above 20 (this cutoff was applied to take into account the differences in terms of degree of freedoms between the HVIC and the AICS). These adjustments improved the goodness-of-fit indices.

We also performed CFAs to examine the construct validity of the French version of the AICS in Switzerland in comparison to the original English version in South Africa. Table 4 shows the results of four oblique models. The theoretical model showed a relatively acceptable but not perfect fit. For instance, the CFI and TLI values were between .83 and .86, whereas the RMSEA was below .08 for Switzerland and South Africa. To improve the fit, the theoretical models were adjusted for the two countries. Specifically, we allowed three pairs of errors to covariate in the South African model, associated with a modification index above 40, and two pairs of errors to covariate in Switzerland, associated with a modification index above 40. The goodness-of-fit indices were acceptable following these adjustments.

Measurement Invariance

For each scale composing the two instruments, the level of measurement invariance across the South African and Swiss samples was analyzed using the method suggested by Steenkamp and Baumgartner (1998). Regarding the HVIC subscales, goodness-of-fit indices indicated that VI and VC reached configural, metric, and scalar equivalence. HI reached configural and metric invariance. The HC scale was not invariant, given that the corresponding goodness-of-fit values did not reach the expected cutoff values. Overall, the CFI values ranged from .86 to 1.00 (*median* = .96); TLI values, from .67 to 1.00 (*median* = .93); RMSEA (root mean square error of approximation) values, from .00 to .25 (*median* = .12); and SRMR (standardized root mean

square residual) values, from .01 to .08 (*median* = .06). The general individualism and collectivism scale did not reach configural, metric, or scalar invariance. In sum, the invariances of the four HVIC subscales were relatively high but were lower for the two main dimensions. These results suggest that mean-level scores may be compared across Switzerland and South Africa for some scales of this instrument, specifically the VI and VC scales.

Regarding the three AICS individualism subscales, goodness-of-fit indices reached configural, metric, and scalar invariance, with the exception of the Responsibility subscale that did not reach scalar invariance. The fit indices were slightly lower for the two collectivism subscales. Concerning collectivism, only the Harmony subscale reached configural and metric invariance. Furthermore, the Advice subscale did not even reach configural invariance. Overall, the CFI values ranged from .84 to .98 (*median* = .94); TLI values, from .81 to .96 (*median* = .92); RMSEA values, from .11 to .14 (*median* = .13); and SRMR values, from .08 to .13 (*median* = .11). The general individualism and collectivism scales did not reach configural, metric, or scalar invariance. Globally, these results indicate that the AICS subscales generally reached structural and metric invariance, while half of the subscales also reached scalar invariance. Results were less positive for the main scales. In sum, the level of invariance of the AICS is rather similar to the level of invariance of the HVIC.

Relationship Between HVIC and AICS Scales and the Mean-Level Differences

Correlations found between the individualism and collectivism across the AICS and the HVIC were relatively weak in both countries, indicating that both instruments assess these two constructs on the basis of fairly different operationalizations. The correlations between the two individualism scales were .67 and .61, respectively, and the correlation between the two collectivism scales were .31 and .37 in Switzerland and South Africa respectively. We further conducted canonical correlations to evaluate the relationship between the two sets of variables in the HVIC and the AICS. The four canonical variables extracted explained only 24% of the variance of the five AICS dimensions in South Africa and 22% in Switzerland and explained 27% of the variance of the four HVIC dimensions in both countries.

Discussion

This study investigated the psychometric properties of the HVIC and AICS measures of individualism and collectivism in two countries: Switzerland and

South Africa. Results obtained indicate that the HVIC is an adequate instrument for the measurement of horizontal and vertical individualism and collectivism in both countries. However, a few nonnegligible associations were found between some dimensions, of which the most important were HI correlating with VI (.28 in Switzerland and .38 in South Africa) and HC correlating with VC (.23 in Switzerland and .52 in South Africa). Surprisingly, Li and Aksoy (2007) found stronger relationships between HI and VI (.39) and between HC and VC (.79), which led them to question the presumed independence between the four-dimensions constituting the HVIC as postulated by Triandis and Gelfand (Triandis, 1995; Triandis & Gelfand, 1998). Though most correlations were fairly weaker in our study compared to those found by Li and Aksoy (2007), their presence reveals that complete independence was not reached among the HVIC dimensions. In addition, results from PCAs indicate that the two-component and four-component structures of the HVIC replicated well across both countries with very high associations between dimensions and factors. Finally, following a few adjustments to the models, CFAs indicated acceptable goodness-of-fit indices for the HVIC, which confirms the four-factor structure of the scale. These results seem to be less in line with Lalwani, Shavitt, and Johnson (2006), who found low-indices fits of the HVIC with their data. However, Li and Aksoy have confirmed through CFAs that the HVIC Scale best fits as "separate I-C constructs with multiple dimensions" (Li & Aksoy, 2007, p. 325). Finally, the invariance indices (configural, metric, scalar) of the HVIC subscales were relatively high and showed moderately good fit, indicating that the HVIC has generally equivalent measurement properties in Switzerland and South Africa. Taken together, the invariance indices demonstrate that the respondents shared a similar understanding of the HVIC Scale and that the underlying meaning and interpretation of the items were comparable in both samples.

Results obtained from the AICS showed that the internal reliability of some scales, in particular the Responsibility subscale, are slightly lower and less adequate in Switzerland than in South Africa. Also, several associations between subscales were found in both countries, of which the most important were *advice* correlating with *harmony* (.28 in Switzerland, .37 in South Africa) as well as *unique* correlating with both *compete* (.32 in Switzerland, .31 in South Africa) and *responsibility* (.41 in Switzerland, .56 in South Africa). Similarly to the HVIC, we cannot claim complete independence among the AICS dimensions on the basis of these correlations. In addition, results from PCAs showed that the five-component structure of the AICS seems slightly less stable across both countries than the two-component structure. Specifically, the Responsibility scale underlying the concept of individualism was not confirmed with the PCAs, notably in South Africa.

Furthermore, CFAs showed that goodness-of-fit indices were acceptable for the AICS in both countries, which is in accordance with Bernardo's (2010) CFA results that led to the most acceptable fit indices using the two higher-order factor structure of individualism and collectivism. Finally, the invariances of the AICS subscales were relatively high for the AICS scales and showed moderately good fit in both countries. Similarly to the HVIC, the invariance indices demonstrate that the respondents shared a similar understanding of the AICS scales and that the underlying meaning and interpretation of the items were comparable in both samples. Moreover, canonical correlations indicate that the relationship between the two sets of variables in the HVIC and the AICS are fairly weak.

When examining the construct validity and the corresponding goodness-of-fit indices, the data had a slightly weaker fit for the AICS compared to the HVIC. However, the goodness-of-fit indices were acceptable following the covariances and secondary loading adjustments. Through the examination of measurement invariance for the AICS and the HVIC, the structural, metric, and scalar equivalence were acceptable but not perfect for both models. However, the four dimensions of the HVIC had the best goodness-of-fit indices compared to the two-dimensional HVIC and compared to the AICS' five-dimensional and two-dimensional models. Similarly, when comparing the validity of three different measures of individualism and collectivism, Paquet and Kline (2009) concluded that the factor structure of the HVIC was the most consistent.

Limitations of this study may be that the two samples taken from Switzerland and South Africa we examined are not representative of the general population. For example, the samples in both countries consisted of particularly well-educated individuals and did not include less socioeconomically privileged individuals. Furthermore, other demographic factors may account for the differences found across countries, such as the higher access to a culturally diverse sample in organizations from Switzerland than from South Africa.

Overall, our results particularly support the idea that Triandis's HVIC measure of horizontal and vertical individualism and collectivism is pertinent. Based on our results, it can be concluded that the original four-factor orthogonal structure of the HVIC is particularly reliable and replicates well across both Switzerland and South Africa. Generally, our results are in line with Hofstede's (1981) results indicating that power distance and individualism are the most correlated constructs of culture out of his five dimensions. Consequently, the horizontal and vertical components add considerable value to the HVIC and should continue to be used when assessing individualism and collectivism. On the other hand, the AICS is slightly less reliable

and valid, but seems to have a fairly transposable construct of individualism and collectivism in both countries nonetheless. More precisely, the relevance of conceptualizing the individualism dimension with three subscales should be questioned and further investigated. In general, our results indicate that these two instruments assess individualism and collectivism quite differently. Indeed, both the HVIC and the AICS define individualism and collectivism based on different operationalizations of the constructs. As mentioned in the introduction, the former focuses on attitudes and values, and the latter focuses on behaviors. However, our results do not provide evidence to support Shulruf and colleagues' (2011) claim that the AICS is an instrument of "superior quality" for measuring individualism and collectivism. This said, the measurement of behaviors seems to have limitations and may represent less stability over time and relative to the different situations compared to attitudes and values. Manifestly, the HVIC scale with its four underlying dimensions seemed to be an especially robust instrument cross-culturally according to our results.

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Note

1. Categories usually used in South Africa for describing the diversity of the population.

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