

How are individualism and collectivism measured?

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The cross-cultural research abound in instruments used to measure individualism and collectivism (27 scales measures various forms of individualism and/or collectivism; Oyserman et al., 2002). The present article takes a closer look at two of the most widely used measures in this literature (Singelis, Triandis, Bhawuk, and Gelfand, 1995; Triandis and Gelfand, 1998) and highlights their psychometrical strengths and limitations (reliability, validity, and measurement equivalence). The article aims to increase awareness regarding the psychometric properties of the measures researchers use in cross-cultural settings as no measure is infallible.

Keywords: validity, organizational culture, measurement, individualism, collectivism

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Introduction

Although attempts to quantify various aspects of culture can be traced further back in time it was not until the publication of Hofstede's "Culture's Consequences" in 1980 that we experienced an explosion of interest in the issue of culture measurement. From the many dimensions of culture on which different culture groups can be compared, individualism-collectivism (IND-COL) is the one which have been most frequently researched (Hofstede, 1980; Triandis, 1986; Singelis, 1995). IND-COL are "cultural syndromes" meaning they reflect shared attitudes, beliefs, categorizations, roles and values organized around a central theme, that are found among individuals who speak a particular language, and live in a specific geographical region, during a specific historical period (Triandis et al., 1995).

Individualists display a preference for being independent, unique, maintaining relationships only when benefits outweigh the costs, pursuing personal rather than social goals, and resisting pressures to obey group norms. By comparison, collectivists value group membership, derive self-definition through relationships with others, and yield to the obligations expected by their friends, family, as well as their larger community (Hui and Triandis 1986).

Even if the above definition seems straightforward, the literature abound in multiple variations of it, fact that makes difficult the measurement of the underlining constructs. As cross-cultural research became more and more vocal in the last decades, this variation of definitions lead to the construction of a variety of IND-COL measures (27 scales measures various forms of individualism and/or collectivism; Oyserman et al., 2002). Because the strengths of a research depend on a great extent on the quality of the measures used, careful examinations of the measures used in IND-COL literature is crucial.

In the present paper we examined the most used measures of IND-COL and took a closer look of their psychometric properties.

Literature Review

Much debate was carried around the dimensionality of IND-COL. Are collectivism and individualism bipolar opposites (unidimensional) or distinct constructs (two dimensions)? Researchers have conceptualized these constructs as either bipolar, with collectivism and individualism on opposite ends of a single dimension, or as distinct, multidimensional constructs, each with a constellation of component features. Most of the conceptual elaboration and much empirical work at the individual level supported the multidimensional conception of collectivism and individualism (Kim et al., 1994; Triandis, et al., 1986).

Moreover Triandis has conducted a great deal of research on IND-COL. Whereas IND-COL are often treated as constituting two distinct cultural patterns, Triandis (1986, 1998) suggested that there are many kinds of IND and COL. For instance, he argued that American IND is different from Swedish IND; likewise, the COL of the Israeli kibbutz is different from Korean COL. Therefore he differentiated between *vertical and horizontal* IND-COL that address the belief in equality/inequality among members of a cultural group (Triandis, 1995; Triandis & Gelfand, 1998). Individuals scoring high on the vertical dimension tend to accept the existence of inequality and emphasize achievement, status, hierarchy, comparison with others, and competition across levels within the group. One self is different from other selves. Individuals scoring high on the horizontal dimension support notions of equality, value the freedom to be themselves without comparison to others, and do not

encourage efforts to be better than others (Triandis & Gelfand, 1998). Generally speaking, horizontal patterns assume that one self is more or less like every other self. When the two dimensions of IND-COL and horizontal-vertical are combined, they yield four constructs: horizontal individualism (HI), vertical individualism (VI), horizontal collectivism (HC), and vertical collectivism (VC).

More specifically, HI people want to be unique and distinct from groups, are likely to say "I want to do my own thing," and are highly self-reliant, but they are not especially interested in becoming distinguished or in having high status. They see themselves as being of equal status with other group members and are less likely to compare themselves to others. HI is a cultural pattern where an autonomous self is postulated, but the individual is more or less equal in status with others. The self is independent and the same as the self of others.

The VI people value being independent and autonomous but they are also competitive and strive to be the best. They are likely to say "I want to be the best." VI is a cultural pattern in which an autonomous self is postulated, but individuals see themselves as different from others, and seek to gain positions of high status. Inequality is expected. The self is independent and different from the self of others. Competition is an important aspect of this pattern.

The HC people see themselves as being similar to others (e.g., one person, one vote) and emphasize common goals with others, interdependence, and sociability, but they do not submit easily to authority. HC is a cultural pattern in which the individual sees the self as an aspect of an in-group. That is, the self is merged with the members of the in-group, all of whom are extremely similar to each other. In this pattern, the self is interdependent and the same as the self of others. Equality is the essence of this pattern.

In VC, people emphasize the integrity of the in-group, are willing to sacrifice their personal goals for the sake of in-group goals, and support competitions of their in-groups with out-groups. If in-group authorities want them to act in ways that benefit the in-group but are extremely distasteful to them, they submit to the will of these authorities. VC is a cultural pattern in which the individual sees the self as an aspect of an in-group, but the members of the in-group are different from each other, some having more status than others. The self is interdependent and different from the self of others. Inequality is accepted in this pattern, and people do not see each other as the same. Serving and sacrificing for the in-group is an important aspect of this pattern.

The ICHV typology is consistent with Rokeach's (1973) analysis of political systems. He discussed political systems that highly value both "equality and freedom," which correspond to HI (social democracy, such as in Australia, Sweden). For example, Feather (1992) identified a tendency among Australians to bring down those who have high status. Systems that Rokeach discussed as valuing equality but not freedom correspond to the conceptualization of HC (e.g., the Israeli kibbutz). Extreme HC is the pattern of theoretical communism. Those systems that value freedom but not equality correspond to the notion of VI (e.g., competitive capitalism and market economies such as in the United States, France, etc.). Finally, those societies that neither value equality nor freedom correspond to VC (e.g., in most traditional villages; traditional societies with strong leaders like India,

China, Muslim countries). In India, for example, the village elders have a very strong hand in village government. Monastic orders that emphasize hierarchical rankings of authority, theocracies, and cults with strong leadership would fall also somewhere near this pattern. Extreme VC is the case of Nazi Germany.

Cultures are not pure. The assumption is that cultures exhibit each of these patterns at different times or in different situations (Singelis et al., 1995). For example, one culture may include individuals who use, across different situations, VI 60% of the time, HI 20% of the time, VC 15% of the time, and HC 5% of the time, whereas the profile of another culture might be VI 40%, HI 40%, VC 10%, and HC 10%. Both cultures may be called individualistic, but it would be more accurate to call the first culture VI.

In evaluating the cultural patterns, Triandis (1995) stressed that there are both desirable and undesirable consequences of these cultural syndromes. Other things being equal (e.g., affluence), collectivism is desirable for family stability and health, but from a civic point of view it can be undesirable (higher probability of war, ethnic cleansing). Horizontal is related with social cohesion and satisfaction with one's status in life. Verticality is functional when decisions must be taken quickly with little debate, and when individual goals must be sacrificed to achieve group goals. Individualism is desirable because it is associated with optimism, well-being, high self-esteem, human rights, and peace between states, but it can be associated with high levels of delinquency and crime within countries.

In their meta-analysis, Oyserman et al. (2002) reported that there are no standard scales to measure IND-COL in general, or ICHV in particular. Also they noted that different scales produce quite different results. In examining the scales cited in the past 20 years, they did not find a single standard or most common measure, though some items are common across many scales (27 different scales). Nevertheless, the most frequently used scales are those proposed by Triandis et al (1986, 1988, 1990, 1991, 1994, 1998) and Singelis et al. (1994, 1995). In U.S. the measure developed by Singelis, Triandis, Bhawuk, and Gelfand (1995) is most used but they actually build their measure on the previous work of Triandis and his collaborators. And later Triandis put together another measure that is actually a shorter adapted version of Singelis et al. (1995). Because of the tied connection of the measures proposed by Singelis et al. (1995) and Triandis and Gelfand (1998) we will examine both of them in the present paper.

Measures Review

Measure 1 - Singelis, Triandis, Bhawuk, and Gelfand (1995)

Following the four factors described by Triandis (1986), Singelis et al (1995) develop a new measure of IND-COL. In their article Singelis et al (1995) focused on proving the robustness of the four factor model of IND-COL by using different methods.

First, they used the 13 statements developed by Sinha and Verma (1994) to reflect collectivism or individualism. For example, please indicate if you are the kind of person who is likely to: Ask your old parents to live with you (collectivism). Spend money (e.g., send flowers) rather than take the time to visit a sick friend (individualism).

Second, they start building the IND-COL measure from a pool of 94 items that were taken from previous measures of IND-COL (especially from the work of Triandis and his collaborators), but also additional items were written for this study. More details about this measure will be provided a couple of paragraphs below in the article.

Third, they used several descriptions of IND-COL and converted them into items. The response format required the subjects to indicate, from 0 to 100%, how much they agree with a situation. For example, "Suppose that most people disapprove of something you like to do. What are the chances you would still do it?" Presumably, collectivists would use the 0 to 40% range of the scale, and individualists somewhat higher percentages. The intention was to correlate each of these exploratory ideas with the factors obtained from the second method to see if the idea is supported.

As a fourth approach they used a forced choice format to again test ideas from the literature. For example, "What is more enjoyable? A large party or an intimate party?" The hypothesis is that the IND will favor a large party where they will have the freedom to circulate, whereas the COL will prefer the close relationships that are more easily available in an intimate setting.

In their last step, Singelis et al. (1995) measured the interdependent and independent self-construal through the Self-Construal Scale (SCS) constructed by Singelis (1994) and correlated this with IND-COL.

The following paragraphs focus on the actual measure developed by Singelis et al. (1995). As mentioned above, they used a combination of existing items and developed several more. Items were answered on 9-point scales, where 1 = never or definitely no and 9 = always or definitely yes. The questionnaire was administered to 267 U.S. college students. Items with low communalities (loading less than .35) were dropped. Items not previously classified were then correlated with scales derived from the previous step. Items correlating more than .30 with a scale were added to that scale, provided they fit the theoretic description of the dimension.

The original 94-item scale was drilled down to a 32-item scale to measure horizontal and vertical IND-COL and was shown to be reliable and valid (see Appendix). The dimensionality of the items was checked through a CFA using LISREL 7. One-, two-, and four-factor models were compared. As expected, the four-factor model provided a better fit than the two-factor model, which provided a better fit than the one-factor model. Hence the scale's structure was shown to be sound by means of CFA and the measure had reasonable reliability coefficients (HI $a = .67$; VI $a = .74$; HC $a = .74$; VC $a = .68$).

To prove convergent and discriminant validities, Singelis et al (1995) use further analysis. Although the horizontal and vertical COL scales were strongly correlated ($r = .39$, $p < .001$), the horizontal and vertical IND scales were not ($r = .00$, $p = ns$). The two horizontal dimensions ($r = .20$, $p < .01$) and the two vertical dimensions ($r = .14$, $p < .05$) were slightly, but significantly, positively related. The horizontal-vertical COL constructs are statistically related to each other. If a researcher is not interested in this distinction, collapsing these two constructs would be reasonable. On the other hand, the horizontal-vertical IND constructs are definitely distinct. Furthermore, the CFA checked the three-construct solutions and they did not fit the data as well as the four-construct solution. Thus it

seems best to recommend that the four constructs be used in future research.

Nonetheless, measurement problems have clouded Singelis et al.'s (1995) results. That is, even though their study's findings supported the four-dimension perspective (Singelis et al., 1995; Triandis and Gelfand, 1998), the scale developed by Singelis and colleagues has not proven to be particularly robust. Sivadas et al. (2008) argue that its usefulness has been hampered because when one reduces the number of items after administering a scale, results indicate inconsistent factor loadings and dubious reliabilities (Lonner and Adamopoulos, 1980). Specifically, after the initial one-country test, subsequent uses in other studies (Triandis and Gelfand, 1998; Probst et al., 1999; Kurman and Sriram, 2002; Soh and Leong, 2002; Cukur et al., 2004) indicated a certain lack of robustness in that results were not fully replicable. Researchers found it difficult to extract unidimensional scales with all items loading on the posited dimensions. As a consequence, certain items have been eliminated in various studies, where the typical practice has been to administer the 32 item scale and then discard some items after an exploratory factor analysis (Sivadas et al., 2008).

Moreover, in the case of cross-cultural studies, beside reliability and validity, prove of measurement equivalence/invariance (ME/I) is a must. The importance of providing evidence for ME/I across countries should not be underestimated, because "violations of measurement equivalence assumptions are as threatening to substantive interpretations as is an inability to demonstrate reliability and validity" (Vanderberg and Lance, 2000). Nevertheless, it appears to be a prevailing notion among cross-cultural researchers that the replicability of factorial structure across countries represents adequate evidence of ME/I (Paunonen and Ashton, 1998). Such evidence, however, is not sufficient. Although the factorial structure of a measuring instrument may yield a similar pattern when tested *within* each of two or more countries, such findings represent no guarantee that the instrument will operate equivalently *across* these countries (Byrne and Watkins, 2003). Equivalence is a function of characteristics of an instrument and of the countries involved. Briefly, equivalence refers to the measurement level at which scores obtained in different countries can be compared (Van de Vijver and Leung, 1997). Demonstration of measurement equivalence is a logical prerequisite to the evaluation of substantive hypotheses regarding countries differences.

The review of literature indicated just one study that looked at ME/I of Singelis et al.'s (1995) measure. Robert et al. (2006) analyzed ME/I using multi-group mean and covariance structure analysis and compared samples of IND-COL data from U.S., Singapore, and Korea. The IND-COL was robust with regard to the interpretability of correlations, whereas differences in culture and translation pose an important potential threat to the interpretability of mean-level analyses. More exactly Robert et al. (2006) proved configural equivalence (factor structure) and metric equivalence (factor loadings) but scalar and uniqueness invariance was not supported (intercept and error). An important limitation of their study was that they made the translation of the measure only for Korean sample, not for Singapore sample too.

Measure 2 - Triandis and Gelfand (1998)

Triandis and Gelfand's (1998) paper includes four studies which come to prove the validity of an improved

IND-COL scale. In the first study, they used a modified version of the original Singelis et al.'s (1995) scale and examined whether the IND-COL structure holds in a non-Western context, more exactly in Korea. Items were answered on 9-point scales, where 1 = never or definitely no and 9 = always or definitely yes. The final scale included 27 items that had the highest factor loadings on the constructs. HI was based on 5 items, including "I often do my own thing". VI was based on 8 items, including "When another person does better than I do, I get tense and aroused." HC was based on 8 items, including "The well-being of my coworkers is important to me." VC was based on 6 items, including "It is important to me that I respect the decisions made by my groups." The items were translated in accordance with the recommendations of Brislin (1980). Both orthogonal approach (orthosim) and oblique (oblimin) approaches that they used indicated the same 4 factors in both US and Korea. The reliabilities (for the US sample) for the scales were: HI ($\alpha = .81$), VI ($\alpha = .82$), HC ($\alpha = .80$), and VC ($\alpha = .73$).

In the second study, Triandis and Gelfand (1998) used two methods for the measurement of horizontal and vertical IND-COL (multi-trait-multi-method matrices of the IND-COL). The same 27 items that were modified from Singelis et al. (1995) were included in this study. In addition to these attitude items, which measured HI, VI, HC, and VC, they used 31 scenarios, in multiple-choice format, that allowed participants to select one of four (i.e., HI, VI, HC, and VC) answers. The correlations that illustrate the convergent validity of the constructs were generally high (e.g., the correlations between the attitude and scenario items for each construct). This analysis indicated that the constructs generally had good convergent and divergent validity. For instance, HI and VI were discriminant different.

To further test the viability of the four dimensions, in the third study, Triandis and Gelfand (1998) examined whether the constructs would relate in hypothesized ways to Triandis and colleagues' previous work on the components of IND (e.g., self-reliance, competition, emotional distance from in-groups, and hedonism) and COL (e.g., interdependence, family integrity, and sociability). Results of this study provide further support for the distinctions among the four cultural patterns. Those which emphasized VI scored especially high on competition and hedonism. Those which emphasized HI were not competitive but scored high on self-reliance. Those which emphasized VC scored especially high on family integrity and sociability and low on emotional distance from in-groups. Those which emphasized HC scored high on sociability and interdependence but not on family integrity. To provide further evidence of convergent validity, this third study helps to clarify the overlap between VC and HC found in the second study. It appears that VC and HC are related because both emphasize sociability but are distinct in terms of their emphasis on family integrity and interdependence, respectively.

Finally, in the fourth study, after a review of the literature on the measurement of IND-COL, Triandis and Gelfand (1998) examined the relationship between their new measures of HI, VI, HC and VC and some of the most widely used measurements of the constructs found in the literature. Many scales developed by other researchers tend to measure the horizontal aspects of the constructs. In particular, HC is well measured by the Gudykunst et al. (1994) Interdependent Construal scale as well as the Singelis et al. (1995) Interdependent Construal scale. HI

may be measured with the Gudykunst et al. (1994) Independent Construal scale satisfactorily. Other data shows that the negative poles of the Yamaguchi (1994) scale also may be used to measure this construct. There are some scales that seem to tap into the vertical aspects, although not as many. VC is linked to the Cheek et al. (1994) Collective Identity scale and to the Altemeyer (1981) scale. Thus, authoritarianism seems to share some elements with VC, but not with HC. This lends further support to the divergent validity of VC and HC, which was discussed in the second study.

Overall Triandis and Gelfand (1998) improved the measure proposed by Singelis et al. (1995). However, even if they used a 27 item scale in the four studies reported in that paper, in Table 2 of their paper (p. 120), they reported the factor loadings for only 16 of those 27 items (see Appendix). Even though Triandis and Gelfand (1998) used the full 27 item scale in studies 2, 3, and 4 of that paper, other researchers have tended to use the 16 items reported in Table 2 of that paper mainly because Triandis and Gelfand (1998) did not mention which are the 27 items that they kept from Singelis et al. (1995) measure.

We found four studies that assessed ME/I of Triandis and Gelfand (1998) measure. All of them used just the 16 items reported in the paper. One study (Chiou, 2001) done with college students in U.S., Taiwan, and Argentina, examined the ME/I of Triandis's scale but only configural invariance was found. Soh and Leong (2002) showed evidence for configural and metric equivalence for a Singapore sample. Interestingly, modification indices, as well as results from exploratory factor analysis, indicated that one of the items would have performed even better on another factor than the expected factor—"It is important to me that I respect decisions made by my groups" (a VC4 item) loaded higher on HC than VC for both U.S. and Singapore samples. Another study was done between U.S. and Turkey (Li & Aksoy, 2007). In this case some issues were reported: VC4 loaded on HC, HC3 had small loadings, and HI4 loaded on a 5th factor. Therefore all this 3 items were removed. The remaining scale proved configural equivalence (factor structure) and metric equivalence (factor loadings), but scalar and uniqueness equivalence were not assessed. Similar results were reported in Soh and Leong's (2002) study. Guo et al. (2008) offer support for configural and partial metric invariance of the four-factor solution across young and older adults, across men and women, and across White Americans and Hispanic Americans.

Discussion

The main accomplishment of the two measures presented above is that they managed to overcome some limitations of the previous measures used in IND-COL studies. Previous measures (Hui, 1988) had low reliabilities, but treating IND-COL as a multidimensional construct (Singelis et al., 1995; Triandis and Gelfand, 1998) the reliabilities increased bringing more confidence in the measure. Also the items of this measure tap better the underlining constructs they represent. This was one of the limitations of Hofstede (1980) measure which lacked of correspondence between operational definitions of IND-COL and the items that Hofstede designated to tap IND-COL constructs.

Despite the fact the measures analyzed above show strong evidence for reliability and validity, in the case of measures used in different cultural setting showing prove

of measurement equivalence is also a must. We found only a couple of studies that looked at this issue (Chiou, 2001; Soh and Leong, 2002; Robert et al., 2006; Li & Aksoy, 2007; Guo et al., 2008). These studies showed evidence for just only configural invariance or just configural and (partial) metric invariance. In order to be able to compare countries based on a certain measure, scalar invariance is necessary too. Moreover, in one case the measure was not even translated for one of the sample (Robert et al., 2006). Also the samples used in the ME/I studies were coming from just a limited number of countries (Singapore, Korea Taiwan, Argentina, Philippines, and Turkey). In this context, more work needs to be done until these measures could fully be considered equivalent and safely used in cross-cultural comparisons.

Another critique addresses the level of measurement: these (and other) IND-COL measures compare individual differences and not cultural differences. Generally in cross-cultural research there is a lack of distinction between levels of analysis (individual vs. cultural level). A partial solution was given by (Triandis, 1995) who argue that at the societal level we can talk about individualism vs. collectivism, and at individual level about idiocentric vs. allocentric. Basically you can be an allocentric person in an individualistic society and even have bicultural competences which mean to have both dimensions (if for example you leaved enough in both IND and COL countries). But the big issue is the way items are formulated which is at individual level (“My musical interests are extremely different from my parents”) not at cultural level (“In our society children have different interests than the parents”).

One common issue in cross-cultural research is that people in different parts of the planet use scales in different ways. As Triandis (1995) mention, in some cultures (e.g., around the Mediterranean, especially among Arabs) if one is truthful one must make strong, clear statements, and thus the use of the extreme ends of the scales is very common. One does not just say “I like this food”; one must say “This is among the best food that I ever had”. In other parts of the world, such as in East Asia, people place great value on modesty and on controlled emotional expression and this results in the frequently use of the middle position of scale when answering questions. On the other hand in U.S. people use the entire scale.

References

- Altemeyer, B. (1981). *Right-wing authoritarianism*. Winnipeg: University of Manitoba Press.
- Byrne, B., & Watkins, D. (2003). The Issue of measurement invariance revisited. *Journal Of Cross-Cultural Psychology*, 34, 155-175.
- Cheek, J. M., Tropp, L. R., & Chen, L. C. (1994). *Identity orientations: Personal, social and collective aspects of identity*. Paper presented at the 102nd Annual Convention of the American Psychological Association, Los Angeles.
- Chiou, J. (2001). Horizontal and vertical individualism and collectivism among college students in the United States, Taiwan, and Argentina. *The Journal of Social Psychology*, 2001, 141, 667-678.
- Cukur C., de Guzman M., & Gustavo, C. (2004). Religiosity, values, and horizontal and vertical individualism-collectivism: a study of Turkey, the United States, and the Philippines. *Journal of Social Psychology*, 144, 613-34.
- Feather, N. (1992). Values, valences, expectations, and Actions. *The Journal of Social Issues*, 48, 109 -124.
- Fiske, A. (2002). Using individualism and collectivism to compare cultures — A Critique of the validity and measurement of the constructs: Comment on Oyserman et al. (2002). *Psychological Bulletin*, 128, 78-88.
- Gudykunst, W. B., Matsumoto, Y., Ting-Toomey, S., Nishida, T., & Karimi, H. (1994). *Measuring self construals across cultures: A derived etic analysis*. Paper presented at the meeting of the International Communication Association, Sydney, Australia.
- Guo, X, Schwartz, S., & McCabe, M. (2008). Aging, gender, and self: Dimensionality and measurement invariance analysis on Self-Construal. *Self and Identity*, 7, 1 – 24.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. London: Sage.
- Hui, C. H., & Triandis, H. C. (1986). Individualism-collectivism: A study of cross-cultural researchers. *Journal of Cross-Cultural Psychology*, 17, 225-248.
- Hui, H. (1988). Measurement of individualism-collectivism. *Journal of Research in Personality*, 22, 17-36.

The use of self-reported measures is a general problem in many studies. But maybe their perturbing effects are even deeper in cultural studies. The core of culture consists of practices and competencies, needs, motives, emotions, institutions and constellations of relationships, and artifacts and technologies. Most of the intangible constituents of culture generally are not accessible to consciousness, reflection, or explicit linguistic expression. People simply are not aware of these aspects of their culture and cannot report them, even in terms of their own behaviors and preferences (Fiske, 2001).

The majority of the IND-COL measures do not take in account the context (e.g., work, home, friends, etc.), or the sub-cultures (e.g., small vs. big city, social-economic status, age, etc.). Moreover IND-COL is a dynamic concept because the culture shifts over time. Hence what was true 30 years ago might not be true now, and what is true now might not be valid 30 years from now.

Conclusion

The present paper highlights the importance of being aware of the psychometrics properties of the IND-COL measures used in cross-cultural research. The importance of using measures with sound psychometrics properties (reliability, validity, and measure equivalence) can not be stressed enough. A measure can make or break the entire results of a research. But just because a measure is widely used this does not mean that it is infallible or that it can not be improved.

Moreover, a single numeric index or a few dimension scores cannot provide a comprehensive description of a culture. No method is valid unless it builds on deep, extensive prior knowledge of the cultures being assessed. Sitting at one's desk, one can not design a universal psychological instrument. On the other hand, this does not mean that participant observation is infallible or that unverified ethnographies can all be trusted - in fieldwork as in the lab, not all results are replicable. The only sound approach is to use a variety of complementary methods, each replicated against similar studies and checked against results from the other methods.

- Kim, U., Triandis, H. C., Kagitçibasi, C., Choi, S. C., & Yoon, G. (1994). *Individualism and collectivism: Theory, method, and applications*. Thousand Oaks, CA: Sage.
- Kurman J. & Sriram N. (2002). Interrelationships among vertical and horizontal collectivism, modesty, and self-enhancement. *Journal of Cross-Cultural Psychology*, 33, 71–86.
- Li, F. & Aksoy, L. (2007). Dimensionality of individualism–collectivism and measurement equivalence of Triandis and Gelfand’s Scale. *Journal of Business and Psychology*, 21, 313-329.
- Lonner WHJ, & Adampoulos J. (1980). Culture as antecedent to behavior. In: J. W. Berry, W. John, Y. Poortinga, J. Pandey (Eds.). *Handbook of cross-cultural psychology* (pp. 43–84) 2nd edition. Needham Heights, MA: Allyn & Bacon.
- Oyserman, D., Coon, H., & Kimmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128, 3–72
- Probst T, Carnevale P, & Triandis H. (1999). Cultural values in intergroup and single-group social dilemmas. *Organizational Behavior Human Decision Process*, 77, 171–91.
- Paunonen, S., & Ashton, M. (1998). The structured assessment of personality across cultures. *Journal of Cross-Cultural Psychology*, Special Issue: Personality and its measurement in cross-cultural perspective, 29, 150-170.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Robert, C., Lee, W., & Chan, K. (2006). An Empirical analysis of measurement equivalence with the INDCOL measure of individualism and collectivism: Implications for valid cross-cultural inference. *Personnel Psychology*, 59, 65–99.
- Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, 20, 580–591.
- Singelis, T. M., Triandis, H. C., Bhawuk, D. P. S., & Gelfand, M. J. (1995). Horizontal and vertical dimensions of individualism and collectivism: A theoretical and measurement refinement. *Cross-Cultural Research*, 29, 240–275.
- Sinha, J.B.P., & Verma, J. (1994). Social support as a moderator of the relationship between allocentrism and psychological well-being. In U. Kim, H.C. Triandis, C. Kagitçibasi, S. Choi & G. Yoon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 175-188). Newbury Park, CA: Sage.
- Sivadas, E., Bruvold, N., & Nelson, M. (2008). A reduced version of the horizontal and vertical individualism and collectivism scale: A four-country assessment. *Journal of Business Research* 61, 201–210.
- Soh S. & Leong F. (2002). Validity of vertical and horizontal individualism and collectivism in Singapore. *Journal of Cross-Cultural Psychology*, 33, 3–15.
- Triandis, H. C., Leung, K., Villareal, M. V., & Clark, F. L. (1985). Allocentric versus idiocentric tendencies: Convergent and discriminant validation. *Journal of Research in Personality*, 19, 395–415.
- Triandis, H. C., Bontempo, R., Betancourt, H., Bond, M., Leung, K., Brenes, A., Georgas, J., Hui, H., Marin, G., Setiadi, B., Sinha, J., Verma, J., Spangenberg, J., Touzard, H. & de Montmollin, G. (1986). The measurement of etic aspects of individualism and collectivism across cultures. *Australian Journal of Psychology*, 38, 257-267.
- Triandis, H. C., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and Social Psychology*, 54, 323–338.
- Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview.
- Triandis, H. C., & Gelfand, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74, 118–128.
- Triandis, H.C. (1998). Vertical and horizontal individualism and collectivism, theory and research implications for international comparative management. *Advances in international Comparative Management*, 12, 7-35.
- Van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross cultural research*, Newbury Park, Sage, CA.
- Vandenberg, R., & Lance, C. (2000). A review and synthesis of the measurement invariance literature: suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3, 4 -70.
- Yamaguchi, S. (1994). Collectivism among the Japanese: A perspective from the self. In U. Kim, H. C. Triandis, C. Kagitçibasi, S.-C. Choi, & G. \bon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 175-188). Newbury Park, CA: Sage.

Appendix

Measure 1 - Singelis, Triandis, Bhawuk, and Gelfand (1995)

Horizontal Individualism

1. I prefer to be direct and forthright when I talk with people
2. One should live one's life independently of others
3. I often do my own thing
4. I am a unique individual
5. I like my privacy
6. When I succeeded, it is usually because of my abilities
7. What happens to me is my own doing
8. I enjoy being unique and different from the others in many ways

Vertical Individualism

1. Winning is everything
2. It annoys me when others people perform better than I do
3. It is important for me that I do my job better than the others
4. I enjoy working in situations involving competition with others

5. Competition is law of nature
6. When another person does better than I do, I get tense and aroused
7. Without competition it is impossible to have a good society
13. Some people emphasize winning; I am not one of them (reverse)

Horizontal Collectivism

1. My happiness depends very much on the happiness of those around me
2. I like sharing little things with my neighbors
3. The wellbeing of my coworkers is important to me
4. It is important for me to maintain harmony within my group
5. If a relative were in financial difficulty, I would help within my means
6. If a co-worker gets a prize I would feel proud
7. To me pleasure is spending time with others
8. I feel good when I cooperate with others
9. I think cooperation in workplace is more important than competition
10. I think it is important everyone has equal access to healthcare

Vertical Collectivism

1. I would do what would please my family
2. I usually sacrifice my self-interest for the benefit of my group
3. We should keep our aging parents with us at home
4. Children should feel honored if their parents receive a distinguished award
5. Children should be taught to place duty before pleasure
6. I would sacrifice an activity that I enjoy very much if my family did not approve of it
7. I hate to disagree with others in my group
8. Before making a major trip, I consult with most members of my family and many friends

Scale: 1-7, Cronbach's α : .67 (HI), .74 (VI), .74 (HC), .68 (VC); test-retest: not available

Measure 2 - Triandis and Gelfand, 1998

Horizontal Individualism

1. I'd rather depend on myself than others
2. I rely on myself most of the time, I rarely rely on others
3. I often do my own thing
4. My personal identity, independent of others, is very important to me

Vertical Individualism

1. It is important for me to do my job better than the others
2. Winning is everything
3. Competition is the law of nature
4. When another person does better than I do, I get tense and aroused

Horizontal Collectivism

1. If a co-worker gets a prize, I would feel proud
2. The well-being of my coworkers is important to me
3. To me, pleasure is spending time with others
4. I feel good when I cooperate with others

Vertical Collectivism

1. Parents and children must stay together as much as possible
2. It is my duty to take care of my family, even when I have to sacrifice what I want
3. Family members should stick together, no matter what sacrifices are required
4. It is important to me that I respect the decision made by my groups

Scale 1-9; Cronbach's α : .81 (HI), .82 (VI), .80(HC), .73(VC); test-retest: not available; loadings .40 to .68