

HOFSTEDE, GLOBE, AND MINKOV: IDENTIFYING CORE PREDICTORS OF CIVILIZATION-LEVEL CULTURE

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ABSTRACT

The Hofstede, GLOBE, and Minkov models of national culture each capture some civilization-level patterns according to Toynbee's hypothesis, to which Huntington further contributed. The proliferation of cultural dimensions raises the question of which model most reliably reflects the attributes of civilizations, where national culture begins, as opposed to nations, which vary culturally beyond civilizational identities. The present study looks for the core cultural dimensions characterizing the civilization level of analysis. It then compares the three models to ascertain which best captures civilization-level attributes. The goal is ultimately to provide a way to estimate cultural dimensions for as yet unmeasured nations.

Keywords: civilizations, GLOBE, Hofstede, Minkov, national culture

INTRODUCTION

The Toynbee-Huntington civilization hypothesis, advanced originally by Toynbee (1946) and updated by Huntington (1993) to include all modern nations, groups the world's nations into meaningful clusters that serve as a common source of higher-order identity for their respective members. While Huntington's primary argument has to do with international relations, the model of civilizations that he extended from that of Toynbee provides a basis for facilitating the search for cultural profiles that might enable applications in international business, such as by providing human-resource directors and training agencies the conceptual material necessary for improving training programs for expatriate employees, or by providing marketing directors and marketing firms reliable insights into where to draw the line in transferring promotional campaigns across national boundaries.

To be sure, cultural dimensions are highly abstract, and it is infeasible to infer specific norms of behavior within a given culture based on cultural dimensions alone. However, cultural dimensions provide a source of explanation for observed behaviors and cultural artifacts, which then permits anticipation of new phenomena within the same culture, without the concomitant shock to the senses that so easily causes confusion, anxiety, and even depression to expatriates. Cultural dimensions similarly provide a way to anticipate attitudes, given that they operate at a level of psychological abstraction equivalent to that of universal human values and thus govern attitude formation (*cf.* Rokeach, 1968).

In this way, each model of cultural dimensions offers practical benefits. However, the question of how to choose from among the available models to achieve sufficient simplicity in the decision-making criteria that may result, such as in terms of providing expatriate trainees a manageable tool for helping navigate foreign cultures, rather than a model that is conceptually unwieldy due to the large number of variables that it presents, remains open. While there is clear

value in knowing that two countries may be culturally similar enough to permit translation of key cultural dimensions from one to the other and thereby bypass the need to conduct independent research to infer a cultural profile before being able to set up a training program to facilitate the conduct of business in the new nation, it is first necessary to discern the most reliable way to tie the two nations together according to a valid theoretical model.

BACKGROUND INTO THE TWO THEORIES

Three models of cultural dimensions currently dominate the literature in this area. These consist of Hofstede's cultural dimensions, which currently incorporates seven dimensions in all (Hofstede, Hofstede, Minkov, & Vinken, 2008), the GLOBE study, which includes nine values and nine practices (House, Hanges, Javidan, Dorfman, & Gupta, 2004), and the Minkov's (2011) four dimensions extracted from the World Values Survey (World Values Study Group, 1989). Of these, the first enjoys the most widespread use, but the second is gaining rapidly in popularity as an alternative with possibly new kinds of explanatory power, compared to the Hofstedeian antecedent. The third has rapidly gained popularity in several countries, but it remains less known than the first two in the English-speaking world.

It is important to avoid confusion between cultural dimensions and personality traits. While each member of a particular culture is responsive to his culture's dimensions, this is a normative, rather than descriptive, fact. Cultural dimensions precede the individual's personality formation. They shape everyone's attitudes toward vertical and horizontal social differentiation by communicating expectations in an overarching way, such that each individual models his behavior after them without realizing it, and when he deviates from them, he generally feels that somehow he is challenging the boundaries of reason or normalcy. However, it would be an error to suggest that individual-level behavior is incapable of belying one's cultural dimensions, which would therefore confound the researcher's observations. Cultural dimensions should inform the cultural acceptability of specific practices and provide clues to the smoothest, least obstructed modes of interaction available within a particular culture. In general, members of a culture will abide by them, while both personality and political motivation may at times induce them to act in quite the opposite fashion. They will rarely predict an individual's personality.

It is also important to note that cultural dimensions *per se* are insufficient as a source of information about common cultural rites, rituals, and practices. Indeed, nations that are clearly dissimilar in terms of their language, religion, ethnicity, political condition, level of conflict, or level of corruption may be quite similar in terms of cultural dimensions before consideration of how the members of those distinct but similar nations actually apply those dimensions. For example, China and Bangladesh both rate 80 in power distance and 20 in individualism in Hofstede and Hofstede's (2005) tables. Nevertheless, this falls short of explaining how Chinese and Bangladeshi people apply high power distance and low individualism within their respective cultures. The careful observer can indeed infer abstract similarities along these lines, but most valid inferences will depend on specific observations, of which the trained observer will have learned to make sense using cultural dimensions as an explanatory principle and thus an aid to predicting further patterns, rather than as the self-sufficient predictor of specific practices *per se*.

Building on Toynbee (1946), Huntington's (1993) civilization model advances an independent conceptualization of how the world has come to organize its cultures in an historical and

sociological sense. In essence, Huntington updated and applied Toynbee's (1946) model to the world's multifaceted alliances, rifts, and trends through modern history to identify human beings' highest-order focus of cultural identity. Huntington acknowledged that some human beings may indeed see themselves most fundamentally as human and hence partisan to no particular subgroup of humanity, but as a rule, human beings have little custom for identifying themselves this way with any notable degree of intensity. Huntington observed that at certain times in human history, some other sources of identity have trumped the power of civilizations as the world's primary motivator.

For practitioners, the relationship between Hofstede's (1980, 1991) cultural dimensions and Huntington's (1993) civilizations is first a question of grouping and second a matter of nuance. Both theories suggest that culture operates most generally at a very high level of analysis, which stops at the boundaries of civilizations for Huntington and nation-level entities for Hofstede. (To be sure, both theorists acknowledged variations on their respective themes; neither suggested that culture resists identification at levels of analysis that vary somewhat from these primary *foci* of interest.) Thus, while Hofstede readily acknowledged the fact that cultural dimensions will often be similar among nations that are similar in some other way (*e.g.*, sharing a common language, religion, or history), Huntington provided a theoretically driven way to group them along the lines of deeper similarities. By doing so, he implicitly provided a way to estimate the cultural dimensions of newly identified nations within an identifiable grouping, by using extant measures of other nations within the same. Moreover, using a theoretically sound conceptual apparatus, Huntington unwittingly provided a way to enrich the information that cultural dimensions convey, by reference to civilization-specific properties.

For theorists, the two theories unite upon a common groundwork of the role of identity as both a motivator of action and a filter of perception, with apparent implications for the study of human values (*e.g.*, Schwartz, 1993). In the absence of Huntington (1993), cultural dimensions appear to underlie the normative sociology of nations without any obvious antecedent. That they reinforce themselves by virtue of their innate inertia is sufficient to argue their enduring nature, but the mechanisms of their mutation over time, especially under conditions of national trauma (*e.g.*, an invasion) are less than apparent. By reference to Huntington, Hofstede's (1980) cultural dimensions can benefit from Toynbee's (1946) explications of sociological transitions in history, thus enriching the available detail that can explain how individual nations differ culturally from one another within the same civilization, let alone among different civilizations. This additional theoretical substance permits the theorist to link resource considerations, for example, to a given nation's particular cultural dimensions, thereby providing a link between theory and observable phenomena for the practitioner. For example, the strong correlation between individualism and *per capita* GDP is common knowledge, but the reason for it has been a matter of speculation. Drawing from Toynbee on the subject provides the basis for stronger theoretical reasoning, while the acknowledgement that civilization *per se* may moderate this relationship refines the analysis.

In short, Huntington's (1993) model of civilizations, as built upon Toynbee's (1946) theory, provides strong logic to justify considerations of common cultural characteristics across a civilization, measurable by means of Hofstede's (1980, 1991) cultural dimensions. Thus, practitioners can have at their disposal a means of understanding culture first from the perspective of the relevant civilization, and then by reference to nationally specific cultural dimensions. For the benefit of training in international business, the following discussion seeks

to explain the two theories individually, then to show the validity of Huntington's civilizations by direct reference to Hofstedean dimensions, and finally to provide examples of how to enrich the information available in cultural dimensions as a practical heuristic by leveraging theoretical detail and nuance from Huntington.

HYPOTHESES

While this is primarily an exploratory study, the expectation is that each of the three models of cultural dimensions will predict the civilization-level pattern significantly. This is because the governing assumption in this study is that the separately developed theories of culture and civilizations will converge in a meaningful way. This convergence would validate each of the models. Accordingly, Hypotheses 1-4 are as follows:

- H1. The Hofstedean 7-dimension model of culture will significantly converge with the Toynbee-Huntington civilization model.
- H2. The GLOBE 9-dimension model of cultural practices will significantly converge with the Toynbee-Huntington civilization model.
- H3. The GLOBE 9-dimension model of cultural values will significantly converge with the Toynbee-Huntington civilization model.
- H4. Minkov's 4-dimension model of culture will significantly converge with the Toynbee-Huntington civilization model.

The implications of significant differences in the relative strength of the respective models will be self-evident and will constitute part of the exploratory facet of this study. To conclude the assessments, however, the final hypothesis posits that the combined model of cultural dimensions will similarly converge with the civilization model, hence:

- H5. The combined model of cultural dimensions, including all significant variables from the foregoing models, will significantly converge with the Toynbee-Huntington civilization model.

While it is clear that a combined model should function better than one of the individual models, the interest in this case is whether the number of retained variables will be excessive, or whether the statistical process will alternatively reduce the number of variables according to Hofstede's (2006) prediction that cultural dimensions are naturally few in number. This last point is difficult to formulate into an hypothesis, however, because the definition of parsimony remains open to speculation at this point.

METHOD

The approach taken in this study is to work around the fact that several nations for which there are published cultural dimensions in one model are missing in one or both of the other models. This reduces the sample size too much to enable the normal range of statistical tests. However, paired comparisons between nations are nevertheless possible. The procedure thus entails creating the sampling frame by listing two nations at a time, noting whether they are theoretically

of the same civilization, and presenting the absolute value of the difference in their respective cultural dimensions. There are only 29 nations for which cultural dimensions are available in all models with no missing data, but the pairing procedure expands that small sample size to $N = 406$ pairs of nations in all.

Because the predictors consist of several variables (each cultural dimension produces one difference score, in the form of the absolute value of the arithmetic difference) and the criterion is a binary variable, the optimal procedure is logistic regression analysis. This approach produces a score associated with the probability that a given pair belongs to the same-civilization category (0), as opposed to the alternative different-civilization category (1). Accordingly, the procedure entails testing each model separately first, to assess which variables the statistical process retains. One advantage with logistic regression analysis is that the procedure identifies which variables fail to add to predictive power, which in turn enables the researcher to remove them and rerun the analysis.

To define civilizations, the approach taken herein is to maintain the same total number of civilizations as presented by Huntington (1993), whose model addresses all major civilizations that exist at the present time (as opposed to historical civilizations), while adjusting boundaries based on a close reading of Toynbee. This approach produces changes from Huntington affecting three specific areas: (1) associating Korea with Japan, in contrast to Huntington's assignment of Korea to the Sino-Confucian civilization; (2) associating the non-Orthodox Slavic nations to the Slavic-Orthodox civilization; and (3) associating the Iberian Peninsula with the Ibero-American civilization. Although the Western civilization remains unwieldy, and indeed Toynbee provided enough guidance to justify subdividing it into core Western European states, Central European states, Nordic states, and the English-speaking states, in addition to relegating the Iberian Peninsula to Latin America, the study will ignore this division and instead reserve judgment, to see whether the statistical analysis produces results that reflect this understanding. Consequently, the civilizations defined herein consist of the following:

TABLE 1
LIST OF CIVILIZATIONS USED IN THE PRESENT STUDY

Civilization	Nations Represented in the Present Study
African	Nigeria
Arabo-Islamic	Egypt, Indonesia, Iran, Morocco, Turkey
Hindu-Buddhist	India
Ibero-American	Argentina, Brazil, Colombia, Mexico, Spain
Korean-Japanese	Japan, South Korea
Sino-Confucian	China
Slavic-Orthodox	Poland, Russia, Slovenia
Western	Australia, Finland, France, Germany, Italy, Netherlands, New Zealand, Sweden, Switzerland, United Kingdom, United States

Table 1 enumerates the civilizations depicted in the present study. As noted previously, this list adheres to Huntington's (1993) enumeration, while adjusting selected civilizational boundaries based on Toynbee's (1946) original observations. The total number of nations in the sample is small, but the sample actually consists of all possible pairs of nations, so the composite facet of the study (*i.e.*, that which includes all models simultaneously) includes $N = 406$ pairs.

Meanwhile, the single-model facets of the study include more nations than shown in Table 1, because the narrower range of cultural dimensions permits a broader selection of nations. These numbers are visible in the descriptive statistics below.

RESULTS

Descriptive Statistics

The descriptive statistics for each model, presented below, reflect the difference scores across all possible pairs of nations. Meanwhile, the large number of possible pairs is visible in the large sample size in each case (*e.g.*, $N = 1,035$ for the Hofstedean 7-dimension model in Table 2). The max figures presented in these tables generally suggest the maximum score on the noted scale, because the maximum difference generally observable between nations is close to the maximum score on the dimension itself.

**TABLE 2
HOFSTEDEAN 7-DIMENSION MODEL
DESCRIPTIVE STATISTICS**

	N	Min	Max	Mean	SD	
civ	1035	0	1	.83	.373	Notes: civ (same civilization [0], different civilization [1]); pdi (power distance); idv (individualism-collectivism); mas (masculinity-femininity); uai (uncertainty avoidance); lto (long-term orientation); ivr (indulgence <i>versus</i> restraint); mon (monumentalism <i>versus</i> self-effacement). These data refer to difference scores between pairs of nations.
pdi	1035	0	72	21.12	15.372	
idv	1035	0	79	24.86	19.188	
mas	1035	0	90	19.39	16.152	
uai	1035	0	92	23.34	17.385	
lto	1035	0	93	28.57	20.890	
ivr	1035	0	100	28.69	20.694	
mon	1035	0	50	18.02	12.497	

**TABLE 3
GLOBE PRACTICES
DESCRIPTIVE STATISTICS**

	N	Min	Max	Mean	SD	
civ	1830	.00	1.00	.83	.380	Notes: civ (same civilization [0], different civilization [1]); asp (assertiveness practices); isp (institutional collectivism practices); igp (in-group collectivism practices); fup (future orientation practices); gep (gender egalitarianism practices); hup (humanitarian orientation practices); pfp (performance orientation practices); pdp (power distance practices); uap (uncertainty avoidance practices). These data refer to difference scores between pairs of nations.
asp	1830	.00	1.36	.40	.282	
isp	1830	.00	1.85	.45	.347	
igp	1830	.00	2.91	.79	.630	
fup	1830	.00	1.82	.51	.373	
gep	1830	.00	1.62	.40	.292	
hup	1830	.00	1.83	.51	.368	
pfp	1830	.00	1.70	.44	.317	
pdp	1830	.00	2.00	.42	.331	
uap	1830	.00	2.33	.66	.508	

**TABLE 4
GLOBE VALUES
DESCRIPTIVE STATISTICS**

	N	Min	Max	Mean	SD	
civ	1830	.00	1.00	.83	.380	Notes: civ (same civilization [0], different civilization [1]); asv (assertiveness values); isv (institutional collectivism values); igv (in-group collectivism values); fuv (future orientation values); gev (gender egalitarianism values); huv (humanitarian orientation values); pfv (performance orientation values); pdv (power distance values); uav (uncertainty avoidance values). These data refer to difference scores between pairs of nations.
asv	1830	.00	3.16	.70	.564	
isv	1830	.00	1.81	.54	.380	
igv	1830	.00	1.56	.36	.266	
fuv	1830	.00	1.84	.42	.318	
gev	1830	.00	1.86	.53	.396	
huv	1830	.00	1.06	.26	.185	
pfv	1830	.00	1.43	.32	.248	
pdv	1830	.00	1.59	.35	.293	
uav	1830	.00	2.57	.67	.501	

**TABLE 5
MINKOV 4-DIMENSION MODEL
DESCRIPTIVE STATISTICS**

	N	Min	Max	Mean	SD	
civ	780	0	1	.83	.372	Notes: civ (same civilization [0], different civilization [1]); mon (monumentalism <i>versus</i> flexumility); ivi (industry <i>versus</i> indulgence); hyp (hypometropia <i>versus</i> prudence); exc (exclusionism <i>versus</i> universalism). These data refer to difference scores between pairs of nations.
ivi	780	0	1000	311.11	214.020	
mon	780	1	1000	323.28	225.958	
hyp	780	0	982	183.07	227.653	
exc	780	0	977	329.21	234.002	

Correlations

Tables 6-9 present standard correlation matrices for the respective scales. Tables 10-15 then provide correlation matrices across scales, for the sake of comparison. It is important to note that these correlations reflect difference scores. However, there is a noticeable similarity between these correlations and those that represent straight measures of cultural dimensions, so these tables effectively reflect the relationships among the cultural dimensions as ordinarily presented. However, the larger sample size resulting from the use of pairs of nations results in more instances of statistical significance than is usually the case in tables of this kind.

**TABLE 6
HOFSTEDEAN 7-DIMENSION MODEL
CORRELATION MATRIX**

	civ	pdi	idv	mas	uai	lto	ivr	
pdi	.312**							Notes: civ (same civilization [0], different civilization [1]); pdi (power distance); idv (individualism-collectivism); mas (masculinity-femininity); uai (uncertainty avoidance); lto (long-term orientation); ivr (indulgence <i>versus</i> restraint); mon (monumentalism <i>versus</i> self-effacement). These data refer to difference scores between pairs of nations.
idv	.278**	.569**						
mas	.049	.239**	.227**					
uai	.304**	.052	.047	.039				
lto	.190**	-.072*	-.058	.089**	.007			
ivr	.113**	.066*	.086**	.062*	-.075*	.141**		
mon	.334**	.128**	.015	.173**	-.035	.616**	.048	

**TABLE 7
GLOBE PRACTICES
CORRELATION MATRIX**

	civ	asp	isp	igp	fup	gep	hup	pfp	pdp
asp	-.020								
isp	.102**	.105**							
igp	.217**	.121**	.150**						
fup	.091**	.019	.177**	.327**					
gep	.088**	.003	.090**	-.007	.041				
hup	.050*	.134**	.087**	-.042	.003	.003			
pfp	.087**	.052*	.166**	.091**	.346**	.051*	-.017		
pdp	-.023	.045	.121**	.137**	.175**	.079**	.027	.088**	
uap	.135**	.095**	.254**	.458**	.562**	.028	.007	.351**	.147**

*p < .05; **p < .01.

Notes: civ (same civilization [0], different civilization [1]); asp (assertiveness practices); isp (institutional collectivism practices); igp (in-group collectivism practices); fup (future orientation practices); gep (gender egalitarianism practices); hup (humanitarian orientation practices); pfp (performance orientation practices); pdp (power distance practices); uap (uncertainty avoidance practices).

These data refer to difference scores between pairs of nations.

**TABLE 8
GLOBE VALUES
CORRELATION MATRIX**

	civ	asv	isv	igv	fuv	gev	huv	pfv	pdv
asv	.135**								
isv	.178**	.067**							
igv	.057*	.057*	.070**						
fuv	.121**	-.031	.017	.116**					
gev	.243**	.074**	-.023	.020	.158**				
huv	.084**	-.096**	-.025	.106**	.032	.092**			
pfv	.160**	.106**	.085**	.210**	.005	.001	-.035		
pdv	.064**	-.113**	.003	.239**	-.014	.054*	.156**	.205**	
uav	.205**	-.014	.034	.067**	.320**	.270**	.131**	-.076**	-.098**

*p < .05; **p < .01.

Notes: civ (same civilization [0], different civilization [1]); asv (assertiveness values); isv (institutional collectivism values); igv (in-group collectivism values); fuv (future orientation values); gev (gender egalitarianism values); huv (humanitarian orientation values); pfv (performance orientation values); pdv (power distance values); uav (uncertainty avoidance values).

These data refer to difference scores between pairs of nations.

**TABLE 9
MINKOV 4-DIMENSION MODEL
CORRELATION MATRIX**

	civ	ivi	mon	hyp	
ivi	.273**				Notes: civ (same civilization [0], different civilization [1]); mon (monumentalism versus flexumility); ivi (industry versus indulgence); hyp (hypometropia versus prudence); exc (exclusionism versus universalism). These data refer to difference scores between pairs of nations.
mon	.326**	.028			
hyp	.204**	-.101**	.124**		
exc	.360**	.369**	.354**	-.035	

**TABLE 10
HOFSTEDE-7 AND GLOBE PRACTICES
CORRELATION MATRIX**

	pdi	idv	mas	uai	lto	ivr	mon
asp	.141**	-.046	.129**	.152**	.008	.048	.054
isp	.054	-.050	.309**	.129**	.186**	-.041	.195**
igp	.682**	.515**	.158**	.210**	-.040	.182**	.121*
fup	.339**	.083	.175**	.152**	-.003	-.010	-.017
gep	.042	.042	.071	.092	.110*	.127*	.075
hup	-.021	-.090	-.113*	.092	.024	.025	.076
pfp	.190**	.012	.044	.053	.010	-.050	-.059
pdp	.027	.028	.074	.056	.065	.068	.153**
uap	.470**	.203**	.154**	.285**	.068	.014	.136**

Notes: civ (same civilization [0], different civilization [1]); asp (assertiveness practices); isp (institutional collectivism practices); igp (in-group collectivism practices); fup (future orientation practices); gep (gender egalitarianism practices); hup (humanitarian orientation practices); pfp (performance orientation practices); pdp (power distance practices); uap (uncertainty avoidance practices). See Table 6 for Hofstede dimensions. These data refer to difference scores between pairs of nations.

**TABLE 11
HOFSTEDE-7 AND GLOBE VALUES
CORRELATION MATRIX**

	pdi	idv	mas	uai	lto	ivr	mon
asv	-.060	-.064	.156**	.119*	.112*	-.045	.117*
isv	-.013	-.059	.098*	.110*	.102*	-.086	.128**
igv	.168**	-.017	-.015	.090	.054	.049	.003
fuv	.139**	.113*	.013	.165**	.130**	.015	.252**
gev	.259**	.247**	-.049	.063	.112*	.304**	.287**
huv	.214**	.017	-.083	-.044	-.101*	.104*	.027
pfv	.000	.036	.132**	-.007	.215**	-.034	.070
pdv	.040	-.006	-.148**	-.040	.021	.087	.032
uav	.621**	.396**	.169**	.093	.085	.132**	.257**

Notes: civ (same civilization [0], different civilization [1]); asv (assertiveness values); isv (institutional collectivism values); igv (in-group collectivism values); fuv (future orientation values); gev (gender egalitarianism values); huv (humanitarian orientation values); pfv (performance orientation values); pdv (power distance values); uav (uncertainty avoidance values). See Table 6 for Hofstede dimensions. These data refer to difference scores between pairs of nations.

**TABLE 12
HOFSTEDE-7 AND MINKOV-4
CORRELATION MATRIX**

	pdi	idv	mas	uai	lto	ivr	mon
mon	.071	.056	.041	-.051	.679**	.139**	1.000
ivi	.401**	.195**	.113*	.168**	.094	.488**	.088
hyp	-.026	.132**	-.091	-.057	.169**	.240**	.193**
exc	.619**	.441**	.041	.060	.073	.185**	.388**

Notes: civ (same civilization [0], different civilization [1]); mon (monumentalism *versus* flexumility—Minkov); ivi (industry *versus* indulgence); hyp (hypometropia *versus* prudence); exc (exclusionism *versus* universalism). See Table 6 for Hofstede dimensions. These data refer to difference scores between pairs of nations.

TABLE 13
GLOBE PRACTICES AND GLOBE VALUES
CORRELATION MATRIX

	asp	isp	igp	fup	gep	hup	pfp	pdp	uap
asv	.139**	.086	-.075	-.086	-.058	.021	-.074	-.127*	-.078
isv	.117*	.564**	.060	.022	.139**	-.030	-.027	.081	.060
igv	.275**	.150**	.181**	.142**	-.022	-.022	.236**	-.020	.126*
fuv	.163**	.085	.348**	.206**	-.028	.002	.103*	.269**	.336**
gev	.147**	-.043	.229**	.000	.162**	.283**	-.086	.118*	.010
huv	.251**	-.033	.096	-.117*	-.033	.148**	.029	.064	-.013
pfv	.029	.219**	-.061	-.067	.194**	-.016	-.034	-.034	-.027
pdv	.092	.070	.079	-.033	-.039	.219**	.119*	.085	-.064
uav	.197**	-.010	.722**	.507**	-.084	.002	.171**	.298**	.520**

*p < .05; **p < .01.

Notes: asp/asv (assertiveness practices/values); isp/isv (institutional collectivism practices/values); igp/igv (in-group collectivism practices/values); fup/fuv (future orientation practices/values); gep/gev (gender egalitarianism practices/values); hup/huv (humanitarian orientation practices/values); pfp/pfv (performance orientation practices/values); pdp/pdv (power distance practices/values); uap/uav (uncertainty avoidance practices/values).

These data refer to difference scores between pairs of nations.

TABLE 14
GLOBE PRACTICES AND MINKOV-4
CORRELATION MATRIX

	asp	isp	igp	fup	gep	hup	pfp	pdp	uap
ivi	.167**	.140**	.403**	.096	.289**	.023	-.047	.130**	.234**
mon	.054	.195**	.121*	-.017	.075	.076	-.059	.153**	.136**
hyp	-.103*	.038	-.141**	-.079	.004	-.126*	-.048	-.121*	-.075
exc	.084	.008	.751**	.263**	.013	.055	.083	.119*	.459**

*p < .05; **p < .01.

Notes: asp (assertiveness practices); isp (institutional collectivism practices); igp (in-group collectivism practices); fup (future orientation practices); gep (gender egalitarianism practices); hup (humanitarian orientation practices); pfp (performance orientation practices); pdp (power distance practices); uap (uncertainty avoidance practices).

These data refer to difference scores between pairs of nations.

TABLE 15
GLOBE VALUES AND MINKOV-4
CORRELATION MATRIX

	asv	isv	igv	fuv	gev	huv	pfv	pdv	uav
ivi	.090	.029	.134**	.152**	.408**	.079	.168**	.018	.253**
mon	.117*	.128**	.003	.252**	.287**	.027	.070	.032	.257**
hyp	.081	.071	.018	-.072	-.098*	-.133**	-.073	-.056	-.036
exc	-.052	.012	.048	.258**	.384**	.108*	-.119*	.000	.675**

*p < .05; **p < .01.

Notes: asv (assertiveness values); isv (institutional collectivism values); igv (in-group collectivism values); fuv (future orientation values); gev (gender egalitarianism values); huv (humanitarian orientation values); pfv (performance orientation values); pdv (power distance values); uav (uncertainty avoidance values).

These data refer to difference scores between pairs of nations.

Analyses

Tables 16a-20c present the results of the logistic regression analyses for the four noted models, followed by the combined model. For each model, the second (c) table presents the percentage correct, according to the dimensions used, but it is important to observe in these cases that there will be several instances of pairs of nations that appear to be similar but in fact are different. This is because there are several coincidences of cultural-dimension profiles between countries in very different civilizations. However, in these cases, theory prevails over empirical analysis. Therefore, the percentage of correctly identified same-civilization cases (predicted civ = 0) is always significantly lower than that of correctly identified different-civilization cases (predicted civ = 1).

**TABLE 16A
HOFSTEDEAN 7-DIMENSION MODEL AS PREDICTOR
LOGISTIC REGRESSION SUMMARY**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	528.781	.324	.545

**TABLE 16B
HOFSTEDEAN 7-DIMENSION MODEL AS PREDICTOR
PERCENTAGE CORRECT PREDICTION**

Step	Observed CIV	Predicted CIV		Percentage Correct
		0	1	
Step 1	0	97	76	56.1
	1	38	824	95.6
Overall Percentage				89.0

**TABLE 16C
HOFSTEDEAN 7-DIMENSION MODEL AS PREDICTOR
RETAINED VARIABLES, COEFFICIENTS**

Step		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	PDI	.063	.012	28.454	1	.000	1.065
	IDV	.049	.010	26.724	1	.000	1.051
	MAS	-.027	.007	15.341	1	.000	.973
	UAI	.081	.010	66.408	1	.000	1.085
	IVR	.022	.005	17.912	1	.000	1.023
	MON	.104	.012	70.236	1	.000	1.109
	Constant	-3.252	.354	84.451	1	.000	.039

The initial run identified LTO ($p = .974$) as a non-significant predictor.

**TABLE 17A
GLOBE PRACTICES AS PREDICTOR
LOGISTIC REGRESSION SUMMARY**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1544.626	.080	.132

TABLE 17B
GLOBE PRACTICES AS PREDICTOR
PERCENTAGE CORRECT PREDICTION

	Observed CIV	Predicted CIV		Percentage Correct
		0	1	
Step 1	0	4	316	1.3
	1	3	1507	99.8
Overall Percentage				82.6

TABLE 17C
GLOBE PRACTICES AS PREDICTOR
RETAINED VARIABLES, COEFFICIENTS

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	ASP	-.617	.236	6.826	1	.009	.539
	ISP	.548	.216	6.440	1	.011	1.730
	IGP	1.196	.134	80.100	1	.000	3.308
	GEP	.903	.239	14.235	1	.000	2.467
	HUP	.459	.185	6.174	1	.013	1.583
	PFP	.599	.223	7.191	1	.007	1.821
	PDP	-.580	.202	8.264	1	.004	.560
	Constant	.224	.201	1.236	1	.266	1.251

The initial run identified FUP ($p = .286$) and UAP ($p = .243$) as non-significant predictors.

TABLE 18A
GLOBE VALUES AS PREDICTOR
LOGISTIC REGRESSION SUMMARY

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1370.972	.163	.270

TABLE 18B
GLOBE VALUES AS PREDICTOR
PERCENTAGE CORRECT PREDICTION

	Observed CIV	Predicted CIV		Percentage Correct
		0	1	
Step 1	0	64	256	20.0
	1	40	1470	97.4
Overall Percentage				83.8

**TABLE 18C
GLOBE VALUES AS PREDICTOR
RETAINED VARIABLES, COEFFICIENTS**

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	ASV	.657	.146	20.322	1	.000	1.928
	ISV	1.338	.205	42.724	1	.000	3.813
	GEV	1.926	.232	68.597	1	.000	6.859
	HUV	.921	.380	5.869	1	.015	2.511
	PFV	2.094	.324	41.724	1	.000	8.116
	UAV	1.193	.179	44.408	1	.000	3.298
	Constant	-1.827	.221	68.554	1	.000	.161

The initial run identified IGV ($p = .111$), FUV ($p = .134$), and PDV ($p = .056$) as non-significant predictors.

**TABLE 19A
MINKOV 4-DIMENSION MODEL AS PREDICTOR
LOGISTIC REGRESSION SUMMARY**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	410.522	.310	.523

**TABLE 19B
MINKOV 4-DIMENSION MODEL AS PREDICTOR
PERCENTAGE CORRECT PREDICTION**

Step 1	Observed CIV	Predicted CIV		Percentage Correct
		0	1	
		0	67	
1	34	617	94.8	
Overall Percentage				87.7

**TABLE 19C
MINKOV 4-DIMENSION MODEL AS PREDICTOR
RETAINED VARIABLES, COEFFICIENTS**

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	IVI	.004	.001	25.488	1	.000	1.004
	MON	.006	.001	42.104	1	.000	1.006
	HYP	.007	.001	27.852	1	.000	1.007
	EXC	.006	.001	45.321	1	.000	1.006
	Constant	-2.995	.364	67.880	1	.000	.050

The initial run identified all variables as significant predictors.

**TABLE 20A
ALL MODELS COMBINED AS PREDICTOR
LOGISTIC REGRESSION SUMMARY**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	135.009	.480	.765

**TABLE 20B
ALL MODELS COMBINED AS PREDICTOR
PERCENTAGE CORRECT PREDICTION**

Step 1	Observed CIV	Predicted CIV		Percentage Correct
		0	1	
		0	64	
1	15	312	95.4	
Overall Percentage				92.6

**TABLE 20C
ALL MODELS COMBINED AS PREDICTOR
RETAINED VARIABLES, COEFFICIENTS**

Step 1		B	S.E.	Wald	df	Sig.	Exp(B)
	IDV	.091	.022	17.152	1	.000	1.096
	MAS	-.040	.014	8.012	1	.005	.961
	LTO	-.055	.019	8.229	1	.004	.947
	IGP	2.386	.569	17.564	1	.000	10.875
	GEP	5.483	1.233	19.769	1	.000	240.509
	PDP	-3.409	.899	14.375	1	.000	.033
	ISV	2.283	.781	8.543	1	.003	9.806
	GEV	3.027	.810	13.982	1	.000	20.640
	PFV	5.971	1.428	17.471	1	.000	391.779
	MON	.011	.002	26.846	1	.000	1.011
	HYP	.008	.003	10.451	1	.001	1.008
	Constant	-7.363	1.205	37.328	1	.000	.001

The initial run identified PDI ($p = .200$), UAI ($p = .433$), IVR ($p = .468$), ASP ($p = .304$), ISP ($p = .209$), FUP ($p = .714$), HUP ($p = .750$), PFP ($p = .680$), UAP ($p = .363$), ASV ($p = .155$), IGV ($p = .978$), FUV ($p = .211$), HUV ($p = .899$), PDV ($p = .903$), UAV ($p = .983$), IVI ($p = .101$), and EXC ($p = .242$) as non-significant predictors.

To summarize the foregoing findings, Table 21 provides a synopsis for comparison. While the overall percentage seems to suggest fairly good predictability overall, it is important to observe that there are far more instances of unlike pairs than like pairs in the sample, so a model that happens to predict all cases to be unlike pairs will already achieve what appears to be a strong percentage correct. However, the stronger the model, the greater the percentage of like pairs (civ = 0) that it will predict correctly. From this perspective, Hofstede’s model is the strongest, followed by the Minkov model. Meanwhile, the calculated R² values are also of interest, in that these attempt to estimate the total amount of explained variance provided by a given model, after accounting for capitalization on chance. On this measure, Hofstede’s model is again clearly

strongest, followed very closely by that of Minkov. Finally, the number of variables retained (as a percentage) reflects the extent to which the model in question consists of only the most necessary variables to explain culture at the civilization level of analysis. For this reason, the combined model naturally lost the most variables, given the fact that different models of cultural dimensions will inevitably feature repetitions of the same variables in some form. Using this criterion, Minkov's 4-dimension model proved superior to all others, followed by that of Hofstede, and then GLOBE Practices. It is worth noting that one of Hofstede's variables in the 7-dimension model is the same as one of Minkov's variables, as the latter was the source of the former.

Of the four models, the two measures of most interest in determining the outcome of each of the hypotheses consist of the correct percentage prediction of like nations ($civ = 0$) and the R^2 values. Using this criterion, GLOBE Practices appear to have failed to predict strongly enough to constitute an affirmation of Hypothesis 2. GLOBE Values performed better in this respect, but fell short of showing evidence of strong predictability; nevertheless, the results appear to affirm Hypothesis 3. The remaining hypotheses enjoy strong affirmation.

TABLE 21
SYNOPSIS OF LOGISTIC REGRESSION OUTCOMES

Model	% Correct			R^2 C	R^2 N	Model Retained	
	Overall	Civ = 0	Civ = 1			%	Variables
Hofstede-7	89.0	56.1	95.6	.324	.545	85.7%	6
GLOBE Practices	82.6	1.3	99.8	.080	.132	77.8%	7
GLOBE Values	83.8	20.0	97.4	.163	.270	66.7%	6
Minkov-4	87.7	51.9	94.8	.310	.523	100.0%	4
Combined Model	92.6	81.0	95.4	.480	.765	39.3%	11

Notes: R^2 C (Cox & Snell R^2); R^2 N (Nagelkerke R^2).

DISCUSSION

This paper set out to compare three models of cultural dimensions against the Toynbee-Huntington civilizational hypothesis. The results show marked differences among the models in terms of their predictive power. Overall, there is little difference between Hofstede's 7-dimension model and Minkov's 4-dimension model, except that the latter's obviously greater parsimony renders it an attractive choice for further study in the area of civilizations. The results also show disappointing outcomes for the GLOBE models. However, the final combined model retained six of the 18 variables (33.3%) in the two GLOBE models combined, in addition to four of the Hofstede variables (57.1%) and two of Minkov's variables (50.0%). The GLOBE variables in question include in-group collectivism practices, gender egalitarianism practices and values, power distance practices, institutional collectivism values, and performance orientation values. The retention of these variables suggests that there is some explanatory power in these that makes up for something lacking in Hofstede's model. Therefore, it remains worthwhile to assess the extent to which the GLOBE models may inform aspects of culture to complement the Hofstede and Minkov models.

Future research should proceed to confirm the civilizational structure presented herein, making further boundary adjustments based on the outcomes of these analyses. This action will help

validate a civilizational structure that conforms more closely to cultural dimensions and in turn lay the groundwork for extending cultural-dimension estimates to new nations by reference to common civilizational identities. This last step should complement ongoing research into measuring cultural dimensions, by providing a means by which to broaden the data set and so improve the basis for validation studies.

Limitations in the present study include those that naturally always affect this line of research, namely, the small number of nations for which sufficient data exist in published form across all models in question. Insofar as there are different lists of nations under different models, and indeed insofar as several nations benefit from published data on only part of a model, this fact limits the ability of researchers to delve into the theoretical properties of these models as quickly as they would like. Nevertheless, the strong predictability against the civilizational model afforded by two of the models studied herein provides an important basis for cross-validation, which is much more difficult to achieve without the benefit of a comparative model of this kind, emanating from a completely independent line of research. From this perspective, the present study helps make up for the small data sets inherent in this research, to provide a better way to improve the models in general.

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