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Beyond the ‘East–West’ Dichotomy: Global Variation in Cultural Models of Selfhood

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Markus and Kitayama's (1991) theory of independent and interdependent self-construals had a major influence on social, personality, and developmental psychology by highlighting the role of culture in psychological processes. However, research has relied excessively on contrasts between North American and East Asian samples, and commonly used self-report measures of independence and interdependence frequently fail to show predicted cultural differences. We revisited the conceptualization and measurement of independent and interdependent self-construals in 2 large-scale multinational surveys, using improved methods for cross-cultural research. We developed (Study 1: $N = 2924$ students in 16 nations) and validated across cultures (Study 2: $N = 7279$ adults from 55 cultural groups in 33 nations) a new 7-dimensional model of self-reported ways of being independent or interdependent. Patterns of global variation support some of Markus and Kitayama's predictions, but a simple contrast between independence and interdependence does not adequately capture the diverse models of selfhood that prevail in different world regions. Cultural groups emphasize different ways of being both independent and

interdependent, depending on individualism-collectivism, national socioeconomic development, and religious heritage. Our 7-dimensional model will allow future researchers to test more accurately the implications of cultural models of selfhood for psychological processes in diverse ecocultural contexts.

Keywords: culture, independence–interdependence, self-construals

Twenty-five years ago, Markus and Kitayama (1991) published their classic article on culture and the self, proposing that people in different parts of the world tend to construe themselves in two fundamentally different ways. They argued that Western cultures are unusual in promoting an *independent* view of the self as bounded, unitary, stable, and separate from the social context, whereas cultures in other parts of the world emphasize an *interdependent* view of the self as closely connected to others, fluid, and contextually embedded. They proposed that people with inde-

pendent self-construals would strive for self-expression, uniqueness, and self-actualization, basing their actions on personal thoughts, feelings, and goals. In contrast, people with interdependent self-construals would strive to fit in and maintain social harmony, basing their actions on situationally defined norms and expectations.

Markus and Kitayama's (1991) proposals had a dramatic impact on social, personality and developmental psychology, challenging ethnocentric assumptions, drawing attention to cultural diversity,

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Study materials and data have been deposited with the United Kingdom Data Archive: Vignoles, V. & Brown, R. (2008–2011). Motivated identity construction in cultural context [computer file]. Colchester, Essex: United Kingdom Data Archive [distributor], October 2011. SN: 6877, 10.5255/UKDA-SN-6877-1. This work was conducted by members of the Culture and Identity Research Network, supported by a grant from the Economic and Social Research Council (ESRC, United Kingdom) to Vivian Vignoles and Rupert Brown (reference: RES-062-23-1300) and an ESRC doctoral studentship (reference: ES/G015074/1) to Ellinor Owe. The work in Chile was supported by the Interdisciplinary Center for Social Conflict and Cohesion Studies: COES, FONDAP/15130009, allocated to Roberto González.

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and providing conceptual tools for theorizing about it. Social and personality psychologists used measures and manipulations of self-construals to predict numerous outcomes: cognitive styles, well-being, self-regulation, self-esteem, communication styles, social anxiety, and pro-social behavior, to name just a few (reviewed by Cross, Hardin, & Gercek-Swing, 2011; Gudykunst & Lee, 2003; Smith, Fischer, Vignoles, & Bond, 2013). Developmental psychologists sought to identify the prevailing theories, styles, and practices of parenting that foster development of independent or interdependent selves in different cultures (reviewed by Greenfield, Keller, Fuligni, & Maynard, 2003; Kağıtçıbaşı, 2007; Keller, 2007). Neuroscientists have begun to identify differences in brain activity that correlate with measures of independence and interdependence (reviewed by Kitayama & Uskul, 2011).

However, the success of this perspective has arguably contributed to the prevalence of a rather black-and-white view of cultural diversity, which we believe was not the authors' original intention (see Markus & Kitayama, 2003, 2010). Inadvertently, their work may have added scientific legitimacy to a common tendency to understand culture in terms of binary oppositions that differentiate "Western" cultures from "Other" cultures, while saying little about how the majority of cultures, which are "non-Western," may differ from each other (Hermans & Kempen, 1998; for a recent example: Henrich, Heine, & Norenzayan, 2010). Concurrently, an empirical focus on comparing "Western" (usually North American) and "Eastern" (usually East Asian) samples has left the cultural systems of other world regions relatively marginalized within the scientific discourse on culture and self (for an example, see Yamaguchi et al., 2007). This narrow focus may have restricted theorizing and thus limited the explanatory potential of self-construals. Hence, a systematic test of Markus and Kitayama's (1991) claims across a suitably diverse range of cultural contexts is long overdue (see Matsumoto, 1999).

Concurrently, the theoretical contrast between "independence" and "interdependence" echoes a wider tendency in Western popular and scientific thought to view individuality and sociality as fundamentally opposed to each other—although writers from many disciplines have emphasized that individuality and sociality are indispensable and mutually reinforcing aspects of human functioning in any cultural system (Guisinger & Blatt, 1994; Kağıtçıbaşı, 2005; Marková, 1997; Matsumoto, 1999; Spiro, 1993; Taylor, 1991; Vignoles, Chryssochoou, & Breakwell, 2004). Reflecting this tendency, researchers have focused on testing *how much* individuals in "Western" versus "non-Western" cultures are independent versus interdependent, rather than asking *in what ways* they are independent and interdependent.

Moreover, East–West comparisons of common self-report measures of independence and interdependence have repeatedly failed to show the expected cross-cultural differences (reviews: Cross et al., 2011; Smith et al., 2013; meta-analyses: Levine et al., 2003; Oyserman, Coon, & Kemmelmeier, 2002). Yet, researchers often attribute such findings to deficiencies in sampling or measurement, thus immunizing their theorizing from the possibility of falsification (Smith et al., 2013). Notably, Kitayama, Park, Sevincer, Karasawa, and Uskul (2009) have proposed that it may be impossible to capture cultural variation in independence and interdependence using explicit self-report measures (but for an apparent reversal, see J. Park & Kitayama, 2014). We argue instead that research using explicit self-construal measures has been hampered

by researchers' premature convergence on a two-dimensional measurement model, popularized by Singelis (1994), which treats independence and interdependence as separate and unitary dimensions of individual differences (see Taras et al., 2014). We believe that this model poorly reflects Markus and Kitayama's (1991) original theorizing, and that its prevalence in the literature stems from a longstanding neglect of well-known principles of cross-cultural research methodology.

In the current paper, we seek to revisit—and hopefully reinvigorate—Markus and Kitayama's (1991) original goal of revealing the diversity of models of selfhood across cultures. We retain their broad focus on independence and interdependence, but our research deconstructs the "cultural binary" fostered by their approach. Using data from two large, multinational studies, we developed (Study 1) and tested (Study 2) a new, seven-dimensional model of self-reported ways of being independent or interdependent, which we believe will allow researchers to examine more precisely how models of selfhood may influence psychological outcomes in different parts of the world. We show that Markus and Kitayama's original characterization of North American and East Asian cultural models of selfhood was partly accurate, but that it does not adequately capture the complexity of global variation in models of selfhood: Depending on prevailing values and beliefs, socioeconomic development, and religious heritage, societies promote different ways of being independent and of being interdependent.

Reconsidering the Dimensionality of Self-Construals

Markus and Kitayama (1991) identified numerous ways of being independent or interdependent that they expected to differ systematically between individuals living in North American and East Asian cultural contexts. Ways of being independent included (among many others) seeing oneself as separate from others, emphasizing one's uniqueness, prioritizing one's personal goals over those of others, and self-expression, whereas ways of being interdependent included seeing oneself as connected to others, fitting in with others, sacrificing one's personal goals for others, and exercising self-restraint. Researchers widely assumed that these tendencies should cluster into one or more coherent dimensions of individual differences, but Kitayama et al. (2009; Kitayama & Uskul, 2011; Markus & Kitayama, 2010) later clarified that independence and interdependence should be understood *not* as properties of individuals—as implied by the term "self-construal"—but as properties of the cultural contexts that individuals inhabit: Cultural systems may incentivize individuals to think, feel, or behave independently or interdependently, but they emphasized that individuals within the same system may adopt very different ways of fulfilling these broad "cultural mandates." According to their revised perspective, ways of being independent and of being interdependent are *not* expected to cluster together into unitary dimensions at the individual level, but they *are* expected to cluster together into a single, bipolar dimension (i.e., independence vs. interdependence) at the cultural level.

Are Independence and Interdependence Separate and Unitary Dimensions?

Widely used self-report measures of self-construals reflect earlier ideas about their dimensional structure, treating independence

and interdependence as monolithic, individual-level constructs that are thought to be orthogonal (Gudykunst et al., 1996; Singelis, 1994). Crucially, however, the lack of reversed items in these scales raises the possibility that their commonly reported two-dimensional structure is an artifact of failing to account for acquiescent responding (Smith et al., 2013). Separating substantive variance from acquiescent responding is especially important in cross-cultural research, because people from different nations are known to show differing levels of acquiescence on Likert-type response scales (T. Johnson, Kulesa, Cho, & Shavitt, 2005; Smith, 2004). Variation in response styles can obscure mean differences in cross-cultural comparisons (Schimmack, Oishi, & Diener, 2005), as well as distorting individual-level dimensional structures (Podsakoff, MacKenzie, & Podsakoff, 2012). Yet, self-construal researchers have very rarely attempted to account for acquiescence, and recent measures continue to include few, if any, reversed items (e.g., Cross, Bacon, & Morris, 2000; Harb & Smith, 2008; Kashima & Hardie, 2000).

Moreover, surprisingly little attention has been paid to theorizing how high independence differs from low interdependence, or vice versa. Researchers usually test paired predictions using both dimensions (e.g., Singelis, Bond, Sharkey, & Lai, 1999), or they compare groups of individuals who score high on one dimension and low on the other, ignoring those who score high on both or low on both (e.g., Sedikides, Gaertner, & Toguchi, 2003). Experimental researchers typically prime independent and interdependent self-construals as two levels of a single factor, rather than attempting to prime them orthogonally (Oyserman & Lee, 2008). In short, the view of independence and interdependence as orthogonal factors has failed to inspire distinct theoretical predictions, and we believe that it needs urgent reconsideration.

Recently, researchers have begun to view both independence and interdependence as multidimensional, either distinguishing construals of the self in relation to different kinds of “others,” or focusing on different ways of being independent or interdependent in relation to the same others (e.g., Gabriel & Gardner, 1999; Harb & Smith, 2008; Kağitçibaşı, 2005; Kashima & Hardie, 2000). A few studies have shown that distinguishing different forms of independence and interdependence helps explain cultural differences in outcomes (Chen, Brockner, & Katz, 1998; Morrison, Chen, & Salgado, 2004; Noguchi, 2007). However, there is no consensus to date regarding which forms of independence and interdependence are important to distinguish.

The Need for Exploratory Research

In cross-cultural psychology, exploratory research is especially important because it can help researchers overcome their own cultural biases when seeking to identify the constructs about which to theorize (Bond, 2009; van de Vijver & Leung, 2000). Yet, very few studies have systematically explored the nature and dimensionality of self-construal. Hardin, Leong, and Bhagwat (2004; Hardin, 2006) conducted exploratory and confirmatory factor analyses of Singelis (1994) scale items among U.S. students. They found four facets of independence and two facets of interdependence. However, theoretical meanings of their factors are unclear, and their exclusive reliance on items from a single scale may have prevented finding additional factors. Moreover, their model re-

ceived only mixed support when tested in other cultures (cf. Christopher, Norris, D’Souza, & Tiernan, 2012; Milfont, 2005).

To develop a more generalizable model, one should start by sampling a wider range of cultures. Fernández, Paez, and González (2005) explored the structure of self-construals among students from 29 nations, finding a four-factor structure. However, their analyses were based on only 13 of Singelis’ (1994) items. Moreover, they did not account for the multilevel structure of their data, and so we cannot know what factors they might have found by using appropriate techniques for cross-cultural data analysis (Leung & Bond, 1989).

In sum, to facilitate future theorizing and research into the relationship between culture and self, we identified an urgent need for systematic exploratory research into the dimensionality of independent and interdependent self-construals, involving (a) improved sampling of item content, (b) improved sampling of cultural groups, and (c) appropriate statistical procedures for analyzing data from multiple cultural groups. This was the first goal of our research.

Cultural Models of Selfhood

As Hofstede (2001) famously noted, “Cultures are not king-size individuals . . . and their internal logic cannot be understood in the terms used for the personality dynamics of individuals” (p. 17). Thus, dimensions on which cultures vary may differ from those on which individuals vary. Measures of cultural orientation often have different structures at individual and cultural levels of analysis (e.g., social axioms: Leung & Bond, 2007; value priorities: Schwartz, 2011). Yet, no previous research that we know of has explored the culture-level dimensionality of self-construals.

Because the self-concept is an individual-level construct, the notion of using self-construal dimensions to describe cultures may seem foreign. However, we consider that individuals’ construals of themselves are grounded in social constructions of selfhood—partially shared representations of the self and its relation to others, created and maintained through interactions and practices within a given cultural context (Berger & Luckmann, 1966; Kitayama & Uskul, 2011; Markus & Kitayama, 2010; Moscovici, 1988; Oyserman & Markus, 1998; Yamagishi, 2010). We do not suggest that these representations are consensual: Prevailing models of selfhood may be internalized or resisted by individuals, generating substantial variance within any given cultural context. Nonetheless, we propose that some meaningful culture-level variance exists, and that this variance will have meaningful consequences (see M. Becker et al., 2012, 2014). This raises several important questions: What is the dimensionality of cultural models of selfhood? And in which parts of the world—or in what kinds of ecocultural context—will particular social constructions of selfhood prevail?

A Single Culture-Level Dimension?

Kitayama et al. (2009; see also Na et al., 2010) hypothesized that different ways of being independent or being interdependent should covary along a single dimension at a cultural level of analysis, but not at an individual level. Across five tasks that they viewed as implicit indicators of independence versus interdependence, student samples from four nations showed a similar pattern—U.S. students showed the most independent performance,

Japanese students the most interdependent performance, and two European student samples showed intermediate levels—although individual differences on the five tasks were uncorrelated. These results are consistent with Kitayama and colleagues' view of independence versus interdependence as a coherent dimension of cultural norms. However, their sampling of only four national groups does not provide a strong empirical basis for testing the presence of a culture-level dimension.

Investigating the culture-level dimensionality of self-construals requires a sufficient number of samples to treat culture as a level of analysis, rather than the two- to four-nation comparisons that are common in self-construal research. This avoids the risk of wrongly extrapolating individual-level constructs to a cultural level, or vice versa (Hofstede, 2001; Leung & Bond, 2007; Smith et al., 2013). In the current research, we collected data from more than 50 cultural groups, allowing us to test whether individuals and cultural groups can be positioned on the same dimensions. This allowed us to conduct the first-ever adequately powered test of a central prediction arising from Markus and Kitayama's (1991, 2010; Kitayama et al., 2009; Kitayama & Uskul, 2011) perspective—that a coherent dimension of independence versus interdependence should underlie culture-level variance in models of selfhood.

Mapping Cultural Variation

More than 15 years ago, Matsumoto (1999) noted the lack of evidence for Markus and Kitayama's (1991) claim that the interdependent self-construal of Japanese culture would also characterize South Asian, African, and South American cultures. Yet, the emphasis on differences between North America and East Asia has continued, and little is known about models of selfhood in other parts of the world (Cross et al., 2011). This is a major gap in the prior literature on self-construals that we seek to address here.

Equally concerning is the frequent lack of support for predicted differences between Western and East Asian participants in previous self-report studies (e.g., Cross et al., 2011; Levine et al., 2003). Admittedly, these troubling findings could be attributed to overreliance on student samples (Smith et al., 2013), reference group effects (Heine, Lehman, Peng, & Greenholtz, 2002), or culturally biased item wordings (Fiske, Kitayama, Markus, & Nisbett, 1998), challenges we strove to address in the current research. However, we believe that a stronger priority is to consider more adequately in what kinds of society one should expect to find what kinds of cultural model of selfhood—to shift the focus from asking *where* to asking *why* different models of selfhood may be prevalent in different parts of the world.

Individualism–Collectivism and Self-Construals

Markus and Kitayama (1991) claimed that contemporary Western cultures are unusual in promoting an independent self-construal. In contrast, they proposed that an interdependent self-construal was more characteristic of human societies in most other parts of the world and in previous historical periods. They did not link their constructs formally to cultural individualism–collectivism (I-C; Triandis, 1993). Nonetheless, their focus on North American and Japanese cultures as contrasting exemplars has resonated with a common (if inaccurate: see Hofstede, 2001; Matsumoto, Kudoh, & Takeuchi, 1996; Schwartz, 2006) tendency

to think of the U.S. as the prototypical individualist nation and Japan as the prototypical collectivist nation.

Conceptions of the relationship between self-construals and I-C vary in the literature. Some have described I-C as causing differences in self-construals (Gudykunst et al., 1996; M. -S. Kim, Aune, Hunter, Kim, & Kim, 2001; H. S. Park & Levine, 1999; Singelis & Brown, 1995); others have considered self-construals as synonymous with I-C (Oyserman et al., 2002; Taras et al., 2014) or have defined independence–interdependence as an individual-level analog of culture-level I-C (Smith, 2011). The theoretical picture is complicated by the common use of similar items to measure both constructs. However, I-C is not necessarily reducible to differences in self-construal. Individualism and collectivism have been theorized as multifaceted “cultural syndromes,” encompassing normative beliefs, values, and practices, in addition to self-construals (Brewer & Chen, 2007; Triandis, 1993). Here, we test empirically to what extent cultural models of selfhood covary with other theorized facets of I-C.

Models of Selfhood in Ecocultural Context

Even if self-construals vary between individualistic and collectivistic societies, I-C may not be sufficient to account for global variability in models of selfhood (Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006; Oishi, 2010). Following an *ecocultural perspective* (Georgas & Berry, 1995; Georgas, van de Vijver, & Berry, 2004), we view cultural differences—including models of selfhood—in part as adaptations to differing ecological and sociopolitical circumstances. Numerous contextual variables might be expected to foster particular cultural models of selfhood, and many large-scale studies will be needed to identify which factors best account for the observed differences. However, for a first look at this question—providing a ‘baseline’ for future investigations—we decided to focus on two contextual variables that are well-established predictors of a range of cultural differences according to previous large-scale studies (Georgas et al., 2004; Hofstede, 2001; Inglehart & Baker, 2000; Schwartz, 2006): *socioeconomic development* and *religious heritage*. In a meta-analysis of data from five major cross-cultural surveys, Georgas et al. (2004) attempted to predict national differences in values and subjective well-being, using a wide range of ecological and sociopolitical indices, including physical climate, economy, education, mass media penetration, population demographics, and religious heritage. They found that the combination of national affluence and religious heritage provided an especially parsimonious prediction of differences in national culture.

There are also good theoretical reasons to expect that both socioeconomic development and religious heritage would affect cultural models of selfhood. Socioeconomic development evidently influences almost every aspect of human social life, including the practices, institutions, and social relationships by which cultural models of selfhood are thought to be sustained and reproduced (Bond & Lun, 2014; Greenfield, 2009; Kitayama & Uskul, 2011; Yamagishi, 2010). Religious traditions provide different answers to the question of how the self and one's relation to others are defined (Ho, 1995; Sampson, 2000) and therefore provide a powerful basis to expect cross-cultural differences in self-construal. Moreover, religious beliefs and institutions are thought to have had a lasting historical influence in shaping national cultures (e.g., Bellah, 1970; Weber, 1905/1958), which seemingly

persists even in nations where a majority of the population is no longer religious (Inglehart & Baker, 2000).

The Current Studies

We identified an urgent need for a systematic large-scale exploration of how people in different parts of the world construe themselves. Hence, we aimed (a) to develop and test a new theoretical model deconstructing the concepts of “independence” and “interdependence” into their constituent, individual-level dimensions, and (b) to use this model to describe and begin to explain the prevalence of different cultural models of selfhood across a wide range of cultural samples, beyond the common focus on East–West comparisons. In so doing, we were especially interested to test the adequacy of Markus and Kitayama’s (1991) contrast between independence and interdependence to represent global variation in self-construals.

In Study 1, we explored the dimensionality of individual differences in independent and interdependent self-construals in a relatively open-ended fashion. Crucially, we sampled participants from 16 cultural contexts, used a more extensive pool of items than in previous exploratory studies, adjusted ratings for acquiescent response style, and used appropriate statistical procedures for individual-level analysis of pan-cultural data (Leung & Bond, 1989). This informed the development of a new, seven-dimensional model of individual differences in self-construals, extending Markus and Kitayama’s (1991) original theory.

In Study 2, we tested and confirmed this new theoretical model among adult participants from more than 50 cultural contexts (Study 2a). We then sought to describe (Study 2b) and account for (Studies 2c and 2d) the prevalence of different models of selfhood across world regions. We tested the prediction that different forms of independence and interdependence would combine to form a coherent culture-level dimension, differentiating “Western” from “non-Western” cultures, as well as the common assumption that patterns of independent and interdependent self-construal would vary with cultural I-C. Finally, we tested the potential role of national development and religious heritage as predictors of different cultural models of selfhood.

Study 1: Exploration and Theory Building

We first conducted the most extensive exploration to date of the dimensionality of self-ratings of independence and interdependence. Overcoming earlier shortcomings, we used a more adequate item pool, a broader range of cultural samples, and appropriate statistical analyses, to guide the development of a cross-culturally valid theoretical model of variation in self-construal. Study 1 was part of a larger multinational research project into culture and identity processes (M. Becker et al., 2012, 2014; Owe et al., 2013; Vignoles & Brown, 2011). We created a pool of 62 self-construal items, designed to represent as fully as possible the ways of being “independent” or “interdependent” identified in previous theoretical discussions and measures of self-construals, and we explored the dimensionality of responses to these items from almost 3000 adolescents residing in 16 nations spanning Western and Eastern Europe, Sub-Saharan Africa, Southeast Asia, the Middle East, and South America.

Method

Constructing an item pool. Although we could not include every item from every previous self-construal scale in our questionnaire, we included a broad range of items that represented the content of prior conceptions of independence and interdependence as fully as possible. We began by reviewing and comparing the many facets or subtypes of independence and interdependence that had previously been theorized or identified empirically (e.g., Fernández et al., 2005; Hardin et al., 2004; Kağıtçibaşı, 2005), as well as inspecting the content of items from earlier measures (e.g., Cross et al., 2000; Gudykunst et al., 1996; Leung & Kim, 1999, in Levine et al., 2003; Singelis, 1994; Singelis, Triandis, Bhawuk, & Gelfand, 1995). This process of theoretical scrutiny and reflection yielded an initial list of at least 10 content areas that we tentatively understood to represent broader domains of independence, relational interdependence, and collective interdependence (Kashima & Hardie, 2000). However, our goal at this stage was not to construct an a priori model—which inevitably would be restricted by our own cultural and theoretical backgrounds—but simply to sample the theoretical constructs of independence and interdependence as fully as possible and thus avoid domain underrepresentation.¹

To represent the range of content that we had tentatively identified, we used or adapted many items from previous measures; however, we reworded many of these items to improve theoretical precision, readability, or translatability. We did not include items from Kashima and Hardie’s (2000) relational-individual-collective scale, nor from Harb and Smith’s (2008) six dimensional scale, because the main focus of these measures is on the importance of different social targets, whereas our main goal was to distinguish ways of being independent or interdependent. We excluded items from the vertical individualism subscale of Singelis et al. (1995), because this measures competitiveness rather than independence. We also created many new items, which were conceptual reversals of existing items, to compensate for the lack of reversed items in existing scales. We avoided using negatively phrased wordings in our new reversed items, as these can be difficult to translate to some languages. For example, to reverse the conceptual content of “*I enjoy being unique and different from others in many ways,*” we created a positively phrased item: “*Being different from others makes me uncomfortable.*” The resulting item pool comprised 62 items that we judged to represent the widest range of relevant theoretical content that we could identify (see Table 1 for items and sources). Thus, we believe that Study 1 provided the most

¹ Our list of potential facets also went through numerous iterations, and we never managed to agree a final list. Indeed, we believe that early ‘closure’ on this question would have been counter-productive. In one version of our list, we identified four constructs that we tentatively considered as possible facets of independence (not depending on others, uniqueness, autonomy/agency, consistency), two possible facets of relational interdependence (connectedness to others, relationships defining the self), and four possible facets of collective interdependence (position/role within the group, flexibility, heteronomy, and esteem for group). Interestingly, our four initial facets of independence were quite clearly distinguished in both studies, whereas our attempts to distinguish facets of interdependence were less successful, and we did not anticipate most of the distinctions among facets of interdependence that emerged from Study 1 and were confirmed in Study 2. This confirms the value of adopting a genuinely exploratory approach, rather than attempting to construct an a priori model, in the initial stages of our research.

Table 1
Study 1 Item Pool With Rotated Component Loadings From 7-Dimensional PCA

Item	Rotated component loadings							Source ^a
	I	II	III	IV	V	VI	VII	
Component I: Self-reliance (+) versus Dependence on others (-)								
I prefer to be self-reliant rather than depend on others.	.612	-.046	.070	.050	-.023	.052	.058	GL-ind
I try not to depend on others.	.611	.046	.027	.098	-.006	.037	.067	GL-ind
I prefer to turn to other people for help rather than solely rely on myself	-.547	-.036	.068	.080	.045	-.143	.028	New
It is important for me to act as an independent person.	.508	.037	-.120	-.033	-.041	.010	.167	GL-ind
I'm uncomfortable if I have to rely on myself.	-.486	-.252	.021	-.040	.133	-.065	-.039	New
I am similar to the people close to me.	-.342	.098	.190	.063	-.058	-.061	.136	New
I feel my fate is intertwined with the fate of those around me.	-.294	.124	-.129	-.195	.102	.007	.093	S-int
It is important to consult close friends and get their ideas before making a decision.	-.262	.261	.213	-.012	.082	.051	-.020	GL-int
I like sharing little things with my neighbors.	-.160	.069	.071	-.050	-.138	-.039	-.031	HC
Component II: Self-containment (-) versus Connection to others (+)								
I consider my happiness separate from the happiness of my friends and family.	-.025	-.583	-.061	-.036	.077	.147	.062	New
It is important for me to be an accepted member of my family as well as my group of friends.	-.084	.483	.032	.190	.061	.080	-.139	New
I usually feel a strong sense of pride when someone in my family has an important accomplishment.	.091	.481	-.078	.243	-.086	-.072	-.058	New
When I think of myself, I often think of my close friends and family also.	-.138	.469	.072	-.113	-.180	.072	.076	RISC
If a person hurts someone close to me, I feel personally hurt as well.	.100	.465	-.017	.013	.038	-.037	-.095	RISC
My close relationships are unimportant to how I feel about myself.	.094	-.448	.000	.078	-.205	-.234	-.128	New
My personal accomplishments are more important than maintaining my social relationships.	-.167	-.435	-.044	.301	.006	.231	.119	New
I see my close relationships as separate from who I am as an individual.	.184	-.432	.016	.142	.056	-.103	-.124	New
I usually feel a strong sense of pride when someone close to me has an important accomplishment.	.066	.429	-.136	.169	-.084	-.059	-.074	RISC
If a person insults a member of my family or my friends, I feel personally insulted myself.	.144	.393	-.034	-.066	.048	.204	-.101	New
I always support a group decision even when I know it is wrong.	-.178	-.347	.056	-.057	.022	-.294	-.093	New
My role within my family gives me a sense of who I am.	-.106	.313	.064	.309	-.180	-.037	-.079	New
I prefer to do what I want without letting my family or friends influence me.	.198	-.302	-.085	-.046	-.058	.286	.103	New
My happiness depends very much on the happiness of those around me.	-.034	.296	.018	-.129	.058	-.208	.025	SL-int, HC
Component III: Difference (-) versus Similarity (+)								
I am a unique individual.	-.159	-.039	-.633	-.010	-.020	.000	.056	HI
Being a unique individual is important to me.	.072	.123	-.629	.085	-.072	-.051	-.048	New
I am a unique person, separate from others.	.104	-.134	-.611	.057	-.026	-.169	-.033	GL-ind
I enjoy being unique and different from others in many ways.	-.005	-.038	-.595	-.042	.040	.014	.072	SGL-ind, HI
Being different from others makes me uncomfortable	-.164	-.131	.402	.111	.275	-.098	.038	New
I avoid standing out among my friends.	.035	-.105	.285	.028	-.022	-.106	-.031	New
I feel good when I cooperate with others.	-.099	.071	.239	-.069	-.185	.102	-.124	HC
Component IV: Self-interest (+) versus Commitment to others (-)								
I will sacrifice my self-interest for the benefit of my group.	-.019	-.011	.030	-.660	.081	-.137	-.036	SGL-int
My relationships with others are more important than my personal accomplishments.	-.114	.077	-.011	-.573	.029	-.098	-.029	SGL-int
I will stay in my group if they need me, even when I am not happy with the group.	-.056	-.127	.077	-.419	.032	.063	-.123	SG-int
I stick with my group even through difficulties.	.187	.202	.050	-.386	-.080	.249	-.112	GL-int
I try to abide by customs and conventions at school/college.	.029	.172	.169	.324	.078	-.155	-.105	G-int
I help people I know, even if it is inconvenient.	.153	.207	.008	-.308	-.028	-.229	.134	G-int
I should be judged on my own merit.	.207	.103	-.077	.238	.053	.029	.067	GL-ind
I am comfortable being singled out for praise and rewards.	-.020	.016	-.206	.207	.039	.136	-.031	SG-int
Component V: Consistency (-) versus Variability (+)								
I always see myself in the same way, independently of who I am with.	.020	-.116	-.006	.048	-.628	.032	-.008	New
I am the same person at home that I am at school/college.	-.169	.029	.075	.167	-.595	-.091	.180	S-ind
I sometimes feel like a different person when I am with different groups of people.	.104	-.004	.013	.062	.542	-.137	.001	New
My social surroundings may change, but I will still be the same person.	.104	-.064	-.042	-.007	-.489	-.005	-.065	New
My perception of myself depends on who I am with.	-.218	-.028	.066	.056	.461	-.117	.131	New
I try to fit in with people around me even if this means compromising who I really am.	-.243	-.212	.147	-.190	.363	.106	-.017	New
I take responsibility for my own actions.	.244	.152	.090	.077	-.307	.021	.188	SGL-ind

(table continues)

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Table 1 (continued)

Item	Rotated component loadings							Source ^a
	I	II	III	IV	V	VI	VII	
Component VI: Self-direction (+) versus Receptiveness to influence (-)								
Being able to take care of myself is a primary concern for me.	.124	.069	.007	.090	.089	.517	-.019	SG-ind
I should decide my future on my own.	.263	.022	.040	.027	-.035	.463	.047	G-ind
I maintain harmony in the groups of which I am a member.	-.096	.132	.092	-.164	-.129	.363	-.203	G-int
Other people's wishes have an important influence on the choices I make.	-.151	.103	.075	-.083	.277	-.344	.065	New
My personal identity, independent of others, is very important to me.	.184	.068	-.195	.092	.003	.330	.071	SGL-ind
I would sacrifice an activity that I enjoy very much if my family did not approve of it.	.023	.051	.145	.055	.106	-.300	-.030	VC
Many aspects of my life have already been planned out for me by other people.	-.168	-.280	-.060	.026	.174	-.290	.021	New
If there is a conflict between my values and the values of groups of which I am a member, I follow my values	.149	-.023	-.148	.072	-.145	.209	.146	G-ind
Component VII: Self-expression (+) versus Harmony (-)								
It is important to me that I respect decisions made by my groups.	.079	-.053	.162	-.060	-.077	.040	-.632	S-int, VC
It is important to maintain harmony within my group.	-.065	.026	.102	.012	-.036	.174	-.559	S-int, HC
I prefer to be direct and forthright when discussing with people.	.044	-.016	.095	-.068	-.277	.009	.360	S-ind, HI
I often do "my own thing."	.149	-.147	.027	.044	.044	.099	.340	HI
When I succeed, it is usually because of my abilities.	-.087	-.062	.063	.124	-.003	.261	.313	HI
I hate to disagree with others in my group.	-.002	-.072	.137	.113	.222	.026	-.297	VC
I respect decisions made by my group.	.198	.107	.192	-.074	-.103	-.154	-.255	G-int, VC
I like my privacy.	.200	.021	.138	.080	.189	.118	.220	HI
What happens to me is my own doing.	.166	-.095	.140	-.027	-.067	-.054	.188	G-ind, HI

Note. Items are grouped according to their primary (highest) loadings. Primary loadings above .2 are printed in bold. Additional loadings above .2 are printed in bold italics.

^a Items adapted from previous scales: ind = independence; int = interdependence; S = Singelis (1994); G = Gudykunst et al. (1996); L = Leung & Kim (1999, in Levine et al., 2003); RISC = relational interdependence (Cross et al., 2000); HI = horizontal individualism (Singelis et al., 1995); HC = horizontal collectivism (Singelis et al., 1995); VC = vertical collectivism (Singelis et al., 1995).

comprehensive sampling of the theoretical content of independent and interdependent self-construals available in the literature to date.

Participants and procedure. A total of 3,551 participants in 16 nations responded to two waves of a longitudinal study (listwise $n = 2,924$). In most nations, high-school students completed our questionnaires during teaching time. Participants in the Philippines were university students, because high school students in this country would have been too young to meet our target age-range (for which ethical approval had been granted).² Participants were recruited via their schools and received no compensation, except in the Philippines where they were invited to participate by university teachers and received small stationery gifts (e.g., pens) upon completion of the questionnaires. Table 2 provides demographic details, as well as further information on the sampling locations and procedures for each cultural sample.

Items were translated from English into the relevant languages (see Table 2), then independently back-translated by translators naïve to the purpose of the study (Brislin, Lonner, & Thorndike, 1973). Original and back-translated versions were compared, discrepancies were discussed, and the translations adjusted where necessary (Sireci, Yang, Harter, & Ehrlich, 2006).

Participants completed the 62 self-construal items during two successive waves of data collection, separated by approximately five months (range: 3 to 8 months). Our main item pool was developed for the Wave 2 questionnaire; however, 14 relevant items had already been measured at Wave 1. The remaining 48 items were measured at Wave 2. To minimize boredom effects, the 48 items were divided between two separate sections of our Wave 2 questionnaire, separated by other measures that used a very

different response format. All items were rated on 7-point response scales (ranging from 1 = *completely disagree* to 7 = *completely agree*).

Results³

Analytical details. To remove effects of acquiescent responding, as well as any systematic variance due to the division of items across survey waves, we ipsatized the item scores within each wave for each individual.⁴ To do this, we calculated the mean across all self-construal items within each wave for each individual and subtracted this mean from each item (Schwartz, 2007). Thus,

² We recognize that students attending university as opposed to high-school are likely to be at a different stage in life and may therefore construct their self in different ways. However, our goal here was to represent diverse cultural groups within the study, and not to examine any particular life-stage. In Study 2, we sampled adult participants over a much wider age range.

³ Much of our theory building leading to the item generation for Study 2 was based on an initial analysis of data from six nations (Ethiopia, GA, Italy, Lebanon, Romania, and the United Kingdom), conducted by the second author (Owe, 2009). However, we report analyses based on the full sample of sixteen nations here, and the results are highly similar.

⁴ In preliminary analyses, we ipsatized across the entire item pool; however, we found that items measured during Wave 1 tended to factor separately from conceptually very similar items measured at Wave 2. By ipsatizing the ratings separately within each time point, we obtained factor structures that were more theoretically interpretable, such that conceptually similar items from different waves loaded together rather than separately. Because our goal at this stage was theory-building, not theory-testing, we adopted a pragmatic view and selected the approach that provided the most interpretable solution.

Table 2
Demographic Details for Each National Sample (Study 1)

Country	<i>N</i>	Mean age	<i>SD</i>	% females	Language	City/Region of data collection	Researcher present	Completion context
Belgium	252	17.31	1.06	57	French	Brussels and surrounding area	Yes	In class
Brazil	554	16.67	2.83	62	Portuguese	Goiânia, João Pessoa, Rio de Janeiro, Niterói, São Gonçalo, Porto Alegre and Belem.	Yes	In class
Chile	347	16.18	.56	45	Spanish	Santiago Metropolitan Region	Sometimes	In class
Colombia	123	15.80	.60	44	Spanish	Soacha, Bogota	Yes	In school but not during class
Estonia	184	16.76	.71	63	Estonian	Tartu and Pärnu with surrounding counties	Yes	In class
Ethiopia	233	17.57	.91	46	Amharic	Addis Ababa	Yes	In class or during free time
Georgia	172	15.83	1.58	55	Georgian	Tbilisi	Sometimes	In class or in school but not during class
Hungary	177	16.43	.81	49	Hungarian	Budapest	Yes	In class
Italy	187	17.73	.66	62	Italian	Lombardy	Yes	In class
Lebanon	211	17.05	.47	45	Arabic	Beirut (Ras Beirut)	Yes	In class
Oman	181	16.44	.76	45	Arabic	Muscat	Yes	In class
Philippines	218	17.39	1.30	71	English	Manila, Iloilo, Sulu	Yes	In class or in school but not during class
Poland	122	17.02	.23	57	Polish	Gdynia and Gdańsk	Yes	In class
Romania	179	17.15	.78	48	Romanian	Timisoara	Yes	In class
Spain	187	16.41	.72	54	Spanish	Toledo and Madrid	Sometimes	In class
UK	224	16.70	.78	75	English	Worthing, Bexhill (Sussex)	Yes	In class
Total	3551	16.76	1.48	56				

we analyzed participants' relative endorsement of each item within their respective measurement occasions, rather than their absolute endorsement. Admittedly, ipsatization would have removed some substantive variance beyond the method variance targeted, but we considered this to be the most defensible approach currently available to adjust for acquiescent responding within an exploratory analysis of clustered data from 16 cultural samples. When testing our model in Study 2, we were able to improve on this approach by modeling acquiescence as a common method factor in confirmatory factor analysis (CFA; Welkenhuysen-Gybels, Billiet, & Cambré, 2003). However, the use of common method factors in exploratory factor analysis (EFA; Aichholzer, 2014) is not yet sufficiently advanced that we could use this approach with confidence for a genuinely exploratory analysis (i.e., where an expected factor structure is not already known) nor with clustered data.

We based our analyses on the pooled, within-cultures correlation matrix of the ipsatized item ratings (G. Becker, 1996). Correlation matrices of the 16 cultural samples were subjected to Fisher's transformation and then averaged to form a single matrix; the averaged matrix was then transformed back to a correlation matrix. This procedure removes the confounding effect of sample mean differences from the individual-level correlations, as well as ensuring that the data from each sample are weighted equally in the analysis (Leung et al., 2002).

Because our data were derived from ipsatized ratings, it was necessary to use principal components analysis (PCA) rather than EFA. In most cases, EFA is preferred for conceptual reasons, because PCA provides data reduction rather than extraction of underlying factors (Fabrigar, Wegener, MacCallum, & Strahan, 1999). We used PCA here, because our ipsative data violate the assumptions of EFA: According to the common factor model, disturbances of each item should be uncorrelated and factor extraction generally requires that correlation matri-

ces should be positive definite, whereas ipsatizing leads to correlated disturbances and a nonpositive definite correlation matrix (Baron, 1996; Jackson & Alwin, 1980). PCA does not suffer from the same restrictions and thus can give meaningful results when used for ipsatized scores (ten Berge, 1999; Wothke, 1993). Moreover, the two analyses typically provide highly similar results (Velicer & Jackson, 1990), and we confirmed this for our current data.⁵

Main analysis. We conducted a PCA of the pooled within-cultures correlation matrix with Oblimin rotation. Twenty components showed eigenvalues >1. However, the scree plot showed points of inflection after 2, 5, 7, and 10 factors. Of these possibilities, a 7-component rotation was most interpretable, and this accounted for 28% of the variance in the item pool.

The rotated component loadings are shown in Table 1. Six of the seven components were defined clearly by both positively and negatively loading items. Although we used an oblique rotation, correlations among the seven rotated components were small, ranging in absolute magnitude from .007 to .161. Crucially, each of these dimensions appeared to contrast a particular way of being independent with a particular way of being interdependent:

- Component I appeared to contrast a preference for *self-reliance* (e.g., "I prefer to be self-reliant rather than depend on others") with a preference for *dependence on others*

⁵ Although not technically valid, we subjected the pooled within-cultures correlation matrix to EFA using principal axis factoring. As in our PCA, the scree plot showed a point of inflection at 7 factors. The output showed no improper results, and the rotated 7-factor solution showed a highly similar pattern of loadings to those reported in Table 1. The seven dimensions appeared in a different order, but the item loadings on corresponding dimensions from the PCA and EFA solutions were almost perfectly correlated ($r = .930$ to $.993$).

(e.g., “I prefer to turn to other people for help rather than solely rely on myself”).

- Component II appeared to contrast a sense of *self-containment* (e.g., “I consider my happiness separate from the happiness of my friends and family”) with a sense of *connection to others* (e.g., “If a person hurts someone close to me, I feel personally hurt as well”).
- Component III appeared to contrast a desire for *difference* (e.g., “Being a unique individual is important to me”) with a desire to be *similar* to others or to fit in (e.g., “I avoid standing out among my friends”).
- Component IV was mainly defined by items reflecting a sense of *commitment to others* at the expense of *self-interest* (e.g., “I will sacrifice my self-interest for the benefit of my group”), all of which loaded negatively. All of these items involved some kind of trade-off between the interests of self and others. Items that loaded positively on this component tended to cross-load on other components, but these also seemed to capture a focus on self-interest at the expense of others (e.g., “My personal accomplishments are more important than maintaining my social relationships,” “I am comfortable being singled out for praise and rewards”).
- Component V appeared to contrast a sense of *consistency* across situations (e.g., “I always see myself in the same way, independently of who I am with”) with a sense of *variability* or flexibility across contexts (e.g., “I sometimes feel like a different person when I am with different groups of people”).
- Component VI appeared to contrast a sense of *self-direction* (e.g., “I should decide my future on my own”) with a sense of *receptiveness to influence* by others (e.g., “Other people’s wishes have an important influence on the choices I make”).
- Component VII appeared to contrast a preference for *self-expression* (e.g., “I prefer to be direct and forthright when discussing with people”) with a desire to maintain *harmony* (e.g., “It is important to maintain harmony within my group”).

Alternative solutions. We considered three other solutions suggested by the scree plot, as well as a 20-component solution based on the Kaiser-Guttman rule, but these were judged to be less interpretable than the 7-component solution (see [Appendix](#)).

Discussion

Consistent with previous studies (Christopher et al., 2012; Guo, Schwartz, & McCabe, 2008; Hardin et al., 2004; Levine et al., 2003; Milfont, 2005; Sato & McCann, 1998), our results showed that both independence and interdependence are multifaceted. However, by removing variance attributable to acquiescence, we were able to detect theoretically interpretable *bipolar oppositions* between ways of being independent and ways of being interdependent. This shows clearly the inadequacy of the prevailing two-dimensional model for measuring independent and interdependent self-construals: Independence and interdependence are neither unidimensional nor orthogonal (cf. Gudykunst et al., 1996; Singelis, 1994). With a more adequate sampling of both item content and cultural contexts than previous studies (Fernández et al., 2005; Hardin et al., 2004; Singelis, 1994), and using appropriate statistical techniques for cross-cultural data analysis, we found evidence of seven bipolar dimensions of self-construal.

Based on these results, we conceptualized a new seven-dimensional theoretical model of self-construal, summarized in [Table 3](#). In this model, each factor represents a choice for the individual about whether to think/feel/act in a relatively independent or interdependent manner within a given domain of personal and social functioning. Within each domain, independent and interdependent ways of being are mutually exclusive: one cannot be more different from others without also being less similar, one cannot turn to others for help without being less self-reliant, one cannot be more consistent across contexts without being less variable, and so on. Across domains, however, independent and interdependent ways of being are largely compatible: being different from others does not presuppose that one has to be self-reliant, nor that one has to be consistent across contexts, and so on.

Notably, the logic of this model seems closer than that of previous measurement models to Markus and Kitayama’s original theorizing (see Markus & Kitayama, 1991, Table 1) as well as subsequent revisions of their perspective (Kitayama & Uskul, 2011; Markus & Kitayama, 2010). If independence and interdependence are priorities of cultural systems, rather than properties of individuals, then there is no reason to expect that they should form monolithic dimensions of individual differences (Kitayama et al., 2009), and this is what we found. This raised the exciting possibility of using our seven-dimensional model to conduct a more adequate test of Markus and Kitayama’s (1991) claims about the prevalence of ways of being independent and interdependent in

Table 3
Ways of Being Independent or Interdependent Across Different Domains of Personal and Social Functioning

Domain of functioning	Independent way of being		Interdependent way of being
Defining the self	Difference	↔	Similarity
Experiencing the self	Self-containment	↔	Connection to others
Making decisions	Self-direction	↔	Receptiveness to influence
Looking after oneself	Self-reliance	↔	Dependence on others
Moving between contexts	Consistency	↔	Variability
Communicating with others	Self-expression	↔	Harmony
Dealing with conflicting interests	Self-interest	↔	Commitment to others

Western and Eastern cultures, and in other world regions—which we turn to in Study 2b. However, given the exploratory nature of Study 1, it was important first to test our seven-dimensional model with new data.

Despite our best efforts, many items in Study 1 had rather complex sentence structures that were difficult to translate (Brislin et al., 1973), or required abstract introspection that may have been especially difficult for people in some cultures (Smith, 2011). We hoped to improve on these items for our next study, so as to measure our dimensions more precisely. Moreover, a confirmatory analysis would allow us to deal with common method variance without resorting to ipsatization (Welkenhuysen-Gybels et al., 2003). Furthermore, although our Study 1 sample was broader than most in the self-construal literature, all participants were late adolescents residing in only 16 nations. None of these nations was in North America, nor in East Asia: thus, the world regions on which Markus and Kitayama (1991) had focused their original theorizing were both absent from Study 1. Most crucially, before exploring cross-cultural differences, we needed to test whether the same seven dimensions would be found at a cultural level of analysis, and whether they might cluster into a single higher-order factor at the cultural level (inspired by Kitayama et al., 2009). Study 2a was designed to address these issues.

Study 2a: Testing the Seven-Dimensional Model

We tested our seven-dimensional model among even more diverse samples and using an improved set of items. Data were collected within a second multinational study into culture and identity processes (Owe et al., 2013; Vignoles & Brown, 2011), among nonstudent adults across a much larger number of cultural groups than Study 1. Rather than equating ‘culture’ with ‘nation,’ we targeted several cultural groups within each nation where relevant and feasible. The nature of the groups varied from nation to nation, such that the differences might be regional (e.g., Eastern and Western Germany), religious (e.g., Baptists and Orthodox Christians in Georgia) or ethnic (e.g., Damara and Owambo in Namibia). We collected data from over 7,000 adult members of 55 cultural groups in 33 nations, spanning all inhabited continents.

Crucially, this larger sample of cultural groups allowed us to investigate the structure of self-construals at a cultural level. We tested whether the same dimensions that characterize individuals can also be used to characterize cultures. We also tested whether these dimensions could be organized into a higher-order structure. Inspired by Kitayama et al. (2009; Na et al., 2010), we were especially interested to test whether *the seven dimensions in our model would cluster together into a single higher-order dimension of independence versus interdependence at the cultural level, even if they were largely uncorrelated at the individual level* (H1).

Method

Participants and procedure. Various means were used to recruit convenience samples of adults in different locations, including a snowballing technique among the researchers’ social networks, through community groups and nongovernmental organizations, and with the help of university students who collected data from their relatives. We analyzed data from 7,279 adults from 55 cultural groups in 33 nations. Table 4 provides demographic

details, as well as further information on the sampling locations and procedures for each cultural sample.⁶

Self-Construal Scale. We developed an improved pool of 38 items to measure the seven dimensions in our new theoretical model. Each dimension was represented by between 4 and 6 items. We included approximately equal numbers of items reflecting the independent and interdependent poles of each dimension, to represent the bipolar nature of the factors and to allow us to control more effectively for acquiescent responding.

Rather than presenting items on *agree-disagree* scales, we wanted to make the task of responding more concrete and more directly self-focused; therefore, we asked our participants “How well does each of these statements describe you?” To leave room for interitem variability while allowing for potential variation in response styles, we created a nine-point response scale ranging from 1 (*not at all*) to 9 (*exactly*), with three intermediate anchor-points (3 = *a little*, 5 = *moderately*, 7 = *very well*). Seeking to reduce the likelihood of reference group effects (Heine et al., 2002), we encouraged participants to compare the items with each other, rather than compare themselves with other individuals in their cultural context: “Below are some statements of what you might be like. Probably some will describe you well and others will not describe you well.”

The content of most items was closely adapted from those used in Study 1. However, we reworded all items, aiming to make them more contextualized and less abstract. All items were worded in the second person, to make the task feel less introspective, despite focusing on the participant’s self-image (Smith, 2011). This wording was also chosen to enhance the natural quality of interviews where semiliterate participants were helped to read the questions by research assistants. The substantive content of many items was adapted in order to reduce the level of abstract thinking required: For example, “It is important to maintain harmony within my group” was reworded as “You show your inner feelings even if it disturbs the harmony in your family” (reversed). As can be seen in this example, many of the original items used the very general ‘my group,’ which may not be very meaningful to respondents. Considering that the family is the most important group to most people across cultures (Fischer et al., 2009), many items were reworded to refer to the family or in some cases to friends.

We sought to produce culturally ‘decentered’ items, avoiding words or expressions that are specific to one language or culture. After generating an initial item pool in English, the items were translated to French, Swedish, and Turkish to test their translatability, and the wordings were discussed with native speakers of these languages. Following some improvements, and dropping some items, an early version of the scale was translated into Romanian and piloted among 20 Romanian students who provided feedback. The resulting item pool went through the same process

⁶ Originally, the study included 64 cultural samples from 36 nations. However, we were alarmed to discover some duplicated cases in the data for certain samples. In most samples, the problems were very minor and we were able to resolve them with help from our international collaborators. However, for nine cultural samples in the Study 2 data the extent of the problems was larger, and we did not receive sufficient assurance of the veracity of the data. Although we cannot be sure what went wrong or who was responsible, we concluded that it was unsafe to use these samples in our analyses, and they are not reported in this paper.

Table 4
Demographic Details for Each Cultural Sample (Study 2)

Cultural group	<i>N</i>	Mean age	<i>SD</i>	% female	Language	Religious heritage	Cultural region	Recruitment procedure	Completion context	Researcher present; Researcher helped read questions	City/Region	Compensation
Belgium: high SES	185	43.78	8.17	48	French	Catholic	Western	Through trade unions.	In groups; during professional training sessions.	No; No	French speaking Belgium	None
Belgium: low SES	178	28.57	9.25	47	French	Catholic	Western	Through vocational training organizations offering training for unemployed people.	In groups; during vocational training sessions.	Yes; Yes	Wallonia	None
Brazil: Central	185	33.60	13.77	44	Portuguese	Catholic	Latin American	In public places (e.g., bus stops, shopping centers)	Individually	Yes; Yes	Goiania	None
Brazil: North East	150	38.95	11.66	73	Portuguese	Catholic	Latin American	In public places (e.g., bus stops, shopping centers, seafont)	Individually	Yes; Yes	João Pessoa	None
Brazil: South	165	25.97	9.67	56	Portuguese	Catholic	Latin American	Through researchers' social networks	Individually	Yes; Sometimes	Porto Alegre	None
Cameroon: Bafut	100	26.07	6.10	67	English	Protestant/Catholic	Sub-Saharan African	In meeting houses in the targeted villages. Only English-speaking people were invited.	In groups; in meeting houses.	Yes; Sometimes	North West	None
Chile: majority	148	44.97	12.46	58	Spanish	Catholic	Latin American	Trained undergraduate students recruited participants within their social networks that were members of the majority group.	Individually	Sometimes; Sometimes	Mainly Santiago Metropolitan Region	USDI-2
Chile: Mapuche	149	38.16	14.83	55	Spanish	Catholic	Latin American	Trained undergraduate students recruited participants within their social networks that were members of the Mapuche group.	Varied	Sometimes; Sometimes	Temuco, La Araucanía Region	USDI-2
China: East	125	31.66	8.27	69	Chinese	Buddhist	Southern/Eastern Asian	During training sessions for adults at the Chinese Academy of Science	In groups; at the end of their classes.	Yes; Sometimes	Beijing	Small souvenirs
China: West	135	31.15	8.70	68	Chinese	Buddhist	Southern/Eastern Asian	Participants were approached in residential compounds.	Varied	Yes; Yes	Sichuan	Small souvenirs
Colombia: rural	150	35.23	13.37	62	Spanish	Catholic	Latin American	25 participants from San Martín and Villavicencio were contacted directly by the researcher. A snowball sampling was used in order to locate other individuals who live in the same rural areas.	Individually; in participants' home.	Yes; No	San Martín, Meta and Villavicencio, Meta	None

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Table 4 (continued)

Cultural group	N	Mean age	SD	% female	Language	Religious heritage	Cultural region	Recruitment procedure	Completion context	Researcher present; Researcher helped read questions	City/Region	Compensation
Colombia: urban	149	38.72	11.52	60	Spanish	Catholic	Latin American	30% of the sample was recruited through the personal network of the researcher. 70% via undergraduate students who recruited their parents.	Individually; at home.	No; No	Bogota	None
Egypt	164	31.12	9.98	52	Arabic	Muslim	Middle Eastern	Participants were approached in various community settings (e.g., shopping malls, mosques, university settings, factories, and governmental hospitals).	Varied	Sometimes; Sometimes	Cairo and greater Cairo area	None
Ethiopia: highlanders	150	33.11	9.23	38	Amharic	Orthodox/Muslim	Sub-Saharan African	Various methods: door to door, in market places, health institutes, etc.	Individually	Yes; Yes	Oromiya	None
Ethiopia: urban	150	35.02	9.00	46	Amharic	Orthodox/Muslim	Sub-Saharan African	Students from a technical and vocational college recruited adults from their social networks	Individually	Sometimes; Sometimes	Addis Ababa	None
Georgia: Baptists	81	44.85	17.27	75	Georgian	Protestant	Eastern European	Through a local religious leader.	Varied	Yes; Sometimes	Tbilisi	None
Georgia: Orthodox	138	39.16	12.08	45	Georgian	Orthodox	Eastern European	Through students' and researchers' own social networks.	Individually	Sometimes; No	Tbilisi	None
Germany: East	153	40.26	14.73	58	German	Protestant/Catholic	Eastern European	East German students recruited participants from their social networks.	Varied; in private contexts (e.g., at home)	N/A	All over East Germany	None
Germany: West	104	39.71	15.74	58	German	Protestant/Catholic	Western European	West German students recruited participants from their social networks.	Varied; in private contexts (e.g., at home)	N/A	All over West Germany	None
Ghana: Ashanti	116	28.58	5.09	23	English	Protestant	Sub-Saharan African	Recruited school teachers.	Individually	Sometimes; Sometimes	Kumasi Regional Capital	None
Hungary: majority	151	36.83	12.78	46	Hungarian	Catholic	Eastern European	Professional school teachers taking an educational psychology course each recruited 5 participants through their social networks.	Individually; at home	No; No	Budapest	None
Hungary: Roma	92	33.37	11.70	48	Hungarian	Catholic	Eastern European	Roma students recruited within their networks; social workers and a political representative of the Roma minority also helped recruiting.	Individually; at home	Sometimes; Sometimes	Various	None

(table continues)

Table 4 (continued)

Cultural group	N	Mean age	SD	% female	Language	Religious heritage	Cultural region	Recruitment procedure	Completion context	Researcher present; Researcher helped read questions	City/Region	Compensation
Iceland	121	35.19	13.30	69	Icelandic	Protestant	Western	(a) Employees of a large company (various occupations); (b) Through social networks of the researchers	(a) At their workplace desk or in the cafeteria; (b) At home.	Sometimes; Sometimes	Greater Reykjavik area	None
Italy: rural	90	40.30	13.69	72	Italian	Catholic	Western	Snowballing technique starting from researchers' social network	Individually; at home	No; No	mainly Lombardy	None
Italy: urban	83	37.59	12.42	69	Italian	Catholic	Western	Snowballing technique starting from researchers' social network	Individually; at home	No; No	mainly Lombardy	None
Japan: Hokkaido	73	50.87	12.50	63	Japanese	Buddhist	Southern/Eastern Asian	During psychology lectures for general public	Individually; at home	No; No	Sapporo	None
Japan: mainland	211	41.43	15.51	60	Japanese	Buddhist	Southern/Eastern Asian	Snowballing technique starting from researchers' social network	Individually; at home or at work	Sometimes; N/A	Kansai-area and Kanto-area	None
Lebanon: East Beirut	137	35.45	13.28	53	Arabic	Catholic	Middle Eastern	In public places (sidewalks, sitting alone in a cafe, public benches, outside shops, or other openly accessible spaces)	Individually	Yes; No	East Beirut	None
Lebanon: West Beirut	123	34.76	14.74	42	Arabic	Muslim	Middle Eastern	In public places (sidewalks, sitting alone in a cafe, public benches, outside shops, or other openly accessible spaces)	Individually	Yes; No	West Beirut	None
Malaysia	150	28.05	7.92	63	Malay	Muslim	Southern/Eastern Asian	Convenience sampling	Varied	Yes; No	Kuala Lumpur	None
Namibia: Damara/ Nama	69	25.14	6.40	61	English	Protestant	Sub-Saharan African	Through community centers	Individually; at home	Sometimes; No	Windhoek	None
Namibia: Owambo	135	24.34	5.30	68	English	Protestant	Sub-Saharan African	Through community centers	Individually; at home	Sometimes; No	Windhoek	None
New Zealand: Pākehā	204	34.91	13.06	49	English	Protestant	Western	In public places (public squares, malls, or other openly accessible spaces)	Individually	Yes; No	Wellington	A small token (chocolate bar)
Norway	102	37.01	13.54	57	Norwegian	Protestant	Western	In private or public places (e.g., libraries, waiting rooms, quiet shops, small offices, door to door)	Individually	Yes; No	East-Norway	None

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Table 4 (continued)

Cultural group	N	Mean age	SD	% female	Language	Religious heritage	Cultural region	Recruitment procedure	Completion context	Researcher helped read questions	City/Region	Compensation
Oman	160	25.12	4.99	45	Arabic	Muslim	Middle Eastern	Research assistants recruited participants from their social networks and in places such as schools and government offices. Door to door and at the community center	Individually	No; No	Various regions	None
Peru: rural	73	41.31	13.47	62	Spanish	Catholic	Latin American	Door to door and at the community center	Varied; at home individually or at the community center in groups	Yes; Yes	Catalina (Chepén)	None
Peru: urban	81	30.65	14.64	52	Spanish	Catholic	Latin American	(a) Students responded themselves and (b) recruited from their families	Varied; (a) in classrooms and (b) at home	Sometimes; No	Lima	None
Philippines: Christian	151	32.01	12.23	52	English/Tausug	Catholic	Southern/Eastern Asian	In offices and through researchers' social networks	Varied	Yes; No	Manila, Iloilo, Sulu	None
Philippines: Muslim	154	24.97	8.82	50	English/Tausug	Muslim	Southern/Eastern Asian	Through researchers' social networks, in work settings	Varied; mostly at work	Yes; No	Sulu	None
Romania: rural	162	37.02	15.04	59	Romanian	Orthodox	Eastern European	Students recruited one adult participant each.	Individually	Yes; Yes	West Region of Romania	None
Romania: urban	318	35.18	12.12	58	Romanian	Orthodox	Eastern European	Students recruited one adult participant each.	Individually	Yes; Yes	The West Region of Romania	None
Russia: Caucasian	139	32.06	11.75	81	Russian	Muslim	Eastern European	Snowballing technique starting from researchers' social network	Individually; at home, at work	Sometimes; Sometimes	Chechnya Republic, Ingishetiya Republic, Stavropol province, Stavropol city, Nazran (town), Grozny city, Maloec town	None
Russia: Russian	122	29.43	12.33	76	Russian	Orthodox	Eastern European	Snowballing technique starting from students' social network	Individually; at home, at work	Sometimes; No	Moscow	None
Singapore	110	34.95	12.74	54	English	Buddhist	Southern/Eastern Asian	Students recruited participants from their social networks.	Individually; mostly at home	No; No	Singapore	None
Spain: rural	75	38.61	16.14	47	Spanish	Catholic	Western	In private or public places (e.g., public squares, parks, or bars and cafés)	Varied	Yes; Sometimes	La Herradura, Granada, and La Puebla de Montalbán, Toledo	None
Spain: urban	105	41.16	13.39	55	Spanish	Catholic	Western	Students recruited participants on site and through researchers' social network	Individually	Yes; Sometimes	Madrid	None
Sweden	101	45.18	16.01	65	Swedish	Protestant	Western	Snowballing technique starting from researchers' social network	Individually	No; No	All over Sweden	None

(table continues)

Table 4 (continued)

Cultural group	N	Mean age	SD	% female	Language	Religious heritage	Cultural region	Recruitment procedure	Completion context	Researcher present; Researcher helped read questions	City/Region	Compensation
Thailand	71	27.99	6.71	69	Thai	Buddhist	Southern/Eastern Asian	Snowballing technique starting from researchers' social network	Varied; at work or at home	No; Yes	Bangkok	None
Turkey: Alevi	114	38.88	11.02	64	Turkish	Muslim	Middle Eastern	Through Alevi associations	Individually	Sometimes; Sometimes	Ankara	None
Turkey: majority	134	40.62	9.94	57	Turkish	Muslim	Middle Eastern	Ten contact people of different socio-economic status recruited from their social networks	Individually	No; No	Bursa	None
Uganda: Baganda	151	34.45	6.31	58	English	Protestant/Catholic	Sub-Saharan African	Teachers were recruited at their schools	Individually; during free time at work or at home	Yes; Sometimes	Kampala, Central region	None
UK: rural	95	51.82	16.50	72	English	Protestant	Western	Students and researchers recruited through their social networks	Individually	Sometimes; No	All over Great Britain	None
UK: urban	133	43.92	17.43	62	English	Protestant	Western	(a) Students and researchers recruited through their social networks; (b) in public and semi-public places	Individually; at home, at work, in public places, on commuter trains	No; No	All over Great Britain	None
US: Colorado	92	36.77	13.74	59	English	Protestant	Western	Students and researchers recruited through their social networks	Individually	No; No	Colorado Springs	None
US: Miami (Hispanic)	122	23.49	5.34	71	Spanish	Catholic	Latin American	Through researchers' social networks and among pool of previous study participants	Individually; mostly at the research lab	Sometimes; No	Miami	None
Total	7279	35.27	13.39	57								

of translation and back-translation as in Study 1. Finally, we tested the performance of each scale item across cultures and across levels of analysis, described below.

Results

We conducted our analyses in several stages. First, we tested the performance of our new items at the individual level of analysis, removing items that did not load cleanly on their target dimension, and testing whether the items performed similarly across groups of samples from different world regions. Second, we compared our seven-dimensional model against one-, two- and three-factor models based on previous literature. Third, we tested the seven-dimensional model across individual and cultural levels of analysis. Finally, we examined whether cultural variation would reveal a single higher-order factor of independence versus interdependence (H1).

Analytical details. Analyses were conducted in Mplus Version 6 (Muthén & Muthén, 2010). All models included a separate method factor, modeling acquiescence, which loaded onto every indicator at a fixed value of 1 and was allowed to correlate with the seven substantive factors (Welkenhuysen-Gybels et al., 2003). Acquiescent responding can be an indicator of substantive differences in communication styles (Smith, 2004), and communication styles have been linked to self-construals in previous research (e.g., Gudykunst et al., 1996). Hence, we reasoned that it was theoretically appropriate to allow the method factor to correlate with the substantive factors. Substantive factors were scaled by fixing one item loading to 1. Because of the large number of cultural samples, we conducted multilevel analyses with individuals at the *within-level* and cultural groups at the *between-level*. To test the individual-level structure, item scores were centered within cultural groups and parameters were specified at the within-level only, while the between-level remained empty. To test the culture-level structure, item scores were grand-mean centered, and between-level intercepts were set to zero.

Model fit was assessed using the Standard Root Mean Squared Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), and Comparative Fit Index (CFI). Values of SRMR < .08 (or < .10), RMSEA < .06 (or < .08), and CFI > .95 (or > .90) have been proposed as criteria for “good” (or “acceptable”) fit (Hu & Bentler, 1999; Kline, 2005). However, Marsh, Hau, and Wen (2004) have cautioned against overreliance on these rules of thumb, arguing that they may be unachievable for most multifactor rating instruments when assessed at item level. Instead, they suggest that model fit should be evaluated in part based on “progress in relation to previous results” (p. 325). Notably, published fit indices for existing self-construal measures typically fall outside of the commonly accepted range, even when assessing single cultural samples. CFAs of the Singelis (1994) scale by Levine et al. (2003) and Hardin et al. (2004) showed values of CFI ranging from .25 to .65 and RMSEA ranging from .076 to .268. Similarly poor fit indices have been observed for the Gudykunst et al. (1996) scale (Hackman, Ellis, Johnson, & Staley, 1999; Levine et al., 2003). In CFAs of their six-factor model, Hardin and colleagues (2004; Hardin, 2006) reported CFIs from .55 to .72, although RMSEA was usually acceptable. The fit indices obtained below should be evaluated against this backdrop.

Testing and refining the individual-level structure. First, we tested our seven-factor model at the individual level only, using all 38 items. To aid interpretation, we scaled each factor so that ‘independence’ items would load positively and ‘interdependence’ items negatively. As shown in Table 4, all items loaded in the expected direction. All standardized loadings were statistically significant ($p < .001$), but some were very small. As shown in Table 5, this model provided a good fit to the data according to SRMR (.050) and RMSEA (.046). CFI (.790) was below the conventionally accepted range, but higher than the values commonly reported in previous self-construal research. These fit indices are acceptable, considering that this was the first test of our newly worded items, as well as the first test of any self-construal measure across such a large and diverse set of cultural groups.

Nonetheless, the low CFI revealed scope for improvement. After inspecting item loadings, as well as sequentially examining modification indices, we removed 10 items that failed to load above .3 on their respective factors, and two items that showed substantial potential cross-loadings. We also allowed a significant negative residual covariance ($p < .001$) between two items that were conceptual opposites of each other: “You behave the same way at home and in public” and “You act very differently at home compared to how you act in public.” This resulted in a 26-item scale (see Table 5), for which all items showed standardized loadings in the expected direction ranging from .308 to .659 (all $p < .001$), and modification indices suggested no potential standardized cross-loadings above .22. Model fit for the 26-item version was good according to SRMR (.033) and RMSEA (.033) and acceptable according to CFI (.922).

Measurement invariance. Any multilevel measurement model assumes invariance of within-level relationships across clusters unless the parameters are freed to be noninvariant by the introduction of random slopes (Selig, Card, & Little, 2008). Our models did not contain random slopes, and so a well-fitting model already indicates that invariance of factor loadings is tenable (Little, Card, Slegers, & Ledford, 2007). Nonetheless, as a further test of measurement invariance, we computed multigroup multilevel models exploring whether the sizes of any item loadings differed systematically across cultural groups from different world regions.

We divided our cultural groups into six ‘world regions,’ according to both geographical position and cultural heritage: Western, Eastern European, Middle Eastern, Southern and Eastern Asian, Sub-Saharan African, and Latin American (see Table 4). To do this, we drew on the classification of countries into major world regions by the United Nations Department of Economic and Social Affairs (2011), as well as the cultural regions identified in major previous studies of cross-cultural differences (Georgas & Berry, 1995; Georgas et al., 2004; Inglehart & Baker, 2000; Schwartz, 2006). Based on ethno-cultural heritage, we included U.S. Colorado and New Zealand Pākehā samples in the Western grouping, and we included U.S. Miami Hispanics in the Latin American grouping. We do not suggest that these very broad groupings are culturally homogeneous—we distinguish them here purely as an analytical device, and we emphasize that they should not be reified into a new set of cultural categories.

We conducted a multigroup multilevel CFA of the 26-item scale, estimating the item loadings freely across the six world regions. One item loaded weakly on its target factor in five of six

Table 5
Standardized Item Loadings for the New Self-Constraint Scale (Study 2a)

Item	SCS-25 (constrained model)							SCS-22		
	SCS-38	SCS-26	West	East Eur	Mid East	S&E Asia	SS Afr	Lat Amer	Within	Between
Difference versus similarity										
You like being different from other people.	.569	.572	.662	.596	.521	.541	.528	.560	.588	.712
You see yourself as unique and different from others.	.492	.491	.526	.494	.442	.503	.479	.446	.504	.467
You like it when people notice you in a group.	.265	—	—	—	—	—	—	—	—	—
Being different from others makes you feel uncomfortable.	-.460	-.475	-.547	-.490	-.388	-.489	-.410	-.463	-.468	-.724
You try to avoid being noticeably different from others.	-.342	-.333	-.385	-.345	-.307	-.357	-.325	-.314	-.321	-.739
Being praised in front of others makes you feel uncomfortable.	-.261	—	—	—	—	—	—	—	—	—
Self-containment versus connection to others										
Your happiness is unrelated to the happiness of your family.	.450	.389	.432	.385	.316	.468	.366	.396	.386	.427 [†]
When you talk about yourself, you don't say very much about your family.	.244	—	—	—	—	—	—	—	—	—
If someone insults a friend, you rarely feel insulted yourself.	.178	—	—	—	—	—	—	—	—	—
If someone in your family is sad, you feel the sadness as if it were your own.	-.554	-.587	-.599	-.594	-.532	-.584	-.521	-.598	-.563	-.524
When someone in your family achieves something, you feel proud as if you had achieved something yourself.	-.485	-.533	-.546	-.558	-.424	-.545	-.474	-.583	—	—
Your happiness depends on the happiness of your friends.	-.159	—	—	—	—	—	—	—	—	—
Self-direction versus receptiveness to influence										
You prefer to do what you want without letting your family influence you.	.595	.617	.706	.672	.532	.535	.514	.661	.631	.511
You make decisions about your life on your own.	.430	—	—	—	—	—	—	—	—	—
You always ask your family for advice before making a decision.	-.510	-.575	-.629	-.602	-.501	-.508	-.500	-.580	-.578	-.757
Other people have great influence over the choices you make.	-.317	—	—	—	—	—	—	—	—	—
Self-reliance versus dependence on others										
You prefer to rely completely on yourself rather than depend on others.	.586	.616	.662	.668	.653	.628	.502	.585	.662	.516
You try to avoid being reliant on others.	.468	.475	.513	.512	.488	.497	.382	.452	.486	.340 [†]
You prefer to ask other people for help rather than rely only on yourself.	-.506	-.491	-.534	-.514	-.488	-.523	-.336	-.478	-.484	-.796
You feel uncomfortable in situations where you have to rely only on yourself.	-.499	-.475	-.517	-.487	-.472	-.483	-.343	-.449	—	—
Consistency versus variability										
You behave in the same way even when you are with different groups of people.	.611	.659	.723	.640	.595	.584	.568	.710	.669	.645
You always see yourself in the same way even when you are with different people.	.547	.601	.661	.602	.547	.526	.536	.655	.631	.525
You behave the same way at home and in public.	.581	.517	.569	.519	.468	.443	.444	.582	.501	.570
You act very differently at home compared to how you act in public.	-.546	-.460	-.508	-.467	-.412	-.387	-.399	-.501	-.457	-.915
You see yourself differently in different social environments.	-.474	-.472	-.542	-.486	-.431	-.440	-.418	-.496	-.441	-.959
You behave differently when you are with different groups of people.	-.518	-.497	-.562	-.496	-.450	-.450	-.457	-.528	—	—
Self-expression versus harmony										
You prefer to say what you are thinking, even if it is inappropriate for the situation.	.438	.454	.505	.499	.413	.449	.426	.447	.464	.504
You show your inner feelings even if it disturbs the harmony in your family.	.473	.440	.497	.485	.398	.418	.400	.422	.446	.675
You are comfortable expressing disagreement with friends.	.314	.308	—	—	—	—	—	—	—	—
You try to adapt to people around you, even if it means hiding your inner feelings.	-.315	-.374	-.404	-.395	-.331	-.361	-.361	-.337	-.369	-.732
You feel uncomfortable when you express disagreement with members of your family.	-.299	—	—	—	—	—	—	—	—	—
You try to maintain harmony among the people around you.	-.229	—	—	—	—	—	—	—	—	—
Self-interest versus commitment to others										
You value personal achievements more than good relations with the people close to you.	.473	.599	.658	.635	.590	.579	.512	.547	.605	.707
Your own success is very important to you, even if it disrupts your friendships.	.392	.453	.500	.501	.451	.437	.388	.396	.444	.587
You follow your personal goals even if they are very different from the goals of your family.	.523	—	—	—	—	—	—	—	—	—
You value good relations with the people close to you more than your personal achievements.	-.407	-.492	-.555	-.545	-.502	-.521	-.427	-.435	-.495	-.763
You always put your family first, even if it means giving up your personal goals.	-.490	—	—	—	—	—	—	—	—	—
You are more concerned with your friends' happiness than your own success.	-.224	—	—	—	—	—	—	—	—	—

Note. All within-culture loadings shown here are statistically significant at $p < .001$. All between-culture loadings are statistically significant at $p < .001$, except for those marked with [†], which are significant at $p < .01$.

Table 6
Fit Indices for Confirmatory Factor Analyses (Study 2a)

Model	χ^2	df	CFI	RMSEA	SRMR _{within}	SRMR _{between}
Item selection for individual-level factors						
Initial scale: SCS-38	11013.099	674	.790	.046	.050	—
Refined scale: SCS-26	2688.161	295	.922	.033	.033	—
Multigroup test of SCS-26 (unconstrained)	4951.403	1770	.904	.038	.042	—
Multigroup test of SCS-25 (unconstrained)	4574.558	1620	.908	.039	.042	—
Multigroup test of SCS-25 (constrained)	4853.032	1710	.902	.039	.044	—
Alternative individual-level models using SCS-25						
7 factors	2527.719	270	.924	.034	.034	—
1 factor	14994.088	298	.507	.082	.091	—
2 factors (no acquiescence)	14638.313	298	.519	.081	.089	—
3 factors (no acquiescence)	14379.326	296	.527	.081	.091	—
21 alternative models with 6 factors	3278.423–5659.162	277	.819–.899	.039–.052	.037–.059	—
Testing culture-level factors						
Multilevel test of SCS-25	3249.464	550	.914	.026	.033	.114
Multilevel test of SCS-22	2375.331	409	.923	.026	.031	.096
21 alternative models with 6 culture-level factors	2390.931–2509.212	416	.918–.922	.026–.027	.031	.101–.146

regions and was dropped from further analyses. The remaining 25 items showed acceptable fit (see Table 6); all items loaded significantly on their target factors in all six regions (all $p < .001$). Supporting measurement invariance, constraining the loadings to be equal across regions produced a negligible loss of fit ($\Delta CFI < .01$; Cheung & Rensvold, 2002). Crucially, this suggests that participants across six world regions understood these 25 items comparably.

Comparison with previous and simpler models. Using these 25 cross-culturally validated items, we now compared our seven-factor model with three simpler alternatives based on previous literature. First, we tested a model with all items loading on a single substantive factor (~ “independence vs. interdependence”), together with an uncorrelated acquiescence factor (Welkenhuysen-Gybels et al., 2003). Second, echoing the structure of the Singelis (1994) and Gudykunst et al. (1996) scales, we created a two-factor model with no acquiescence factor,⁷ where items measuring difference, self-containment, self-direction, self-reliance, self-expression, self-interest, and consistency loaded on an “independence” factor and items measuring similarity, connection, receptiveness to influence, dependence on others, harmony, commitment, and variability loaded on an “interdependence” factor. In a third alternative model, we sought to distinguish between individual, relational, and collective self-construals (e.g., Kashima & Hardie, 2000). Because in Study 1 items from the Cross et al. (2000) measure of relational self-construal had been concentrated in the self-containment versus connection factor (see Table 1), we modeled self-containment versus connection as a separate factor (~ “relational self-construal”) and we modeled the remaining items from the independence (~ “individual self-construal”) and interdependence (~ “collective self-construal”) factors as in the two-factor model. As shown in Table 6, all three alternative models showed poorer values of SRMR and RMSEA, and unacceptable values of CFI, confirming the superiority of our seven-factor model.

Individual-level discriminant validity. We also compared our seven-factor model against all 21 possible six-factor models that could be made by collapsing any pair of two factors into a single factor. All 21 six-factor models showed a significantly

worse fit than the seven-factor model—all $\Delta\chi^2(7) > 750$ and all $p < 10^{-157}$ —and every one of these models showed a lower CFI, higher RMSEA and higher SRMR compared with the seven-factor model. This confirms the discriminant validity of each of the seven factors.

Testing and refining the culture-level structure. We then sought to establish whether cultural models of selfhood could be located meaningfully along the same seven dimensions as individuals’ personal self-construals, by testing for isomorphism across individual and cultural levels of analysis. To do this, instead of centering the item scores within cultural groups, we now allowed Mplus to decompose the variance of each item into the two levels of analysis. To account for age and gender differences in the composition of our samples, we included these variables as predictors of the seven individual-level self-construal factors. Intercepts of the individual-level indicators were allowed to vary across cultural groups, and these became the indicators of each factor at the cultural level (Muthén & Muthén, 2010).

We tested a multilevel version of the seven-factor model with item loadings estimated freely across the two levels of analysis.⁸ At the cultural level, all items loaded in the expected direction with standardized loadings ranging in size from .269 to .958 (all $p < .05$). As reported in Table 6, the model showed acceptable values of CFI, RMSEA and SRMR_{within}; however, the SRMR_{between} was somewhat above the commonly accepted range, suggesting the presence of some misfit at the cultural level of analysis (Hsu, 2009). Inspection of the model parameters and modification indices led to removing one item that did not load cleanly on its target factor and two items that contributed substantially to between-level misfit. The resulting 22-item model showed acceptable fit

⁷ Because of the lack of reversed items on the substantive factors, it was not appropriate to model an acquiescence factor in the two- and three-factor models (Welkenhuysen-Gybels et al., 2003). Moreover, modeling these factors without correcting for acquiescence reflects common practice using the Singelis (1994) and Gudykunst et al. (1996) scales.

⁸ To avoid negative variance estimates, we imposed a non-linear constraint on the models in this section, such that the culture-level residual variances of all items must be greater than 0.

according to all indices (see Table 6), and the standardized culture-level loadings ranged from .340 to .959 (all $p < .01$; Table 5).

Culture-level discriminant validity. We now compared our seven-factor model against all 21 possible six-factor models that could be made by collapsing any pair of two culture-level factors into a single factor, while retaining the confirmed seven-factor structure at the individual level. Every one of these six-factor models showed a significantly worse fit than the seven-factor model—all $\Delta\chi^2(7) > 15$ and all $p < .05$ —and every one of these models showed a higher SRMR_{between} compared to the seven-factor model (see Table 6). Thus, the seven factors in our individual-level model are also distinguishable at a cultural level of analysis.

Is there a higher-order factor of independence versus interdependence? We were now in a position to test for the presence of a higher-order culture-level factor of independence versus interdependence underlying our data (H1: inspired by Kitayama et al., 2009). Table 7 shows estimated correlations among the seven factors at individual and cultural levels of analysis. H1 predicts that all seven dimensions should be positively correlated at the cultural level, but not at the individual level. This prediction was unambiguously refuted by our data: Culture-level correlations ranged from $-.893$ to $+.880$,⁹ and almost half of the correlations were negative. The correlation matrix also revealed no obvious pattern of two or more higher-order factors. At the individual level, some factors showed moderate positive correlations. However, a closer examination of the individual-level correlations within different cultural samples, using factor scores saved from our final model, revealed considerable heterogeneity in their size and even in their direction. Hence, as expected, it was not considered meaningful to impose a higher-order structure at this level. Rather, the interrelations among the seven dimensions may themselves be an expression of cultural differences. In sum, the pattern of correlations clearly refutes the possibility of a single factor of independence versus interdependence underlying all seven dimensions at either level of analysis.

Discussion

Using a new set of items, Study 2a was designed to test whether the structure identified in Study 1 would apply to a more diverse set of adult samples and at the cultural-level of analysis, as well as whether a possible higher-order structure could be identified. Corroborating and extending the main findings of Study 1, the seven-factor model was found to fit the data well, whereas previous one-, two-, and three-dimensional models did not. Moreover, fine-grained model comparisons discriminated all seven factors in our model at both individual and cultural levels of analysis. Since the structure of the seven-factor model was supported across levels of analysis, we can conclude that it is possible to characterize both individuals' personal self-views and cultural groups' prevailing models of selfhood along these seven dimensions.

Although similar structures were found at both levels of analysis, this does not mean that they have the same meaning. At the individual level, the seven dimensions refer to different ways that an individual may see herself and her relations to others. At the cultural level, on the other hand, they refer to normative cultural constructions of selfhood, likely sustained by cultural practices and institutions (Kitayama & Uskul, 2011; Yamagishi, 2010).

Notably, our analyses did not support the prediction inspired by Kitayama et al. (2009) that the seven dimensions of self-construal would cluster into a single higher-order dimension of independence versus interdependence at the cultural level of analysis (H1). Instead, the culture-level correlations in Table 7 showed a much more complex pattern. Thus, the simple contrast between 'independent' and 'interdependent' models of selfhood proposed by Markus and Kitayama (1991) was clearly not sufficient to characterize variation in models of selfhood across a wider range of global cultural contexts than the East-West focus of their original theorizing. This made it all the more pressing to establish which forms of independence and interdependence are more prevalent in different parts of the world, and how their differential prevalence can be explained—tasks that we turned to next. In Studies 2b to 2d, we added culture-level predictors or correlates into our multilevel measurement model, providing further evidence for the importance of distinguishing among these seven dimensions of cultural models of selfhood.

Study 2b: Models of Selfhood Across World Regions

Previous theorizing (e.g., Markus & Kitayama, 1991) implied that *Western samples should be expected to score toward the independent pole of all seven dimensions, whereas samples from all other regions—with the possible exception of Eastern Europe—should show a more interdependent profile* (H2). However, the need for a comprehensive test of this claim has long been noted (Matsumoto, 1999), and the lack of a higher-order factor of independence versus interdependence at the cultural level in Study 2a already made such a simple pattern seem unlikely. Hence, we tested for "West-versus-the-rest" differences on each dimension, but we also explored in an open-ended fashion whether particular forms of independence or interdependence would be especially characteristic of samples from each world region.

Method

Study 2 samples were classified for analytical purposes into six 'world regions' as described earlier and shown in Table 4.

Results and Discussion

We modified our final measurement model from Study 2a to test for mean differences across regions. Culture-level intercepts were freed, and the six regions were represented with five contrasts predicting all culture-level dimensions. We created several versions of this model using different combinations of contrasts, which allowed us to estimate latent means for all six regions and to compare these with the average across the six regions, as well as with each other

⁹ The size of the largest correlations may seem to question whether all seven factors are separable at the cultural level. Nonetheless, these correlations are significantly less than unity, as evidenced by the preceding analysis of culture-level discriminant validity, which showed a significant loss of fit when these or any other pairs of culture-level dimensions were collapsed together. Readers should also bear in mind that these are latent correlations, and so they are not attenuated by unreliability, and that most of the correlations (17 of 21) are below .50. Even the two very high correlations indicate that an estimated 20% to 23% of true variance is *not* shared between these dimensions, and it is possible that future research across a broader range of cultural contexts would differentiate them further.

Table 7
Estimated Correlations Among the Seven Latent Self-Construal Dimensions at Individual (Below Diagonal) and Cultural (Above Diagonal) Levels of Analysis (Study 2a)

Dimension	1	2	3	4	5	6	7
1. Difference vs. Similarity	—	.496	.464	.168	.182	.880	-.361
2. Self-containment vs. Connection to others	.112	—	.625	-.893	-.130	.761	.305
3. Self-direction vs. Receptiveness to influence	.288	.646	—	-.253	-.201	.408	-.241
4. Self-reliance vs. Dependence on others	.436	-.075	.328	—	.454	-.123	-.294
5. Consistency vs. Variability	.136	-.219	-.002	.301	—	.377	.101
6. Self-expression vs. Harmony	.401	.330	.417	.132	.251	—	-.236
7. Self-interest vs. Commitment to others	.214	.557	.435	.104	-.141	.366	—

(Table 8; see Appendix for further details). All fit indices were acceptable: $\chi^2(457) = 2587.969$; CFI = .917; RMSEA = .026; SRMR_{within} = .026; SRMR_{between} = .089. Cultural region accounted for 23.2% to 93.1% of variance in the seven culture-level dimensions of selfhood.

Are “Western” cultural samples distinctively independent? Consistent with H2, Western samples tended to score above average on difference ($p < .001$), self-expression ($p < .001$), and self-direction ($p = .004$), and marginally on self-containment ($p = .080$). Contradicting H2, however, they scored significantly above average on commitment to others ($p < .001$) and nonsignificantly toward the interdependent pole of the other two dimensions (both $p > .21$).

Thus, the common view of Western cultures as emphasizing a distinctively independent model of selfhood (H2) is not fully supported. Our data provide evidence for a much more nuanced view, such that Western cultural models of selfhood distinctively emphasize *some* forms of independence, but not others. This may help explain why previous studies comparing explicit self-construal scores of Western and non-Western cultural samples have often shown inconsistent and unexpected results (Kitayama et al., 2009; Levine et al., 2003).

Are “non-Western” cultural samples uniformly interdependent? We now conducted a more open-ended examination of the pattern of means across the six world regions. Given the exploratory focus of this part of the analysis, we used a Holm–Bonferroni sequentially adjusted alpha (Holm, 1979; see Appendix

to identify which regions differed significantly from the average across regions on each dimension. To mitigate against Type II error, we consider as “marginal” those findings that were significant by conventional standards but did not meet the more stringent Holm–Bonferroni criterion. Table 8 shows the results of this analysis, as well as post hoc pairwise comparisons among the six regions.

Rather than distinguishing cultures of independence from cultures of interdependence, the overarching picture is that samples from different world regions emphasize different ways of being independent or interdependent. Western and Latin American samples shared an emphasis on difference and self-expression, but differed in that Western samples also emphasized commitment to others and self-direction, whereas Latin American samples emphasized self-interest and consistency. In contrast, Southern/Eastern Asian samples showed an emphasis on similarity, harmony, and variability across contexts, together with marginal tendencies toward dependence on others and commitment to others. Middle Eastern samples emphasized self-reliance and (marginally) consistency, but also connection to others and harmony, whereas Sub-Saharan African samples were distinguished by their focus on self-interest and self-containment, together with similarity and dependence on others. Eastern European samples showed an intermediate profile, tending toward commitment to others (similar to Western samples) and marginally toward self-reliance (similar to Middle Eastern samples).

We were interested to test the utility of our seven-dimensional model to distinguish samples from different cultural regions, beyond

Table 8
Estimated Latent Means Across Samples From Six World Regions for the Seven Culture-Level Self-Construal Dimensions (Study 2b)

Dimension	Western		Eastern European		Middle Eastern		Southern/Eastern Asian		Sub-Saharan African		Latin American		R ²
	M	(SE)	M	(SE)	M	(SE)	M	(SE)	M	(SE)	M	(SE)	
Difference vs. Similarity	.849_{ab}	(.195)	.233 _{abc}	(.224)	-.267 _{bcd}	(.360)	-.639_{cd}	(.232)	-1.213_d	(.226)	1.036_a	(.190)	62.6%
Self-containment vs. Connection to others	.525 _a	(.299)	.213 _a	(.366)	-2.370_b	(.468)	-.189 _a	(.418)	1.222_a	(.400)	.600 _a	(.389)	93.1%
Self-direction vs. Receptiveness to influence	.770_a	(.270)	-.640 _b	(.337)	-.203 _{ab}	(.433)	-.007 _{ab}	(.348)	-.071 _{ab}	(.385)	-.256 _{ab}	(.332)	23.2%
Self-reliance vs. Dependence on others	-.322 _{bc}	(.259)	.676 _{ab}	(.297)	1.287_a	(.298)	-.659 _{bc}	(.322)	-1.430_c	(.283)	.448 _{ab}	(.276)	64.9%
Consistency vs. Variability	-.216 _{bc}	(.237)	-.186 _{abc}	(.281)	.757 _{ab}	(.315)	-.793_c	(.271)	-.410 _{bc}	(.309)	.847_a	(.244)	33.4%
Self-expression vs. Harmony	.822_a	(.218)	.197 _{ab}	(.273)	-.814_b	(.315)	-.823_b	(.264)	-.449 _b	(.292)	1.067_a	(.243)	57.0%
Self-interest vs. Commitment to others	-1.013_c	(.166)	-.538_c	(.204)	-.287 _{bc}	(.268)	-.424 _c	(.215)	1.644_a	(.186)	.617_b	(.193)	74.5%

Note. We parameterized the model so that these means also represent effect sizes (Cohen’s *d*) for the difference of each region from the mean across all six regions. Means printed in bold differ significantly from the average score (i.e. zero) across world regions for that dimension with a Holm–Bonferroni sequentially adjusted alpha (starting at .05/6 = .0083; Holm, 1979); means printed in italics differ from the average score with $p < .05$, but do not meet the Holm–Bonferroni criterion for statistical significance. Means within the same row that do not share a subscript differ significantly in pairwise post hoc comparisons with a Holm–Bonferroni sequentially adjusted alpha (starting at .05/15 = .0033; Holm, 1979).

distinguishing Western from non-Western samples. To avoid any risk of circularity, we saved culture-level factor scores from the final measurement model of Study 2a which did not include information about world region (Appendix: Table A1), and we entered these scores in a discriminant function analysis predicting the regional classification of cultural samples. Despite the diverse sampling strategies used by collaborators in different nations, the analysis successfully classified 43 of 55 cultural samples (78%) into their expected region: 13 of 14 Western groups, 4 of 9 Eastern European groups, 6 of 6 Middle Eastern groups, 6 of 9 Southern/Eastern Asian groups, 6 of 7 Sub-Saharan African groups, and 8 of 10 Latin American groups. Thus, beyond distinguishing “Western” from “non-Western” cultural models of selfhood, our seven dimensions were useful for distinguishing the prevailing cultural models of selfhood across parts of the world often treated interchangeably as “non-Western” or “Collectivist” cultures in previous theorizing.

A note of caution. Readers should avoid the temptation to reify our ad hoc categorization of samples into a new set of cultural ‘categories.’ Although world region accounted for considerable culture-level variation in models of selfhood, note that between 7% and 77% of cultural variation on each dimension was *within* these regional groupings. For example, as shown in the table in the Appendix, our U.K. samples did not share the focus of other Western samples on self-expression (consistent with anthropological observations of British culture by Fox, 2004), and Spanish, Italian, and Icelandic samples did not share the focus of other Western samples on self-direction. Thus, support for characterizing Western cultural models of selfhood as “independent” depends on not only which dimension of independence, but also which Western cultural context one is examining. Strikingly, Japanese cultural models of selfhood diverged sharply from those of other Southern/Eastern Asian samples. Both Japanese samples were among the highest scoring samples for self-direction and self-containment (whereas other Southern/Eastern Asian samples showed low scores), as well as for variability and dependence on others (whereas other Southern/Eastern Asian samples showed moderate scores). Thus, it is highly problematic to treat Japanese culture as a prototypical example of “Asian” or “Eastern,” let alone “non-Western,” cultures (for converging evidence, see Bond & Lun, 2014; Schwartz, 2006).

Study 2c: Associations With Cultural Individualism and Collectivism

Individualistic cultures are commonly thought to promote an independent view of the self and collectivistic cultures to promote an interdependent view of the self (Gudykunst et al., 1996; M. -S. Kim et al., 2001; Singelis & Brown, 1995). Yet, this assumption is rarely tested. Some researchers have investigated this link using nation as a proxy for culture among a small number of nations (Gudykunst et al., 1996; M. -S. Kim et al., 2001; H. S. Park & Levine, 1999; Singelis & Brown, 1995). However, this approach reinforces stereotypes by assuming that a nation is collectivistic or individualistic when in fact national samples may not vary as predicted (Matsumoto, 1999; Oyserman et al., 2002; Takano & Osaka, 1999). Because measures of I-C and self-construals often share similar items, few studies have attempted to investigate their relationship empirically. Here, we could avoid this problem by measuring I-C with multiple indicators—not including self-construals—across many cultural samples.

To our knowledge, this study is the first adequately powered empirical test of the culture-level relationship between I-C and self-construals. Given that we had identified seven culture-level dimensions of self-construal, it seemed unlikely that they would all be similarly related to I-C. Nonetheless, to evaluate the conventional understanding in the literature, we tested the hypothesis that *independent (vs. interdependent) scores on all seven dimensions would be higher in more individualist (vs. collectivist) cultural samples* (H3).

Method

Self-construal data reported in Study 2a were supplemented by four indicators of cultural I-C: two nation-level scores from archival sources and two sample-level scores from our current study. We used published nation scores for *individualism values* (Hofstede, Hofstede, & Minkov, 2010) and *in-group collectivism practices* (House, Hanges, Javidan, Dorfman, & Gupta, 2004). From our data, we computed sample scores for two facets of I-C: autonomy (vs. embeddedness) values (Schwartz, 2006) and contextualism beliefs (Owe et al., 2013).

Autonomy (vs. embeddedness) values were measured using aggregated responses to 10 items ($\alpha = .826$)¹⁰ selected from the 21-item Portrait Values Questionnaire (Schwartz, 2007). Participants read short descriptions of 21 target individuals gender-matched to the participant (e.g., “Thinking up new ideas and being creative is important to her. She likes to do things in her own original way”). Participants rated how similar each target was to themselves, from 1 (*very much like me*) to 6 (*not at all like me*), but we reversed these scores so that higher numbers indicated greater value endorsement. We ipsatized items by subtracting the mean score across all 21 items (Schwartz, 2007). *Contextualism*, defined as belief in the importance of context in understanding people (Owe et al., 2013), was measured using aggregated responses to six items ($\alpha = .894$; e.g., “To understand a person well, it is essential to know about his/her family”), rated from 1 (*completely disagree*) to 6 (*completely agree*).

Results and Discussion

The four indicators of cultural I-C were used to create a latent variable, which was added into our final measurement model from Study 2a at the cultural level and allowed to covary freely with all culture-level factors in the existing model. Missing indices of individualism (Hofstede et al., 2010) and in-group collectivism practices (House et al., 2004) for some nations were handled with full information maximum likelihood. The resulting model showed acceptable or marginally acceptable fit on all indices: $\chi^2(491) = 2553.847$; CFI = .919; RMSEA = .024; SRMR_{within} = .027; SRMR_{between} = .111.¹¹ The I-C latent factor was well-defined by its four indicators (all standardized $|λ| > .53$, all $p < .001$).

¹⁰ We included two fewer items than are used to measure the corresponding individual-level dimension of openness to change vs. conservation, as there is a potential shift in meaning of these items across levels (Shalom Schwartz, personal communication, March 1, 2011).

¹¹ This value of SRMR_{between} suggests the presence of some misfit at the cultural level. Further analyses showed some differences of emphasis among the four indicators of I-C in their relationships with the seven self-construal dimensions. Nonetheless, the pattern of findings for each separate indicator was largely consistent with those reported here for the latent factor. Details of these findings are available on request from the first author.

Table 9
Estimated Latent Correlations With Cultural I-C (Study 2c)

Dimension	Correlation with individualism (vs. collectivism)		
	<i>r</i>	(<i>SE</i>)	<i>p</i>
Difference vs. Similarity	.690	(.117)	<.001
Self-containment vs. Connection to others	.561	(.218)	.010
Self-direction vs. Receptiveness to influence	.752	(.093)	<.001
Self-reliance vs. Dependence on others	-.023	(.171)	.893
Consistency vs. Variability	-.153	(.158)	.332
Self-expression vs. Harmony	.532	(.150)	<.001
Self-interest vs. Commitment to others	-.425	(.138)	.002

Note. Individualism (vs. collectivism) was modeled as a culture-level latent factor with four indicators: Hofstede individualism scores (standardized $\lambda = .737$), ingroup collectivism practices (standardized $\lambda = -.944$), autonomy vs. embeddedness values (standardized $\lambda = .579$), and contextualism beliefs (standardized $\lambda = -.533$).

Table 9 reports the estimated correlations of I-C with the seven dimensions of cultural models of selfhood. Four self-construal dimensions varied with I-C largely as predicted by the common view (H3): Individualist samples scored higher on difference, self-direction, and self-expression (all $p < .001$) as well as self-containment ($p = .010$), whereas collectivist samples scored higher on similarity, receptiveness to influence, harmony, and connection to others. However, the remaining three dimensions of selfhood did *not* show predicted relations with I-C. Contradicting H3, self-reliance (vs. dependence on others) and consistency (vs. variability) did not covary significantly with cultural I-C, and individualist samples scored significantly higher on commitment to others, rather than self-interest as predicted by the common view ($p = .002$).

Thus, the culture-level relationship between I-C and independence (vs. interdependence) depends on which dimension of independence (vs. interdependence) one is considering. Cultural models of selfhood are not reducible to I-C, just as I-C is not reducible to models of selfhood. The current preoccupation with I-C in the self-construal literature is therefore problematic. It risks reducing models of selfhood to cultural stereotypes and ignores many other important ways that cultural contexts differ (Gregg, 2007).

Study 2d: Models of Selfhood in Ecocultural Context

Study 2b established the utility of our new model for distinguishing models of selfhood across world regions beyond the East-West dichotomy, and Study 2c showed that models of selfhood are not reducible to individualism and collectivism. Our final goal was to provide a first look at the ecocultural contexts that might foster these different models of selfhood. Although any number of contextual variables may relate to cultural models of selfhood—and much future research will be needed to examine this—we conducted an initial parsimonious exploration focusing on two variables known from previous large-scale studies to predict a broad range of cultural differences (Georgas et al., 2004; Hofstede, 2001; Inglehart & Baker, 2000; Schwartz, 2006): *socioeconomic development* and *religious heritage*.

Research has shown that socioeconomic development predicts various indicators of individualism, independence and autonomy,

both contemporaneously across nations and historically within nations (Greenfield, 2013; Greenfield, Maynard, & Childs, 2003; Grossmann & Varnum, 2015; Hofstede, 2001; Inglehart & Baker, 2000; H. Park, Twenge, & Greenfield, 2014). In the U.S., groups of higher socioeconomic status show more independent forms of agency (Snibbe & Markus, 2005), and priming thoughts about affluence (vs. scarcity) promotes independent forms of agency (Adams, Bruckmüller, & Decker, 2012). However, the literature gives an insufficient basis to predict a priori which forms of independence would be more or less closely tied to human development. Hence, we tested the initial hypothesis that *independent (vs. interdependent) scores on all seven dimensions would be higher in cultural samples from more developed nations (H4)*, even if we expected that this hypothesis would be supported better for some dimensions in our model than for others.

Religious beliefs are important in defining what it means to be a person, especially with others, and thus to be a good cultural member (Ho, 1995; Sampson, 2000). Christianity, and Protestantism in particular, has often been linked to self-sufficiency, autonomy and a focus on the individual (Dumont, 1985; Sampson, 2000; Weber, 1905/1958). Sanchez-Burks (2005) has shown that low relational focus in work settings in the United States can be explained by Protestant ideology. In contrast, Ho (1995) describes a lack of focus on the individual self within four Eastern traditions: Confucianism, Buddhism, Taoism and Hinduism. Rather, the self is decentered and defined by, or at one with, social relationships, the universe, and nature. Although the number of people who actively practice religion is declining in many parts of the world (Pew Research Center's Forum on Religion and Public Life, 2012), sociologists have argued that historical effects of religion on cultural practices and institutions may persist over centuries (e.g., Weber, 1905/1958), and contemporary evidence suggests that religious heritage predicts cultural values, even where religiosity is low (Georgas et al., 2004; Inglehart & Baker, 2000). Hence, rather than focus on the religious beliefs of our respondents, we were interested in the potential influence of the dominant religious tradition within their cultural contexts.

Relationships between religious traditions and constructions of the self are likely to be complex. In the absence of sufficient prior theoretical literature, we began our exploration with some tentative—albeit rather simplistic—hypotheses: that *independent (vs. interdependent) scores on all seven dimensions would be higher in samples with a Protestant religious heritage (H5a)*, whereas *interdependent (vs. independent) scores on all seven dimensions would be higher in samples with an Islamic (H5b) or Buddhist (H5c) religious heritage*. Catholic and Orthodox samples were tentatively predicted to fall somewhere between.

Method

Self-construal data from Study 2a were supplemented by the following measures:

Socioeconomic development. We retrieved values of the Human Development Index (HDI: United Nations Development Programme, 2010) for the 35 nations where participants were recruited. Rather than focusing narrowly on economic affluence or purchasing power, HDI is a composite measure of socioeconomic development based on life-expectancy, mean years of schooling,

expected years of schooling, and Gross National Income per capita.

Religious heritage. We classified our 55 cultural samples into the following religious categories: Christian Protestant, Christian Catholic, Christian Orthodox, Muslim, and Buddhist. Samples were classified by triangulating frequency data from our questionnaires with external information about the religious traditions and composition of the nations and groups concerned (e.g., *Pew Research Center's Forum on Religion and Public Life*, 2011, 2012). Although most cultures have been subject to multiple religious influences and traditions, identifying a single religious grouping as the *dominant* tradition was relatively unproblematic for most cultural samples. However, six cultural samples were coded with dual religious heritages in our analyses. Assigned categories are shown in Table 4, and further details of our decision rules for classifying samples are in the Appendix.

Results and Discussion

We modified our final measurement model from Study 2a to test for effects of national development and religious heritage. Culture-level intercepts were freed, and HDI and religious heritage were entered together as predictors of all culture-level dimensions.¹² The five religious groupings were represented with four contrast codes. We created several versions of this model involving different sets of contrasts, allowing us to estimate differences from the mean of all five categories of religious heritage, as well as pairwise differences among the categories, while controlling for differences in HDI (Table 10, see Appendix for further details of the contrast coding). Fit indices were acceptable: $\chi^2(458) = 2508.332$; CFI = .920; RMSEA = .025; SRMR_{within} = .026; SRMR_{between} = .089. The model accounted for between 25.1% and 100% of culture-level variance in the seven selfhood dimensions.

Socioeconomic development. As shown in Table 10, samples from more developed nations scored higher on difference, self-reliance, self-direction, and self-expression (supporting H4), but also commitment to others (against H4). Thus, our results did not support a simple shift from interdependence to independence with socioeconomic development. Instead, they point to a shift away from certain ways of being independent (i.e., self-interest) and interdependent (i.e., similarity, harmony, dependence on others, receptiveness to influence) and toward other ways of being independent (i.e., difference, self-expression, self-reliance, self-direction) and interdependent (i.e., commitment to others).

Religious heritage. Omnibus tests showed significant differences across religious groupings for five of the seven dimensions (see Table 10). Given the tentative nature of our hypotheses, we used a Holm–Bonferroni sequentially adjusted alpha (Holm, 1979; see Appendix) to identify which religious groupings differed significantly from the mean across groupings on each dimension. However, to mitigate against Type II error, we also consider as “marginal” those findings that were significant by conventional standards but did not meet the more stringent Holm–Bonferroni criterion.

As shown in Table 10, the findings provided inconsistent support for H5, thus painting a more nuanced picture of the possible influences of religious heritage on cultural models of selfhood. Supporting H5a, Protestant samples showed a greater than average emphasis on self-containment; however, against H5a, these sam-

ples also showed a greater than average emphasis on dependence on others, and they did not differ significantly from average on the other five dimensions. Three other forms of independence—difference, consistency, and self-expression—were instead distinctively high among Catholic samples. Orthodox samples did not differ significantly from average on any of the seven dimensions. Supporting H5b, Muslim samples showed a relatively strong emphasis on similarity, connection to others, and harmony, and a marginal tendency toward receptiveness to influence; but, against H5b, they also showed a distinctive emphasis on both self-reliance and consistency. Providing limited support for H5c, Buddhist samples showed a greater than average emphasis on variability across contexts, as well as marginal tendencies toward greater dependence on others and greater harmony, but they did not differ significantly from average on the other four dimensions.

Summary. These results further illustrate the importance of differentiating among the seven dimensions when studying cultural models of selfhood. Each dimension showed a distinct pattern of ecocultural predictors. Notably, ecocultural context accounted for variance in dimensions that were not associated with I-C in Study 2c: Samples with higher socioeconomic development, as well as those with a Muslim (or Orthodox) versus Protestant (or Buddhist) religious heritage showed more emphasis on self-reliance rather than dependence on others. Samples with a Catholic or Muslim versus Buddhist religious heritage showed a greater emphasis on consistency rather than variability in their cultural models of selfhood. These results provide further evidence that global variability in cultural models of selfhood is not reducible to effects of cultural I-C and that a more detailed understanding is needed.

General Discussion

Deconstructing “Independence” and “Interdependence”

Our findings point to the need for a major rethinking of the literature on culture and self. Over the last 25 years, this literature has been dominated by the theoretical perspective of Markus and Kitayama (1991) and strongly influenced by the measurement model of Singelis (1994). Focusing on a cross-cultural level of analysis, Markus and Kitayama claimed that cultural models of selfhood in different parts of the world can be usefully characterized as either “independent” or “interdependent.” Focusing on an individual level of analysis, Singelis claimed that “independence” and “interdependence” form coherent dimensions of individual differences. Our data contradict both claims and show that a multifaceted approach is needed.

Contradicting Singelis (1994), Studies 1 and 2a provided converging evidence for a seven-factor structure underlying individual differences in independent and interdependent self-construals. Consistent with Markus and Kitayama's (1991) original theoriz-

¹² For the models in this section, the non-linear constraints described in note 8 led to problems of non-convergence. Hence, instead of using non-linear constraints, the culture-level residual variance of one item was set to zero. However, to avoid a negative residual variance estimate for the culture-level self-containment versus connection to others factor, we imposed a non-linear constraint such that this variance must be greater than 0.

Table 10
Estimated Effects of HDI and Religious Heritage on the Seven Culture-Level Self-Construal Dimensions (Study 2d)

Dimension	HDI		Religious heritage		Protestant		Catholic		Orthodox		Muslim		Buddhist		R ²	
	β_{STDYX}	(SE)	p	$\Delta\chi^2(4)$	p	β_{STDY}	(SE)	β_{STDY}	(SE)	β_{STDY}	(SE)	β_{STDY}	(SE)	β_{STDY}		(SE)
Difference vs. Similarity	.668	(.068)	<.001	24.315	<.001	.219 _{ab}	(.171)	.651_a	(.134)	.154 _{abc}	(.239)	-.612_c	(.193)	-.411 _{bc}	(.216)	80.3%
Self-containment vs. Connection to others	-.182	(.165)	.273	31.858	<.001	1.398_a	(.230)	.486 _{ab}	(.299)	-.223 _{ab}	(.446)	-1.914_c	(.243)	-.194 _b	(.463)	100.0%
Self-direction vs. Receptiveness to influence	.310	(.129)	.017	5.847	.211	.435 _a	(.260)	-.108 _a	(.226)	.033 _a	(.383)	-.676 _a	(.297)	.256 _a	(.341)	25.1%
Self-reliance vs. Dependence on others	.358	(.136)	.008	17.960	.001	-.891_c	(.257)	.057 _{abc}	(.242)	.723 _{ab}	(.415)	.929_a	(.297)	-.817 _{bc}	(.363)	43.2%
Consistency vs. Variability	-.028	(.129)	.828	19.112	.001	-.417 _b	(.245)	.733_a	(.190)	-.176 _{ab}	(.369)	.731_a	(.273)	-.870_b	(.312)	35.9%
Self-expression vs. Harmony	.430	(.112)	<.001	19.964	.001	.095 _{ab}	(.253)	.825_a	(.182)	.352 _{ab}	(.363)	-.682_b	(.268)	-.591 _b	(.300)	61.0%
Self-interest vs. Commitment to others	-.690	(.092)	<.001	5.427	.246	.045 _a	(.249)	.285 _a	(.206)	.248 _a	(.348)	-.583 _a	(.276)	.004 _a	(.312)	46.4%

Note. HDI = Human Development Index. Effects of HDI are scaled as standardized betas. Effects of each religious heritage category are scaled to represent effect sizes (Cohen's *d*) for the difference of each religion from the mean across all five religions. Effects of individual religious categories printed in bold indicate significant differences from the average score (i.e. zero) across categories for that dimension with a Holm–Bonferroni sequentially adjusted alpha (starting at .05/5 = .010; Holm, 1979); means printed in italics differ from the average score with $p < .05$, but do not meet the Holm–Bonferroni criterion for statistical significance. Means within the same row that do not share a subscript differ significantly in pairwise post hoc comparisons with a Holm–Bonferroni sequentially adjusted alpha (starting at .05/10 = .005; Holm, 1979).

ing, each of the seven factors in our model contrasts an independent way of being with an interdependent way of being within a given domain (see Table 3). Thus, individuals can be independent or interdependent in many different ways, and these different ways of being do not necessarily co-occur (see also Kitayama et al., 2009; Na et al., 2010). Yet, up to now, an adequate self-report measure of these differences has been lacking, and some have questioned whether independent and interdependent self-construals can be measured validly using self-reports (Kitayama et al., 2009; but see J. Park & Kitayama, 2014). Our results show that the problem lies not with self-reports per se but with the conceptual and methodological limitations of previous self-report measures.

Developing a more adequate measurement model for self-reported independence and interdependence allowed us to conduct the most valid and comprehensive test to date of several core propositions arising from Markus and Kitayama's (1991) perspective that are commonly treated as axiomatic in the literature on culture and self: In Study 2a we found no support for the predicted higher-order factor of independence versus interdependence at the cultural level of analysis (H1); instead, we found evidence of seven correlated but distinct dimensions at a cultural level, paralleling those at the individual level. Further analyses showed that neither a contrast between Western and non-Western cultures (H2: Study 2b) nor between individualist and collectivist cultures (H3: Study 2c) was sufficient to characterize the complexity of cultural models of selfhood across our diverse samples. These findings show clearly that it is not useful to characterize any culture as “independent” or “interdependent” in a general sense. Instead, future researchers should seek to identify which forms of independence and which forms of interdependence prevail in different cultural contexts, in order to theorize and test potential explanations and implications of the patterns that they find.

Broadening the Focus Beyond East–West Comparisons

Crucially, our findings extend self-construal research beyond the usual focus on East–West differences and I–C, showing somewhat distinct patterns of self-construal across six loosely defined ‘world regions’ (Study 2b), as well as predictive effects of socio-economic development and religious heritage (Study 2d). Notably, our Western samples did not occupy an outlying position in relation to broader patterns of global variation (cf. Henrich et al., 2010). In fact, Latin American samples emphasized independence at least as much as Western samples across six out of seven dimensions—inconsistent with a common view of Latin American cultures as focused on interdependence, but perhaps explained by the extensive history of voluntary (as well as involuntary) settlement in this region (see Kitayama et al., 2006).

Middle Eastern and sub-Saharan African models of selfhood each combined a different mix of independent and interdependent elements. Middle Eastern samples emphasized self-reliance and consistency, together with receptiveness to influence and connection to others. This seems consistent with portrayals of Middle Eastern cultures as “honor cultures,” combining an emphasis on toughness, machismo, and self-enhancement with a close attention to others and to the social consequences of one's actions (e.g., Abu-Lughod, 1985; Gregg, 2005; Maddux, San Martin, Sinaceur, & Kitayama, 2011). Supporting previous characterizations of Af-

rican selves as interdependent (Adams & Dzokoto, 2003; Beattie, 1980; Chasiotis, Bender, Kiessling, & Hofer, 2010; Cheng et al., 2011; Eaton & Louw, 2000; Ma & Schoeneman, 1997), sub-Saharan African samples emphasized similarity and dependence on others. Against previous characterizations, these samples also showed a distinctive focus on self-interest and self-containment.

It is important to reiterate that much cultural variation was within, rather than between, these regions. We emphatically do not seek to replace the East-West heuristic for understanding cultural differences with a new set of regional stereotypes. Rather, cultural models of selfhood should be characterized along the seven dimensions that we have identified here—and perhaps others. More generally, we advocate reliance on empirical data, rather than geographical location or ethnicity, to determine the cultural norms of any given sample.

Beyond mapping geographical variation, our findings showed the utility of adopting an ecocultural perspective to explain the patterns of variation we found (after Georgas et al., 2004). Far from being associated with cultural individualism, self-interest (vs. commitment to others) was highest in samples from the poorest nations, especially those in sub-Saharan Africa, and was negatively associated with individualism. Commitment to others was highest in rich, Western nations. Although this may seem surprising, writers for more than a century have questioned the assumption that cultural individualism is associated with greater selfishness (e.g., Durkheim, 1898/1969; Hofstede, 2001; Welzel, 2010). This result also questions a romanticized view of poverty—that groups somehow compensate for material deprivation with greater social solidarity; our findings suggest that African forms of independence are strategic adaptations to challenging living conditions, rather than effects of heightened identification with, or concern for, others (Adams & Plaut, 2003; Adams et al., 2012; Turnbull, 1972).

Religious heritage was an important predictor of cultural models of selfhood, with the most distinctive profiles found among samples with Catholic and Muslim heritages. Samples from both groupings showed a similar emphasis on consistency. Speculatively, this emphasis may be linked to the fact that both traditions link salvation to a person's deeds—thus behaving consistently across contexts would be important. In other respects, Catholic and Muslim samples were diametrically opposed, with Catholic samples emphasizing difference and self-expression whereas Muslim samples emphasized similarity and harmony. Although the importance of religion has diminished in many nations, the influence of religious heritage is still great (Georgas et al., 2004; Inglehart & Baker, 2000). Religious traditions provide different answers to the question of how the self and one's relation to others are defined, and they therefore offer a powerful explanation for patterns of cross-cultural differences in self-construal. Our findings support recent calls for greater integration of the psychological literatures on culture and religion (K. A. Johnson, Hill, & Cohen, 2011; Saroglou & Cohen, 2011).

New Possibilities for Research Into Culture and Self

We believe that our multidimensional model presents exciting opportunities for future research. Here, we focused on potential antecedents of cultural models of selfhood, showing that the seven dimensions we identified are differentially emphasized across

world regions, and that they vary in different ways with I-C, socioeconomic development, and religious heritage. Yet, this broad approach only scratches the surface of how future research might seek to explain the prevalence of these dimensions. Our categorization of samples by 'religious heritage' inevitably oversimplifies the likely complex influences of multiple religious traditions in many parts of the world. Moreover, our sampling did not allow us to compare the effects of Sunni with Shia forms of Islam, nor to distinguish among Eastern religious traditions, such as Buddhism, Shinto and Taoism. Future research should also explore the interplay of *personal* wealth and religious beliefs with the *contextual* predictors examined here, and it should evaluate the importance of other likely contextual and historical influences, such as voluntary settlement (Kitayama et al., 2006), residential mobility (Oishi, 2010), climato-economic interactions (van de Vliert, 2013), and pathogen prevalence (Fincher, Thornhill, Murray, & Schaller, 2008).

Equally exciting is the opportunity to develop more fine-grained—and thus accurate—predictions of the cognitive, affective, motivational, and behavioral consequences of personally adopting different patterns of self-construal, and of inhabiting cultural contexts with different prevailing models of selfhood. For example, consequences of construing oneself as self-reliant will differ from those of construing oneself as different from others and from those of inhabiting a cultural context where it is normative to be self-reliant. Detailed theorizing of these effects should lead to more precise predictions of the prevalence of different outcomes in cultural contexts around the world, as well as how social and developmental processes may be moderated by cultural models of selfhood. Early findings reveal that differentiating among these dimensions improves our ability to predict in which cultures well-being will be more closely linked to general self-efficacy or to harmonious relationships (Smith, Ahmad, et al., 2016), to predict cross-cultural variation in survey response styles (Smith, Vignoles, et al., *in press*), and to account for Chinese-English differences in social closeness, emotions, achievement motivation and face motivation (Yang & Vignoles, 2016). Large-scale multilevel studies should clarify the effects of individual and cultural variation in these seven dimensions on the numerous outcomes examined in previous self-construal research (Cross et al., 2011; Gudykunst & Lee, 2003).

We are currently developing an extended version of our multidimensional self-construal measure that we hope will provide an optimal balance between cross-cultural validity and internal consistency for future studies.¹³ To complement the self-report approach used here to identify cultural models of selfhood, researchers should examine how different ways of being independent or interdependent are emphasized in cultural products and institutions from different parts of the world (see H. Kim & Markus, 1999; Yamagishi, 2010). Experimental researchers should examine which specific forms of independence and interdependence are activated by the various primes that have been used in previous studies (see Oyserman & Lee, 2008), as well as developing primes that more accurately target the forms of independence and interdependence that they are interested in understanding. Develop-

¹³ Researchers wishing to measure these dimensions should contact the first author for the latest version of our scale.

mental researchers should identify parenting styles and practices associated with individual or cultural variation on these seven dimensions (Keller, 2007), and neuroscientists should examine whether individual differences are associated with specific patterns of brain activity (Kitayama & Uskul, 2011).

Contradictory findings using previous self-report measures led Kitayama et al. (2009) to propose that national differences in independence and interdependence should be measured implicitly by scores on a range of experimental tasks. Their implicit approach adds an important level to the relationship between culture and self and has the potential to enrich the field in many ways. It seems likely that culture-level differences in implicit independence and interdependence may also be multidimensional, and future research, involving an adequate number of cultural samples, should investigate this possibility.

Conclusion

In closing, we have argued that previous confusions in the self-construal literature are attributable in no small measure to researchers' premature convergence on an oversimplified dimensional model of self-construals (independent and interdependent) and cultures (Western and non-Western), without having passed through a prior phase of systematic exploration to identify the nature and cross-cultural distribution of these constructs. This is especially unfortunate because Markus and Kitayama's (1991) original goal was to draw psychologists' attention to the possibilities of cultural diversity—not to suggest that there were only two possible cultural models of selfhood in the world, nor that forms of independence and interdependence should be the only dimensions on which self-construals differ (see Markus & Kitayama, 2003).

Hence, in the spirit of Markus and Kitayama's (1991) original project, we ask readers not to consider our seven-dimensional model as a definitive account of global variation in models of selfhood. Future researchers should be especially aware that the scope of our initial item pool—and hence the coverage of our seven-dimensional model—was limited to contents that had been theorized and measured previously under the umbrella terms of "independence" and "interdependence." Our research was not designed to investigate other known dimensions of cultural variation, such as power distance or hierarchy (Hofstede, 2001; Schwartz, 2006; Singelis et al., 1995), let alone the range of differences that might have been identified in a more open-ended, bottom-up approach. Hence, in parallel with the future research directions outlined above, it will be essential not to shut down further exploration of indigenous forms of selfhood from the widest possible range of cultural contexts (Enriquez, 1979; U. Kim & Berry, 1993).

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(Appendix follows)

Appendix

Further Details of Coding and Analyses

Study 1: Alternative PCA Solutions

We also inspected three alternative solutions suggested by the scree plot. The 2-component solution explained only half as much variance as our preferred solution (14%). Notably, this solution did not produce separate “independence” and “interdependence” factors. Instead, the first rotated component showed a greater prevalence of items focusing on self-reliance and self-direction versus dependence on others and receptiveness to influence, whereas the second rotated component showed a greater prevalence of items focusing on self-containment versus connection. Items reflecting the other components identified above showed weaker or mixed loadings. In the 5-component solution, items reflecting self-reliance versus dependence and self-direction versus receptiveness to influence were combined into a single component, and items reflecting self-expression versus harmony were divided between the difference versus similarity and consistency versus variability components. In the 10-component solution, the first seven components were conceptually very similar to those of the 7-component solution, but selected items loaded instead on the final three components; we were unable to come up with interpretations of these three additional components that would distinguish them conceptually from the existing ones. We also considered a 20-component rotation based on the Kaiser–Guttman rule. However, many of the rotated components were defined by single items, and we judged that this solution was not sufficiently parsimonious to be theoretically useful.

Study 2b: Contrast Coding and Adjustment for Multiple Comparisons

To estimate latent means, samples in the focal region were coded as 1, samples in the reference region as -1 , and all other samples as 0; thus, each contrast tested whether the mean score for its focal cultural region differed significantly from the mean of the six regions (set to zero). Two versions of the contrast coding were created with different reference categories, to provide estimated latent means for all six cultural regions. Parameters were estimated using STDY standardization in Mplus (Muthén & Muthén, 2010). For exploratory analyses involving these contrasts, we used a Holm–Bonferroni sequentially adjusted alpha (starting at $.05/6 = .0083$; Holm, 1979).

For pairwise comparisons, dummy coding was used: samples in the focal category were coded as 1 and all other samples as 0. Six versions of the model were computed with each of the six regions used in turn as reference category, so as to estimate all 15 pairwise

differences among the six categories. Parameters were estimated using STDY standardization in Mplus (Muthén & Muthén, 2010). For post hoc pairwise comparisons, we used a Holm–Bonferroni sequentially adjusted alpha (starting at $.05/15 = .0033$; Holm, 1979).

Study 2d: Classification of Samples for Religious Heritage

Samples were classified into five categories of religious heritage, Christian Protestant, Christian Catholic, Christian Orthodox, Muslim and Buddhist, using the following steps:

1. Where our collaborators had specifically targeted different religious communities (Georgia: Baptists vs. Orthodox; Philippines: Christians vs. Muslims), geographical areas known to have different religious majorities (Lebanon: East vs. West Beirut), or ethnic groups that were known to have a different religious heritage from the national majority (U.S.: Hispanics; Russia: Caucasians), we assigned that religious heritage to these groups.
2. For most of the remaining samples, it was unproblematic to identify a single dominant national religious tradition from the available national statistics (Pew Research Center’s Forum on Religion and Public Life, 2011, 2012) that was consistent with the dominant self-categorizations of our participants (although a majority of participants in some samples reported being non-religious).
3. In a few cases, the Pew Research Center’s Forum on Religion and Public Life (2011, 2012) data indicated that two religious traditions were more or less equally prevalent in a nation: Catholics and Protestants in Germany, Cameroon, and Uganda; Orthodox Christians and Muslims in Ethiopia; Buddhists and Chinese Folk Religion in China. With the exception of China (because we had no separate category for Chinese Folk Religion), we allowed the groups from these nations to have a dual heritage, coding them with a 50% weight for both of their dominant religious traditions in our analyses, rather than assigning them to a single tradition. The Buddhist category should therefore be interpreted to include Chinese Folk Religion.

(Appendix continues)

Study 2d: Contrast Coding and Adjustment for Multiple Comparisons

To estimate HDI-adjusted latent means, samples in the focal religious heritage grouping were coded as 1, samples in the reference grouping as -1, and all other samples as 0; thus, each contrast tested whether the mean score for its focal religious heritage differed significantly from the mean of the five religious heritages (set to zero). Samples with a dual religious heritage were assigned the mean of the codes for their two religious heritages (i.e., .5, 0 or -.5). Versions of the contrast coding were created with different reference categories, to estimate adjusted latent means for all five heritages. Parameters were estimated using STDY standardization in Mplus (Muthén

& Muthén, 2010). For analyses involving these contrasts, we used a Holm-Bonferroni sequentially adjusted alpha (starting at .05/5 = .01; Holm, 1979).

For pairwise comparisons, samples in the focal category were coded as 1, samples with a dual religious heritage that included the focal category were coded as .5, and all other samples were coded as 0. Five versions of the model were computed with each of the five religious heritages used in turn as reference category, so as to estimate all 10 pairwise differences among the five categories. Parameters were estimated using STDY standardization in Mplus (Muthén & Muthén, 2010). For post hoc pairwise comparisons, we used a Holm-Bonferroni sequentially adjusted alpha (starting at .05/10 = .005; Holm, 1979).

Table A1
Estimated Factor Scores for Culture-Level Dimensions Across Cultural Groups (Study 2)

Cultural group	Difference vs. Similarity		Self-containment vs. Connection to others		Self-direction vs. Reception to influence		Self-reliance vs. Dependence on others		Consistency vs. Variability		Self-expression vs. Harmony		Self-interest vs. Commitment to others	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Western samples														
Belgium: high SES	.335	18	.324	10	.321	2	-.062	39	.178	16	.414	9	-.745	54
Belgium: low SES	.491	10	.372	7	.167	11	-.103	44	.188	15	.503	5	-.138	35.5
Germany: West	.280	20	.346	9	.223	8	-.270	52	-.147	39	.417	8	-.352	39
Iceland	.075	27	-.184	37	-.131	42	-.022	34	-.038	32	.128	19	-.576	48
Italy: rural	.673	6	-.201	41	-.149	44	.222	3	.238	12	.342	14	-.734	53
Italy: urban	.565	9	-.155	32	.006	24.5	.105	16	.191	14	.364	13	-.778	55
New Zealand: Pākehā	.382	17	-.062	28	.094	16	.026	25	-.020	30	.180	17	-.112	32
Norway	.189	23	.226	16	.185	9	-.129	46	-.220	41	.187	16	-.425	43
Spain: rural	.413	14.5	.288	15	.061	19.5	-.006	31	.177	17	.317	15	.130	20
Spain: urban	.086	26	.225	17	-.005	28	-.096	43	-.309	43	.091	22	-.362	40
Sweden	.700	4	.359	8	.135	14	-.117	45	-.545	50	.404	10	-.695	52
UK: rural	.096	25	-.241	45	.272	4	.097	17	-.338	47.5	-.173	43	-.436	44
UK: urban	.432	13	-.008	27	.258	6	.068	18	-.548	51	.004	28	-.585	49
US: Colorado	.618	7	.042	23	.150	12.5	.046	22	.089	24	.389	11.5	-.377	41
Eastern European samples														
Georgia: Baptists	-.271	41	-.376	50	-.199	48	.036	23	-.062	34	-.128	37	-.529	47
Georgia: Orthodox	-.088	33	-.166	36	-.094	37	-.058	37	-.280	42	-.085	31	-.085	30
Germany: East	.412	16	.186	18	.252	7	-.133	47	.214	13	.509	4	-.647	51
Hungary: majority	.456	11	-.223	42	-.245	51.5	.209	6	.104	23	.108	21	-.043	28
Hungary: Roma	-.046	30	-.348	47	-.224	49.5	.107	15	.150	20	-.048	30	-.116	33
Romania: rural	-.175	38	.028	24	-.076	34	.030	24	.161	19	-.112	33	.501	9
Romania: urban	-.063	31	.006	26	.056	21	.067	19	.133	21	-.114	34.5	.456	10
Russia: Caucasian	-.242	40	-.391	51	-.224	49.5	.025	26	-.127	37	-.158	40	-.382	42
Russia: Russian	.441	12	-.187	38	-.001	26.5	.155	10	-.685	52	-.135	38	-.469	45
Middle Eastern samples														
Egypt	-.583	47	-.363	48	-.156	45	.149	11	.053	26	-.411	46	-.619	50
Lebanon: East Beirut	-.069	32	-.158	33.5	.173	10	.183	9	.170	18	-.261	44	.340	13
Lebanon: West Beirut	-.357	44	-.271	46	.083	18	.276	1	.318	9	-.435	48	.124	21
Oman	-.829	50	-.532	55	-.245	51.5	.216	4.5	-.311	44	-.859	55	.138	19
Turkey: Alevi	.018	28	-.104	30	-.106	39	.233	2	.772	2	.120	20	-.134	34
Turkey: majority	-.104	34	-.159	35	-.032	30	.216	4.5	.657	4	.024	26	-.319	38

(Appendix continues)

Table A1 (continued)

Cultural group	Difference vs. Similarity		Self-containment vs. Connection to others		Self-direction vs. Reception to influence		Self-reliance vs. Dependence on others		Consistency vs. Variability		Self-expression vs. Harmony		Self-interest vs. Commitment to others	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Southern and Eastern Asian samples														
China: East	-.547	45	-.189	39	-.115	41	.021	27	-.326	45	-.486	50	.067	23
China: West	-.609	48	-.375	49	-.107	40	.011	29	-.345	49	-.463	49	-.482	46
Japan: Hokkaido	.276	21	.445	3	.313	3	-.260	49	-.936	54	.008	27	-.039	27
Japan: Mainland	.298	19	.496	2	.393	1	-.288	54	-1.057	55	.028	25	-.245	37
Malaysia	-.769	49	-.420	54	-.307	54	.133	13	-.139	38	-.643	53	.197	16
Philippines: Christian	-.192	39	-.073	29	.052	22	-.026	35	-.054	33	-.088	32	-.089	31
Philippines: Muslim	-.946	54	-.227	43	-.145	43	-.084	42	.016	28	-.511	51	.353	11
Singapore	-.302	42	.017	25	-.078	35	-.068	40	-.185	40	-.164	41	.151	18
Thailand	-.336	43	-.419	53	-.038	31	.201	7	.282	10	-.324	45	.017	26
Sub-Saharan African samples														
Cameroon: Bafut	-.884	51	.085	21	-.091	36	-.266	50.5	-.890	53	-.650	54	.581	7
Ethiopia: highlanders	-1.048	55	-.158	33.5	-.185	47	.007	30	.704	3	-.414	47	.617	6
Ethiopia: urban	-.918	52	-.190	40	-.099	38	-.059	38	-.066	35	-.536	52	.244	14
Ghana	-.568	46	.391	6	-.265	53	-.266	50.5	-.104	36	-.150	39	1.080	2
Namibia: Damara>Nama	-.130	36	.312	12	.150	12.5	-.175	48	.079	25	.061	23	.557	8
Namibia: Owambo	-.040	29	.417	5	.119	15	-.280	53	-.338	47.5	.040	24	1.096	1
Uganda: Baganda	-.921	53	.597	1	-.030	29	-.538	55	-.336	46	-.114	34.5	.721	3
Latin American samples														
Brazil: Central	-.148	37	-.398	52	-.045	32	.051	21	.019	27	-.168	42	.065	24
Brazil: North East	.235	22	.063	22	-.068	33	-.028	36	.008	29	.150	18	.186	17
Brazil: South	.100	24	-.237	44	.006	24.5	.134	12	-.037	31	-.127	36	-.045	29
Chile: majority	.785	3	.289	14	.025	23	.053	20	.797	1	.731	2	.043	25
Chile: Mapuche	.594	8	.293	13	-.179	46	.117	14	.476	8	.441	7	.230	15
Colombia: rural	.413	14.5	.314	11	-.001	26.5	-.074	41	.497	6	.478	6	.649	5
Colombia: urban	.878	2	.431	4	.088	17	-.017	33	.613	5	.754	1	.345	12
Peru: rural	-.124	35	-.144	31	-.421	55	.019	28	.263	11	-.036	29	.694	4
Peru: urban	.678	5	.091	20	.260	5	-.010	32	.109	22	.389	11.5	.095	22
US: Miami (Hispanic)	.960	1	.109	19	.061	19.5	.198	8	.487	7	.566	3	-.138	35.5

Note. Scores in the upper tertile (i.e. towards the independent pole; ranks 1 to 18) of each dimension are shown in bold; scores in the lower tertile (i.e. towards the interdependent pole; ranks 38 to 55) of each dimension are italicized.

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