Cultural intelligence: A theory-based, short form measure

David C. Thomas[1], Yuan Liao[2], Zeynep Aycan[3], Jean-Luc Cerdin[4], Andre A. Pekerti[5], Elizabeth C. Ravlin[6], Günter K. Stahl[7], Mila B. Lazarova[1], Henry Fock[8], Denni Arli[9], Miriam Moeller[5], Tyler G. Okimoto[5] and Fons van de Vijver[10,11,12]

[1]Beedie School of Business, Simon Fraser University, Vancouver, Canada; [2]IESE Business School, Barcelona, Spain; [3]Department of Psychology & Faculty of Management, Koç University, Istanbul, Turkey; [4]Human Resource Management, ESSEC Business School, Cergy-Pontoise, France; [5]UQ Business School, The University of Queensland, Brisbane, Australia; [6]Darla Moore School of Business, University of South Carolina, Columbia, USA; [7]WU Vienna University of Economics and Business, Vienna, Austria; [8]Department of Marketing, Hong Kong Baptist University, Kowloon, China; [9]Department of Marketing, Griffith University, Brisbane, Australia; [10]Department of Culture Studies, Tilburg University, Tilburg, The Netherlands; [11]Work-Well Unit, North-West University, Potchefstroom, South Africa; [12]School of Psychology, University of Queensland, Brisbane, Australia

Correspondence:
DC Thomas, Beedie School of Business, Simon Fraser University, 500 Granville Street, Vancouver, Canada V6C 1W6.
Tel: +778 782 9475;
Fax: +778 782 5122;
email: dcthomas@sfu.ca

Abstract
This article reports the development and validation of a theory-based, short form measure of *cultural intelligence* (SFCQ). The SFCQ captures the original theoretical intent of a multifaceted culture general form of intelligence that is related to effective intercultural interactions. The validity of the scale is established with 3526 participants in five language groups from around the world. Results provide evidence for construct and criterion-related validity of the measure, and indicate that cultural intelligence is a single latent factor reflected in three intermediate facets. In support of construct validity the measure is modestly related to but distinct from emotional intelligence and personality and correlates positively with several indicators of multicultural experience. With regard to criterion-related validity, it relates as predicted to several dimensions of intercultural effectiveness. Implications for the measurement and understanding of culture and the influence of culture on management practice are discussed.
Journal of International Business Studies (2015), 1–20. doi:10.1057/jibs.2014.67

INTRODUCTION
Linking culture to behavior in organizations is one of the distinctive features of the field of international management (see Devinney, Pedersen, & Tihanyi, 2010), and the importance of understanding the effect of cultural differences on management behavior has never been greater. As organizations increasingly face a knowledge-based competitive environment (Doz, Santos, & Williamson, 2001), the human aspect of management becomes ever more important. And, as the forces of globalization and migration patterns influence the world of work, the need to interact effectively with individuals who are culturally different, either face-to-face or through electronic media, is critical. Therefore the ability to assess variation in the capability of individuals to function across cultural contexts and with culturally different others is fundamental to furthering our understanding of the influence of culture on business operations.

Much has been learned from early anthropological study of culture (e.g., Geertz, 1973; Kluckhohn & Strodtbeck, 1961; Mead, 1937) and from large-scale studies of cultural values (e.g., Hofstede, 1980; House, Hanges, Javidan, Dorfman, & Gupta, 2004; Schwartz, 1992) about how societies are similar and different. However, this latter set of studies has been criticized for an overreliance on values (Earley, 2006; Kirkman, Lowe, & Gibson, 2006) and alternatives such as social axioms (Bond et al., 2004) or sources of guidance

(Smith & Peterson, 1988; Smith, Peterson, & Schwartz, 2002) have been proposed. These recent efforts overcome the problem of thinking of culture as simply a set of values by recognizing that culture is the set of learned meanings maintained by a group of people (see Rohner, 1984). However, they do not do an adequate job of linking cultural context to behavior. Recent work, based in cognitive theory, provides the potential for integrated explanations of the processes that combine cognitive structures and societal context to understand action (see Peterson & Wood, 2008). As opposed to a reliance on cultural dimensions for explanations of culturally different behavior, cognitive theory suggests that cultural differences in the cognitive structures that drive behavior are made salient at different times (e.g., Hong, Morris, Chiu, & Benet-Martínez, 2000). This recognition opened the door to the idea that in addition to culture-specific knowledge a more general development of cognitive structures and processes might occur that could influence intercultural effectiveness. The construct that has been theorized to embody this notion is *cultural intelligence* (CQ). cultural intelligence was introduced to the literature by Earley (2002: 274) as "a person's capability to adapt effectively to a new cultural context." This introduction was followed by two books (Earley & Ang, 2003; Thomas & Inkson, 2003), from which two somewhat different conceptualizations emerged. By far the most popular instrument to measure the construct is a 20-item self-report questionnaire constructed by Ang et al. (2007). However, rather than reflecting the theoretical uniqueness of the cultural intelligence construct, this measure seems to resemble other intercultural effectiveness inventories (see Paige, 2004 for a review) with some limitations in incremental validity (see Ward, Fischer, Lam, & Hall, 2009). In this article we describe and validate an alternative measure of cultural intelligence that, while brief and easy to use, captures the original theoretical intent of a multifaceted culture general form of intelligence that is related to effective intercultural interactions.

THEORETICAL BACKGROUND AND NEED FOR A NEW SCALE

The conceptualization of cultural intelligence that guides the scale development effort described here is the result of a decade long program of research that began with the articulation of (a) what is included and what is not included in the construct; (b) the process through which these facets are developed in individuals; (c) how these underlying facets combine to form the higher level construct of cultural intelligence; and (d) the process through which the construct influences intercultural effectiveness. This theory of cultural intelligence (see Thomas et al., 2008) forms the basis for the measure reported here. This initial focus on theory and the establishment of content validity through expert opinion is consistent with an emphasis on content validity in scale development and contrasts to the mechanistic application of psychometric procedures, which has been recently criticized (see Diamantopoulos, 2005; Rossiter, 2002). Cultural intelligence is the ability that individuals have to interact effectively across cultural contexts and with culturally different individuals. It is theorized to consist of three facets of cultural knowledge, cross-cultural skills, and cultural metacognition that reflect the higher-level latent factor.

Despite being developed independently cultural intelligence as defined here has much in common with the Earley and colleagues' initial articulation of the construct (Earley, 2002; Earley & Ang, 2003). First, both conceptualizations identify individual differences that will explain and predict effectiveness in a cross-cultural context. Second, the constructs are culture independent in that their development is not tied to a specific cultural context. Finally, the constructs are multidimensional. However, to set the stage for the following discussion of the development of a new scale two differences are important to identify. The first has to do with the number and type of constituent elements, and the second, which is a result of the operationalization of the construct (Ang & Van Dyne, 2008), is the way in which the elements combine or emerge.

While other more minor theoretical variations exist between cultural intelligence approaches, the main difference in terms of constituent elements is the absence here of a motivational facet – the motivation to direct energy positively toward intercultural interaction. Our view is that specifying a motivational facet of cultural intelligence is problematic in the same way as is the relationship of motivation to general intelligence. Motivation and intelligence may have a limited recursive relationship, but they are not components of each other (see Ackerman, 1996; Ceci, 1990). Specifying a motivational component of cultural intelligence casts a prosocial (positive) halo over the construct (Gelfand, Imai, & Fehr, 2008) that we do not believe exists. In contrast we suggest that it is possible that cultural intelligence could be employed in the service of less than noble goals. Motivation is concerned with the *willingness* to behave in a particular way, while

cultural intelligence is the *ability* to interact effectively. Therefore we consider motivation, while potentially an important element in cross-cultural interactions, to be external to cultural intelligence.

In the original exposition of cultural intelligence (Earley, 2002: 283; Earley & Ang, 2003: 86–90) an effort was made to describe the process through which the components interacted. In subsequent work, however, cultural intelligence is described as an aggregate multidimensional construct in which the four dimensions, which make up the construct, exist at the same level as the conceptualization of the overall construct (Ang & Van Dyne, 2008). However, aggregate constructs by definition are formed as a mathematical function of their dimensions (Law, Wong, & Mobley, 1998), and the current popular operationalization of cultural intelligence with the 20-item self-report measure (Ang & Van Dyne, 2008) does not specify the relationship between the overall construct and each dimension. The four-factor structure has been found in a number of studies and the internal consistency reliability of the factors is good (Ang et al., 2007; Van Dyne, Ang, & Koh, 2008) and one factor or another has been related to a number of dimensions of intercultural effectiveness (see Ang et al., 2007). However, with this measure, little if anything can be said about the relationship of the overall construct of cultural intelligence to outcome variables. And, to our knowledge, no study has shown how the four facets (measured in this way) are aggregated. In our view, while the internal consistency of each facet and the predictive validity of some elements may be good, this measurement loses the conceptual distinctiveness of the construct. In this form the measure does not reflect a theoretically based multidimensional type of intelligence, but a loosely aggregated set of facets and is thus similar to other inventories of this type with somewhat marginal utility (see Diamantopoulos, 2005 for a discussion).

Recognizing the limitations of this measure, some scholars have begun to focus on the underlying facet of cultural metacognition as the key construct to explain intercultural effectiveness (e.g., Mor, Morris, & Joh, 2013). This is certainly one way forward as this element is central to both conceptualizations of cultural intelligence. However, we believe that a measure of individual variation in cultural intelligence that captures the complexity of the theoretical construct has significant potential for international management research. The articulation and validation of such a measure is the goal of the remainder of this article.

MEASURING CULTURAL INTELLIGENCE

Defining this construct as a type of intelligence as opposed to intercultural competence or any number of similar terms has two advantages. It substitutes well-studied ideas in cognitive psychology for the more popular, but less well specified, concepts such as global mindset (e.g., Gupta & Govindarajan, 2002; Levy, Beechler, Taylor, & Boyacigiller, 2007) that have made their way into the management literature. In addition it clearly separates this individual difference construct from institutional and environmental influences on intercultural effectiveness (see Johnson, Lenartowicz, & Apud, 2006).

Intelligence is commonly defined as the abilities necessary for adaptation to an environmental context (Binet & Simon, 1916; Sternberg, 1997; Wechsler, 1939). Cultural intelligence is this ability as applied to a specific aspect of the environmental context – the cultural context. Consistent with contemporary views of intelligence, we define cultural intelligence as multifaceted (see Gardner, 1985; Sternberg, Lautrey, & Lubart, 2003) and as a unique construction of abilities that exists outside the cultural boundaries in which these abilities are developed. Cultural intelligence consists of knowledge and skills, developed in specific cultural (intercultural) contexts, but is dependent on the culture general process of cultural metacognition to produce culturally intelligent behavior. The measurement implications of each of these three facets of cultural knowledge, cross-cultural skills, and cultural metacognition are reviewed in the following.[1]

Cultural Knowledge
Cultural knowledge is composed of both declarative (Chi, 1978) or content-specific knowledge and general process knowledge of the effect of culture on one's own nature or the nature of others (Chi & VanLehn, 1991). Content-specific knowledge relates to recognizing the existence of other cultures and defining the nature of these differences, and is at the core of systems definitions of intelligence (see Sternberg, 1997). This knowledge allows a grasp of the internal logic and modal behavior of another culture so that we can map ourselves onto the terrain of the new culture (DiStefano & Maznevski, 2000). Process knowledge involves intercultural encounters, the demands of problem solving and how these demands can be met under varying conditions. The creation of this cultural general knowledge involves learning from specific experience with culturally different others, resulting in higher levels of cognitive complexity (see Tadmor & Tetlock, 2006).

Therefore cultural knowledge should be assessed with regard to an understanding of different cultures as well as the complexity of this knowledge.

Cultural Skills

A key element that is consistent across theories of cultural intelligence is the presence of a skill or behavioral component. Exhibiting cultural intelligence involves skills associated with learning from social experience, appreciating critical differences in culture and background between oneself and others, relating successfully with culturally different others, and being able to adapt behavior appropriate to the particular cultural situation. Therefore the construct of cultural intelligence is very broad, so broad in fact (in parallel with general intelligence, see Gottfredson, 2002) that the skills component might be categorized and measured in any number of ways. While we had theorized a skills component in the domain presented previously (see Thomas et al., 2008), our review of literature presented a wide range of specific skills in dozens of inventories that were potential contenders as a facet of cultural intelligence. Therefore in the initial empirical work based on this theory (Thomas et al., 2012) we focused on those skills that have been theorized and demonstrated to have a relationship with intercultural effectiveness (Thomas & Fitzsimmons, 2008). However, even this reduction yielded far too many skills to be considered. We therefore relied on a traditional psychometric approach to item reduction. Note that the goal here was not to increase internal consistency reliability in some artificial way (see Rossiter, 2002), but to systematically reduce a large number of items to manageable categories. These skill measures were reduced through factor analysis (84 initial skill items selected from a range of existing scales based on the extent to which they represented the content of the skills domain theorized were reduced to 24 with a sample of 495 participants in 85 different countries of origin) to five skill categories. A multi-group confirmatory factor analysis (CFA) across four cultural clusters was conducted with models constrained to equal factor loadings across cultures to establish equivalence. The resultant five skill categories were relational skills, tolerance of uncertainty, adaptability, empathy, and perceptual acuity, all of which should be assessed in a measure of cultural intelligence.[2]

Cultural Metacognition

Cultural metacognition occupies a central position in the theory of cultural intelligence underlying the measure developed here. Based on the more general concept of metacognition (Flavell, 1979), cultural metacognition is knowledge of and control over one's thinking and learning activities in the specific domain of cultural experiences and strategies. It functions by regulating cognition, transferring knowledge gained in specific experiences to broader principles, focusing cognitive resources, and compensating for individual disadvantages in cultural knowledge or skills (Thomas et al., 2008). Not all researchers agree on all aspects of metacognition. However, there seems to be a general consensus that metacognition involves the ability to consciously and deliberately monitor one's knowledge processes and cognitive and affective states, and also to regulate these states in relation to some goal or objective. This aspect of cultural intelligence is indicative of what Sternberg (1985) suggested are core mental processes that transcend environmental context. The components of this process include (a) the recognition or awareness of the issue or problem, (b) analysis of information about the problem, allocating mental resources to solve it, and monitoring the solution, and finally (c) evaluating the solution to the problem and processes that can be applied across contexts. An empirical construct validation of metacognition has found support for similar context-independent elements (Allen & Armour-Thomas, 1993). Therefore an assessment of cultural metacognition involves measuring: (a) awareness of the cultural context, (b) conscious analysis of the influence of the cultural context, and (c) planning courses of action in different cultural contexts (Thomas et al., 2012).

Our definition of cultural intelligence is a system consisting of cultural knowledge, cross-cultural skills, and cultural metacognition that allows people to interact effectively across cultures. As opposed to the currently popular four-facet model, which consists of four elements that do not reflect a single construct, our conceptualization is of a single construct in which the three facets are compensatory. For example, two individuals might have similar cultural intelligence scores but in one individual this might be reflected in very high cultural metacognition, but in low cross-cultural skills and for the other individual reflected in low cultural metacognition and high levels of cross-cultural skills. This structure influences our approach to measurement as discussed ahead.

METHOD

Instrument Development

Consistent with the theory of cultural intelligence we sought to construct a measure that would assess

the latent construct (see Law et al., 1998) of cultural intelligence, which is in turn reflected in three facets of cultural knowledge, cross-cultural skills, and cultural metacognition. As in general intelligence (Edwards & Bagozzi, 2000), cultural intelligence is theorized to be a reflective model where the underlying construct of cultural intelligence is indicated in the measure as opposed to a formative model in which the latent construct is an index composed of the measures (see Coltman, Devinney, Midgley, & Venaik, 2008 for a discussion). In this case, cultural intelligence is an indirect reflective model (see Edwards & Bagozzi, 2000) because of the multiple mediating constructs of cultural knowledge, cross-cultural skills, and cultural metacognition (shown graphically ahead in Figure 2).

An original instrument created to capture the construct involved a matrix of assessment approaches contained in an online delivery system (see Thomas et al., 2012). This measure was sophisticated (employing concurrent cognitive process tracing using verbal protocol, for example) and demonstrated good reliability and validity. However, both administration and coding was very complex, which has limited its acceptance and utility. Therefore based on our theory of cultural intelligence and guided by the initial instrument development, we extracted the key elements of the measure of each facet of cultural intelligence to form a 10-item scale consisting of measures of the three constituent elements of cultural knowledge, cultural skills, and cultural metacognition (English-language version of the short form cultural intelligence (SFCQ) scale shown in Appendix A). In support of the content validity of the scale the wording of specific items was created by an international panel of experts in cross-cultural management to best represent each overall facet. The scale was translated and back translated (Brislin, 1970) into five languages, the equivalence of which is tested ahead.

Cultural knowledge is measured with two items that assess knowledge of the ways in which cultures vary and also the complexity of that knowledge. Complexity is measured indirectly by asking respondents the extent to which they can give examples of cultural differences. Previous instrument development (Thomas et al., 2012) indicated the ability to relate stories of cultural variation was indicative of more complex thinking in this regard. Each of the five cultural skill dimensions of relational skills, perceptual acuity, empathy, adaptability, and tolerance of uncertainty are represented by one item. Finally, the three facets of cultural metacognition of

awareness, analysis, and planning are measured by one item each.

Validity Assessments

First, to establish content validity items were carefully selected to match the theoretical conceptualization of cultural intelligence. Some approaches to scale development suggest that this is the only type of validity that is essential (Rossiter, 2002). Our view (consistent with Diamantopoulos, 2005; Finn & Kayande, 2005) is "that both theoretical and empirical criteria are necessary to design and validate measurement models" (Coltman et al., 2008: 2). Therefore we took several additional steps to establish the validity of the SFCQ scale similar to the scale validation procedure used by Judge, Erez, Bono, and Thoresen (2003) in their work on core self-evaluations and also as recommended by DeVellis (2012).

Since reliability is a necessary condition for construct validity (Pedhazur & Schmelkin, 1991), as a second step we estimated internal consistency by Cronbach's α, and investigated the item-total correlations.

Third, to establish construct validity we investigated the factor structure with regard to theoretical predictions of the relationship among multiple items (Schwab, 1980). In this case, cultural intelligence should be a second-order single factor with three first-order factors, namely, knowledge, skills, and metacognition. We further investigated the equivalence of the factor structure across five language versions of the scale.

Fourth, we examined the relationship between the SFCQ scale and other similar constructs by constructing a nomological network (Cronbach & Meehl, 1955). One aspect of the nomological network is discriminant validity. In this case, discriminant validity was evaluated by testing whether the SFCQ scale was distinct from emotional intelligence (EQ) and personality traits such as Extraversion and Openness. Another aspect of the nomological network is convergent validity. This was tested by evaluating the relationship of the SFCQ scale with Ethnocentrism and multicultural experience, such as whether people were born in a different country than their parents, the number of languages they speak, and the number of countries in which they had lived and the number of countries they had visited.

Fifth, we investigated the criterion-related validity with multiple variables. We examined if the SFCQ scale related as predicted to several variables that are often associated with intercultural effectiveness. We

tested if the SFCQ scale predicted whether or not individuals had a close friend from other cultures, which is often used as a surrogate for the ability to develop long-term relationships with culturally different others (Canary & Dainton, 2003). We then examined the relationship of the scale to intercultural adjustment, which is often considered one factor in multifaceted assessments of intercultural effectiveness (Caligiuri, 1997). We also examined whether SFCQ predicted correct causal attributions of intercultural interactions. The ability to make so-called isomorphic attributions (describe accurately the causes of behavior of others from a different culture) is a long-standing criterion of intercultural effectiveness (Triandis, 1975).

Finally, we examined whether the SFCQ scale displayed incremental validity by predicting job performance among people who work with others from other cultures, beyond that accounted for by personality traits and EQ.

Samples

We collected data from 3526 participants in 14 samples around the world.[3] Since we theorized cultural intelligence to be a culture-independent construct, we recruited participants in a variety of cultures and with a wide range of demographic characteristics in order to better generalize from the results. The survey was conducted in five languages – English, French, Indonesian, Turkish, and traditional Chinese. Additional information about each sample, including sample size, language in which the survey was administrated, age, gender, number of countries of birth, is reported in Table 1. Data were collected at different points in time and samples are numbered based on the time sequence.

Measures

Not all measures were collected in every sample. The measures collected in each sample are indicated in Table 1. Not all measures were included in all subsequent analyses. Ahead we indicate which samples and measures are used to test each step of the analysis. The following section describes the measures used. Reliability estimates of the measures included in the research are reported for the overall sample only, except for the SFCQ measure where reliability estimate for each sample are also reported. Information on the reliability of all measures in each sample can be obtained from the first author.

Cultural intelligence was measured by the 10-item SFCQ scale presented in Appendix A on a 5-point Likert scale (1 = not at all, 5 = extremely well).

Internal consistency reliability as measured by Cronbach's α was 0.88 in the overall sample. The internal consistency reliability of the SFCQ scale was calculated for each sample and along with the means and standard deviations is reported in Table 2.

As shown in Table 2 the average mean score across samples was 3.55 with a standard deviation of 0.57. Across the 14 samples, all internal consistency reliability estimates as measured by Cronbach's α were above 0.77 with an average reliability of 0.85. Across the 14 samples, the average item-total correlations ranged from 0.43 to 0.63 on the 10 items with a mean of 0.55. The distribution of the SFCQ score across all samples is presented in Figure 1.

This distribution with some very minor deviations follows a normal curve. Based on a Kolmogorov–Smirnov test it is slightly leptokurtic (Kurtosis = 0.29) and has a very small negative skewness (Skewness = –0.23). In large samples, minor deviations from normality are often statistically significant, but often do not deviate enough from normality to make realistic differences in analysis and the visual appearance of the distribution is of greater importance (Tabachnick & Fidell, 1989). Overall, this distribution is what we would expect from an individual difference construct across a large sample of participants. Minimum and maximum scores for each item suggested that respondents used the entire response scale indicating that scores did not have range-restriction.

Other measures included in the validation studies were EQ, personality, intercultural effectiveness, sociocultural acculturation and adaptation, ethnocentrism, job performance, attribution accuracy, and demographics. Details of these measures are reported in Appendix B.

RESULTS

Construct Validity

To examine construct validity of the SFCQ measure we conducted a CFA using EQS 6.0 software package (Bentler, 2008) with maximum likelihood estimation and mean structure analysis to compare a one-factor model vs a theoretically based model with one second-order factor (CQ) and three first-order factors (knowledge, skills, metacognition) using data from Sample 1, $N = 499$. A graphic representation of the second-order factor structure is shown in Figure 2.

A good model fit is indicated by a non-significant χ^2 test, but since χ^2 is sensitive to a large sample size, we also considered other recommended model fit indices

Table 1 Characteristics of samples

Sample	Country data collected	N	Language survey administrated	Demographics	Age mean (s.d.)	Gender (percentage of males)	Number of countries of birth	Variables
1	USA	499	English	General population	31.38 (10.44)	59.7	19	SFCQ, demographics
2	India	109	English	General population	30.47 (9.91)	68.8	3	SFCQ, demographics
3	France	359	English ($N=53$) French ($N=306$)	Employees	36.71 (10.36)	38.7	25	SFCQ, demographics
4	Australia	59	English	EMBAs	34.90 (5.80)	61.0	18	SFCQ, demographics
5	Australia and Indonesia	1120	English ($N=699$) Indonesian ($N=421$)	Students and respective family members	26.92 (12.03)	42.3	47	SFCQ, demographics (age, gender, and country of birth only)
6	Australia	162	English ($N=70$) Indonesian ($N=92$)	Migrants	34.99 (9.04)	48.8	5	SFCQ, demographics, sociocultural acculturation, and adaptation
7	Australia	229	English	International students	22.89 (2.92)	35.8	30	SFCQ, demographics, sociocultural acculturation, and adaptation
8	Turkey	153	Turkish	Employees	31.65 (9.80)	52.3	3	SFCQ, demographics, EQ, personality, intercultural effectiveness, ethnocentrism
9	HK	243	Traditional Chinese	University Alumni and Mall customers	31.92 (13.29)	32.5 (missing = 24.7)	4	SFCQ, demographics, EQ, personality, intercultural effectiveness, ethnocentrism
10	Multiple countries	142	English	Students	22.31 (2.16)	37.3	22	SFCQ, demographics, EQ, personality, intercultural effectiveness, ethnocentrism
11	France	211	English ($N=21$) French ($N=190$)	Employees	39.57 (9.76)	46.9	27	SFCQ, demographics, EQ, personality, intercultural effectiveness, ethnocentrism, job performance
12	US	56	English	Part-time MBAs	31.60 (7.40)	62.5	7	SFCQ, demographics, EQ, personality, intercultural effectiveness, ethnocentrism, job performance
13	US	72	English	General population	37.55 (11.22)	36.1	3	SFCQ, demographics, EQ, personality, intercultural effectiveness, ethnocentrism
14	Multiple countries	112	English	General population	33.08 (10.10)	53.6	13	SFCQ, demographics, EQ, conscientiousness, job performance, attribution
Total		3526						

Table 2 Means, standard deviations, and reliabilities of SFCQ scale across samples

| Sample	Country Data Collected	N	Mean	s.d.	Cronbach's α
1	USA	499	3.32	0.65	0.87
2	India	109	3.61	0.56	0.85
3	France	359	3.78	0.58	0.86
4	Australia	59	3.43	0.43	0.77
5	Australia and Indonesia	1120	3.40	0.66	0.90
6	Australia	162	3.49	0.50	0.82
7	Australia	229	3.59	0.65	0.91
8	Turkey	153	3.70	0.50	0.82
9	Hong Kong	243	3.39	0.55	0.85
10	Multiple countries	142	3.58	0.51	0.78
11	France	211	3.85	0.52	0.83
12	USA	56	3.67	0.52	0.83
13	USA	72	3.24	0.68	0.90
14	Multiple countries	112	3.65	0.61	0.87
	Total	3526	3.51	0.63	0.88
	Average		3.55	0.57	0.85

Mean = 3.51
Std. Dev. = 0.63
N = 3,522
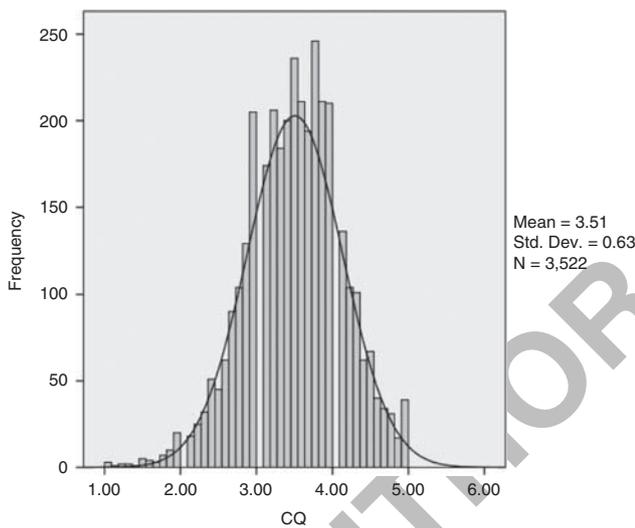
Figure 1 Distribution of SFCQ score across all samples.
Note: Missing data $N = 4$.

to evaluate model fit, including standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), Non-Normed Fit Index (NNFI), and Comparative Fit Index (CFI). A good model fit is indicated by SRMR lower than 0.08, RMSEA lower than 0.06, and other indices higher than 0.95 (Hu & Bentler, 1998, 1999). The one-factor structure yielded poor model fit, with $\chi^2(35) = 263.48$, $p<0.01$, NNFI = 0.84, CFI = 0.86, SRMR = 0.06, RMSEA = 0.11, 90% CI = (0.10,0.13). In contrast, the second-order factor structure yielded good model fit, with $\chi^2(32) = 127.67$, $p<0.01$, NNFI = 0.93, CFI = 0.95, SRMR = 0.04, RMSEA = 0.08, 90% CI = (0.06,0.09).

All items significantly loaded on the expected factors and the factor loadings ranged from 0.58 to 0.86. Data fit the theoretically driven second-order factor structure confirming the construct validity of the measure. A vanishing tetrad test (Bollen & Ting, 2000; Hipp, Bauer, & Bollen, 2005; Ting, 1995) supported the reflective structure of the construct.[4]

Measurement Equivalence

Fundamental to equivalence of a culture-independent construct is that the scale functions in a similar manner in different languages. To test if the English-language SFCQ scale had been translated appropriately, we examined its equivalence across five language groups (English, French, Indonesian, Turkish, and traditional Chinese) by conducting a likelihood ratio test (Bollen, 1989) with multi-group CFA (Little, 1997) using data from all samples $N = 3526$ (English = 2091, French = 496, Indonesian = 543, Turkish = 153, traditional Chinese = 243). We examined a configural model, a metric invariance model with constraints on the factor loadings between the observed variables and their respective first-order factors across the five language groups, and a final metric invariance model with constraints on the factor loadings as well as paths between the second-order factor and the three first-order factors. All three models yielded good model fit, and χ^2 difference tests indicated that the final metric invariance model fit did not significantly deteriorate from the less restrictive models. These results supported metric invariance across the five language groups and
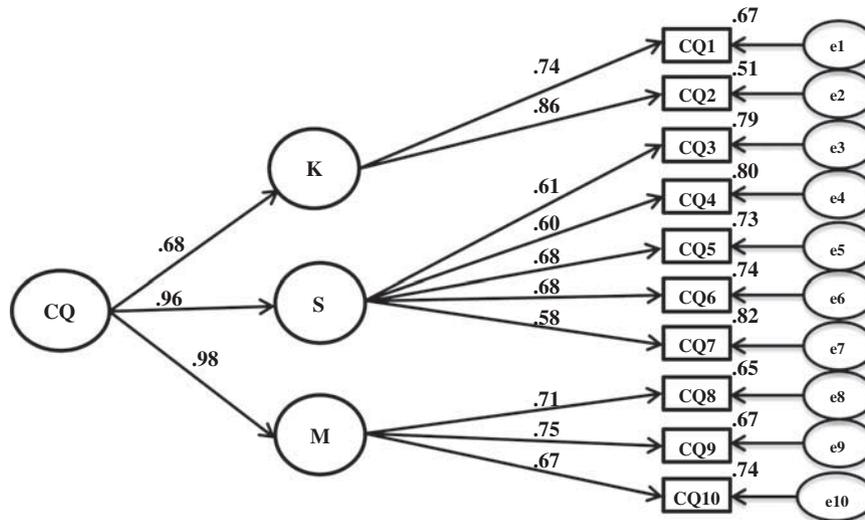
Figure 2 Indirect reflective factor structure of SFCQ.
K = Knowledge, S = Skills, M = Metacognition

Table 3 Model fit indices and χ^2 difference tests of measurement equivalence

Model	χ^2 (df)	$\Delta\chi^2$ (Δdf)	NNFI	CFI	SRMR	RMSEA (90% CI)
Configural	649.94 (160)**	-	0.95	0.96	0.04	0.03 (0.03,0.03)
Metric invariance (factor loadings only)	689.64 (188)**	39.70 (28)	0.95	0.96	0.05	0.03 (0.03,0.03)
Final metric invariance (factor loadings and paths)	701.47 (196)**	11.83 (8)	0.96	0.96	0.05	0.03 (0.03,0.03)

Notes: ** = p<0.01. $\Delta\chi^2$ is sensitive to sample size (Brannick, 1995; Kelloway, 1995). Because of this limitation, researchers such as Cheung and Rensvold (2002) have recommended the use of ΔCFI. If the reduction in the value of CFI is smaller or equal to 0.01 in the constrained model, then it is suggested that the constrained model does not deteriorate from the original model. In our case, CFI remained 0.96 across all models, which indicated the final metric equivalence model with constraints on both factor loadings and paths between the second-order factor and the three first-order factors is accepted.

indicated that the relationships between the items in the SFCQ scale and the three first-order factors, as well as the relationships between the second-order CQ factor and the three first-order factors are equivalent across the five language versions. These results also lend support to the accurate translation of the scale. Model fit indices and χ^2 difference tests are presented in Table 3.

Discriminant and Convergent Validity
To construct a nomological net we evaluated the relationship of the SFCQ scale with EQ, personality, ethnocentrism, and indicators of multicultural experience (number of languages spoken, number of countries lived in, number countries visited, having parents born in a different country). Correlations based on the composite score of each variable are presented in Table 4.

As shown in Table 4, the SFCQ scale had a negative and moderate relationship with ethnocentrism and a weak to moderate relationships with EQ and perso-

nality traits (correlations ranged from 0.17 to 0.44). To demonstrate that SFCQ is distinct from EQ and personality traits, we conducted CFAs with χ^2 difference test to determine whether the correlations between SFCQ and EQ as well as personality traits are different from 1 (Bagozzi, Yi, & Phillips, 1991). In the first CFA model testing EQ, we freely estimated the correlation between latent factors CQ and EQ. The model yielded good fit, with $\chi^2(291) = 674.29$, p<0.01, NNFI = 0.96, CFI = 0.96, SRMR = 0.05, RMSEA = 0.04, 90% CI = (0.04,0.04). In the second model, we fixed the correlation between CQ and EQ to 1. χ^2 significantly increased ($\Delta\chi^2 = 244.30$, Δdf = 1, p<0.01), indicating the model significantly deteriorated from the first model and that the correlation between the SFCQ scale and EQ was significantly different from 1. Following the same approach we found that the correlations between SFCQ and the five personality traits differed from 1 as well. Although the SFCQ scale was correlated with EQ and some personality traits, these data indicate that they

Table 4 Correlations between SFCQ, EQ, personality, and multicultural experience variables

	N	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
SFCQ	2405	3.51	0.63	(0.88)										
EQ	885	3.76	0.52	0.44**	(0.88)									
Extraversion	875	3.27	0.73	0.35**	0.35**	(0.88)								
Agreeableness	875	3.82	0.52	0.38**	0.51**	0.40**	(0.78)							
Conscientiousness	987	3.68	0.62	0.17**	0.45**	0.06	0.26**	(0.81)						
Neuroticism	875	3.26	0.76	−0.17**	−0.38**	−0.24**	−0.15**	−0.19**	(0.87)					
Openness	875	3.64	0.58	0.40**	0.44**	0.35**	0.41**	0.25**	−0.12**	(0.81)				
Ethnocentrism	850	28.84	8.71	−0.33**	−0.16**	−0.15**	−0.37**	−0.20**	0.26**	−0.31**	(0.90)			
Number of languages spoken	2391	2.40	1.00	0.29**	−0.02**	0.15**	−0.09**	−0.02**	0.05**	−0.01...	−0.02...	−		
Number of countries lived in	2371	1.40	0.60	0.26**	0.10**	0.12**	0.06**	0.03**	−0.09**	0.15**	−0.16**	0.29**	−	
Number of countries visited	2385	3.70	1.47	0.27**	0.06**	0.23**	0.10**	0.10**	−0.16**	0.20**	−0.26**	0.31**	0.36**	−

Notes: Numbers in parentheses on the diagonal are coefficient αs. * = $p<0.05$, ** = $p<0.01$. Correlations of SFCQ with EQ, personality (except conscientiousness), and ethnocentrism are obtained from Samples 8–13 ($N=877$); correlation between SFCQ and conscientiousness is obtained from Samples 8–14 ($N=989$); and correlations between SFCQ and multicultural experience variables are obtained from all samples except Sample 5 ($N=2406$).

measure different things. This provided initial support for discriminant validity and was consistent with the theoretical underpinnings of cultural intelligence.

We also found evidence to support convergent validity. Indicators of multicultural experience, specifically number of languages spoken, number of countries lived in, and number of countries visited, were all positively correlated with CQ (see Table 4). Also, a comparison of mean scores on the measure of CQ indicated significantly higher CQ for those individuals who were born in a different country from their parents ($M_{\text{diff}} = 3.69$, $M_{\text{same}} = 3.54$, $t = 3.91$, $p<0.01$). Taken together these results provide support for the SFCQ scale as a valid measure of cultural intelligence as theorized.

Criterion-Related Validity

The criterion-related validity of the SFCQ scale was examined with regard to its relationship with (a) overall intercultural effectiveness, (b) sociocultural acculturation and adaptation, (c) the ability to develop long-term relationships with culturally different others, (d) the ability to make accurate intercultural attributions, and (e) job performance in a culturally diverse environment.

To examine the relationship between the SFCQ scale and intercultural effectiveness we selected participants who had the opportunity for intercultural interactions by limiting the sample to only those who had a close friend or best friend from another culture, or who interacted with people from other cultures at work from Samples 8–13, $N=877$. We regressed intercultural effectiveness on the SFCQ scale and found that CQ significantly predicted intercultural effectiveness ($\beta=0.27$, $t=7.51$, $p<0.01$, $\Delta R^2 = 0.05$) after controlling for EQ and the five personality traits.

As noted previously, one key indicator of intercultural effectiveness (Thomas & Fitzsimmons, 2008), and one that is commonly found in multidimensional measures of overseas effectiveness (Caligiuri, 1997), is the ability of individuals to adapt to their host culture. We measured sociocultural acculturation and adaptation with two different scales in two independent samples. In Sample 6 ($N=164$) we measured sociocultural acculturation with the scale developed by Ward and Rana-Deuba (1999) and found it significantly correlated with the SFCQ scale ($r=0.17$, $p<0.05$). In Sample 7 ($N=229$), we examined the relationship between a measure of sociocultural adaptation developed by Ward and Kennedy (1999) and the SFCQ scale and found significant correlation between the two scales ($r=0.29$, $p<0.01$).

A second often cited indicator of intercultural effectiveness is the ability to develop long-term relationships with culturally different others. A surrogate for this ability is whether or not an individual has a close friend from another culture or whether his/her best friend is from another culture (Canary & Dainton, 2003). We expected that CQ would relate

to whether or not individuals had a close friend or best friend from another culture. Further we expected this effect would still be significant after controlling for EQ and personality.

Drawing on data from all samples except Sample 5 in which these measures were not included ($N = 2406$), we examined the mean differences on the SFCQ scale for those participants who reported having a close friend (or best friend) from another culture and those who did not. Results indicated that those participants who had a close friend (or best friend) from another culture scored significantly higher on the SFCQ scale than those who did not (close friend: $M_{Yes} = 3.69$, $M_{No} = 3.24$, $t = 17.02$, $p < 0.01$; best friend: $M_{Yes} = 3.77$, $M_{No} = 3.50$, $t = 8.65$, $p < 0.01$). Additionally, we conducted logistic regressions and found that the SFCQ scale significantly predicted the close or best friend relationship (close friend: $Wald\ \chi^2 = 44.04$, $p < 0.01$; best friend: $Wald\ \chi^2 = 15.91$, $p < 0.01$) after controlling for EQ and personality traits. A behavioral indicator of effectiveness in intercultural interactions is the ability to make accurate causal attributions for the behavior of culturally different others (Triandis, 1975). Honing this ability was the basis for the development of the cultural assimilator approach to cross-cultural training. In order to evaluate the ability of the SFCQ scale to predict accurate causal attributions participants (Sample 14, $N = 112$) were shown two videos of intercultural interactions (described in Appendix B) and then asked after each video to choose among four possible causes of the behavior of one of the protagonists. To test the relationships of cultural intelligence as measured by the SFCQ scale we regressed the accuracy of participant's attributions on SFCQ controlling for age, gender, and EQ. Results indicated that the SFCQ scale significantly predicted the correct attribution ($\beta = 0.33$, $t = 3.23$, $p < 0.01$, $\Delta R^2 = 0.09$).

A final examination of the criterion-related validity of the SFCQ scale was conducted with Samples 12 and 14 and part of Sample 11, $N = 264$. Only those participants who reported that they had substantial engagement with culturally different others at work were included in these analyses. To test the incremental validity of the SFCQ scale on predicting job performance, we controlled for conscientiousness and EQ and found that the SFCQ scale predicted job performance over and above the effect of conscientiousness and EQ ($\beta = 0.19$, $t = 3.12$, $p < 0.01$, $\Delta R^2 = 0.03$).

DISCUSSION

The promise of cultural intelligence as originally conceptualized (Earley & Ang, 2003; Thomas & Inkson, 2003) was as an individual difference construct related to intercultural effectiveness. It differs from the numerous inventories of cross-cultural skills and abilities in that it is a culture general form of intelligence that applies to the domain of intercultural interactions. This individual difference construct substitutes well-studied ideas in cognitive psychology for more popular concepts such as global mindset, and while related to intercultural interactions it is not constrained by the specific culture in which it was developed. Realization of the promise of cultural intelligence has been hampered by the lack of a rigorously developed measure that reflected its original theoretical intent. The scale presented in this article captures cultural intelligence as originally conceptualized with a short yet powerful instrument. The ability to capture the complexity of the construct of cultural intelligence with this brief instrument should certainly enhance its utility.

As shown in this series of studies, this short instrument captures the construct of cultural intelligence as theorized as an indirect reflective model with a single latent factor consisting of three mediating facets of cultural knowledge, cultural skills, and cultural metacognition:

- Supporting the notion of a culture-independent construct, the indirect reflective model of SFCQ is equivalent across cultural and language groups. That is, cultural intelligence is not dependent on individual cultural variation.
- In support of construct validity the SFCQ scale is modestly related to but distinct from EQ and personality and correlates positively with several indicators of multicultural experience thus establishing a nomological net.
- With regard to criterion-related validity, the SFCQ scale demonstrates an ability to predict sociocultural adaptation, the development of long-term relationships with culturally different others, job performance in a multicultural environment, and the ability to make accurate causal attributions for cross-cultural interactions.

Therefore in these preliminary tests this measure of cultural intelligence has demonstrated its content and construct validity, and the potential to be an excellent predictor of many aspects of intercultural effectiveness. The SFCQ scale appears robust across a wide range of cultural and language groups.

Limitations

The SFCQ was subjected to a series of rigorous development procedures and tests including: the

items were carefully selected to match the theoretical conceptualization of cultural intelligence, reliability and construct validity were established, equivalence across cultures demonstrated, and criterion and incremental validity examined. However, the evaluation of this new instrument must of course be conducted within the confines of our ability to establish its validity in a single series of studies. While the SFCQ met the rigorous conditions we established to prove its validity, numerous other tests could be conducted. Also, the instrument relies on the self-report of participants and is thus subject to the criticisms leveled at all self-report scales (see Spector, 1994). The participants in the study were solicited through a variety means from around the world. While every attempt was made to establish equivalence in instrument administration there was variance in this regard. In addition, some variability in response styles could also be present. However, the performance of the instrument across five language groups lends support to its universality. While this series of studies does not test every aspect of the performance of this new scale, it does provide a very solid foundation for its use in future studies. With it, there is a huge potential for advancing our understanding of individual variation in cross-cultural interactions of all types.

Implications for Measurement and Understanding of Culture

The creation of this instrument is consistent with a move toward the development of mid-range theory that links culture to action (see Earley, 2006). That is, cultural intelligence does not rely on dimensions of cultural variation for the explanation of culturally different behavior. Rather it articulates a culture general individual difference construct related to intercultural effectiveness. An important implication of the scale development process undertaken here is the attention given to articulating the nature of the relationship between the construct and its measure. Here, we theorized and demonstrated the indirect reflective structure of cultural intelligence. Often, great emphasis is placed on articulating causal relationships between constructs with little attention given to this related aspect of theory (see Edwards & Bagozzi, 2000 for a discussion). In this study, we bridge the gap between the abstract construct of cultural intelligence and the measurable phenomenon.

Both theoretical and empirical criteria were used to establish the validity of the measure. Each stage of instrument development, beginning with a determination of what should and should not be included in the construct through to sample selection for empirical validation, was conducted with a concern for the theoretical basis of cultural intelligence. While not radical in our approach, we suggest that the level of concern for theory demonstrated here, combined with rigorous psychometric analysis is relatively rare (see Sharma, 2014 for an exception). For example, the level of validity tests conducted here stands in stark contrast to the results reported in a recent review of the 10 most popular measures of cross-cultural competence by Matsumoto and Hwang (2013).

A second implication of this study is its contribution to the development of combined emic (indigenous) and etic (universal) approaches to understanding individual differences in intercultural effectiveness (see Morris, Leung, Ames, & Lickel, 1999). In this study we followed an etic approach and defined cultural intelligence as a culture general idea that does not depend on the specific cultural context in which it was developed. We found the structure of knowledge, skills, and metacognition generalized across multiple cultural samples. However, there might be cross-cultural differences in the way that cultural intelligence operates. For example, in low context countries cross-cultural skills may involve the ability to read between the lines and interpret implicit meanings from the context. However, this capability may not be an essential part of cultural intelligence in high context countries where it is normally so well developed. The potential for indigenous characteristics of intercultural effectiveness call for future studies using an emic approach.

This study also has implications for the conceptualization of culture. The view of culture as an exogenous and static force influencing behavior of human groups has been under increased scrutiny for some time (e.g., Bruner, 1990; DiMaggio, 1997; Sperber, 1996). Recent developments in cognitive science have stimulated the discussions of how culture should be best conceptualized. Social constructivists claim that "cultural knowledge is conceptualized to be like a contact lens" that affects the individual's perception at all times (Hong et al., 2000: 709). According to this view, culture is not a set of integrated, highly general, and stable structures, such as value orientations. Rather, it is an accumulated loose network of multiple and sometimes conflicting knowledge structures, which can be activated (or suppressed) depending on the demands of the situation (e.g., Hong et al., 2000; Markus & Conner, 2013; Shore, 1996). Our conceptualization and measurement of cultural intelligence is in line

with this dynamic and constructivist view of culture. We suggest that individuals with high cultural intelligence, which was developed in specific cultural or intercultural contexts, can react effectively to the demands of new and culturally different situations. Culturally intelligent individuals may therefore engage in a process similar to *cultural frame switching* (e.g., Benet-Martínez, Leu, Lee, & Morris, 2002) – switching between cultural frameworks or systems in response to environmental demands.

By focusing on an individual's capability to be effective in any cultural context, research in cross-cultural management can shift from an overreliance on exogenous and contextual factors (e.g., societal values). The specific cultures involved in a cross-cultural interaction become the backdrop for the culture general capabilities of the individuals involved. And, in combination with a deep understanding of cultural context it offers integrated explanations of many international management questions including issues related to overseas assignments, cross-cultural leadership, multicultural teams, and cross-cultural negotiation. An example is provided in a recent qualitative study by Barner-Rasmussen, Ehrnrooth, Koveshnikov, and Mäkelä (2014) in which they find that culture general skills (conceptually similar to cultural intelligence) combine with language skills to allow individuals to perform better as boundary spanners than those with language alone. The SFCQ offers a complimentary quantitative approach to this type of study that would allow for methodological triangulation.

There are numerous additional implications that result from being able to measure cultural intelligence as originally conceptualized. Researchers can assess and accurately reflect on the influence of the overall construct of cultural intelligence on outcomes as opposed to being relegated to a discussion of one or more subordinate facets. And, the potentially confounding effect of motivation to interact with culturally different others as opposed to the capability to do so is eliminated from the equation. Motivation can then be properly treated as a separate element in cross-cultural studies. In so doing, the potentially interacting effects of the motivation to engage in intercultural interaction and the ability to do so can be unbundled. Finally, the brevity and ease of administration of the SFCQ scale suggest a wide range of human resource management applications, especially with regard to training and development. Individuals considering work that involves high levels of cross-cultural interaction might find the instrument useful as a self-assessment and as a

developmental tool related to their career aspirations. As with any single psychometric test, caution in its over interpretation is urged.

Implications for Practice

As organizations increasingly face a knowledge-based competitive environment, the human aspect of management becomes paramount. And in international management this means understanding the effect of cultural differences on management behavior. An important aspect of this endeavor is understanding variation in the ability of individuals to deal effectively with the cultural aspects of their environment. Cultural intelligence helps us explain the variation we observe in cross-cultural effectiveness among individuals who are otherwise intelligent, emotionally mature, and seem to have good social skills. If the instrument described and validated here is as robust as it initially seems it has wide application in the management of people in a global context such as in selection, training and development, performance management, and global mobility. All of these areas have the need to explain and predict individual differences in cross-cultural effectiveness (see Thomas & Lazarova, 2014). At the organizational level the success of cross-border organizational activities is increasingly concerned with the ability to deal effectively with intercultural interactions (see, e.g., Stahl, 2008). The introduction of the concept of cultural intelligence to the international management literature (Earley, 2002; Earley & Ang, 2003; Thomas & Inkson, 2003) held enormous potential for helping to explain effectiveness in intercultural interactions. We hope the development of the SFCQ scale will help it reach that potential.

NOTES
[1]A more detailed articulation of the theory supporting this conceptualization can be found in Thomas et al. (2008).
[2]A complete report of this analysis is presented in Thomas et al. (2012).
[3]Samples 1 and 2 were recruited using the online data collection website Amazon Mechanical Turk (M-Turk). M-Turk is a relatively new website that coordinates between workers and requesters on tasks requiring human intelligence to complete. It has become popular

for data collection among social scientists because it is inexpensive and rapid. Participants recruited at M-Turk are at least as representative of the US population as traditional subject pools and data obtained are at least as reliable as those obtained using traditional methods and magnitude of effects in judgment and decision making studies is not different to that obtained using traditional subject pools (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Participants in Sample 1 resided in the United States and participants in Sample 2 resided in India. They were paid 50 US cents for their participation. Participants in Sample 3 were invited through the connections of former part-time EMBA (Executive MBA) and Masters students from a large Business School in France and they chose to complete the survey in either English or French. Participants in Sample 4 were EMBA students in a large Australian university who volunteered to complete the survey. Participants in Sample 5 were undergraduate students in Australia and Indonesia and their respective family members; data were collected in English and Indonesian, respectively. Participants in Sample 6 were Indonesian migrants living in Australia and they chose to complete the survey in either English or Indonesian. All participants were placed in a draw to receive one iPad mini. Participants in Sample 7 were international students studying in Australia who completed the survey in English. They were paid AUD$10.00 for participation as part of a larger study. Sample 8 consisted of employees in Turkey who completed the survey online in Turkish. Participants with work experience were recruited from graduate programs and through alumni rosters at four universities and participated voluntarily. Participants in Sample 9 were alumni of a large university recruited with assistance from the Alumni Office on a voluntary basis ($N=85$) and customers intercepted in a large shopping mall ($N=158$) in Hong Kong. The shoppers were given a US$1.3 cash voucher as an incentive after completion of the questionnaire. They completed the survey in traditional Chinese. Participants in Sample 10 were students enrolled in Masters level courses in Europe, Japan, and China who completed the survey in English. European participants were enrolled in the CEMS (formerly the Community of European Management Schools) Master in International Management Program at several European Universities; Chinese and Japanese participants were in similar programs in China and Japan, respectively. Participants in Sample 11 were working professionals in France contacted through one author's professional networks. They volunteered to complete the survey in either English or French. Participants in Sample 12 were part-time MBA students enrolled in a large southern university in the United States who volunteered to complete the survey in English in exchange for partial course credit. Participants in Sample 13 were general Masters (who have demonstrated accuracy in previous tasks) from Amazon Mechanical Turk. They resided in the United States and were paid US$1 for participation. The majority (83.9%) of participants in Sample 14 were recruited from Amazon Mechanical Turk and were paid US$2 for participation. The remainder of the participants in Sample 14 was recruited through authors' professional networks and volunteered to complete the survey. Samples 2, 6, 8, 9, and 12 were relatively culturally homogeneous, while other samples are multicultural, represented by larger numbers of country of birth.

[4]The details of this analysis are available from the first author.

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APPENDIX A

SFCQ Scale

Instructions: Below are 10 statements about one's experience when interacting with people from other cultures. Please indicate to what extent each of the following statements describes you.

1	2	3	4	5
Not at all	A little	Somewhat	A lot	Extremely well

1. I know the ways in which cultures around the world are different. (*K*)
2. I can give examples of cultural differences from my personal experience, reading, and so on. (*K*)
3. I enjoy talking with people from different cultures. (*S*)
4. I have the ability to accurately understand the feelings of people from other cultures. (*S*)
5. I sometimes try to understand people from another culture by imagining how something looks from their perspective. (*S*)
6. I can change my behavior to suit different cultural situations and people. (*S*)
7. I accept delays without becoming upset when in different cultural situations and with culturally different people. (*S*)
8. I am aware of the cultural knowledge I use when interacting with someone from another culture. (*M*)
9. I think a lot about the influence that culture has on my behavior and that of others who are culturally different. (*M*)
10. I am aware that I need to plan my course of action when in different cultural situations and with culturally different people. (*M*)

K = Knowledge Item.
S = Skill Item.
M = Metacognition Item.

APPENDIX B

Measures Used in Validating SFCQ

EQ was measured by the 16-item EI scale developed by Wong and Law (2002) on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Internal consistency reliability as measured by Cronbach's α was 0.88.

Personality was measured on the Big Five personality traits (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness) with 50 marker items from the International Personality Item Pool (Goldberg, 1992). Each personality characteristic was measured by 10 items on a 5-point Likert scale (1 = very inaccurate, 5 = very accurate). Internal consistency reliability as measured by Cronbach's α was $\alpha = 0.88$ for Extraversion, $\alpha = 0.81$ for Agreeableness, $\alpha = 0.87$ for Neuroticism, $\alpha = 0.81$ for Openness, and $\alpha = 0.81$ for Conscientiousness.

Intercultural effectiveness was measured by three items tapping key aspects of effectiveness in a cross-cultural context with a scale developed by Thomas et al. (2012) of specific relevance to the validation of cultural intelligence. This approach is based on research on successful adjustment to a foreign culture (Brislin, 1981; Cushner & Brislin, 1996; Ruben & Kealey, 1979) and expatriate adjustment and performance (e.g., Aycan, 1997; Tung & Varma, 2008). The literature in these areas has summarized the characteristics of effective intercultural interaction in an organizational context as (a) good personal adjustment indicated by feelings of contentment and well-being when interacting with culturally different others, (b) development and maintenance of good interpersonal relationships with culturally different others, and (c) the effective completion of task-related goals in an intercultural context. Based on this definition of intercultural effectiveness the 3-item scale was used to tapping each of the three elements. Responses were provided on a 5-point scale (1 = disagree strongly, 5 = agree strongly). The internal consistency reliability of the 3-item scale as measured by Cronbach's α was 0.59. Given the breadth (high bandwidth) of the construct, we were not surprised with this level of internal consistency. Bandwidth is the amount of information obtained,

while fidelity is the consistency of information. The idea of balancing bandwidth and fidelity in measures of this type has been widely discussed and has generally had broad acceptance (see, e.g., Chen, Meindl, & Hunt, 1997).

Sociocultural acculturation and adaptation was measured with two instruments in two different samples. We measured sociocultural acculturation with 20 items from the Acculturation Index (Ward & Rana-Deuba, 1999) in Sample 6 (Indonesian migrants in Australia). This scale measures how similar immigrants' experiences and behaviors are to locals in the host country evaluated on a 7-point Likert scale (1 = not at all similar, 7 = very similar). Internal consistency reliability as measured by Cronbach's α was 0.97. We used 20 items from the Sociocultural Adaptation Scale (Ward & Kennedy, 1999) in Sample 7 (international students in Australia). This scale measures the extent of difficulty people experience in a number of areas in the host culture, such as making friends and following rules, using a 5-point Likert scale (1 = no difficulty, 5 = extreme difficulty). Internal consistency reliability was 0.96.

Ethnocentrism was measured by the Generalized Ethnocentrism Scale developed by McCroskey and Neuliep (Neuliep, 2002; Neuliep & McCroskey, 1997). This scale contains 22 items (including 15 scoring items and 7 distractors) with a 5-point response scale (1 = strongly disagree, 5 = strongly agree). It measures a person's ethnocentrism regardless of his or her cultural background. Internal consistency reliability as measured by Cronbach's α was 0.90.

Job performance was measured by a 4-item, self-rating scale consistent with similar measures used in previous studies (see Fletcher, Major, & Davis, 2008; Halbesleben, Wheeler, & Paustian-Underdahl, 2013; Shore, Cleveland, & Goldberg, 2003). Participants indicated how they felt their supervisor would rate their (1) overall performance, (2) problem solving performance, (3) leadership effectiveness, and (4) communication effectiveness on a 4-point scale (anchored by 1 = below average to 4 = outstanding). Internal consistency reliability as measured by Cronbach's α was 0.81.

Attribution accuracy was measured by participants' responses to the behavior of a protagonist depicted in two short videos. The two videos were scripted and filmed (see Thomas et al., 2012) based on scenarios derived from a large-scale survey (Smith & Hecker, 2006) of the most frequent failures in intercultural interactions. For example, one video involved indirect vs direct communication behavior

and interpersonal space differences. Prior to filming, the scripts were pretested in two multicultural focus groups. Based on these reactions and the reactions of the multicultural research team, scripts were modified to convey a sense of mundane realism (Enzle & Schopflocher, 1978). The short videos (about 2 min each) were made by a professional film company and employed professional actors. Subsequent responses to the videos by focus groups confirmed the realism of the scenarios depicted.

The four choices of response to the video were constructed in a similar manner to the development of the choices offered in the original culture assimilator (Fiedler, Mitchell, & Triandis, 1971). The correct response among the four choices was established by an international panel of experts on intercultural behavior. The accuracy of participants' scores was the sum of correct responses ranging from 0 to 2.

Demographics: Participants reported their age, gender, education level (1 = primary school, 2 = some secondary (high) school, 3 = secondary (high) school, 4 = some post-secondary (university/college/polytechnic), 5 = university degree, 6 = post-graduate degree (e.g., Masters, Doctorate, LLD, MD), country of birth, whether they were born in the same country as their parents, their parents' country of birth, number of languages they speak other than their native language (1 = none, 2 = one, 3 = two, 4 = three or more), number of countries in which they have lived (1 = one country, 2 = two to three different countries, 3 = four to five different countries, 4 = over five different countries) and visited (1 = none, 2 = one country, 3 = two to three different countries, 4 = four to five different countries, 5 = over five different countries), whether they have a close friend from another culture (1 = yes, 2 = no), whether their best friend is from another culture (1 = yes, 2 = no), and whether they interact with people from other cultures at work (1 = yes, 2 = no).

ABOUT THE AUTHORS

David C. Thomas is the Beedie Chair and Professor of International Management at Simon Fraser University, Vancouver, Canada. He is the author of 10 books (including the best-selling *Cultural Intelligence: People Skills for Global Business*, Berrett-Koehler, and the award winning *Cross-Cultural Management: Essential Concepts*, Sage Publications). His numerous journal articles on cross-cultural management have appeared in the major journals in the field.

Yuan Liao is an Assistant Professor in the Managing People in Organizations Department at IESE Business School, Spain. She earned her PhD from the Beedie School of Business at Simon Fraser University. Her current research interests include cultural intelligence, regulatory focus, cross-cultural performance management, psychological contract, and multiculturalism.

Zeynep Aycan is Professor of Psychology and Management at Koç University, Turkey. She received her PhD from Queen's University, Canada and spent 2 years at McGill University as a postdoctoral research associate. She is a Fellow of SIOP and APS. Her research interests include cross-cultural management, culture and HRM practices, leadership, and work–life balance.

Jean-Luc Cerdin is Professor of Human Resource Management at ESSEC Business School, France. He has served as a visiting professor at Rutgers University and University of Missouri St-Louis, and a visiting scholar at Wharton. His research interests include expatriate management, career management, and international human resource management. Most recently, he has been working on global talent management.

Andre A. Pekerti is a Senior Lecturer at The University of Queensland Business School. He is a Christian of Indonesian–Chinese heritage, who grew up in Jakarta, Southern California and New Zealand; he is naturalized in New Zealand and Australia. His research interests include: individual adjustment to cultures, development of multi-method assessment on n-Culturals and cultural intelligence; career development; organizational communication and attribution; servant leadership.

Elizabeth C. Ravlin is on the faculty of the Darla Moore School of Business, University of South Carolina. She received her PhD from Carnegie Mellon University. Her research examines multicultural interactions and interpersonal and team processes in organizations. Her publications have appeared in such outlets as *Journal of International Business Studies, Journal of Management*, and *Journal of Applied Psychology*.

Günter K. Stahl is a Professor of International Management at WU Vienna University of Economics and Business, and formerly a Professor of Organizational Behavior at INSEAD. His areas of interest include leadership, corporate social responsibility, and the sociocultural processes in international teams, alliances, mergers and acquisitions, and how to manage people and culture effectively in those contexts.

Mila Lazarova is an Associate Professor of International Management at Beedie School of Business, Simon Fraser University in Vancouver, Canada. Her research interests include expatriate management, with a focus on repatriation and the career impact of international assignments; work–life balance issues related to assignments and organizational management of global careers. She is the Canada Research Chair in Global Workforce Management and a Director of the Centre for Global Workforce Management.

Henry Fock is an Associate Professor of Marketing at the Hong Kong Baptist University. His research interests include cross-cultural management, services marketing, and affinity marketing. His publications have appeared in the *Journal of International Business Studies, Journal of Cross-Cultural Psychology, International Journal of Research in Marketing*, and *Journal of Advertising*.

Denni Arli is currently a Lecturer at the Department of Marketing, Griffith University, Australia. He holds a PhD in Marketing from University of New South Wales, Australia. His research interests include consumer ethics, social marketing, and digital marketing.

Miriam Moeller is a Lecturer of International Business in the UQ Business School at the University of Queensland, Australia. Her research interests include international human resource management in the context of global staffing practices. She has published in the *International Journal of Management Reviews, Journal of World Business, International Journal of Human Resource Management*, and *Journal of Business Research*, among others.

Tyler G. Okimoto is a Senior Lecturer in Management at the University of Queensland Business School. His research investigates threats to belongingness/status, with a focus on how such threats affect identification and psychological engagement within a group. His work has implications for improving interpersonal and intergroup relations in the aftermath of conflict.

Fons van de Vijver holds a Chair in Cross-Cultural Psychology at Tilburg University, the Netherlands, and has honorary positions at North-West University, South Africa, and the University of Queensland, Australia. He has (co-)authored over 400 publications, mainly on cross-cultural psychology. He is the former editor of the *Journal of Cross-Cultural Psychology*. He is President of the *European Association of Psychological Assessment* and President-Elect of the *International Association for Cross-Cultural Psychology*.