# 2 Cultural Intelligence

**Two Bowls Singing** 

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# Introduction

Cultural intelligence (CQ) refers to an individual's and an organization's capability to function effectively in situations characterized by cultural diversity (Ang & Van Dyne, 2008; Earley & Ang, 2003). Developed at the turn of the century, CQ forges new research directions for scholars, and offers new solutions to organizations. In terms of research, scholars from more than 20 academic disciplines (including management, social sciences, economics and finance, arts and humanities, decision sciences, engineering, and medicine) have cited CQ in journals, proceedings, and book chapters. CQ has spawned doctoral theses across the myriad disciplines.

Beyond academia, CQ, especially its measurement (Ang, Van Dyne, Koh, Ng, Templer, Tay, & Chandrasekar, 2007; Van Dyne, Ang, Ng, Rockstuhl, Tan, & Koh, 2012) also shapes the policies and practices of global human capital across a wide range of industries. These industries include aviation, consulting services, counselling and mental health, education, finance, high tech, food, real estate, oil and gas, etc.; as well as in government and nonprofit sectors (e.g., armed forces, education, judiciary courts, public service, and religious missions). As of now, more than 100,000 people across 161 nations have received their CQ profile via the Cultural Intelligence Survey (CQS; Ang, Van Dyne, Koh, Ng, Templer, Tay, & Chandrasekar, 2007) or the expanded CQS (E-CQS; Van Dyne, Ang, Ng, Rockstuhl, Tan, & Koh, 2012), the first set of validated instruments measuring CQ.

The rigor and impact of my research has resulted in a number of awards. They include four prestigious awards for my scientific leadership and achievements: (1) the Distinguished Leadership Award for International Alumni (University of Minnesota); (2) the Walter F. Ulmer, Jr. Applied Research Award (Center for Creative Leadership, USA); (3) the inaugural Nanyang Award for Research and Innovation in the Social Sciences—the highest recognition given to an outstanding faculty member at the university and the first awarded to a social scientist; and (4) in September 2019, installation as Distinguished University Professor at Nanyang Technological University (NTU), an honor conferred to five faculty members to date at NTU for their extraordinary scholarly achievements across multiple research disciplines and global recognition. I have also won awards from the Academy of Management, the American Psychological Association, the Association of Computing Machinery, and others.

"Two bowls singing," the subtitle of this chapter, symbolizes the resonance of CQ research with scientists (bowl 1) and practitioners (bowl 2). A singing bowl vibrates and produces a long-lasting resonant tone when struck by a mallet. In the physical sciences, resonance is a phenomenon that occurs when the frequency at which a force is applied is nearly equal to one of the natural frequencies of the system on which it acts. This causes the system to oscillate with larger amplitude than when the force is applied at other frequencies. In a similar fashion, striking the right chords with both target audience groups—scientists and practitioners—is important. Scientists primarily address the "what" and the "why" of phenomena, whereas practitioners focus on resolving the "how" of solving problems in their environment.

Importantly, the two bowls reinforce and impact each other in "sympathetic resonance", where a vibratory body responds to the external vibrations of another body that shares a harmonic similarity. In this context, the



Figure 2.1 Two Tibetan Singing Bowls. Source: Standard License from ShutterStock. Also, watch whiteboard: https://www.youtube.com/ watch?v=hm5Fa9x3GaM

"science bowl" excites the "practice bowl" through offering evidence-based practices for developing culturally intelligent individuals and organizations. Conversely, the "practice bowl" energizes the "science bowl" through practice-based evidence, where practice reveals meaningful phenomena and problems that stimulate new scientific inquiry and evidence on CQ (Rousseau & Gunia, 2016). Hence, the metaphor of the two bowls singing and their sympathetic resonance underscores the symbiosis between science and practice.

For the two bowls to "sing," they need to rest on a solid base. The solid base involves institutional building and community building to sustain the research beyond individual researchers. Building institutions, such as the Center for Leadership and Cultural Intelligence (the world's first research center on CQ) and the Culture Science Institute, both at the Nanyang Business School, attract resources such as funding, faculty members, and postdocs with deep expertise on culture science, PhD students interested in culture research, and opportunities for research collaborations with organizations. Growing the community of scientists and practitioners interested in CQ bridges both the scientific and practice realms and enables the two bowls to sing in harmony. Thus, the wooden base signifies the critical enablers (institution and community building) that advance the impact of CQ exponentially beyond what a single or even a few scientists can achieve.

In this chapter, I reflect on my journey and approach to starting and sustaining the resonance of CQ. I've organized the chapter in five parts. First, I describe the genesis of CQ. In the second and third sections, I describe how I strike the "science bowl" and the "practice bowl," respectively. Fourth, I share the importance of institution and community building as a metaphorical "base" for the two bowls. Fifth, I conclude with my future aspirations for the science and practice of CQ.

# The Genesis of Cultural Intelligence

#### Pre-2000: The Y2K Bug

I started out my career in the early 1990s focusing on solving problems faced by the IT profession, which faces unique challenges. With the rapid advances of technology, IT professionals often wrestle with obsolescence of their technical skills. Moreover, the IT profession is not just a technical profession but also a helping profession, since IT professionals work with a variety of stakeholders to solve IT problems in organizations. These factors create substantial performance problems for IT professionals and the organizations that employ them. The idea of CQ struck me in 1993, when I got involved with a range of organizations in aviation, finance, and other industries, to solve the "Y2K" problem. Many organizations at that time were revamping their IT systems so as to avoid this problem—issues related to the formatting and storage of data involving dates, as many IT systems had represented four-digit years with only the final two digits.

*From cognitive ability (IQ) to practical intelligence.* I collaborated with these organizations to help them select effective programmers. Instead of focusing only on technical competence and cognitive ability, I examined "practical intelligence," as comprising four capabilities: managing self, task, career, and others (Sternberg, Forsythe, Hedlund, Horvath, Wagner, Williams, Snook, & Grigorenko, 2000). In the context of IT professionals, managing others includes managing six different stakeholders: (1) sponsors, (2) clients, (3) end-users, (4) supervisors, (5) peers, and (6) subordinates.

From practical intelligence to cultural intelligence. While examining practical intelligence, I discovered a new challenge faced by IT professionals. Although the programmers possessed good technical skills, they could not always work with others from different cultures. For instance, one organization I worked with hired many IT programmers from Australia, China, India, Malaysia, the Philippines, Vietnam, and elsewhere to debug the Y2K problem and to update its software applications. Differences in working norms and habits created huge conflicts between the local management and the programmers, as well as among programmers from different cultures. The powerful yet invisible role of culture struck me—how do people with vastly different norms and habits due to their cultural backgrounds work effectively with one another? I realized the need for a different type of intelligence, and began my foray into research on culture and intelligence.

#### Culture

*Culture* refers to the shared values, norms, and practices of a group of people. The late Harry Triandis, who was the "father" of cross-cultural psychology, visited NTU several times and played an instrumental role in my grounding in culture research. His research focused on cross-cultural comparisons and laid an important foundation for understanding intercultural challenges. For instance, his treatise on subjective culture (Triandis, 1972) provided a comprehensive model to explain how distal factors (such as physical environment and historical events) influence more proximal macro factors (such as

economic activities and labor structure), which in turn shape pancultural psychological processes that create subjective cultures.

## Intelligence

The field of intelligence dates back more than a century, beginning with the development of the first IQ test by French psychologists Alfred Binet and Theodore Simon. Since then, scholars have long debated the nature of intelligence. Sternberg (2019: 23) noted that "intelligence has been used for more than a century to refer to a fairly standardized set of cognitive abilities." Contemporary research on intelligence now embraces a much wider view of intelligence that goes beyond a singular general intelligence (g) factor, and extends beyond academic settings. Early examples of contemporary views of intelligence include multiple intelligences (Gardner, 1993), emotional intelligence (Mayer & Salovey, 1993), and practical intelligence (Sternberg et al., 2000).

Despite the diverse views held by intelligence scholars, "almost all definitions of intelligence . . . agree on one thing—that intelligence crucially involves the ability to adapt to the environment" (Sternberg, 2019: 23). In this regard, the different forms of intelligences enable individuals to adapt to the demands of different environments. For instance, IQ focuses on the academic environment; EQ on the emotional environment; and practical intelligence on the real-world context of solving practical problems.

Further, Sternberg's (1986) multiloci framework of intelligence proposed that meeting the demands of any environment requires not only mental capabilities, but behavioral capabilities as well. Mental capabilities include metacognition (processes used to acquire and understand knowledge); cognition (knowledge structures); and motivation (processes to direct and sustain energy on a particular task). Behavioral capabilities refer to outward manifestations or overt actions required to accomplish the task effectively.

# Cultural Intelligence—The Birth of a New Construct

My research on cultural intelligence integrates two bodies of research culture and intelligence; and extends existing faceted models of intelligence (e.g., emotional intelligence, practical intelligence, multiple intelligences) into the intercultural realm. Cultural Intelligence research addresses the question: *Why are some individuals and organizations more effective in crossing cultures than others? How do they become effective?* This question shifts the dominant focus of cross-cultural psychology and management research in the twentieth century from a comparative approach (i.e., why and how do cultures differ) to a capability approach. Defining what this capability entails to help people and organizations bridge cultural differences marks the major contribution of my research on CQ.

My sabbatical after Y2K offered me a timely space to explore and integrate the two established bodies of research on culture and intelligence. Christopher Earley and I secured a two-book contract with Stanford University Press to explicate this new construct. The two books targeted two different audiences the first book scientists, and the second practitioners. This challenged me to strike two bowls.

Some people have asked me, "Why did you embark on the research with a book, instead of writing a conceptual piece for a journal?" Writing a book freed me from the constraint of page and word limits required by journals, and allowed me to develop ideas of CQ in greater depth and breadth. I drew from multiple disciplines—intelligence, culture, cultural anthropology, cross-cultural psychology, and cross-cultural communication—to develop the ontology of CQ. Unlike some authors who write what they know, I wrote to discover. The writing process exhilarated and inspired me to dig more deeply into the CQ phenomenon.

## **Bowl 1: The Science Bowl**

Scientists focus on the rigor of scientific inquiry, which centers on the "what" and the "why" questions of a construct or a phenomenon. As with any study of a new construct, I first defined the essential concept of CQ (what is CQ and how it was similar to and different from other constructs) and its nomological network. Next, I developed a valid measure of CQ in order to test theories and advance empirical research.

I articulated three major principles, which I describe as three "strikes" of the science bowl. They are (1) the conceptualization of CQ; (2) the measurement of CQ; and (3) the nomological network of CQ.

## Strike 1: The Conceptualization of Cultural Intelligence

The extant research on cross-cultural competencies offers a wide array of frameworks and measures to assess cultural competencies. (See the review by

Leung, Ang, & Tan, 2014.) A challenge to this body of work, however, is the "jingle and jangle" of constructs—where constructs with the same meaning are labeled differently while constructs with different meanings are labeled similarly (Gelfand, Imai, & Fehr, 2008).

Rather than adopting the inductive approach popular in the extant literature (see Matsumoto & Hwang, 2013), I conceptualize CQ using a theoretically deductive approach. First, I define CQ as a set of capabilities of individuals, teams, or organizations that enable them to function effectively in culturally diverse settings. As such, CQ refers to a culture-general construct that is independent of specific cultural settings (see also Ng & Earley, 2006). Moreover, unlike traditional notions of cultural competence that focus on cultural knowledge and skills (i.e., demonstrated behaviors), CQ emphasizes dynamic and motivated processing of information in culturally novel and diverse settings via two additional capabilities: metacognition and motivation (Ang, Ng, & Rockstuhl, 2020a).

Second, drawing from the multiple-loci-of-intelligence framework (Sternberg, 1986), Linn Van Dyne and I (2008) have proposed four distinct dimensions: (1) metacognitive CQ (i.e., a person's capability to acquire and make sense of cultural knowledge); (2) cognitive CQ (i.e., a person's know-ledge about how cultures are similar to and different from each other); (3) motivational CQ (i.e., a person's capability to direct attention and sustain energy toward learning to function effectively in intercultural contexts); and (4) behavioral CQ (i.e., a person's capability to exhibit a wide repertoire of verbal and nonverbal behaviors in intercultural interactions; see also, on code-switching, Molinsky, 2007).

Building on this individual-level construct, Andrew Inkpen and I advanced a firm-level conceptualization of CQ (Ang & Inkpen, 2008). We asked this question, "Why are some firms more efficient and effective in their international ventures than others?" Drawing on a resource-based view of the firm, we proposed three components of firm-level CQ: (1) managerial CQ (i.e., the CQ of the top management team); (2) competitive CQ (i.e. the firm's capability to identify, calibrate, and manage international competition); and (3) structural CQ (i.e., the development of routines and norms to govern intra- and interorganizational interfaces).

#### Strike 2: Measurement

With the conceptualization of CQ, I developed valid measures of CQ to advance empirical research and promote evidence-based practices. Here I describe the rigorous methodological process we undertook in developing the multiple probes of CQ.

*The original 20-item Cultural Intelligence Survey (CQS).* Van Dyne and I developed the first psychometric instrument for assessing CQ (Ang et al., 2007) based on a four-factor model. We validated and triangulated our measure following a rigorous scale development and validation process.

First, we developed operational definitions for each of the four factors of CQ based on a thorough review of the relevant literatures and interviews with eight global executives. Second, we generated an initial item pool of 53 items to allow for psychometric refinement. Third, we asked a panel of scientists and executives to rank-order the items in terms of clarity, readability, and fidelity. We retained the 10 best items for each CQ factor, resulting in an initial 40-item version.

We then refined and validated the scale in a series of six studies. In Study 1, with participants from Singapore, we assessed the factor structure of the scale using confirmatory factor analyses (CFA). We deleted items with high residuals, low factor loadings and small standard deviations or extreme means, and low item-to-total correlations. This resulted in a 20-item version that demonstrates discriminant validity of the four factors, and high internal consistencies (ranging from .71 to .85). In Study 2, we replicated the psychometric properties of the 20-item scale with a different sample from Singapore.

In the next three studies, we tested the generalizability of the 20-item scale across time (Study 3), countries (Study 4), and methods (Study 5). In Study 3, we examined the longitudinal measurement invariance of the CQS across a four-month period using CFA. This involved testing for invariance of factor loadings, intercepts, and means. Results showed that the CQS demonstrated factorial and intercept invariance, suggesting that the scale has high test-retest reliability. At the same time, we found that latent means changed over time, supporting our conceptualization of CQ as a malleable construct that can be developed. In Study 4, we assessed the equivalence of the CQS across a Singaporean and US samples using a sequential test of model invariance. Results demonstrate strong support for the four-factor structure in both samples.

In Study 5, we tested the generalizability of the self-report measure of CQS with an observer measure of CQS using multitrait, multimethod (MTMM) and CFA. In a sample of US executives, we obtained self-reports and observer reports of their CQ and interactional adjustment. For the CQS to be generalizable across methods, results from both self-reported and observer-reported measures would need to be similar. The results demonstrated both convergent and discriminant validity of the CQS. For instance, self-ratings and

observer-ratings of all the four factors were significantly correlated (r = .41 to r = .54), suggesting convergent validity. Further, these correlations are higher than correlations of the validity diagonal, suggesting discriminant validity. Results of the CFA MTMM analyses further show that traits explained 43% of the total variance while methods explained only 22%, confirming the generalizability of the scale across self-ratings and observer ratings.

In addition to the reliability and factor structure, we tested the criterion validity of the CQS in Study 5. The results showed that self-rated CQS predicted observer-rated interactional adjustment. Similarly, observer-rated CQS also predicted self-rated interactional adjustment. These results provide strong evidence for the predictive validity of CQS.

In Study 6, we tested the incremental predictive validity of the CQS, controlling for cognitive ability and EQ. We measured three outcomes: cultural judgment and decision-making (CJDM), interactional adjustment, and mental well-being. Our results demonstrated (1) the four factors from the outcomes had discriminant validity; (2) metacognitive CQ and cognitive CQ predicted CJDM; and (3) motivational CQ and behavioral CQ predicted interactional adjustment and well-being, controlling for demographics (age, sex), cognitive ability, and EQ.

The 37-item E-CQS. Following the 20-item CQS, my colleagues and I developed an expanded version to measure subdimensions of the four CQ factors (Van Dyne et al., 2012). The E-CQS comprises 11 subdimensions. Specifically, metacognitive CQ includes planning, awareness, and checking. Cognitive CQ encompasses both cultural-general and culture-specific knowledge. Motivational CQ distinguishes between intrinsic interest, extrinsic interest, and self-efficacy for intercultural encounters. Finally, behavioral CQ includes flexibility in verbal behaviors, nonverbal behaviors, and speech-acts.

Specifying subdimensions of the four broad CQ factors facilitates (1) more nuanced theorizing, especially in terms of explicating underlying processes of CQ effects; (2) more precise matching of cultural intelligence predictors and outcomes; and (3) identification of concrete ways to train cultural intelligence. Importantly, the distinction between culture-general and culture-specific knowledge in cognitive CQ enables a more contextualized application of CQ to different domains. *Culture-general knowledge* refers to understanding of universal (etic) elements of culture, as measured in the original CQS. By contrast, context-specific knowledge refers to understanding of domain-specific (emic) norms and expectations of a specific group of people. Domains could be a country (e.g., how do people decline a request in Japan) or a specific subculture based on professions (e.g., business managers, teachers, diplomats, etc.) or demographic groupings (e.g., age, gender, etc.). Incorporating

context-specific knowledge offers a "plugged and played" source for more precise predictions in different contexts.

Using data from 286 individuals from more than 30 countries, we conducted CFA to assess the discriminant validity of the subdimensions within each CQ factor. Results showed that the data fit well to the hypothe-sized model for each factor. We also conducted CFA to assess the 11-factor vis-à-vis the 4-factor structure. Results showed that the fit of the former, with four correlated second-order factors, was better than the latter, with four correlated first-order factors. This provides support for the 11 subdimensions of the four-factor CQ.

*Performance-based measures of CQ.* The CQS and E-CQS are report-based measures of CQ. Responding to Gelfand and colleagues' (2008) call for methodological diversity, Rockstuhl, Ng, Lievens, Van Dyne, and I embarked on developing situational judgment tests (SJTs) as a form of performance-based measure of CQ (Rockstuhl, Ang, Ng, Lievens, & Van Dyne, 2015). We chose to develop multimedia SJTs over the more common text-based SJTs so as to achieve greater task stimulus fidelity. Moreover, since "life is not multiple choice," we adopted a constructed-response (i.e., open-ended) format rather than a selected-response (i.e., closed-ended) format for greater response fidelity. That is, participants had to watch short video scenarios of intercultural conflict in the workplace, and then describe what they would do to resolve the conflict.

Our research shows promising predictive validity of the SJT. In three studies involving students and professionals working in multicultural teams, we found that SJT performance predicted peer-rated task performance and citizenship behaviors, controlling for the Big Five personality traits, general cognitive ability, international experience, and demographic characteristics (Rockstuhl et al., 2015).

Another performance-based measure is the assessment center. We developed the CQ assessment center with George Thornton, who visited the center. The assessment center exercise assessed behavioral CQ: the ability of participants to vary their behaviors to suit the cultural context. To do so, participants played the role of a leader who had to give feedback to two subordinates, one from a Western culture with a direct style of communication, the other from an Asian culture with an indirect style of communication. We hired and trained professional Caucasian and Asian actors to enact the roles of the subordinates based on actors' assigned cultural profiles. We then video-recorded participants' interactions with the two subordinates and coded their variations in speech-acts and verbal and nonverbal behaviors across the two episodes of interaction.

#### Strike 3: A Nomological Network

Understanding how CQ is related to other constructs is key to establishing its construct validity. Linn Van Dyne and I proposed a CQ nomological network in the *Handbook of Cultural Intelligence* (Ang & Van Dyne, 2008). A metaanalysis involving 167 empirical studies and 199 independent samples (N=44,155) reveals that CQ relates meaningfully to a diverse range of constructs (Rockstuhl & Van Dyne, 2018). I will review empirical evidence of the nomological network of CQ briefly here (see also Ang, Ng, & Rockstuhl, 2020b; Van Dyne, Ang, & Tan, 2019).

Antecedents. Studies show that Big Five personality traits and international experience predict CQ (Ang, Van Dyne, & Koh, 2006; Rockstuhl & Van Dyne, 2018) but the strength of these relationships depends on boundary conditions. For example, Li, Mobley, and Kelly (2013) found that learning style moderates the relationship between experience and CQ, such that people with divergent learning styles are more likely to translate their international experiences into higher CQ. Chao, Takeuchi, and Farh (2017) have suggested that implicit culture beliefs affect how individuals develop their CQ during international assignments via cultural adjustment.

*Correlates.* Studies demonstrate that CQ is distinct from, and related to, other forms of intelligence such as IQ and EQ (e.g., Ang et al., 2007; Rockstuhl & Van Dyne, 2018). Other correlates of CQ include global identity (Erez, Lisak, Harush, Glikson, Nouri, & Shokef, 2013)—the sense of belongingness to a global versus a local community; and context dependence (Adair, Buchan, Chen, & Liu, 2016)—an individual's attentiveness to contextual cues during communication.

*Outcomes.* Research demonstrates that CQ predicts many outcomes. Examples include (1) sociocultural adjustment (e.g., Ang et al., 2007; Chen, Kirkman, Kim, Farh, & Tangirala, 2010; Firth, Chen, Kirkman, & Kim, 2014; Volpone, Marquardt, Casper, & Avery, 2018); (2) cultural judgment and decision-making (Ang et al., 2007); (3) job performance, including task (e.g., Chen, Liu, & Portnoy, 2012) and contextual (Ng, Van Dyne, & Ang, 2019) performance; (4) leadership performance (e.g., Groves & Feyerherm, 2011; Rockstuhl, Seiler, Ang, Van Dyne, & Annen, 2011); (5) negotiation effectiveness (e.g., Imai & Gelfand, 2010); (6) creativity (Chua & Ng, 2017; Xu & Chen, 2017); and (7) cultural learning (e.g., Morris, Savani, & Fincher, 2019).

Metaanalytic structural equation modeling by Rockstuhl and Van Dyne (2018) showed that both a four-factor CQ model and a general latent CQ model predicted observer-rated task performance via two mediators: sociocultural adjustment and cultural judgment and decision-making. The results of the metaanalysis suggest a bifactor model of CQ, where the CQ factors provide both holistic and unique information.

### The Resonance of the Science Bowl

Here I will discuss how the three "strikes" of the science bowl—the conceptualization, measurement, and nomological network of CQ— resonated with and contributed to the scientific community.

*Conceptualization.* In a review of 100 years of culture research in the *Journal* of *Applied Psychology*, Gelfand, Aycan, Erez, and Leung (2017: 523) called for the focus of research to shift from cross-cultural differences to cross-cultural interactions, and for researchers to be "in closer contact with the cultural intelligence and diversity management literatures to develop theories capturing processes and outcomes of cross-cultural interactions." Hence, CQ's paradigmatic shift from cross-cultural difference to cross-cultural interactions two decades ago continues to resonate with scientists today.

Gelfand et al. (2008) also highlighted three notable contributions of CQ. First, CQ "breaks new ground" by integrating culture and intelligence. In doing so, CQ broadens the extant intelligence literature by addressing the demands of a culturally diverse environment. Second, the CQ construct offers theoretical parsimony, synthesis, and coherence as it captures the different bases of capabilities (cognitive, metacognitive, motivational, and behavioral) that many other cultural competency frameworks do not. Third, CQ also offers theoretical precision and cleans up the "jingle and jangle" of the extant cultural competence literature.

*Measurement.* This stream of research on CQ measurement offers three contributions to the field. First, the 20-item CQS ignited an exponential growth of empirical research on CQ by offering scientists a validated measure of CQ. Publishing the full scale in an article (Ang et al., 2007) allowed other researchers to incorporate CQ into their research questions and design their studies more readily, thus allowing us to accumulate and advance our knowledge of CQ. Indeed, Rockstuhl and Van Dyne's (2018) metaanalysis showed that in a relatively short span of 10 years, the field has accumulated a significant number of studies examining the predictive validity of CQ using the CQS (199 independent samples; N=44,155).

Second, the CQS provided researchers with a valid measure to assess CQ. Kraimer, Bolino, and Mead (2016: 90) remarked that the CQ framework and the CQS "prompted recent, highly cited empirical research" in expatriation. In a comprehensive review of existing cultural competence measures, Matsumoto and Hwang (2013) concluded that the CQS is one of the three measures in the field that holds the most promising evidence for measuring cultural competence. This review shows that, consistently across studies conducted in different countries, results confirm the four-factor structure of CQ, and demonstrate high internal consistencies for the factors in the scale (above .70).

Third, the different probes of CQ (the report- and performance-based measures) allow for triangulation of findings, as well as offering choices for researchers depending on the outcomes of interest. I recommend that researchers choose the type of CQ measure they will use depending on their research question and design and the feasibility of the assessment.

The nomological network. Establishing the nomological network of CQ, especially in how CQ predicts outcomes, offers important construct validity evidence for the scale. Matsumoto and Hwang (2013: 856) remarked in their comparison of 10 cultural competence scales that "there is considerable evidence for the concurrent and predictive ecological validity of CQ with samples from multiple cultures." The explication of the CQ nomological network has also contributed to the advance of science by "connecting research across disciplinary borders," and—even within the field of management—"helps to integrate a broad number of topics" (Gelfand et al., 2008: 377). This is made possible by offering to researchers across different disciplines a common intellectual framework and validated measures of CQ.

## Challenges

Striking the "scientist bowl" is not without its challenges. The construct of CQ, as a "new kid on the scientific block," has raised many questions from reviewers concerning its nature. Here I share two significant ones we have encountered.

The nomenclature of intelligence. The influential economist John Maynard Keynes famously said, "The difficulty lies not so much in developing new ideas as in escaping from old ones" (cited in Shtulman, 2017: 252). I have experienced how old ideas could constrain the appreciation of new ideas. Reviewers and editors, reflecting the broader debate among psychologists about the meaning of the term "intelligence," raised concerns about our use of the "intelligence" label. This debate stems from the established tradition of research on IQ tests focusing on intelligence as a general cognitive ability (Sternberg, 2019). Proponents of this narrow view of intelligence questioned whether noncognitive capabilities such as CQ constitute a form

of intelligence. Sternberg (2019: 24) noted how, "despite the definition of intelligence as adaptation, the usual use of the term has little to do with adaptation.... 'Intelligence' has been used for more than a century to refer to a fairly standardized set of cognitive abilities."

Addressing reviewers' concerns on the nature of CQ requires a deep understanding of the huge body of research on intelligence. This includes understanding the historical context of research on intelligence and how researchers from diverse disciplines have defined and measured it. Recent reviews and integration of the diverse views of intelligence provided a strong theoretical basis for the conceptualization of CQ, in two ways (Sternberg, 2019). First, our definition of CQ as a capability to function effectively in culturally diverse settings (Earley & Ang, 2003) aligns with contemporary conceptualizations of intelligence as a person's adaptability to a specific environment (Sternberg, 2019). Sternberg has argued that "intelligence crucially involves the ability to adapt to the environment" and that "intelligence . . . always occurs in, and hence is mediated by, a cultural context" (2019: 23, 24).

Second, Sternberg's (1986) multiloci framework of intelligence at the molar (including metacognitive, cognitive, and motivational capabilities) and behavioral levels within a person offers the theoretical basis for conceptualizing the four factors of CQ (metacognitive, cognitive, motivational, and behavioral capabilities).

The discriminant validity of a new construct. A second common review point concerns the discriminant validity of CQ. Reviewers have often asked how CQ is distinct from related constructs such as other forms of intelligence, personality, and existing cultural competences. This reflects a common "growing pain" associated with "young" constructs like CQ.

To respond to reviewers' requests, we dug through the large and unsystematic body of literature on intercultural competencies and compared CQ with other intercultural competency models and instruments (Ang et al., 2007; Ang et al., 2020a; Leung et al., 2014). We also designed research studies to measure as many related constructs (e.g., IQ, EQ, personality, other crosscultural competencies, etc.) as possible to demonstrate discriminant validity and incremental predictive validity.

I credit the eventual breakthrough in the CQ research journey to our having the persistence and tenacity to respond to reviewers' questions and requests. As an editor and reviewer myself, I know that reviewers put in great effort to help authors strengthen their studies. Therefore, as an author, I treat every reviewer's points and suggestions seriously and with respect. Even if a reviewer's suggestion does not work, I find alternative ways to address

the underlying concern. I ensure that the revised manuscript addresses the weaknesses of the previous manuscript and emerges as a stronger study.

## **Bowl 2: The Practice Bowl**

Practitioners focus primarily on how CQ can solve their problems. To help it resonate with practitioners, I have adopted two major approaches: (1) conducting sustained inquiry and observations in organizations, and (2) designing evidence-based interventions.

## Strike 1: Sustained Inquiry and Observations in Organizations

Engaged scholarship involves close collaboration with organizations to understand a complex phenomenon and uses scientific inquiry to help them solve complex problems (Van de Ven, 2007). Here I discuss two strategies for working with organizations: conducting translational research and choosing collaborative relationships carefully.

*Conducting translational research.* Reaching out to organizations requires a different language. One significant difference between the practice audience and the science audience lies with the preference for in-depth case studies versus experiments. Practitioners often prefer case studies because they are richer in contextual details, which allows them to decide for themselves whether the case situation is like their own, and thus whether the findings— the "how"—truly apply to them.

In writing the second book in our two-book contract with Stanford University Press (Earley, Ang, & Tan, 2006), we relied more on vignettes and case studies of real intercultural challenges to bring out our points, rather than statistical results. Instead of expounding on the conceptual basis of CQ, the second book focuses on applying CQ in solving management problems, including how to succeed in global work assignments, how to build high-performing multicultural teams, and how to lead people from different cultures. Subsequently, I moved from writing practice-oriented materials myself to finding collaborators who can translate CQ research into accessible trade books. David Livermore is a key partner who successfully translated CQ research into accessible trade books to reach the practice community (e.g., Livermore, 2015).

We also disseminated our research to the practice community through conferences. Kok-Yee Ng and I organized our first CQ conference targeted at practitioners in Shanghai. As China was growing exponentially in its global trade, demand for CQ was also growing. Organizing this CQ conference was a cross-cultural adventure in itself, as it was conducted in Mandarin (which required us to use a translator). The conference succeeded in disseminating our work to a practice audience, as it attracted more than 400 practitioners and gained attention in the local press. Shortly after the conference, we received many requests for a Chinese version of our CQ scale. Not having completed our extensive validation of the scale, we scaled back on our outreach to practice. We were simply not ready.

*Choosing collaborative relationships with care.* Cultural intelligence caught the attention of many large multinational organizations once Stanford University Press released the first book. I received numerous requests from organizations expressing interest in applying CQ to their work. Many asked me to give a talk or conduct workshops for executives. Responding to all these requests was neither feasible nor effective. Instead, I prioritized my collaborations with industry. I worked with early adopters who seriously intended to nurture a long-term research and development partnership rather than organizations who wanted a one-shot intervention, such as giving a talk or conducting a workshop. Giving priority to long-term partnerships enables me to probe more deeply the problems and phenomena the organizations face, to design interventions and collect data to assess their impact, and to offer contextualized solutions to solve the organizations' real challenges.

Over the years, I have collaborated with a number of local and global organizations. Local organizations include the Singapore Armed Forces and the Public Service Division of the Prime Minister's Office. With these large organizations, Ng and I developed systematic and evidence-based leadership development interventions that were contextualized to the organizations' culture and leadership demands. Outside Singapore, we collaborated and worked with SAP Labs China (Shanghai) on working in global teams; with the International Air Transport Association (Switzerland) on designing its global leadership development and performance management systems; with the International Organization for Standardization (Switzerland) on global standards setting; and with Nippon Telephone and Telegraph (Japan) on developing an online e-learning module on CQ.

I have also extended my collaborations to work with educators, since the Ministry of Education in Singapore has designated cultural intelligence (global awareness and cross-cultural skills) as a key twenty-first-century

competency for students. I partnered with principals and teachers of elementary and middle schools to infuse CQ into their curriculum. This has required that we first develop capabilities in teachers to teach CQ. It has also required that we translate our research into age-appropriate concepts and materials so as to resonate with elementary and middle school students. Students now learn about CQ in different subject areas (e.g., second language, literature, social studies), inbound and outbound exchange programs, and servicelearning journeys.

## Strike 2: Designing Evidence-Based Interventions

Organizations and schools believe that CQ is important for the challenges of the twenty-first century. What they lack are systematic interventions to help develop CQ in their employees and students. Many have assumed that they could develop CQ in their leaders or students by merely exposing them to intercultural experiences, whether through an overseas assignment or working in multicultural teams.

To debunk this myth, Ng, Van Dyne, and I published a study in *Academy of Management Learning and Education* explaining why experience is not equal to experiential learning (Ng, Van Dyne, & Ang, 2009). We argued that CQ enhances leaders' ability to engage in the full cycle of experiential learning of concrete experiences, reflective observations, abstract conceptualization, and active experimentation. Further, we suggested how organizations can translate leaders' experiences into experiential learning through their policies and practices for global work assignments.

Two related research paradigms have influenced our thinking regarding the design of interventions for CQ development (see also Ng, Tan, & Ang, 2011; Ng et al., 2009): situated learning (Lave & Wenger, 1991) and experiential learning theory (Kolb, 2015). Both emphasize the importance of actual experiences for the development of complex capabilities such as CQ. Situated learning theory posits that "knowing" cannot be separated from "doing" and that working on authentic or realistic tasks facilitates learning (Lave & Wenger, 1991). Experiential learning theory provides an account of how individuals might develop their CQ from intercultural experiences. In particular, this theory suggests that learning occurs in a cycle of (1) engaging in concrete experiences, (2) reflecting critically on the experiences, (3) abstracting these reflections into general theories to guide future behavior, and (4) experimenting actively with the new behaviors to assess their effectiveness. Based on these theories, our interventions emphasize a combination of knowledge, powerful experiences, and feedback. For instance, in our long-term collaboration with the International Air Transport Association, the trade association that represents and leads the global aviation industry, we infused CQ into their Intercultural Leadership Engagement and Development Program—an intensive leadership program targeted at grooming high-potential leaders. Ng and I developed a multimedia case study that described the context, process, and outcomes of the association's transformation into a culturally intelligent organization (Ng & Ang, 2012), based on our theory on how firms' global culture capital (i.e., organizational mindset and routines) shapes their cosmopolitan human capital (i.e., CQ and intercultural experience) (Ng et al., 2011).

Evaluating the effectiveness of evidence-based interventions is essential in our collaborative partnerships with organizations. We have adopted quasiexperimental designs, such as the recurrent institutional cycle design (Campbell & Stanley, 1963), for interventions that are conducted on a cyclical basis (e.g., annual programs). We have collected self and observer CQ ratings before and after an intervention with different cohorts of participants. We have then assessed the different cohorts of data for measurement equivalence, before comparing the postintervention scores of a cohort with the preintervention scores of the next cohort (as a comparison, baseline measure) to assess the impact of the intervention. In addition to quasi-experimental designs, we have also adopted personbased analyses to identify distinct clusters of participants with differentiated growth. This approach not only offers more fine-grained insights into how different subgroups of participants benefit from the CQ intervention but also offers insights into factors that contribute to the different patterns of growth.

Our interventions extend beyond training and development to include selection. In one instance, we worked with a global organization that was going through a worldwide restructuring, where a number of local offices had to cease operations. The restructuring resulted in the redeployment of a group of employees to regional offices. Given that regional offices are more culturally diverse than local offices, the organization wanted to know whether CQ could predict who would perform better in regional offices. To address this question, we designed a study with the organization to assess employees' CQ using the multimedia SJT. Three months after employees were redeployed to the regional offices, we collected performance data from their new supervisors. Our results showed that employees who performed better in the multimedia SJT received higher performance ratings after three months into their jobs in the regional offices, thus demonstrating the value of the CQ multimedia SJT for selection.

# The Resonance of the Practice Bowl

The overwhelmingly positive response from industry early in my CQ journey demonstrated the resonance of the CQ concept with practice. Cultural intelligence shapes the global human capital policies and practices of multinational corporations in different ways. For instance, the International Air Transport Association adopted CQ as a key performance metric in their performance appraisal system. Through the Center for Cultural Intelligence in Michigan, organizations such as Coca-Cola, Google, IBM, MacDonald's, and Unilever have incorporated CQ into their talent management programs; and more than 100,000 individuals from over 161 nations have received their CQ profiles by completing the CQS or E-CQS. In addition, as many as 400 universities teach CQ in various programs, including study-abroad and MBA programs.

# Challenges

As we did with the science bowl, we faced challenges with striking the practice bowl. Practitioners value speed, while scientists value rigor. Organizations often want quick solutions to their problems, which poses a challenge to scientists' need for rigorous and evidence-based solutions. As a scientistpractitioner, I need to respect the timelines of organizations yet not succumb to their pressure by pushing out instruments or interventions prematurely. It is also important that I educate my practice-collaborators about the importance of designing interventions based on scientific principles of inquiry.

Another challenge arises from top leadership transitions in long-term projects. Typically CEOs stay for three to five years, while some of my projects span a decade. When the original sponsor of the project leaves the organization, the research team needs to socialize the new leader in the project. I have learned that developing a rigorous measurement system to demonstrate the "returns on investment" enables us to offer critical evidence to win over new management and gain their buy-in.

# The Wooden Base: Institutional and Community Building

Providing a stable base to support the two bowls is critical. Institution and community building draws valuable resources and opportunities and, more importantly, creates a larger ecosystem for disseminating, advancing, and sustaining the research on CQ. In 2004, Ng and I started the Center for Leadership and Cultural Intelligence at the Nanyang Business School. In operating a research center in a business school, it is imperative that we strike the science bowl and the practice bowl concurrently. The center's mission—to lead in the knowledge, assessments, and programs for growing culturally intelligent leaders and organizations—reflects this scientist-practitioner identity and focus on applied research.

Shortly after we founded the center, Professor Guan Ning Su, then president of NTU, recognized the potential impact of CQ research and unequivocally funded the center for our research. The grant enabled me to build a community of scientists through CQ conferences and competitive grants. For instance, we organized CQ conferences to gather culture scientists to push the boundaries of research on CQ. We awarded competitive grants to promote research on CQ, and we shortlisted candidates to present their research proposals. This strategy resulted in rigorous and creative research proposals on CQ. For example, Chen, Kirkman, and Kim's winning proposal on CQ in expatriate employees won the Best Paper Award at the 2009 Academy of Management conference and was subsequently published in the *Academy of Management Journal* (Chen et al., 2010).

Developing and sustaining any programmatic research requires close collaborative relationships with scientists and practitioners. Two criteria guide my choice of close collaborators—people who "sojourn" with me in this pilgrim's journey with CQ. First, I look for complementary fit—those who bring a fresh research perspective or question, a new discipline, or new content into existing research on CQ. Second, I look for people who are highly motivated in their pursuit of excellence (in science or in practice) as well as competent. Over the years, I have developed close collaborations with scientists and practitioners from more than 20 nations in North America, Europe, Asia, Australia/New Zealand, the Middle East, and elsewhere.

In 2009, I started another center, the Culture Science Institute, with former colleagues C. Y. Chiu and Ying-Yi Hong, which was funded by the NTU President at that time, Bertil Andersson. While the Center for Leadership and Cultural Intelligence focuses on applied research, the Culture Science Institute focuses on basic research on culture, at four levels of analysis—(1) culture and the brain (neuroscience), (2) culture and the mind (cognition), (3) culture and behavior, and (4) culture and society. These two centers complement each other in terms of the research questions addressed. Extending the spectrum of research on culture, the two centers work jointly to attract more culture scientists to the Nanyang Business School, and so the school supports

a vanguard of culture science experts, including cognitive scientists (e.g., Krishna Savani, Zou Xi) and neuroscientists (e.g., George Christopoulos).

The two centers also attract a number of postdocs and doctoral students from different parts of the world. To date, postdocs and PhD students from China, France, Germany, India, Japan, the Philippines, Portugal, South Korea, and the United States have come through the two centers. They bring diverse perspectives and extend my capacity to push new boundaries in our CQ research.

# The Future of Cultural Intelligence

As I enter the third decade of my journey, two ideas to create new resonance for the science and practice bowls excite me. I share these two ideas here.

# The Science Bowl: Cultural Intelligence 2.0

To date, CQ research examines intercultural interactions primarily through a horizontal differentiation lens. That is, they tend to focus on cross-cultural differences in the way people think, feel, and act as a result of socialization in different cultural environments. The horizontal differential lens emphasizes anxiety reduction and uncertainty due to unfamiliarity during intercultural interactions (Gudykunst, 1993).

The vertical differentiation lens offers a different and increasingly important perspective based on social injustice and status and power disparities (Bunderson & Van der Vegt, 2018). Status characteristics theory and status organizing process suggest that evaluations people make of others often result in unequal social interactions. Attributes such as nationality, ethnicity, and gender evoke inequality and power imbalance due to sociohistorical events such as colonialization, oppression, and marginalization. Vertically differentiated interactions create different concerns for members of the dominant group versus the minority groups. Building on this stream of research, I intend to broaden the conceptualization of CQ to embrace dynamics of vertical differentiation, from the point of view of both the dominant and minority groups.

#### The Practice Bowl: Culturally Intelligent Virtual Humans

Advances in information and communication technology create exciting opportunities to revolutionize CQ training. For instance, we can leverage artificial intelligence and immersive technologies such as virtual reality to develop culturally adaptive agents—interactive digital agents who can adapt their verbal and nonverbal behaviors according to different cultural norms.

Using culturally intelligent virtual humans to train and develop CQ in actual humans could offer several advantages. First, it would reduce the need for human trainers, making what is currently labor-intensive training more scalable and cost-efficient. Second, by offering an immersive experience, this kind of high-fidelity training would elicit trainees' reactions as though they were *in* the situation, as opposed to eliciting trainees' reactions *to* a low fidelity simulation. Third, the virtual humans could record and store interaction data, including the tracing of attentional and emotional processes of the trainee. This would allow for online real-time feedback to trainees to enhance their self-awareness and learning.

# Conclusion

I started the research on CQ in 2000. Twenty years later, I look back at this journey with satisfaction about three key contributions of my efforts. First, by integrating the science on culture and intelligence, I have catalyzed a paradigmatic shift from studying cross-cultural differences to studying intercultural capabilities. By anchoring the research in the multiloci theory of intelligence, I have offered a comprehensive yet parsimonious construct to define the cognitive, metacognitive, motivational, and behavioral bases of CQ. The wide-spread adoption of this paradigmatic shift in diverse academic disciplines demonstrates the resonance of the CQ construct with scientists.

Second, I have developed multiple instruments to measure CQ, including report-based measures (i.e., the 20-item CQS and 37-item E-CQS) and performance-based measures (i.e., multimedia intercultural SJT, the assessment center, and sociometer to assess honest signals). These complementary measures allow for triangulation of findings and enable researchers to choose the appropriate measures based on the purpose and context of their research.

Third, CQ also exerts important influence in the private and public sectors, as well as in education at all levels, ranging from universities to elementary and grade schools. Through deep, engaged scholarship with organizations, my work shapes policies and practices directly and indirectly, and helps leaders become more effective.

In describing my journey, I chose the metaphor of "two bowls singing" to symbolize the resonance of CQ with science and practice. The sympathetic resonance of the two bowls also highlights the virtuous circle between science

and practice. Good science makes the practice bowl sing. Important questions and insightful observations from practice make the science bowl sing. When the two bowls "sing" together, they create a deep humming resonance that will last longer and create a deeper impact on the listener.

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