

From Contact to Development in Experiential Cultural Intelligence Education: The Mediating Influence of Expectancy Disconfirmation

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Cultural intelligence (CQ) has emerged as a promising capability that allows individuals to enhance their intercultural effectiveness. However, little is known about factors and processes supporting its development. In a longitudinal study involving pre- and postintervention measures of CQ, we explored the role of the individual perception of optimal cross-cultural contact and the experience of expectancy disconfirmation. The study was conducted among 212 management students and professionals who partook in an experiential CQ education intervention encompassing cross-cultural contact as part of a university management course. The results of our work reveal that the relationship between participants' perception of optimal cross-cultural contact and CQ development is mediated by the experience of expectancy disconfirmation. When participants perceived optimal cross-cultural contact, which involved a number of conditions including equal status among participants, personalized contact, establishment of common goals, and support of the contact by authorities, they were more likely to experience expectancy disconfirmation. In turn, greater experience of expectancy disconfirmation was associated with greater CQ development. Researchers, educators, and managers who understand the factors and processes supporting CQ development are better equipped to prepare individuals for greater effectiveness in a variety of cultural contexts.

Rising globalization and diversity compel researchers and practitioners to look for ways to

increase the individual capability to adapt effectively in culturally diverse contexts, defined as

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cultural intelligence or CQ (Ang & Van Dyne, 2009; Earley & Ang, 2003). Effective adaptation in culturally diverse contexts involves successful interaction and coping with members of different cultural groups (Earley & Mosakowski, 2004). According to Ang and Van Dyne (2009), people with higher levels of cultural intelligence possess greater knowledge about cultures and cultural differences, engage in a greater amount of critical thinking and reflective observation, have greater motivation and efficacy to learn about different cultures, and exhibit culturally appropriate behaviors. As a result, these individuals have been argued to realize better communication, achieve greater performance, suffer lower burnout, experience greater adjustment and well-being, cope better with conflict, and develop greater trust and cooperation in culturally diverse contexts (Kim, Kirkman, & Chen, 2009; Rockstuhl & Ng, 2009; Tay, Westman, & Chia, 2009). Considering the above, cultural intelligence (CQ) has been viewed as a vital capability in cross-cultural literature (Earley & Ang, 2003).

As a capability, cultural intelligence can be developed and enhanced through cross-cultural training and education (Earley & Ang, 2003). In our work here, we refer to the development or enhancement of the individual levels of cultural intelligence as *CQ development*. In fact, cross-cultural training and education approaches focusing on CQ development have been identified as superior and more holistic compared to most existing approaches (Earley & Peterson, 2004; Tan & Chua, 2003). Comprehensive reviews typically divide the existing cross-cultural training and education approaches into several major types: cognitive, attributional, experiential, self- and cultural awareness, and behavioral (Brislin & Horvath, 1997; Brislin & Yoshida, 1994; Littrell & Salas, 2005). Consistent with the idea that using multiple methods appeals to people with different learning styles, most of the existing training and education approaches “provide something of a cafeteria style of education—that is a bit of this and a bit of that in the hope that something will be useful” (Earley & Peterson, 2004: 103). For example, it has been suggested that cognitive and experiential types of cross-cultural training and education work best together (Tan & Chua, 2003; Thomas & Inkson, 2004). However, this cafeteria style of training and education tends to be problematic. First of all, it lacks an underlying conceptual framework linking various types of training and relating them to the individual requirements. In addition, a majority of

the existing approaches focus heavily on cognitive skills that encompass knowledge and awareness of specific cultures, paying minimal attention to the development of motivation and metacognitive abilities necessary for successful cross-cultural adaptation. These approaches also provide limited opportunity for learning how to transfer knowledge and skills across different cultural contexts.

On the other hand, cross-cultural training and education approaches focusing on CQ development have been argued to provide a significant improvement (Earley & Peterson, 2004; Tan & Chua, 2003). Following Sternberg and Detterman’s (1986) framework of multiple intelligences, cultural intelligence (CQ) has been conceptualized as a multidimensional construct consisting of cognitive, metacognitive, motivational, and behavioral dimensions or capabilities. In view of that, CQ development has been argued to offer a more parsimonious cross-cultural training and education approach grounded in a comprehensive framework that encompasses the most crucial capabilities supporting effective adaptation in culturally diverse contexts (Ng, Van Dyne, & Ang, 2009). Therefore, unlike previously fragmented approaches, CQ development addresses all important cross-cultural training outcomes, including changes in cognition, metacognition, motivation, and behavior in a holistic rather than piecemeal fashion. In addition, rather than being focused on the enhancement of one’s capability to adapt in a specific culture, CQ development involves the enhancement of capabilities for effective adaptation across different cultural contexts and experiences (Ng & Earley, 2006). These benefits make CQ development vital for anyone working in culturally diverse workplaces and living in culturally diverse communities in our rapidly globalizing world.

Consequently, educators, researchers, and managers have been concerned with identifying factors and processes supporting CQ development (Ang & Van Dyne, 2009; Eisenberg et al., in press; Erez, Lisak, Harush, Glikson, Nouri, & Shokef, this issue; Kim & Van Dyne, 2012; MacNab, Brislin, & Worthley, 2012a; Shannon & Begley, 2009; Tarique & Takeuchi, 2009). Firsthand experience and contact with different cultures and their members has been repeatedly considered an important aspect in cultural intelligence and its development. A number of studies presented empirical evidence on the positive association between individual cultural intelligence and engagement in various international work and nonwork experiences and contact

(Crowne, 2008; Eisenberg et al., in press; Kim & Van Dyne, 2012; Li, Mobley, & Kelly, 2013; MacNab et al., 2012a; Shannon & Begley, 2009; Tarique & Takeuchi, 2009). However, research that specifies factors and processes supporting the relationship between contact and CQ development is lacking, thus; we lack understanding of how individuals may develop greater capability to adapt effectively in culturally diverse contexts as a result of contact with members of different cultures. In addition, understanding how contact in the context of cross-cultural training and education may contribute to CQ development is limited. Furthermore, better understanding of how CQ can be developed through cross-cultural training and education is needed (Eisenberg et al., in press; Erez et al., this issue).

Our work here fills that void by developing and testing a model that explains the relationship between the individual perception of optimal cross-cultural contact and CQ development in the context of experiential CQ education. Conceptually developed by Allport (1954) as part of contact theory, *optimal contact* involves a number of conditions, including equal status among participants, common goals, personalized contact, and support of the contact by authorities. In our study, the *perception of optimal contact* refers to the individual awareness and experience of these conditions during cross-cultural contact. Grounding our arguments in contact theory research (Allport, 1954; Brown & Hewstone, 2005; Cook, 1978; Dovidio, Gaertner, & Kawakami, 2003; Pettigrew, 1998; Pettigrew & Tropp, 2006) and experiential cross-cultural learning research (Bhawuk, 2009; Hughes-Weiner, 1986; Kolb, 1984), we argue that the perception of optimal cross-cultural contact is associated with the experience of expectancy disconfirmation. *Expectancy disconfirmation* refers to a state where individuals expect a certain behavior or response from those they interact with but experience a different one (Bhawuk, 2009; Brislin, Worthley, & MacNab, 2006). The experience of expectancy disconfirmation is, in turn, associated with CQ development. Thus, we argue that the experience of expectancy disconfirmation mediates the relationship between the perception of optimal cross-cultural contact and CQ development. In our work we capture CQ development as a change in the individual levels of CQ that result from partaking in experiential CQ education encompassing a cross-cultural contact. To investi-

gate our model, we utilize the experiential CQ education approach developed by MacNab (2012).

Our study aims to contribute to cross-cultural management learning and education literature by conceptually and empirically examining factors and processes involved in CQ development. We explore how cross-cultural management learning and education efforts can be enriched through the incorporation of direct optimal contact experiences with members of culturally different groups. We also add to the scarce empirical evidence on the crucial role of disconfirmation in cross-cultural learning and education, and specifically, in the development of the individual capability to adapt effectively in culturally diverse contexts. In addition, we augment contact theory research by outlining how the individual perception of optimal contact is associated with positive outcomes in the context of cross-cultural learning and education.

The remainder of this article explores the above by providing: (1) an overview of cultural intelligence and experiential CQ development; (2) a theoretical development of the model explicating the process of CQ development; (3) empirical analysis, and; (4) discussion of the findings, limitations, future research, and implications for theory and practice.

CULTURAL INTELLIGENCE AND EXPERIENTIAL CQ DEVELOPMENT

Cultural intelligence, defined as an individual capability to adapt effectively in culturally diverse contexts, has been theorized as a multidimensional construct (Earley & Ang, 2003; Thomas & Inkson, 2004). The multidimensional conceptualization of CQ is based on Sternberg and Detterman's (1986) framework of intelligence, which goes beyond the cognitive view by integrating multiple perspectives and proposing that individual intelligence includes cognitive, metacognitive, motivational, and behavioral "loci." The multidimensional construct of CQ parallels this contemporary view of intelligence and encompasses the same four dimensions (Ang & Van Dyne, 2009). The cognitive CQ dimension includes knowledge and nuances that can be learned from a book or personal experiences. This encompasses an understanding of what culture is and is not. It also involves knowledge of culturally universal aspects, or *etics*, which exist across cultures (e.g., knowledge of psychological and sociological concepts such as sex roles, status hierarchies, and personal space) and cultur-

ally specific aspects, or *emics* (e.g., the concept of *guanxi* referring to the personalized networks of influence in China). The metacognitive CQ dimension embraces higher order cognitive processes incorporating awareness during intercultural interactions, reflection on intercultural experiences, active challenging of cultural assumptions, and adjustment of cognitive structures when interacting with those from other cultures. It focuses on understanding and regulation of one's mental models and thought processes relating to culture. The motivational CQ dimension incorporates intrinsic willingness, drive, and enthusiasm to partake in cross-cultural contact and perseverance to deal with challenges of cross-cultural encounters. The behavioral CQ dimension refers to the capability to display appropriate verbal and nonverbal actions (e.g., words, tones, gestures) in different cultural contexts. Although conceptually these four dimensions are deemed independent of each other, they tend to be moderately and positively correlated (Ang et al., 2007). Thus, CQ is represented as an aggregate multidimensional construct with four dimensions existing at the same level of conceptualization as the overall construct (Ang & Van Dyne, 2009).

As a capability, cultural intelligence may be developed (Earley & Ang, 2003; Ng et al., 2009; Tan & Chua, 2003) and a number of reviews recommend various techniques from the fields of psychology, management, and education that could be utilized in CQ development (e.g., Earley & Peterson, 2004; Ng & Earley, 2006; Tan & Chua, 2003; Thomas et al., 2008; Thomas & Inkson, 2004). Experiential approaches have been acknowledged as particularly effective. According to Thomas and Inkson (2004: 72), "true cultural intelligence requires learning from experience . . . [and] experiential training is the most rigorous and effective in developing a high CQ." Thomas and Inkson argue that CQ development is not a linear process but an active and iterative one. It involves learning from social interactions and requires a base level of knowledge, the eagerness to gain new knowledge, attainment of new perspectives through mindfulness and reflection, assimilation and accommodation of the new knowledge and different perspectives into behavioral skills, and experimentation with the new knowledge and skills in different contexts. Thomas and Inkson's (2004) experiential CQ development process resonates with Kolb's (1976, 1984) experiential learning cycle consisting of four consecutive steps: concrete experience, reflective observation,

abstract conceptualization, and active experimentation. According to Kolb, learning is created through concrete experiences, which provide a basis for reflective observations encompassing reflection on current knowledge and consideration of different perspectives related to the experience. As various perspectives are considered, they are assimilated and distilled into more abstract concepts, or symbolic representations of experience, resulting in new knowledge structures that will guide future actions. Consequent active experimentation involves testing of the new or adapted concepts during new experiences, triggering another cycle of learning. MacNab (2012) provided some initial empirical findings supporting the effectiveness of an experiential approach to CQ development. After partaking in the experiential CQ education, built on the premises of the experiential-learning approaches described above (Kolb, 1976, 1984; Thomas & Inkson, 2004) and encompassing a cross-cultural contact, management students demonstrated a significant increase in all examined dimensions of cultural intelligence.

Although experiential CQ education encompassing cross-cultural contact has been conceptually and empirically demonstrated to contribute to greater cultural intelligence, the process by which cross-cultural contact results in CQ development is not well understood. In the following section, we examine the role of the individual perception of optimal cross-cultural contact and the experience of disconfirmed expectancy in the development of the four dimensions of cultural intelligence. We examine all four dimensions of CQ because previously authors argued and demonstrated that certain types of cross-cultural training and education (e.g., cognitive vs. experiential) may affect the development of certain CQ dimensions to different extents (Eisenberg et al., in press). For example, intellectual-centered learning focusing on cognitive skills has been shown to affect cognitive and metacognitive dimensions of CQ more strongly; whereas experiential learning emphasizing motivation and behavioral elements has been suggested to influence the development of motivational and behavioral dimensions of CQ to a greater extent. In addition, previous studies reported that different types of cross-cultural contact and experiences were associated with certain CQ dimensions more than others (Shannon & Begley, 2009; Tarique & Takeuchi, 2009). For example, Shannon and Begley (2009) reported that international work experience was related positively only

to motivational CQ; whereas Tarique and Takeuchi (2009) demonstrated that international nonwork experience is related positively to all four dimensions. In light of these findings we examine the relationships between the perception of optimal contact and the experience of expectancy disconfirmation with all four CQ dimensions.

THE PROCESS OF CQ DEVELOPMENT

Perception of Optimal Contact and CQ Development

A number of studies demonstrated a positive association between various types of cross-cultural contact (e.g., international work and nonwork experience, educational experience abroad, living in another country for longer than 6 months) and cultural intelligence (e.g., Crowne, 2008; Ng et al., 2009; Shannon & Begley, 2009; Tarique & Takeuchi, 2009). However, MacNab et al. (2012a) point out that not all types of cross-cultural contact may contribute to CQ development equally. Drawing from Dewey (1938), Itin (1999), and Allport (1954), MacNab et al. (2012a) suggest that unstructured approaches may become too overwhelming, compromising future efforts to experience and learn. They argue that the perception of optimal contact as outlined by Allport (1954) during cross-cultural experiences is particularly beneficial for CQ development. Allport's optimal contact involves a number of conditions: (a) nondominance or reasonably equal status between contact parties; (b) establishment of common goals or grounds; (c) meaningful personalized contact; and (d) support of the contact by recognized authorities.

A recent meta-analysis of the contact theory research (Pettigrew & Tropp, 2006) indicated that although contact in general was associated with various positive effects across a wide range of groups and situations, contact under Allport's optimal conditions typically resulted in even stronger positive effects. The same meta-analysis reported that these optimal contact conditions tend to work better as an interrelated bundle rather than independent factors. Pettigrew (1998) argued that optimal contact promotes intergroup understanding by allowing individuals to learn more about others. In addition, optimal contact promotes positive emotions enhancing people's motivation to interact with members of a different group (Dovidio et al., 2003). Furthermore, "optimal contact acts as a benign form of behavior modification" contributing to

the ability to display context appropriate behaviors (Pettigrew, 1998: 71).

Brislin (1981) explains that equal-status contact, when members of one cultural group are not perceived as having grossly more power than another, promotes willingness to interact, to provide mutual feedback, and to learn from and about others. This willingness represents the motivational dimension of CQ (Ang & Van Dyne, 2009). The perception of equal status is also likely to put participants at ease with questioning their own and others' cultural beliefs, assumptions, knowledge, and behaviors. Thus, participants are also more likely to attain greater levels of metacognitive CQ. Finally, participants perceiving equal-status are less likely to experience timidity and may feel less inhibited to exhibit new behaviors appropriate in a different culture, resulting in higher behavioral CQ.

In addition, the perception of personalized contact provides an opportunity for individuals to break down barriers of communication, share cultural knowledge and facts, challenge preconceived attitudes and stereotypes, and develop a more accurate view of others (Brislin, 1981), contributing to greater levels of cognitive and metacognitive CQ. Furthermore, the perception of personalized contact may provide an opportunity to share new skills and behaviors and practice them, which is likely to result in the enhancement of behavioral CQ.

The perception of having common goals is likely to help overcome tensions inherent in cross-cultural encounters and promote knowledge sharing and willingness to cooperate (Brislin, 1981), which represent cognitive and motivational CQ, respectively. Finally, Brislin (1981) argues that participants' perception of having support of authorities may enhance motivation to engage in cross-cultural contact, representing motivational CQ, and to apply the acquired knowledge and skills to future contact opportunities, representing behavioral CQ. The perception of having supporting authorities may also provide the green light for challenging and modifying culturally bounded thinking and assumptions, allowing participants to enhance their metacognitive CQ. Consequently, we argue that the perception of optimal cross-cultural contact is beneficial for the development of all CQ dimensions.

Hypothesis 1: The perception of optimal cross-cultural contact is associated positively with the development of (a) cognitive CQ, (b) metacognitive CQ,

(c) motivational CQ, and (d) behavioral CQ.

Perception of Optimal Contact and the Experience of Expectancy Disconfirmation

Several works grounded in contact theory (Allport, 1954) argue that the experience of optimal conditions during intergroup contact is associated with the experience of expectancy disconfirmation (Brewer & Miller, 1984; Hewstone, 1996). We posit that the perception of optimal contact conditions during cross-cultural contact is also likely to result in the experience of expectancy disconfirmation. *Expectancy disconfirmation* refers to a state where individuals expect a certain behavior or response from those they interact with but experience a different one (Bhawuk, 2009; Brislin et al., 2006). For example, armed with a stereotype that all Germans are punctual (Cooper & Kirkcaldy, 1995), a person may experience disconfirmation when a German business partner shows up to a meeting late without an agenda.

According to Snyder and Stukas (1999), expectancy disconfirmation results from the use of cognitive categories and structures (e.g., stereotypes, beliefs, values) to perceive, interpret, and predict the behaviors of others. Individuals construct cognitive structures to deal with the complexity of external stimuli (Brislin, 1981). Culture, among other modes of formative socialization, influences how individuals construct cognitive structures and categories (Keller, 2005), resulting in cultural differences. Thus, expectancy disconfirmation often occurs during contact with members of other cultures (Bhawuk, 2009); however, not all types of contact may be conducive to the experience of disconfirmation (Cook, 1978). According to Brewer and Miller (1984), the experience of Allport's (1954) optimal conditions during intergroup contact provides opportunities for disconfirmation because participants are more likely to engage in personalized interactions and collect more individuating information. Personalized interactions allow individuals to pay greater attention to expectancy-disconfirming evidence (Erber & Fiske, 1984; Neuberg & Fiske, 1987). In addition, the experience of optimal contact may provide opportunities for members of culturally different groups to create a common identity, which further promotes greater information sharing and attention to disconfirming information (Gaertner, Dovidio, Banker, Houlette, Johnson, & McGlynn, 2000). Hence, we posit that

participants are more likely to experience expectancy disconfirmation when perceiving optimal conditions during cross-cultural contact.

Hypothesis 2: The perception of optimal cross-cultural contact is associated positively with the experience of expectancy disconfirmation.

The Experience of Expectancy Disconfirmation and CQ Development

We further propose that the experience of expectancy disconfirmation during cross-cultural contact is associated with the development of all four dimensions of cultural intelligence. Cognitive analyses of intergroup contact theory posit that individual cognitive categories and structures change as a result of the experience of disconfirming evidence (Brown & Hewstone, 2005; Weber & Crocker, 1983). Weber and Crocker (1983) describe three models depicting the process of change: bookkeeping, conversion, and subtyping. The bookkeeping model (Rothbart, 1981) suggests that the process is incremental. As individuals experience disconfirmation, they note the discrepancies and fine tune existing cognitive structures, resulting in minor changes. Major changes occur gradually in response to the accumulation of many disconfirming instances. The conversion model (Rothbart, 1981) proposes that individuals alter their cognitive structures as a result of dramatic disconfirmations rather than minor disconfirmations. The subtyping model (Weber & Crocker, 1983) posits that as individuals acquire disconfirming information, they reformulate their current cognitive categories and structures to create subcategories by increasing the number of hierarchical levels or dimensions. All three models suggest that as individuals experience disconfirmation, they are likely to become more aware of their cognitive categories and structures as well as the discrepancies within them and engage in the process of altering them. As a result, individuals develop new cognitive structures and update their current ones with new information. A number of studies on information processing and information seeking behavior also demonstrate that people are more likely to undertake cognitive analysis and search for new information after observing unexpected or discrepant events or behaviors (for review, see Pyszczynski & Greenberg, 1981). Higher levels of cognitive awareness, information seeking, cognitive processing, and adjustment of cognitive struc-

tures during cross-cultural interactions represent the metacognitive dimension of CQ. Thus, we argue that the experience of expectancy disconfirmation during cross-cultural contact is likely to be associated with the enhancement of individual metacognitive CQ. On the other hand, the acquisition of new discrepant culture-specific information and the development of new cognitive structures that integrate these discrepancies with current cognitive structures results in a greater understanding of the emic and etic aspects of culture, representing cognitive CQ. Accordingly, we posit that the experience of expectancy disconfirmation is also related to the development of cognitive CQ.

Furthermore, we argue that the experience of expectancy disconfirmation is also linked to the development of motivational CQ. Theorists suggest that discrepancies between expectations and actual occurrences motivate discrepancy-reduction efforts (e.g., Bandura, 1986; Feather, 1971; Festinger, 1957; Rokeach, 1979). According to Bandura (1986), increased motivation to learn develops when individuals experience an imbalance between the cognitive structures they possess and the actual perceived course of events. Festinger (1957) posited that the experience of discrepancy among individual cognitions drives individuals to reduce dissonance. Drawing on Feather's (1971) discrepancy theory, Rokeach (1979) pointed out that as individuals in cross-cultural environments learn more about a different culture, discrepancies involving beliefs, values, attitudes, and behaviors are often found. These discrepancies motivate engagement in more social interactions to obtain more accurate information and learn new skills. Consequently, as individuals experience expectancy disconfirmation during cross-cultural contact, they are more likely to develop greater motivational CQ (Ang & Van Dyne, 2009).

Finally, we posit that the experience of expectancy disconfirmation is likely to be associated with the development of behavioral CQ. Individuals high in behavioral CQ are able to readily modify and regulate their behavior to complement different cultural contexts (Ang & Van Dyne, 2009). Describing the mechanisms guiding behavior control and modification, Carver and Scheier (1981) point out the important role of discrepancy-reducing processes. They argue that humans actively regulate and correct their behavior to maintain a perception of the environment in accordance with expected reference values or standards. When environmental elements disconfirm their ex-

pectations, individuals initiate a behavior change. Consequently, we argue that the experience of expectancy disconfirmation during cross-cultural contact is likely to prompt greater modification of one's behavior to meet the requirements of the context, and as a result, is associated positively with the development of behavioral CQ.

Hypothesis 3: The experience of expectancy disconfirmation is associated positively with the development of (a) cognitive CQ, (b) metacognitive CQ, (c) motivational CQ, and (d) behavioral CQ.

The Mediating Role of the Experience of Expectancy Disconfirmation

Given the relationships described above, it is reasonable to argue that the experience of expectancy disconfirmation mediates the relationship between the perception of optimal cross-cultural contact and CQ development. For the underlying logic explaining the mediating role of the experience of expectancy disconfirmation, we draw on Bhawuk's (2009) model of disconfirmed expectancies and learning how to learn. Building on Hughes-Weiner's (1986) adaptation of Kolb's (1976) experiential learning theory to cross-cultural learning, Bhawuk (2009) presented an experiential cross-cultural training model for the global workforce that highlights the crucial role of expectancy disconfirmation. Following experiential learning theory (Kolb, 1976, 1984), the model encompasses four major steps: concrete experience, reflective observation, abstract conceptualization, and active experimentation; however, Bhawuk (2009) suggests that for the learning process to take place following a cross-cultural experience, it is important for participants to experience disconfirmation of expectations. If the participants' expectations are met, they are more likely to respond automatically and practice behaviors that they already know. However, when faced with disconfirmation, motivated individuals are more likely to activate metacognitive processes, which may include greater awareness of self and others and contemplation on why things happen a certain way. As participants consider and reflect on different perspectives, they are more likely to expand their cultural knowledge by learning about specific cultural differences, or emics. As various perspectives and emics are considered, they are integrated with the participants' existing cultural knowledge through the develop-

ment or application of abstract conceptualizations. Abstract conceptualizations help participants organize different perspectives and emics coherently into categories, leading to the development of culture-general knowledge, or etics. The learning progresses as participants actively apply the newly developed cultural knowledge of emics and etics to practice new culturally appropriate behavior during cross-cultural experiences. Thus, an experiential cross-cultural learning process encompassing expectancy disconfirmation contributes to the enhancement of participants' metacognition, knowledge, motivation, and behavioral abilities and arguably results in CQ development. Following Bhawuk (2009), we argue that the experience of expectancy disconfirmation plays an important role in the development of the four CQ dimensions. As individuals perceive optimal cross-cultural contact, they are more likely to experience expectancy disconfirmation. In turn, the experience of expectancy disconfirmation is likely to result in CQ development. Our arguments are portrayed in Figure 1.

Hypothesis 4: The experience of expectancy disconfirmation mediates the relationship between the perception of optimal cross-cultural contact and the development of (a) cognitive CQ, (b) metacognitive CQ, (c) motivational CQ, and (d) behavioral CQ.

METHODS

Participants and the CQ Education Approach

We tested our model in a study involving 212 management students and professionals who participated in an experiential CQ education as part of management courses at a large private university in Australia. The participants were on average 25.1 years of age, 59.9% were female, and 68.4% had work experience. They were also a multicultural sample representing 32 countries of origin: 47.6% from China, 15.1% from Australia, 5.7% from Germany, 3.3% from Hong Kong, 2.4% from Japan, and the remaining 25.9% represented another 27 countries of origin. Foreign participants indicated that they spent on average 1.99 years in Australia. Participants were also ethnically different: 70.8% were Asian, 21.3% Caucasian, and 7.9% included Hispanic, Arab, African, and other ethnicities. University participants were ideal for this study because they are dedicated to education and represent the future management employee pool.

The experiential CQ education was a 6 to 8-week intervention focused on CQ development. It was embedded within international management and cross-cultural management courses, so it was a subject of natural fit. Built on the premises of the experiential learning approaches (Kolb, 1976, 1984; Thomas & Inkson, 2004), the process consisted of seven stages. The following is a summary of the

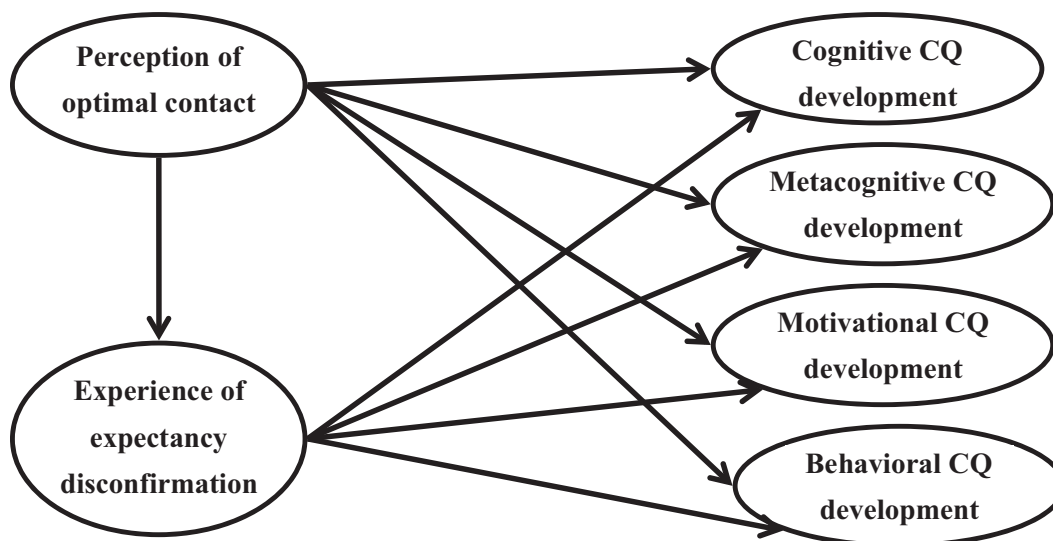


FIGURE 1

Hypothesized Model of the Relationship Between the Individual Perception of Optimal Contact, Experience of Disconfirmed Expectancy, and the Development of the Four Dimensions of Cultural Intelligence.

process; for a more detailed description see MacNab (2012).

Stage 1: Awareness Development

Participants were provided basic "awareness-level" knowledge related to key concepts associated with the CQ education process (e.g., culture, emics, etics, CQ). Providing this basic knowledge has been suggested as a first key step in cross-cultural training and education (Cushner & Brislin, 1996). According to Thomas and Inkson (2004: 68–69), experiential CQ development "requires a base level of knowledge," which allows individuals to pay attention and appreciate cultural differences during social experiences.

Stage 2: Experiential Instructions

Participants were given instructions on seeking out contact with members of a different cultural group, which they could choose based on their interests. Each participant was required to have contact with one culturally different group. Participants were instructed to select a cultural group with which they were not generally familiar. In addition, participants were required to engage in a new cultural experience conforming to the optimal contact conditions (Allport, 1954): (a) equal status positions among participants and target group members; (b) establishment of common goals or grounds; (c) personalized, one-on-one contact with members of the target culture group; and (d) support of the instructors and the authorities of the target culture group. The contact had to last longer than 2 hours to provide enough intensity and material.

Stage 3: Pre-Experience Check

Participants submitted a description of the intended project, allowing instructors to conduct a "pre-experience check" to ensure that participants were reasonably within the requirements for selecting their target experience.

Stage 4: New Cultural Experience

The participants took part in their new cultural experience during a specific time frame and following the requirements. Instructors maintained open lines of communication to address any questions. Among the different types of contact that

participants partook in were interactions with culturally different religious groups (e.g., Baha'i community, Tibetan Buddhist, Greek Orthodox, Jehovah's Witnesses, Mormons), participation in culture-specific sport and wellness activities not common in one's own culture (e.g., Esperanto, Indian Dancing, Japanese Kendo, Brazilian Capoeira, Spanish Flamenco), or a significant interaction with a family from a different culture (e.g., Filipino family, Macedonian family).

State 5: Post-Experience Internalization

Participants described the experience and reflected on the contact as related to cultural intelligence in a report. Participants were specifically instructed to provide their honest thoughts and describe both their successes and failures with CQ. Participants were also encouraged to critique any part of the process.

Stage 6: Feedback and Communication

Participants were provided feedback by the instructors based on the assignment requirements and material application.

Stage 7: Social Sharing

Participants discussed their experience with others in small groups. Following the small group discussion, a larger forum for discussion was opened and each group reported on any interesting outcomes of their small group discussions.

Data Collection Procedure

Data were collected using three surveys. Survey 1 was conducted prior to the CQ education process and was designed to assess the initial levels of CQ (pre-CQ) and collect individual demographic data. Approximately 6–8 weeks later, Survey 2 was conducted after the CQ education process. It included measures of the participants' perception of optimal contact, the experience of expectancy disconfirmation, and the levels of CQ following the CQ education process (post-CQ). Survey 3 was conducted in parallel with Survey 2 (after the CQ education process but at a different time) to measure the individual tendency for socially desirable responses among other constructs.

Because all participants were enrolled in programs that required high levels of English profi-

ciency, the study was conducted in English. All participants remained anonymous during the data collection process. They were encouraged to provide honest assessments reflecting their successes and failures with the experience of optimal contact, expectancy disconfirmation, and CQ. All participants were assured that the information provided in the survey would have no influence on their course performance. For participation, respondents received a small amount of extra credit toward their course grade. However, participants were also offered an alternative, nonsurvey, reflective option if they did not wish to participate in the survey. The survey response rate was over 90%. We believe the response rate is high because participants had invested a notable amount of time and energy in the process. Following the data collection, we shared summary information about the findings while keeping specific participant responses anonymous.

Measures

The items for this study were available from a combination of published validated scales and established research on cultural intelligence, contact theory, and disconfirmed expectancy (Ang et al., 2007; MacNab et al., 2012a; MacNab, O'Connor, Rosenblatt, Worthley, and Hannifin-MacNab, 2012b). All responses were made on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. All but one measure (Behavioral CQ pre-post difference score Cronbach's alpha = 0.69) exhibited desirable internal reliabilities ranging from 0.70 to 0.80 as recommended by DeVellis (2003).

Perception of Optimal Contact

The perception of optimal contact was measured using a 21-item scale described by MacNab et al. (2012a). Five items measuring equal status (Cronbach's alpha = 0.79) were averaged to yield the equal status score, for example, "People did not force demands on me during the experience." Five items measuring common ground (Cronbach's alpha = 0.84) were averaged to yield the common ground score, for example, "With myself and people in the new contact culture, there was some common purpose we could all relate to." Five items measuring personalized contact (Cronbach's alpha = 0.81) were averaged to yield the personalized contact score, for example, "I came to know some

people in the other group (new contact culture) on a personal level." Six items measuring the support of authorities (Cronbach's alpha = 0.77) were averaged to yield the support of authorities score, for example, "I felt the instructor encouraged me to participate in this cultural experience" and "Leaders of the other group (new contact culture) had a positive attitude toward this interaction." Cronbach's alpha of the scale with four averaged indicators was 0.75.

Experience of Expectancy Disconfirmation

The experience of expectancy disconfirmation was assessed using a previously validated 4-item measure asking participants to indicate their ability to notice, identify, and describe experiences of unexpected events and disconfirmation of one's expectations during a cross-cultural experience (MacNab et al., 2012b). For example, "I am aware that I sometimes experience the unexpected during a new culture experience" and "I would be able to describe disconfirmed expectancy that I encounter during a new culture experience" (Cronbach's alpha = 0.76).

CQ Development

CQ development was determined by a difference between the pre-CQ and post-CQ measures assessed in Survey 1 and Survey 2. We utilized a previously validated 20-item CQ measure assessing cognitive, metacognitive, motivational, and behavioral dimensions (Ang et al., 2007; Van Dyne, Ang, & Koh, 2009). Six items measured cognitive CQ (Cronbach's alphas: pre = 0.81, post = 0.80, pre-post difference score or development = 0.76). An example item is "I know the arts and crafts of other cultures." Four items measured metacognitive CQ (Cronbach's alphas: pre = 0.76, post = 0.83, pre-post difference score or development = 0.75). An example item is "I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds." Five items measured motivational CQ (Cronbach's alphas: pre = 0.81, post = 0.78, pre-post difference score or development = 0.72). An example item is "I enjoy interacting with people from different cultures." Five items measured behavioral CQ (Cronbach's alphas: pre = 0.74, post = 0.81, pre-post difference score or development = 0.69). An example item is "I change my verbal behavior (e.g., accent, tone) when a cross-cultural interaction requires it."

Control Variables

We controlled for gender (1 = female, 0 = male), work experience (1 = have previous work experience, 0 = no experience), and international experience because these variables have been found to influence individual capability to adapt in cross-cultural environments (Kim & Van Dyne, 2012). International experience was represented as a binary variable (1 = have one or more previous international experiences prior to turning 18 years old, 0 = no international experience prior to turning 18 years old). We controlled for international experience during formative years given our participants' age group and indication that experience during formative years may contribute to greater intercultural understanding (Selmer & Lam, 2004). Because our sample contained a large number of foreign-born participants (85%) and particularly participants from China (47%), we controlled for whether participants were born in Australia (1 = born in Australia and currently lives in Australia; 0 = not born in Australia but currently lives in Australia) and born in China (1 = born in China but currently lives in Australia; 0 = not born in China but currently lives in Australia). For the same reason, we also controlled for ethnicity (1 = Asian; 0 = non-Asian). In addition, we controlled for social desirability response bias using a 10-item measure of impression management (Steenkamp, de Jong, & Baumgartner, 2010) adapted from Paulhus (1986). Impression management assesses the degree to which respondents overreport socially desirable behaviors and underreport socially undesirable behaviors systematically and consciously, for example, "I never cover up my mistakes." To maintain an adequate sample-size-to-parameter ratio, the 10 items were randomly assigned to 3-item parcels (Bentler & Chou, 1988), meeting the minimum requirement of at least two indicators per latent construct (Bollen, 1989). Cronbach's alpha of the 3-item measure was 0.74.

Analysis

Since the constructs of interest are latent variables, structural equation modeling (SEM) procedures based on the analysis of covariance structures were used to test the proposed theoretical model. Since we specified the model structure a priori, a confirmatory approach with maximum likelihood estimation was used. Analyses were conducted using the SPSS Amos 17 program. Prior

to testing the model, a number of procedures were conducted to establish measurement invariance, measurement validity (e.g., measurement model fit), and the proposed structural model fit to the data as described below. Hypotheses of direct effects were analyzed using path analysis. The hypothesis of the indirect or mediated effect was tested using the bias-corrected bootstrap estimation procedure with 1,000 bootstrap samples and 95% confidence intervals recommended by Cheung and Lau (2008). Bootstrap estimation has been advocated as a superior test of mediation (Preacher & Hayes, 2004; Zhao, Lynch, & Chen, 2010).

A fundamental aspect of examining change in participant responses over time is the establishment of longitudinal measurement invariance, which concerns the equality of response scales over time (Brown, 2006; Vandenberg & Lance, 2000). According to Chan (1998), temporal change in a construct may be represented in three ways: alpha change, beta change, and gamma change. *Alpha change* refers to the true score change and can be identified only when longitudinal measurement invariance is established. *Beta change* reflects temporal inconsistencies in measurement properties of construct indicators. *Gamma change* encompasses change in the meaning of the construct over time, typically reflected in temporal inconsistencies in the number or configuration of factors representing the construct. To determine true alpha change and establish the lack of gamma and beta change, Brown (2006) recommended establishing the equivalence of factor structures, factor loadings, and indicator intercepts. A hierarchical set of analyses using the chi-square difference test was performed using a repeated measures sample approach. First, the equivalence of factor structures was tested by fitting a model representing the CQ construct as structurally the same at both assessment points (i.e., pre and post) and examining the model fit. Second, the factor loadings equivalence was tested by imposing equality constraints on the factor loadings of indicators administered repeatedly across the two testing occasions. Third, the indicator intercept equivalence was tested by constraining indicator intercepts to be equal across testing occasions and assessing the significance of the chi-square change. Nonsignificant chi-square changes between the unconstrained and the constrained models would indicate factor loadings and indicator intercepts equivalence. If the chi-square difference test between the constrained and the unconstrained mod-

els was significant, the parameters responsible for the significant difference were identified using the critical ratio difference method in SPSS *AMOS* (Byrne, 2001). At least partial invariance where a majority of the indicators are invariant is essential (Vandenberg & Lance, 2000).

After the establishment of measurement invariance, the measurement model was fitted to the data to validate the measures following the 2-step approach to SEM recommended by Anderson and Gerbing (1988). Once the measurement invariance and measurement model were established, the posited model was fitted to the data. Throughout the analysis, the fit of the models was assessed following the 2-index presentation strategy recommended by Hu and Bentler (1998). Hu and Bentler suggested using a combination of an absolute index (e.g., Standardized Root Mean Square Residual or SRMR, Goodness-of-Fit Index or GFI, Adjusted Goodness-of-Fit Index or AGFI, and Root Mean Square Error of Approximation or RMSEA), which determines how well an a priori model fits the data, and an incremental fit index (e.g., Tucker Lewis Index or TLI, Comparative Fit Index or CFI, Normed Fit Index or NFI, and Incremental Fit Index or IFI), which measures an incremental improvement in a model's fit by comparing it with a more restricted baseline model. Maximum likelihood based NFI, TLI, GFI, and AGFI are sensitive to sample sizes (Anderson & Gerbing, 1984; Bentler, 1990; La Du & Tanaka, 1989; Sharma, Mukherjee, Kumar, & Dillon, 2005), and IFI and CFI are preferable when sample size is small (Bentler, 1990; Bollen, 1989; Byrne, 2001; Hu & Bentler, 1998). Since our sample size was relatively small ($N < 250$), we elected to report CFI, IFI, RMSEA, and SRMR indexes. In addition, we report the normed chi-square index, χ^2/df (Wheaton, Muthen, Alwin, & Summers, 1977), which tends to be sensitive to model parsimony. The following guidelines for the

acceptable model fit were used: CFI and IFI values above 0.90 and close to 0.95; RMSEA values close to 0.05; SRMR values of less than 0.08; and χ^2/df values below 2.0 (Bentler, 1990; Bollen, 1989; Brown, 2006; Byrne, 1989; Hu & Bentler, 1999; Kline, 2011).

RESULTS

Measurement Invariance

Following the recommendations and procedures outlined by Brown (2006), we used the confirmatory factor analysis framework to evaluate the equivalence of factor structures, factor loadings, and indicator intercepts for the CQ development construct. The results are summarized in Table 1. The measure exhibited full structural and factor loadings equivalence. Equality constraints for 4 out of 20 indicator intercepts were relaxed. Overall, the construct exhibited full factor loadings equivalence and at least partial indicator intercept equivalence as recommended by Vandenberg and Lance (2000).

Measurement Model

The measurement model consisted of seven latent constructs: perception of optimal contact (POC), experience of expectancy disconfirmation (EED), cognitive CQ (CCQ) development, metacognitive CQ (MCCQ) development, motivational CQ (MCQ) development, behavioral CQ (BCQ) development, and social desirability. The control variables of gender, work experience, ethnicity, Australian-born, Chinese-born, and international experience were represented as single indicators, assuming that they were measured without error. The measurement model provided an acceptable fit to the data ($\chi^2/df = 1.31$, CFI = 0.91, IFI = 0.92,

TABLE 1
Summary of Models and Goodness-of-Fit Tests Assessing Measurement Invariance for the CQ Development Construct ($N = 212$)

Model	χ^2/df	CFI	IFI	RMSEA	SRMR	$\Delta\chi^2/\Delta df$	p value
Model 1: Unconstrained (factor structure invariance)	1.32	0.93	0.93	0.04	0.06		
Model 2: Equal factor loadings	1.31	0.93	0.93	0.04	0.06	14.99/16	0.53
Model 3: Equal indicator intercept loadings	1.36	0.92	0.92	0.04	0.06	65.96/32	0.0001
Model 3a: Partially equal indicator intercept loadings	1.32	0.93	0.93	0.04	0.06	36.59/28	0.13

Note. CFI = Comparative Fit Index; IFI = Incremental Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

RMSEA = 0.04, SRMR = 0.06). Standardized factor loadings ranged from 0.46 to 0.92.

Correlations

Means, standard deviations, and zero-order correlations for all study variables are presented in Table 2. In addition, we report the pre- and post-CQ education scores that were utilized in the calculation of the CQ development scores. Most of the correlations between the variables discussed in the hypotheses were as expected, except the nonsignificant correlations between the perception of optimal contact and the four variables representing the development of the four dimensions of CQ. A few correlations among the control variables and the main constructs are noteworthy. Being female was negatively correlated with MCCQ development ($r = -.20, p < .01$); MCQ development ($r = -.14, p < .05$); and BCQ development ($r = -.16, p < .05$). Being of Asian ethnicity was negatively correlated with EED ($r = -.29, p < .0001$) and BCQ development ($r = -.13, p < .05$). Being born in China was also negatively correlated with EED ($r = -.15, p < .05$), while being born in Australia was positively correlated with EED ($r = .19, p < .01$). Having previous international experience was

negatively correlated with BCQ development ($r = -.13, p < .05$).

The pre- and post-CQ scores for all four dimensions were positively correlated with the perception of optimal contact and the experience of expectancy disconfirmation. However, pre-CQ scores were negatively correlated with the CQ development scores. On the other hand, post-CQ scores were positively correlated with the CQ development scores.

Hypothesized Model and Testing

The structural model encompassed seven latent constructs and six single indicators representing the control variables as described above. The hypothesized model provided acceptable fit to the data ($\chi^2/df = 1.31, CFI = 0.91, IFI = 0.92, RMSEA = 0.04, SRMR = 0.06$). Overall, it was estimated that all predictors explain 17% of the variance in CCQ development, 20% of the variance in MCCQ development, 15% of the variance in MCQ development, and 39% of the variance in BCQ development. Figure 2 presents the standardized parameter estimates (for the ease of presentation control variables are not depicted in the figure).

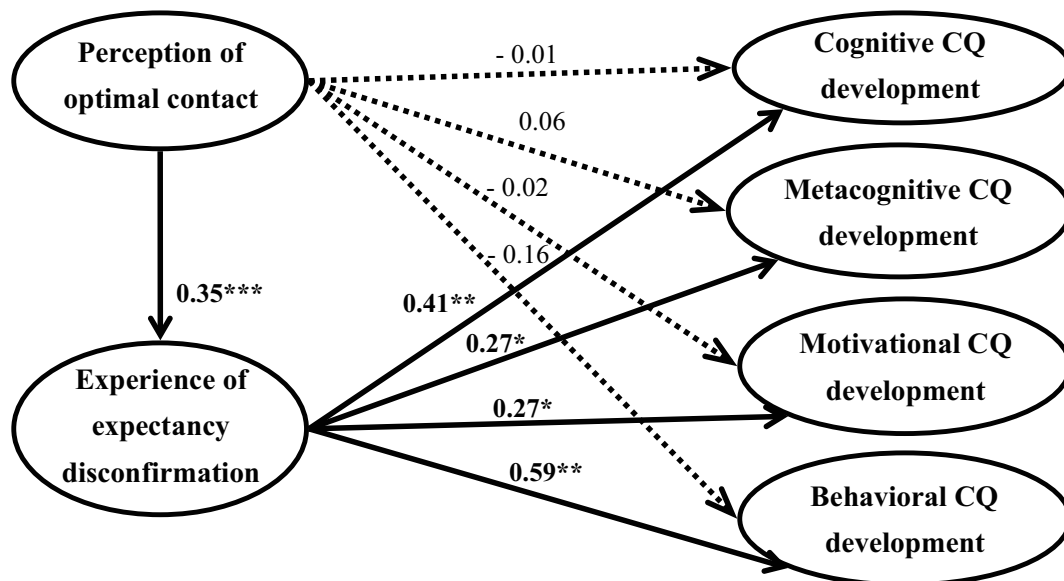


FIGURE 2

Results of the Structural Equation Modeling Analysis With Standardized Parameter Estimates ($N = 212$).

Note. Although the model does not depict this for the ease of presentation, we controlled for the effects of gender, work experience, ethnicity, country of origin (Australian-born and Chinese-born), international experience, and social desirability on all constructs represented in the model.

* $p < .05$. ** $p < .01$. *** $p < .0001$.

TABLE 2
Means, Standard Deviations, Zero-Order Correlations ($N = 212$)

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Perception of optimal contact	4.09	0.44																				
2. Experience of expectancy disconfirmation	4.28	0.44	0.31*																			
3. Cognitive CQ development	0.29	0.67	0.06	0.22*																		
4. Metacognitive CQ development	0.44	0.66	0.12	0.20*	0.37*																	
5. Motivational CQ development	0.16	0.62	0.06	0.19*	0.38*	0.44*																
6. Behavioral CQ development	0.37	0.65	0.06	0.30*	0.39*	0.44*	0.32*															
7. Precognitive CQ	3.34	0.64	0.18*	-0.01	-0.65*	-0.24*	-0.13	-0.23*														
8. Premetacognitive CQ	3.88	0.59	0.20*	0.21*	-0.25*	-0.73*	-0.31*	-0.15*	0.37*													
9. Premotivational CQ	3.97	0.63	0.19*	0.17*	-0.25*	-0.27*	-0.66*	-0.15*	0.27*	0.43*												
10. Prebehavioral CQ	3.70	0.61	0.19*	0.16*	-0.25*	-0.29*	-0.20*	-0.65*	0.33*	0.44*	0.35*											
11. Postcognitive CQ	3.63	0.55	0.28*	0.26*	0.47*	0.17*	0.31*	0.21*	0.37*	0.13	0.01	0.07										
12. Postmetacognitive CQ	4.31	0.47	0.42*	0.56*	0.20*	0.49*	0.23*	0.36*	0.14*	0.23*	0.16*	0.14*	0.41*									
13. Postmotivational CQ	4.13	0.51	0.31*	0.44*	0.15*	0.21*	0.40*	0.20*	0.18*	0.14*	0.42*	0.18*	0.39*	0.48*								
14. Postbehavioral CQ	4.07	0.53	0.29*	0.56*	0.20*	0.21*	0.17*	0.49*	0.08	0.23*	0.21*	0.34*	0.34*	0.60*	0.46*							
15. Female	0.60	0.49	0.07	-0.12	-0.04	-0.20*	-0.14*	-0.16*	0.08	0.17*	0.04	0.12	0.03	-0.08	-0.11	-0.05						
16. Work experience ^a	0.68	0.47	0.09	0.07	-0.04	0.02	-0.09	-0.04	-0.01	-0.05	0.15*	0.13	-0.07	-0.02	0.07	0.10	-0.18*					
17. Ethnicity ^b	0.71	0.46	-0.08	-0.29*	0.04	-0.13	-0.05	-0.13*	-0.01	0.04	-0.23*	0.06	0.04	-0.13	-0.34*	-0.10	0.28*	-0.17*				
17. Australian-born ^c	0.15	0.36	-0.06	0.19*	-0.04	-0.12	-0.03	-0.08	-0.04	0.15*	0.14*	0.25*	-0.08	0.02	0.13	0.18*	-0.17*	0.26*	-0.34*			
18. Chinese-born ^d	0.48	0.50	0.01	-0.15*	0.09	-0.06	0.07	-0.02	0.02	0.01	-0.23*	-0.02	0.14*	-0.07	-0.20*	-0.05	0.30*	-0.31*	0.59*	-0.40*		
19. International experience ^e	0.66	0.48	-0.03	0.10	-0.08	0.04	0.08	-0.13*	0.11	-0.01	-0.05	0.10	0.03	0.04	0.04	-0.05	-0.01	-0.25*	0.11	-0.32*		
20. Social desirability	3.04	0.50	0.11	0.06	-0.04	-0.02	-0.05	0.06	0.11	0.12	0.12	0.05	0.09	0.12	0.08	0.13	0.13	-0.21*	0.07	-0.15*	0.19*	-0.16*

Note. CQ = Cultural Intelligence.

*significant at least at $p < .05$

^aBinary variable (0 = no previous work experience, 1 = have previous work experience)

^bBinary variable (0 = non-Asian, 1 = Asian)

^cBinary variable (0 = not born in Australia but currently lives in Australia, 1 = born in Australia and currently lives in Australia)

^dBinary variable (0 = not born in China and currently lives in Australia, 1 = born in China and currently lives in Australia)

^eBinary variable (0 = no international experience prior to turning 18 years old, 1 = have one or more international experiences prior to turning 18 years old)

The results of the path analyses indicated that POC was not directly related to CCQ development (standardized parameter estimate = -0.01 , unstandardized parameter estimate = -0.01 , standard error = 0.12 , $p = .95$); MCCQ development (standardized parameter estimate = 0.06 , unstandardized parameter estimate = 0.07 , standard error = 0.13 , $p = .56$); MCQ development (standardized parameter estimate = -0.02 , unstandardized parameter estimate = -0.02 , standard error = 0.12 , $p = .88$); and BCQ development (standardized parameter estimate = -0.16 , unstandardized parameter estimate = -0.19 , standard error = 0.12 , $p = .11$). Thus, Hypothesis 1 is not supported. However, as expected, POC was related positively to EED (standardized parameter estimate = 0.35 , unstandardized parameter estimate = 0.22 , standard error = 0.06 , $p < .0001$; Hypothesis 2 is supported). Providing support for Hypothesis 3, EED was related positively with CCQ development (standardized parameter estimate = 0.41 , unstandardized parameter estimate = 0.78 , standard error = 0.26 , $p < .01$); MCCQ development (standardized parameter estimate = 0.27 , unstandardized parameter estimate = 0.55 , standard error = 0.25 , $p < .05$); MCQ development (standardized parameter estimate = 0.27 , unstandardized parameter estimate = 0.55 , standard error = 0.24 , $p < .05$); and BCQ development (standardized parameter estimate = 0.59 , unstandardized parameter estimate = 1.12 , standard error = 0.28 , $p < .0001$).

The results of the bias-corrected bootstrap estimation procedure demonstrated that POC was indirectly related to CCQ development (unstandardized indirect effect = 0.17 , 95% confidence intervals: $.06, .54$, $p < .01$; standardized indirect effect estimate = 0.14 , 95% confidence intervals: $.04, .36$, $p < .01$); MCCQ development (unstandardized indirect effect estimate = 0.12 , 95% confidence intervals: $.01, .37$, $p < .05$; standardized indirect effect estimate = 0.09 , 95% confidence intervals: $.00, .27$, $p < .05$); MCQ development (unstandardized indirect effect estimate = 0.12 , 95% confidence intervals: $.02, .38$, $p < .05$; standardized indirect effect estimate = 0.10 , 95% confidence intervals: $.02, .27$, $p < .05$); and BCQ development (unstandardized indirect effect estimate = 0.25 , 95% confidence intervals: $.07, .66$, $p < .01$; standardized indirect effect estimate = 0.20 , 95% confidence intervals: $.07, .43$, $p < .01$), providing support for Hypothesis 4.

Similar to the results reported in the correlation analysis, among the control variables, being a fe-

male was related negatively to MCCQ development (standardized parameter estimate = -0.23 , unstandardized parameter estimate = -0.28 , standard error = 0.11 , $p < .01$) and MCQ development (standardized effect estimate = -0.19 , unstandardized parameter estimate = -0.23 , standard error = 0.11 , $p < .05$). Asian ethnicity was related negatively to EED (standardized effect estimate = -0.29 , unstandardized parameter estimate = -0.19 , standard error = 0.07 , $p < .01$). Being born in Australia was related positively to EED (standardized effect estimate = 0.20 , unstandardized parameter estimate = 0.17 , standard error = 0.07 , $p < .05$), but negatively to MCCQ development (standardized effect estimate = -0.29 , unstandardized parameter estimate = -0.50 , standard error = 0.16 , $p < .01$) and BCQ development (standardized effect estimate = -0.30 , unstandardized parameter estimate = -0.47 , standard error = 0.15 , $p < .01$). Being born in China was related positively to MCQ development (standardized effect estimate = 0.22 , unstandardized parameter estimate = 0.26 , standard error = 0.13 , $p < .05$). Work experience was related positively to POC (standardized effect estimate = 0.17 , unstandardized parameter estimate = 0.18 , standard error = 0.08 , $p < .05$). International experience was related negatively to BCQ development (standardized effect estimate = -0.23 , unstandardized parameter estimate = -0.27 , standard error = 0.10 , $p < .01$).

Alternative Models

A number of alternative models were tested where we changed the order of the constructs. In one, all the paths were reversed such that the experience of expectancy disconfirmation was predicted to mediate the relationship between the development of the four dimensions of cultural intelligence and the perception of optimal contact. Although the fit of the model remained practically unchanged, most of the paths were not significant (e.g., the paths between the development of the three out of four CQ dimensions and the experience of expectancy disconfirmation; and the paths between the development of the four CQ dimensions and the perception of optimal contact). In another alternative model, the development of the four dimensions of cultural intelligence was predicted to mediate the relationship between the perception of optimal contact and the experience of expectancy disconfirmation. Similarly, the fit of the model remained

practically unchanged, but most of the paths were not significant (e.g., the paths between the perception of optimal contact and the development of the four dimensions of CQ; and the paths between the development of three of the four dimensions of CQ and the experience of expectancy disconfirmation).

DISCUSSION

We introduced and tested a model explicating how the perception of optimal cross-cultural contact influences CQ development. We tested the model in the context of the experiential CQ education approach developed by MacNab (2012). Our results showed that the relationship between the perception of optimal contact and the experience of expectancy disconfirmation was significant. Also, the relationships between the experience of expectancy disconfirmation and the development of all four dimensions of cultural intelligence were significant. Furthermore, the results of the bias-corrected bootstrap estimation procedure demonstrated a significant indirect effect of the perception of optimal contact on the development of the four dimensions of cultural intelligence. Taken as a whole, our study showed that in the context of experiential CQ education, CQ development did not happen automatically following the participants' perception of optimal cross-cultural contact. For CQ development to occur, it was important for participants to experience disconfirmation of their expectations. The perception of optimal cross-cultural contact set the stage for the participants to experience expectancy disconfirmation as a result of their awareness and experience of conducive conditions, including equal status among the participants, personalized interaction, common grounds, and support by authorities.

Our findings support Bhawuk's (2009) argument that the experience of expectancy disconfirmation provides an opportunity for us to learn during cross-cultural experiences. Bhawuk posited that if participants' expectations are met during a cross-cultural experience, they are more likely to respond habitually and practice behaviors that they already know. For learning to take place, participants need to experience a disconfirmation in their expectations. Following the disconfirmation, motivated individuals are likely to become more aware and reflect on the experience, develop greater knowledge of culture and cultural differences, and actively experiment with the new knowledge. Our

findings are also in line with the previous contact theory research, which suggested that the experience of Allport's (1954) optimal conditions during intergroup contact provides opportunities for the experience of disconfirmation by allowing participants from different groups to share more information as they develop common ground (Gaertner et al., 2000) and by helping participants to collect more individuating and disconfirming information as they experience personalized interactions (Brewer & Miller, 1984). In turn, the experience of disconfirmation promotes greater awareness and adjustment of cognitive structures (Brown & Hewstone, 2005; Weber & Crocker, 1983). It drives individuals to engage in interactions to obtain more accurate information that may help reduce dissonance resulting from the experience of disconfirmation (Bandura, 1986; Feather, 1971; Festinger, 1957; Rokeach, 1979). Experience of disconfirmation also instigates self-regulation of one's behavior, resulting in behavior modifications necessary to meet the requirement of the context (Carver & Scheier, 1981). Here, we demonstrated that these processes result in the development of the four dimensions of cultural intelligence in the context of experiential CQ education.

Another interesting finding is that among the indirect effects of the perception of optimal cross-cultural contact on the development of the four dimensions of cultural intelligence, the strongest indirect effect appears to be on the development of behavioral CQ. Our results provide support for the argument by Eisenberg et al. (in press) that certain types of cross-cultural training and education affect certain dimensions of CQ more than others. Eisenberg et al. (in press) found that intellectual-centered learning grounded in a traditional academic approach centered on lectures and readings affected the development of meta-cognitive and cognitive dimensions of CQ more strongly than motivational and behavioral dimensions. In fact, the intellectual-centered approach had no effect on behavioral CQ. The authors suggested that experiential learning grounded in direct cross-cultural contact and experience may be more effective for the development of motivational and, especially, behavioral CQ dimensions. In line with this thinking, our study demonstrated that the strongest indirect effect of the experience of optimal cross-cultural contact was on the development of behavioral CQ. The indirect effect of the perception of optimal cross-cultural contact on the development of motivational CQ was comparable to

that of metacognitive CQ and cognitive CQ. That the experience of optimal cross-cultural contact in the context of experiential CQ education contributed to the development of all CQ dimensions is also consistent with Thomas and Inkson's (2004) argument that training grounded in direct contact and experience is the most effective in developing all dimensions of cultural intelligence.

Against expectations, the direct relationship between the individual perception of optimal contact and the development of the four dimensions of cultural intelligence was not significant. Zero-order correlations between these constructs were also not significant. A popular causal step approach advocated by Baron and Kenny (1986) maintains that the presence of a significant relationship between the independent variable *x* (i.e., perception of optimal contact) and dependent variable *y* (i.e., CQ development) is an important initial step in establishing mediation. However, researchers recently disputed this requirement (Hayes, 2009; Rucker, Preacher, Tormala, & Petty, 2011; Zhao et al., 2010). Furthermore, simulation studies have shown that the causal step approach is among the lowest in power compared to other methods (e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In support of previous arguments (MacKinnon, Krull, & Lockwood, 2000; Preacher & Hayes, 2004), Zhao et al. (2010: 204) advocated that in testing for mediation "all that matters is that the indirect effect is significant" and proposed a simple framework for establishing mediation and understanding the types of mediation and nonmediation. It starts with establishing mediation by testing for a significant indirect effect of *x* on *y*, continues with classifying a type of mediation (e.g., complementary mediation, competitive mediation, indirect-only mediation, direct-only nonmediation, and noneffect nonmediation) by testing for a significant direct effect of *x* on *y* and examining the sign of the indirect and direct effects, and ends with the interpretation of the results to reach a conclusion about the study's theoretical model.

Following this framework, our study demonstrated that the experience of expectancy disconfirmation mediates the relationship between the perception of optimal cross-cultural contact and the development of the four dimensions of cultural intelligence by establishing significant indirect effects in Hypothesis 4 using the recommended bootstrap estimation procedure. In the indirect paths, greater perception of optimal cross-cultural contact is associated with greater experience of ex-

pectancy disconfirmation and, while holding the perception of optimal cross-cultural contact constant, greater experience of expectancy disconfirmation is associated with greater development of cognitive, metacognitive, motivational, and behavioral CQ dimensions. However, when holding the experience of expectancy disconfirmation constant, greater perception of optimal cross-cultural contact is not associated with the development of the four CQ dimensions. In line with the mediation classification developed by Zhao et al. (2010), our study demonstrated an indirect-only mediation, where an indirect effect exists but there is no direct effect. The Zhao et al. (2010) indirect-only mediation overlaps with Baron and Kenny's (1986) full mediation, also known as complete or total mediation. According to Zhao et al. (2010), the results of the indirect-only mediation suggest that the mediator is consistent with the hypothesized theoretical framework and omitted mediators are unlikely.

A few other findings are noteworthy. Participants' CQ scores assessed prior to partaking in the experiential CQ education were related negatively to CQ development afterward. These results are also in line with Eisenberg et al. (in press) suggesting that cross-cultural training and education may serve as "experience equalizers," allowing less culturally competent students to "catch up" with their more competent peers. The study demonstrated that following a cross-cultural management course, students' cultural intelligence was relatively more homogenous than prior to partaking in the course. The authors explained that the course resulted in a greater improvement in CQ for those students who were initially less culturally competent.

Furthermore, CQ scores assessed prior to the experiential CQ education were positively related to the perception of optimal contact and the experience of disconfirmation, suggesting that individuals with higher initial levels of CQ were more likely to perceive optimal cross-cultural contact and experience expectancy disconfirmation. These results are in line with the argument by Ng et al. (2009) that cultural intelligence may act as a moderator that enhances an individual engagement in experiential learning during an international assignment. Ng and colleagues (2009) posit that different CQ dimensions are related to the individual tendency to seek concrete cross-cultural experiences, engage in reflective observations, detect patterns and develop conceptual generalizations, and implement and test these conceptual general-

izations in cross-cultural interactions during their international assignments.

Having previous international experience was related negatively to behavioral CQ development. Eisenberg et al. (in press) demonstrated that the impact of international experience on the reported levels of CQ diminished after partaking in a cross-cultural management course. The authors explained that the course provided less internationally experienced students with knowledge and skills comparable to those acquired through international experiences prior to the course. We maintain this notion and believe that since experiential CQ education is arguably more effective in behavioral CQ development (Eisenberg et al., in press), the necessity and benefits of having prior international experience diminish. An alternative explanation may be that different types of previous international experiences may affect the development of the four CQ dimensions differently. A study by Shannon and Begley (2009) reported that previous international work experience was not significantly related to behavioral CQ. On the other hand, Tarique and Takeuchi (2009) demonstrated that previous international nonwork experience was positively related to all four CQ dimensions. Arguably, specific types of international contact may have differing influence on cultural intelligence and CQ development.

A large part of our sample consisted of individuals of Asian ethnicity (71%), foreign-born participants (85%), and particularly, Chinese-born participants (48%). Although there is very little research on the role of ethnicity and country of origin in CQ development, we controlled for these factors and found some interesting results. Being of Asian ethnicity was related negatively to the experience of expectancy disconfirmation. In our sample, among the participants of Asian ethnicity approximately 93% were foreign born. On the other hand, being born in Australia was related positively to the experience of expectancy disconfirmation. The experience of expectancy disconfirmation results from the use of cognitive categories (e.g., stereotypes) to perceive, interpret, and predict the behavior of others (Snyder & Stukas, 1999). Individual cognitive categories tend to transform as a result of contact with members of different cultures, and individuals are more likely to perceive greater variability in the behavior of individuals from different cultures following a cross-cultural contact (Stangor, Jonas, Stroebe, & Hewstone, 1996). Thus, it is plausible that foreign-born students, who on average

spent 2 years in Australia, were more likely to expect greater variability in behavior of those from other cultures and as a result experienced lower levels of disconfirmation when faced with disconfirming (e.g., nonstereotypical) behaviors.

Our results also revealed that metacognitive CQ development and behavioral CQ development were lower among the participants who were born in Australia. In contrast, motivational CQ development was greater among the participants who were born in China. Correlational analysis showed that, in comparison with foreign-born participants, Australian-born participants reported significantly higher levels of metacognitive, motivational, and behavioral CQ prior to partaking in the experiential CQ education. On the other hand, Chinese-born participants currently living in Australia reported lower levels of motivational CQ prior to partaking in the experiential CQ education. Our study also demonstrated that lower initial levels of cultural intelligence were related to greater CQ development. Our interpretation of these results is that foreign-born participants were likely to have more realistic views of the levels of their knowledge of culture and cultural differences, greater ability to exhibit culturally appropriate behavior, and more motivation to partake in culturally different experiences resulting from their current immersion in a different culture. Accordingly, foreign-born participants were more modest in scoring of the initial levels of cultural intelligence.

Finally, being a female was related negatively to metacognitive CQ development and motivational CQ development. Some prior studies reported males having higher levels of CQ (e.g., Shannon & Begley, 2009; Van Dyne et al., 2009) and others did not find significant relationship between gender and CQ (e.g., Ang, Van Dyne, & Koh, 2006; Tarique & Takeuchi, 2009); however, the research on the relationship between gender and CQ development is still largely inconclusive.

Implications for Theory

Our findings make a number of theoretical contributions to cross-cultural management learning and education literature. First, several authors have pointed out the importance of experiential education grounded in contact with members of a culturally different group in CQ development (e.g., Earley & Peterson, 2004; MacNab, 2012; Thomas & Inkson, 2004). This study extends previous research

by exploring factors and processes supporting CQ development in the context of experiential CQ education. We demonstrated that the perception of optimal cross-cultural contact and the experience of expectancy disconfirmation contributed to the development of all four dimensions of CQ.

Second, our study provides empirical evidence on the important role of the experience of expectancy disconfirmation in CQ development. Previous cross-cultural training and education literature argued that disconfirmations are crucial in the development of cultural competencies (Bhawuk, 2009; Brislin et al., 2006; Cushner & Brislin, 1996). We empirically demonstrated that the experience of expectancy disconfirmation was positively related to the development of cognitive, metacognitive, motivational, and behavioral CQ dimensions and mediated the relationship between the perception of optimal cross-cultural contact and the development of all four CQ dimensions in the context of experiential CQ education. Our results also provide empirical evidence for Bhawuk's (2009) model of disconfirmed expectancies and learning how to learn. Generally speaking, if expectations are met during cross-cultural contact, participants are more likely to respond habitually and practice behaviors they already know, whereas the experience of expectancy disconfirmation creates an opportunity to learn and develop cross-cultural capabilities.

Third, we extend research on the role of the experience of optimal contact conditions as outlined by Allport (1954) in the context of experiential CQ education. MacNab et al. (2012a) argued that not all types of social contact may be associated with CQ development. They demonstrated that the perception of optimal contact in the context of CQ education is positively related to the reported levels of CQ following the CQ education (i.e., posteducation levels of CQ). We extend the MacNab et al. (2012a) findings by demonstrating that the perception of optimal contact is related to CQ development assessed as the difference between pre- and post-education levels of CQ, albeit indirectly. Our results demonstrate that the perception of optimal cross-cultural contact creates more opportunities for the experience of expectancy disconfirmation, which in turn is associated with the development of all four dimensions of CQ.

Finally, we augment contact theory research by showing that the perception of optimal contact is associated with the experience of expectancy disconfirmation in the context of experiential CQ ed-

ucation. We also provide additional support for the argument that the experience of disconfirmation is important for successful outcomes of intergroup contact (Brown & Hewstone, 2005; Cook, 1978; Crocker, Fiske, & Taylor, 1984) by demonstrating the mediating role of the experience of expectancy disconfirmation in CQ development.

Limitations and Future Research

There are a number of limitations to this study. To fully understand the benefits of cross-cultural contact under the optimal conditions suggested by Allport (1954), experimental solutions should be developed encompassing a control group. Given the requirements encountered during our university human participants review process, particularly not being able to deny participants enrolled in management courses access to the experiential CQ education, designing a true experimental version of this project with a control group was not immediately feasible. Future researchers are encouraged to ethically and creatively overcome these difficulties to design experimental approaches as a progression of this work.

In addition to investigating the effects of the individual perception of optimal cross-cultural contact, future scholars should design experimental studies to investigate how the manipulation of optimal contact conditions (e.g., having equal status among participants vs. not having equal status among participants) influences CQ development. The results of a meta-analysis of the contact theory research demonstrated that samples not adhering to the optimal contact conditions still showed positive outcomes, albeit much weaker effects (Pettigrew & Tropp, 2006). By manipulating the presence of particular optimal conditions during cross-cultural contact, future studies may provide a richer picture of how different optimal contact conditions influence CQ development. This future research is particularly valuable for organizations, where all optimal contact conditions are not likely to occur naturally but must be designed consciously and carefully (Ensari & Miller, 2006).

Future studies should also explore factors and processes involved in CQ development that result from the experience of less structured and less optimal cross-cultural contact. Oftentimes cross-cultural contact in educational institutions and organizations occurs informally as a result of daily contact with members of culturally different groups, international travel, or short-term interna-

tional work and educational experiences. Informal cross-cultural contact may be characterized by differences in status among participants, lack of common ground and support of authorities, and impersonalized contact. Although we found that a structured approach grounded in optimal contact conditions is more likely to result in the experience of disconfirmation leading to CQ development, we encourage future research to investigate how less structured and informal contact may contribute to CQ development.

This research explored the mediational mechanisms in the relationship between the perception of optimal cross-cultural contact and CQ development. A valuable extension would be to explore potential moderators. Reviewing contact theory literature, Pettigrew (1998) argued that individual and situational factors may influence the effects of contact. For example, differences in individual values, beliefs, and attitudes, as well as organizational and societal differences, may influence the individual readiness for cross-cultural contact and the perception of optimal contact, resulting in different CQ development outcomes.

In addition, although we report interesting results about participants' individual characteristics (e.g., gender, ethnicity, country of origin, and international experience) being associated with CQ development, this study does not explain why and how various individual characteristics may influence CQ development. Future studies should provide additional insights into the relevance of individual characteristics in CQ development, particularly in context of cross-cultural training and education.

Last, in this work we collected individual cultural intelligence data before and after the experiential CQ education. Future studies should use longitudinal design including a time-distant post-survey to evaluate the long-term impact of the perception of optimal cross-cultural contact and expectancy disconfirmation on cultural intelligence and CQ development.

Practical Implications

Our results here have practical implications for cross-cultural training and education in the academic and organizational environments. While researchers have indicated that experiential approaches are effective in cross-cultural training and education, few studies investigated the specific factors and processes contributing to success-

ful training and education outcomes (Yamazaki & Kayes, 2004). The experiential CQ development approach that we described in this work could be easily implemented as part of various college-level courses addressing cross-cultural issues and competencies. Especially encouraging is that the experiential CQ development approach resulted in the enhancement of all four dimensions of cultural intelligence, corroborating Thomas and Inkson's (2004) claim that the experiential approach is the most effective in CQ development. Thus, trainers and educators are advised to implement experiential cross-cultural management training and education programs to enhance the individual capability to adapt effectively in culturally diverse contexts.

Research empirically examining factors and processes contributing to CQ development in the context of experiential training and education has also been scarce (MacNab, 2012; MacNab et al., 2012a). Our finding that the perception of optimal cross-cultural contact during experiential CQ education is indirectly related to CQ development suggests that it is important to consider contextual factors when designing cross-cultural training and education programs. We recommend that trainers and educators design experiential CQ training and education programs that foster personalized contact, equal status, common goals among participants, and support of authorities.

In addition, our findings highlight the important role of the experience of expectancy disconfirmation. We suggest that during cross-cultural education and training programs it is insufficient to simply provide opportunities for cross-cultural contact. It is important to ensure that participants experience disconfirmation during contact. According to our results, one way to increase the possibility of the experience of disconfirmation is by ensuring that participants experience optimal cross-cultural contact. In the absence of the experience of disconfirmation, participants might resort to their habitual responses and learning might not occur.

Our sample consisted of a large number of foreign-born participants which is typical of college-level cross-cultural courses that usually attract large numbers of students with international experience and exchange students. Our results indicated that foreign-born participants reported lower levels of the experience of expectancy disconfirmation and lower initial scores on three out of four CQ dimensions. We presume that, be-

cause of their current immersion experience in a different culture, foreign-born participants were likely to have more realistic expectations of the variability in behaviors among individuals from different cultures and more realistic views of their levels of cultural intelligence. However, the experiential CQ education resulted in CQ development among both foreign- and Australian-born participants. Thus, we recommend that management trainers and educators implement experiential CQ education in a variety of programs, as we expect that these programs will benefit both foreign-born and local participants.

Overall, participants and instructors in our CQ education found the process to be beneficial, engaging, and relevant to cross-cultural management education. Although many participants deemed the experience challenging, as it involves planning, active engagement, thorough reflection, and social sharing, they reported that the process provided a meaningful growth experience. Participants also indicated that instructions with regard to the experience and optimal contact conditions aided in the selection of the experience and by that also contributed to the effective facilitation of CQ education.

Yamazaki and Kayes (2004) pointed out that experiential learning may also happen informally in organizational environments as a result of cross-cultural encounters, such as a multiyear foreign expatriation, short visits to overseas divisions, or daily contact with members of a culturally different group. Based on the results of our research, we advocate that organizations foster conditions that facilitate and accelerate CQ development during these organic cross-cultural experiences. Specifically, managers may promote CQ development by providing more opportunities for personalized cross-cultural experiences (e.g., off-site meetings and company outings), setting common goals for members of culturally different groups, providing support through mentoring and feedback, and minimizing status differences in cross-cultural work experiences.

CONCLUSIONS

Our results indicated that cultural intelligence may be developed through experiential CQ education. In addition, we identified factors and processes that contribute to CQ development in the context of experiential CQ education. In particular, we demonstrated that the perception of optimal

cross-cultural contact and the experience of expectancy disconfirmation play an important role in the development of all dimensions of cultural intelligence. We believe our study should inspire educators to implement experiential CQ education as part of the cross-cultural education curriculum. In addition, our study reveals how experiential CQ education can be enriched by incorporating optimal cross-cultural contact that provides opportunities for the experience of expectancy disconfirmation. Exploring how CQ development occurs in the context of experiential cross-cultural training and education is a fruitful area for future research and we encourage researchers to conduct more in-depth analyses to reveal other individual and contextual factors and processes underlying CQ development.

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Brent MacNab passed away in July 2012 in a car accident in the mountains of San Diego. He was a two-time Fulbright Scholar and was a professor in international business at the University of Sydney, Australia. MacNab was an active researcher with many publications in top-rated academic journals and an award-winning teacher. He balanced his life with his love of surfing, hiking, and being a kind and loving husband, father, son, and brother. His wry sense of humor, sharp intellect, and true sense of adventure will be deeply missed by his family, friends, and colleagues.