

Approaches for Developing Intercultural Competence: An Extended Learning Model With Implications From Cultural Neuroscience

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Abstract

In today's workplace, organizations invest widely in intercultural training programs to develop leaders' and employees' abilities to function effectively overseas or in a culturally diverse work environment. However, these training programs are often perceived as ineffective or are even occasionally suspected of increasing the biases between groups from varied backgrounds. Faced with such results, the emerging field of cultural neuroscience has provided a biological perspective to explain the contradictions between training goals and outcomes. This article first discusses the prevailing training approaches and reviews recent studies in cultural neuroscience to explore neural reasons for certain cultural behaviors. It then identifies three implications from this review and presents an extended experiential learning model. Finally it provides three suggestions for intercultural training design.

Keywords

experiential learning, psychological theory, training and development, change (individual), adult learning

Given the global nature of employment, workplaces now comprise individuals from various cultural backgrounds with unique inherited traits and experiences. People's unique and idiosyncratic characteristics create cultural diversity within human resources. Faced with this trend, global leaders are expected to be equipped with intercultural

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competence to work effectively with their coworkers from various cultures and are expected to create and sustain an inclusive environment (Bird & Mendenhall, 2016; Ng, Tan, & Ang, 2011). To develop such competence, organizations typically invest many resources in training aimed at developing people's abilities for effective intercultural interactions (Bezrukova, Jehn, & Spell, 2012). According to a recent survey of approximately 292 human resource professionals in business (Society for Human Resource Management, [SHRM], 2014), more than one third of organizations provided training that covered content related to intercultural issues. Such cultural training programs are used for different purposes, including global leader development (Ng, Van Dyne, & Ang, 2009; Rockstuhl, Seiler, Ang, Van Dyne, & Annen, 2011), diversity management training (Holladay & Quiñones, 2008), or expatriate training (Chang, 2005; Selmer, 2000) to prepare people for more effective interpersonal relations and for job success when they interact with individuals from different cultures.

Intercultural competence is defined as the ability to communicate effectively in cross-cultural situations and to relate appropriately in a variety of cultural contexts. (Bennett, 2004; Spitzberg, 2009). In the literature, many studies have explored the connotations of intercultural competence. For example, Portalla and Chen (2010) measured intercultural effectiveness from six dimensions: behavioral flexibility, interaction relaxation, interactant respect, message skills, identity maintenance, and interaction management. Similarly, the concept of cultural intelligence (CQ) also emphasized individuals' competence to effectively interact with people from other cultures, which included four dimensions: motivation, cognition, metacognition, and behaviors (Earley & Ang, 2003). Mendenhall, Stevens, Bird, Oddou, and Osland (2008) identified six dimensions in their global competence inventory: self-awareness, exploration, global mind-set, relationship interest, positive regard, and resilience. From a developmental point of view, Bennett (2004) constructed a model for intercultural sensitivity that suggested a developmental process for intercultural competence moving from *ethnocentrism* toward *ethnorelativism*.

Although many cultural training programs have provided information about customs, taboos, or rituals in specific cultures, the methodology involved in moving from *ethnocentrism* toward *ethnorelativism* has received little discussion. Although researchers have discussed how to assist professionals in developing ethnorelativism in various fields, the understanding regarding how to design the training is scarce. As intercultural competence has become an essential requirement for many workers in multicultural settings (Chang 2007; Ober, Granello, & Henfield 2009; Stevens, Bird, Mendenhall, & Oddou, 2014), a systematic review for training design is crucial.

Conventional intercultural training designs share two similarities. First, as for the training methods, an eclectic approach, including lectures, audiovisual presentations, panel presentations, and group discussion for cultural teaching is typical. Among these methods, information giving remains one of the most common training strategies for enhancing intercultural understanding (Salas & Littrell, 2005). Similarly, Earley and Peterson (2004) pointed out that the majority of cultural training programs focus on providing culture-specific knowledge to trainees. The information provided in the training is generally threefold. The first portion regards history, facts, and the customs

and taboos of a target culture. The second portion is information regarding social oppression and underrepresented groups. The third portion includes tips for successful interactions with people from different cultures (Stewart, Crary, & Humberd, 2008). Second, in terms of training materials, the training content is often informed by studies based on survey methods (e.g., Hofstede, 2001; Schwartz, 1992; Smith, Dugan, & Trompenaars, 1996). Therefore, cultural differences and behaviors are generally identified based on participants' self-reporting with the assumption that individuals are conscious of their own cultural behaviors. Findings from such a paradigm in turn affect intercultural training design that aims to deepen participants' understanding regarding other cultures and change their behaviors (Kitayama & Park, 2010).

However, increasing evidence has demonstrated the limitations of these two assumptions. First, an information-providing approach may have the adverse effect of promoting cultural stereotyping rather than helping individuals develop a more dynamic approach to understanding and appreciating cultures (Earley & Peterson, 2004; Osland & Bird, 2000). In practice, many intercultural training programs are often perceived as ineffective (Maister, 2008); sometimes, they are even suspected of increasing the barriers between groups from varied cultural backgrounds (Kalev, Dobbin, & Kelly, 2006; Nemetz & Christensen, 1996). Such contradictions between training goals and results push researchers to more carefully examine the potential inconsistency between desired goal and conventional approach in training because knowing the causes does not necessarily lead to knowing the treatment (Kalev et al., 2006). In addition, recent scientific studies have revealed the limitations of the self-reporting paradigm for understanding people's cultural behaviors. Neuroscience measurements have shown that cultural differences can occur on a deep neural level that is beyond individuals' conscious awareness.

For training designers, the process of human change (or resistance to change) should consistently be examined from new perspectives. Although how to develop intercultural competence has been discussed in various fields, empirical scientific studies regarding the relations among cultural backgrounds, values, and behaviors are rarely used as a basis for the design and selection of training methods. As Kalev et al. (2006) noted, "Current prescriptions are not based on evidence" (p. 591). Based on these problems, the aim of this article is to offer a perspective from scientific and empirical studies. This purpose was achieved through a systematic literature review (SLR) of literature on cultural neuroscience.

Recently, the emerging field of cultural neuroscience has demonstrated interdisciplinary attempts to combine the theories and methods of cultural psychology with neuroscience (Ames & Fiske, 2010; Fiske, 2009; Han & Northoff, 2008). A growing number of empirical examinations have documented how people's backgrounds, practices, and beliefs have shaped the psychological and neurobiological processes underlying a wide range of behaviors (Chiao & Ambady, 2007; Chiao, Li, & Harada, 2008; Kitayama & Cohen, 2007; Park & Gutches, 2006). These studies from neuroscience provide a biological foundation for individuals' behaviors and may suggest implications when intercultural researchers and educational facilitators endeavor to improve on methodological design and outcomes.

The present article first reviews recent studies in neuroscience regarding three aspects of cultural behaviors; based on these findings, it then analyzes implications of those findings for learning. Finally, an extended experiential learning model and three suggestions for intercultural training design are provided.

Study Method

This study utilized an SLR as its approach (Alhejji, Garavan, Carbery, O'Brien, & McGuire, 2016; Denyer & Tranfield, 2008; Tranfield, Denyer, & Smart, 2003). Six steps were followed: setting the research purpose, defining the conceptual boundary, setting inclusion criteria, coding, categorizing, and relating. The purpose of this article is to examine teaching design in intercultural programs through a review of recent studies in cultural neuroscience. The conceptual boundary was composed of three themes: culture, learning, and neuroscience, which later became the inclusion criteria for paper selection. Each paper selected had to include cultural component in the discussion related to brain or neural responses. Both experimental and theoretical papers were reviewed because the development of such an interdisciplinary inquiry that combines cultural issues and neuroscience is still in its primary stage, and this present article attempts to further connect cultural neuroscience with the cultural learning aspect. For this pioneering attempt, empirical research as well as theoretical studies had value. A total of 36 papers were selected and retrieved from journals—such as *Asian Journal of Social Psychology*, *Brain and Language*, *Current Directions in Psychological Science*, *Journal of Cognitive Neuroscience*, *Journal of Consciousness Studies*, *Mind*, *Brain*, and *Education*, *Nature Reviews Neuroscience*, *Neuroimage*, *Perspectives on Psychological Science*, *Proceedings of the National Academy of Sciences (PNAS)*, *Psychological Science*, *Social Cognitive and Affective Neuroscience*—and books—such as *Handbook of Cultural Psychology*, *Handbook of Neuroscience for the Behavioral Sciences*, and *Neuroscience in Intercultural Contexts*.

In the coding stage, each article was given a code based on its study focus, for example, self versus others, in-group versus out-group, and individualism versus collectivism. Then, the papers were grouped into different categories based on the similarity of the codes. In the relating phase, constant comparison was utilized to link the results of this review with existing adult learning theories to draw implications for teaching design. After this process, three major categories were generated. These are presented in the next section, following by three implications for cultural learning.

Understanding Behavior Through Cultural Neuroscience

An increasing number of empirical examinations have demonstrated a correlation between brain activities and cultural practices (Ames & Fiske, 2010; Chiao et al., 2008). Because intercultural competence involves different cultures and intergroup interactions, three culturally related aspects are discussed here: in-groups compared with out-groups, perception of self and others, and a preference for staying in a similar culture. Problems involving these aspects often become the targets of many intercultural

training programs. Recent scientific evidence has helped reveal the possible underlying causes for these problem behaviors and provides new perspectives in terms of training design.

In-Group Versus Out-Group

Psychologists and cultural researchers have observed that people generally have a positive perception of in-group members (autostereotypes) and a negative perception of out-group members (hetero-stereotypes; Hofstede, Hofstede & Minkov, 2010). Because such preferences may become the root of prejudice (Barak, 2014), diversity training often seeks to persuade people to change their preferences and correct this stereotype.

However, studies have shown that favoring the in-group is related to neural activity rather than to a simple cognitive choice. For example, Chiao et al. (2008) used functional magnetic resonance imaging (fMRI) to measure the amygdala response to fearful and nonfearful faces in two distinct cultures and observed that people of similar cultural backgrounds to the faces shown showed stronger empathy and made better guesses regarding emotional reactions. Native Japanese in Japan and Caucasians in the United States showed greater amygdala activation in response to fear expressed by members of their own cultural group. In a similar manner, Adams et al. (2009) required both Japanese and American participants to guess people's emotions in different images. These images showed only the individuals' eyes. Seeing only the eyes, participants had to identify the emotion being expressed. Results showed that participants more often correctly identified the emotions expressed by people from the same culture. In other words, participants were able to more accurately identify the correct emotion of people from their own culture (their in-group). Therefore, during interaction with people from one's in-group, guessing errors may be reduced and the possibility of correct decisions increased. As for brain activity, when participants saw images from their own culture, an important region for making social perception judgments (the superior temporal sulcus) was significantly more active than when they saw images from another culture. This finding provides evidence that cultural tuning in the same group is an automatic neural response. In-group and out-group discrimination is more than a superficial behavior that can be changed by information gain; rather, such bias is deeply connected to neural systems associated with decision making and social interpretation.

Perception of Self and Others

Different perceptions regarding the self and others have been well documented in the literature. For example, psychologists and cultural researchers identified the differences between individualists and collectivists (Hofstede, 2001; Oyserman, Coon, Kemmelmeier, 2002; Triandis, 2001; Trompenaars & Hampden-Turner, 2012). Individualists view themselves as independent; their focus is on their own goals and desires, and they value self-reliance and the interests of the individual. Conversely,

collectivists view themselves as fundamentally related to others. These identities fundamentally influence how group members interact with other groups.

Individualist and collectivist orientations affect viewpoints and perspectives and often create misunderstandings between groups. For example, Adler (2008) noted that individual-oriented personnel directors prefer to hire individuals with the best personal, educational, and professional achievements. By contrast, collective-oriented directors prefer to hire people who not only are the most qualified but who also possess the characteristics of trustworthiness, loyalty, and compatibility with coworkers; their friends, relatives, or community members may become sources for such information. Therefore, many individualist managers view group-oriented hiring practices as nepotism whereas group-oriented managers may question ethical issues having to do with the individualistic approach. When viewed from the perspective of the contrasting culture, the behaviors of the two groups appear biased, illogical, unfair, or inconsiderate. Such contrasts and potential misunderstandings can occur in areas such as decision making, working styles, and performance appraisals.

To alleviate these conflicts, intercultural trainers generally provide information from both orientations in the hope that people can either learn to tolerate or change. These trainings are developed based on an assumption that people are fully aware of their orientation and can control their orientation. However, such an assumption is flawed because these values are deeply embedded and generally occur automatically. To understand this difference, cultural neuroscientists have hypothesized that the differences in self/other understanding would emerge at the level of the brain. To examine this hypothesis, Zhu, Zhang, Fan, and Han (2007) enlisted Western and Chinese participants and asked them to think about both themselves and their mothers during fMRI scanning. When both groups thought of themselves, the brain regions that showed responses were the ventral medial prefrontal cortex (mPFC) and perigenual anterior cingulate cortex (ACC). However, when participants thought about their mothers, only the Chinese participants had preferential activation in the ventral mPFC. Such results are consistent with a previous finding that many Easterners view close others as a part of the self whereas Westerners perceive the self as an independent unit (Markus & Kitayama, 1991).

Similarly, the Japanese are portrayed as being more collectivist than Americans. In Japanese culture, thinking about others' beliefs is important. The Japanese emphasize greater attention to the feelings of others than Americans do, who may remain more emotionally distant. To test this cultural pattern, one study showed that when thinking about others' beliefs, Japanese participants exhibited greater neural activity in the orbitofrontal cortex, as compared with the American participants (Kobayashi, Glover, & Temple, 2006). These regions have been associated with general evaluative processes and certain social cognitive tasks such as considering the feelings of others (Hynes, Baird, & Grafton, 2006, as cited in Ames & Fiske, 2010). Because of the different orientations of how *I* and *we* are perceived, research has also shown that when perceiving a focal object, people from collectivistic cultures are better at incorporating contextual information whereas people from individualistic cultures are better at ignoring contextual information. These results suggest that values and beliefs such as individualism and collectivism affect perception at a fundamental level (Kitayama, Duffy, Kawamura, & Larsen, 2003) that individuals may not be fully aware of.

Preference for Staying in a Similar Culture

The terms *melting pot* and *salad bowl* have been used as metaphors to describe different approaches of intergroup and intercultural interaction. Instead of being blended together in one “pot,” many individuals prefer to stay in their own group and work with people with similar values. Such a preference sometimes creates difficulties for intergroup teamwork in multinational organizations or in university classrooms. Although interventions are designed to encourage diversity, the outcomes of these attempts are often limited or last only for a short period.

Recent studies have shown that such preferences are associated with biological psychology. A brain imaging study conducted by Hedden, Ketay, Aron, Markus, and Gabrieli (2008) showed that when engaged in a task that was not congruent with their cultural values, people required increased attention, their frontal and parietal regions that control attention were activated to a greater extent. Hedden et al. (2008) examined neural activity when people from individualist and collectivist cultures completed tasks both congruent and incongruent with their cultural values (either incorporating or ignoring contextual information). The results showed greater activation in the frontal-parietal regions when people from East Asia (more collectivism) ignored contextual information and when people from Europe (more individualism) incorporated contextual information. These results indicated that extra attention and energy are required when people encounter an experience that is not congruent with their cultural values. In other words, less attention processing is required for culturally preferred modes. This finding supports previous reports of reduced attention activation in response to well-practiced tasks and well-supported cognitive models because neural automaticity increases with experience (Milham, Banich, Claus, & Cohen, 2003). When people become skilled at a task, its demand for energy diminishes. Therefore, in the economy of action (Kahneman, 2011), the preference for being with people from a similar culture is a choice that reduces effort.

Above mentioned research discloses the biological process behind cultural behaviors and helps explain why certain training design could not reach the desired outcomes. Scientific findings provide opportunities for the human resource development professional to reexamine intercultural training (Glazer, Blok, Mrazek, & Mathis, 2015). The review of recent studies in neuroscience provided three implications: Behaviors are connected to neural systems, repeated behaviors increase neural automaticity, and behavioral choices involve economic considerations.

Implications for Cultural Learning

Behaviors Are Connected to Neural Systems

Studies in cultural neuroscience have shown the biological grounds for individuals’ differences. Different values and behaviors such as having stronger in-group empathy, being an individualist or a collectivist, and preferring the same cultural group are not simply choices occurring at a cognitive level; these behaviors and values are deeply affected by neural circuitry. Behaviors are deeply connected to neural systems that are developed through experiences and contexts. The connection is fundamental, and individuals may not be fully aware of this connection.

Repeated Behaviors Increase Neural Automaticity

Behaviors shaped by context and background are an accumulation of lifelong experiences, and, over time, these behaviors become a stable framework for people's daily decisions. As suggested in the experiential learning model, people learn in a cycle that includes four stages: concrete experience, reflective observation on that experience, abstract conceptualization based on the reflection, and active experimentation by testing the new concepts (Kolb, 2015; Kolb & Fry, 1975). Waytz and Mason (2013, p. 111) noted that the human brain handles incoming sensory information via two routes. One route is the *low road*, an expressway that bypasses brain areas that support conscious reasoning; the other is the *high road*, which runs through more brain regions to get to the affected network, like a local road. Behavioral repetition develops the expressway (low load) that helps people perform the task better and better due to neural automaticity.

In the 1970s, Piaget (1975) introduced the concept of *schema*, a knowledge structure gradually formed by lessons from daily events and experiences (Bartlett, 1932; Minsky, 1974; Taylor & Crocker, 1981). When a person encounters a familiar situation, schemas are retrieved and used as reference frameworks for information processing during social interactions (Chang, 2009; Harris, 1994). As similar experiences accumulate, the schema becomes more elaborate and renders the interactive process easier (Nishida, 2005). Thus, when individuals have more experience in one cultural context, the energy and effort they require to comprehend and react to similar situations are reduced (Chang, 2009). Schema theory illustrates the human learning process and helps explain people's behaviors and preferences while recent studies in neuroscience have provided biological support for this learning process.

Behavior Choices Involve Economic Consideration

Studies of the brain have shown that as skill increases, fewer brain regions become involved, and required energy diminishes. Psychologists have found that human behaviors follow the *law of least effort* (Kahneman, 2011). If there are several alternative means to achieving a goal, people choose the least-demanding course of action. In other words, unless people pay extra attention, the neural expressway (the established pattern) would easily play the dominant role in daily decisions.

Therefore, behavioral choices involve not only preferences on the cognitive level but also economic considerations on the biological level. Behaviors congruent with one's cultural values, such as well-practiced skills, require fewer reasoning processes and activate fewer brain regions. Over time, the familiar sensory information is transmitted to the affected network via an expressway (Waytz & Mason, 2013); the demand for energy therefore diminishes, and automaticity is increased.

An Extended Experiential Learning Model

These three implications that are derived from recent neuroscience studies have enhanced our understanding of the learning process. An integrated model (Figure 1)

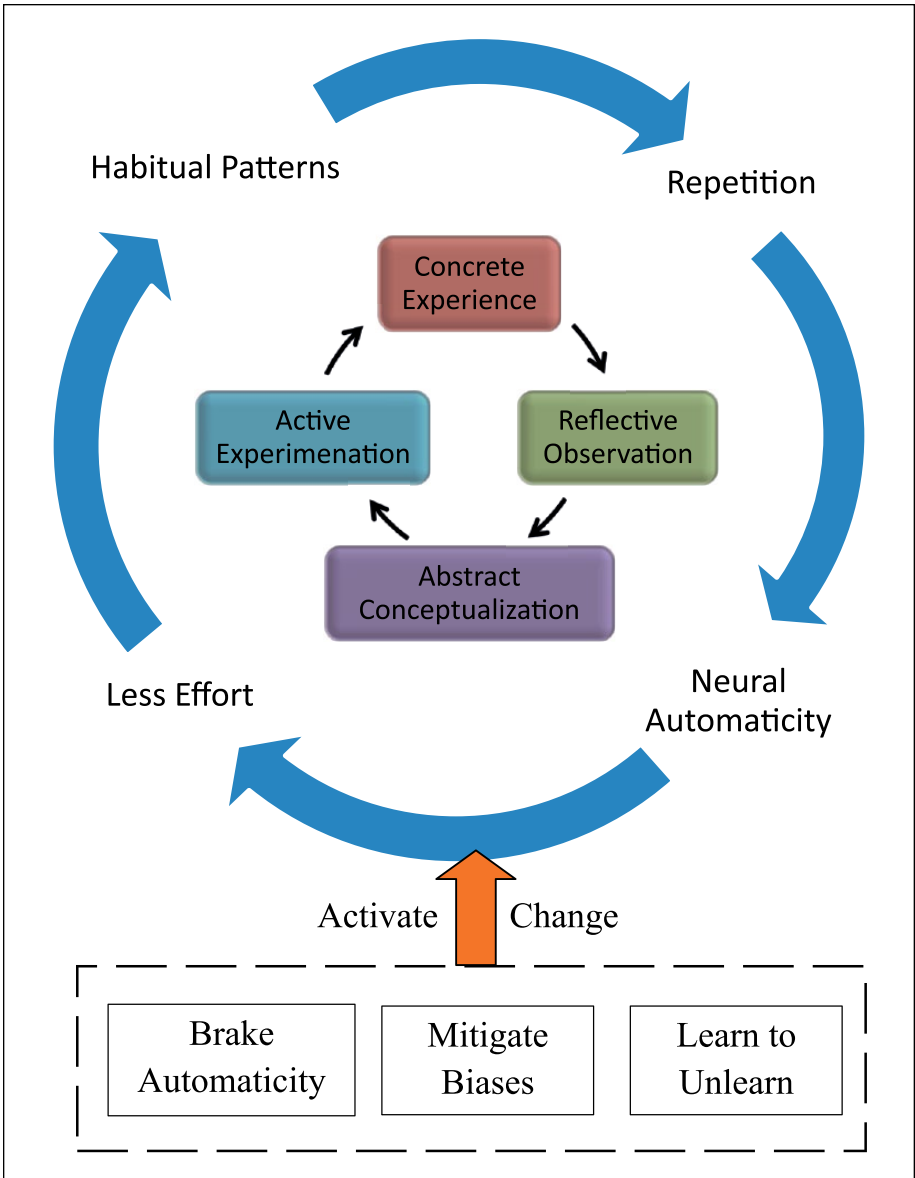


Figure 1. Experiential learning model with a neuroscience perspective.

helps show the process. There are two cycles in this model. The inner cycle is the experiential learning model suggested by Kolb (2015) that includes four components: concrete experience, reflective observation, abstract conceptualization, and active

experimentation. The outer cycle shows the process that includes the four points summarized from the recent studies on neurons and the brain. Although experience plays a key role in learning, repetition increases the neural automaticity and reduces the individuals' effort in performing particular behaviors, which encourages the formation of habitual patterns. The patterns help people respond to external demands but also subject them to potential biases.

In sum, intercultural training generally seeks to enhance awareness regarding bias and discrimination toward other cultural groups to improve workplace relationships and performance (Holladay & Quiñones, 2005). Utilizing lecture, reading, video presentations and other mediums, the training design often focuses on providing information regarding other groups and cultures; knowing more about others may render one more culturally competent (Ben-Ari & Strier, 2010; Salas & Littrell, 2005). However, the rates of failure for intercultural training programs illustrate the limitations of such approaches, and the findings of studies in neuroscience help explicate the underlying reasons. As recent studies suggest, culturally learned and repeated behaviors generally create more stable and automatic neural circuitries, creating an expressway between stimulation and response. Simply adding new information may not affect the well-established expressway and may initiate little change.

Heeding these scientific findings, educators began to discuss the relations among the mind, the brain, and education (MBE; Rodriguez, 2012; Tokuhama-Espinosa, 2010a, 2010b; Zull, 2002). Rodriguez (2013) used the human nervous system as a base to develop a framework for a reconceptualized teaching system, emphasizing a constant feedback loop between teacher and student. Such interdisciplinary discussions open new possibilities for reconsidering intercultural training design from a more profound perspective.

Suggestions for Intercultural Training Design

Based on the extended learning model, three suggestions are provided. These include activating change, mitigating egocentric biases, and integrating organizational interventions.

Activating Change

According to the *law of least effort*, well-established behaviors are economic choices. Therefore, change is not free, but instead requires effort and devotion. In the 1950s, Lewis suggested three stages of change that included unfreezing, change, and refreezing. Schein (1996) elaborated on Lewis's change theory and portrayed change as "a profound psychological dynamic process that involved painful unlearning without loss of ego identity and difficult relearning as one cognitively attempted to restructure one's thoughts, perceptions, feelings, and attitudes" (p. 28). Learning for new knowledge is different from learning for change. The unfreezing process does not occur automatically or by preaching but is triggered by a disconfirmation in which present conditions lead to dissatisfaction or dysfunction (Mezirow, 2003; Wirth, 2004) and

when the existing behavioral pattern is viewed as having created *survival anxiety*. However, this disconfirmation may not be sufficient to prompt change if *learning anxiety* is present. Learning anxiety arises from the pain of having to unlearn what had been previously accepted. Argyris and Schön (1996) viewed *unlearning* as a manner in which to subtract something from ones existing store of knowledge. Hislop, Bosley, Coombs, and Holland (2014) suggested that change involves not only acquiring new knowledge but also giving up or abandoning some established knowledge, that is, unlearning. They reviewed academic articles on unlearning from 2000 to 2011 and concluded that unlearning plays a critical role in change. However, unless the need for new learning is greater than learning anxiety, people may prefer to remain in their comfortable patterns. According to a survey of 546 senior company executives (SHRM, 2008), one of the greatest challenges in diversity training is the *general attitude of indifference*. Cognitively, human perception processes filter away any information considered irrelevant. If people do not regard the changes being undertaken as favorable, the process may trigger defensiveness and resistance (Tsang, 2008; Tsang & Zahra, 2008). The emotional process of unlearning should not be neglected.

Mitigating Egocentric Biases

Because familiar behaviors and thinking habits often go through neural expressways, to mitigate this process is a major issue, particularly for the egocentric bias. According to psychologists, *egocentrism*, developed during the process of maturation, is one of the primary obstacles preventing people from developing intercultural competence. Piaget (1997) defined *egocentrism* as an innocent mind that perceives the immediate sight of people and things to be the only perception possible and is not yet situated relative to other points of view (p. 218). It is a form of unilateral respect that reflects the asymmetry between the self and others (Piaget, 1995), preventing people from seeing the equality between themselves and other groups and creating an exclusive organizational climate. Individuals who do not move beyond this developmental position will interpret others who are different and their perspectives as *wrong* or *less than* themselves (Stewart et al., 2008, p. 377). Such a mind-set often creates in-group and out-group biases (positive or negative perceptions of people similar or different from oneself) and becomes the root of prejudice and ethnocentrism. To change, one must move from a relatively egocentric and cognitively simple state (self-orientation) to a more other-centered and cognitively complex manner of integrating into the world (Garcia, 1994; Stewart et al., 2008).

Barriers to intercultural interactions (such as bias, racism, discrimination, or prejudice) are learned during ones maturation process. Experiences from the individual's original culture shape his or her essential mind-set and frame of reference. Therefore, a critical step forward involves assisting people in moving away from egoistical thinking patterns and deeply embedded biases. The more biases a person removes, the more equality that person can perceive and the more his or her behavior changes. This step-away process generally begins from the moment people recognize their taken-for-granted values and stop immediately accepting them (Psaltis,

Duveen, & Perret-Clermont, 2009, p. 305). Emirbayer and Mische (1998) stated that habitual action

is largely unreflective and taken for granted; as actors encounter problematic situations requiring the exercise of imagination and judgment, they gain a reflective distance from received patterns that (in some contexts) may allow for greater imagination, choice, and conscious purpose. (p. 973)

To reach such an outcome, the facilitation of a cognitive transformation from an egocentric status to a status of ethnorelative understanding is invaluable. With the emergence of an ethnorelative understanding, relationships of mutual respect between the self and others can be developed. In other words, breaking down the existing egoistical mental structure and reducing self-superior bias or discrimination become important goals of intercultural training.

Integrating With Organizational Approaches

Although neurons have plasticity for new learning, repetition helps strengthen this process. The development of stable neural circuitries generally relies on repeated experience and behaviors. The repeated practice is more effective when it is embedded in context. Therefore, intercultural training should not function in addition to or in isolation from the participants' work environment because when that one-shot of information gradually fades, the prospective outcomes of training would also diminish.

In practice, multiple organizational interventions can be integrated into training such as mentoring for intercultural teamwork (on-the-job learning for intercultural competence), job rotation (to break neural expressways), inviting outside observers (to detect thinking pitfalls), and multiple cultural exposures (to create experience and immersion). When integrating with other organizational interventions, the two important components for effective learning, *contextualization* and *repetition*, can be presented in intercultural training programs to have a more prevalent influence on organizations.

Contextualization suggests integrating general content and specific context. Neuroplasticity studies have suggested that the structure of an adult human brain is altered in response to environmental demands (Draganski et al., 2004). For example, London taxi drivers who engage in sustained wayfinding show increased gray matter in the posterior hippocampi, and such effect increases with experience (Maguire et al., 2000; Park & Huang, 2010). Although trainers may face difficulties bringing a work context into the training arena in a structured training class, an alternative is to collect real cases in advance, both successful and failed, regarding intergroup interaction or intercultural teamwork. These true stories collected from a work context can then be used as the scenario for problem solving, case study, and role play during the training.

Finally, repetition has been shown in scientific studies to be a key to competence development. This principle has been widely used in technique training for hard skills such as biking, typing, and product repairing. However, for social skills training such as leadership, communication, or intercultural competence, repetition is more difficult

to apply because all incidents are not identical. To repeat, trainers can first identify a model or a series of steps they want participants to learn (e.g., conflict management) and prepare multiple cases and activities to allow trainees to apply these models or steps. Although the situation for each case is different, trainers repeat the learning points by discussion, analysis, presentation, or role-playing. By collaboration between program designers and organization managers, the training content can be repeated and integrated as an intercultural intervention package.

Conclusion

Based on the three points derived from recent neuroscience studies, the previous section identified three suggestions for intercultural training design. The three points from neuroscience included the following: Behaviors are connected to neural systems, repeated behaviors increase neural automaticity and reduce mental effort, and behavioral choices involve economic consideration. These points lead to an extended experiential learning model and three suggestions: Activate change, mitigate egocentric biases, and integrate the programs with organizational approaches.

Today, although many companies have implemented training programs to develop employees' intercultural competence, the effectiveness of such training remains uncertain. This article discussed the potential limitations of the prevailing approach and provided suggestions for training design based on recent studies in neuroscience. On one hand, an ever-increasing number of empirical studies have revealed the biological reasons for individuals' cultural preferences and behaviors; conversely, these studies have also illustrated the neuroplasticity for new learning (Draganski et al., 2004; Lee et al., 2007; Park & Huang, 2010), which has opened a new window for renovating training approaches. As Ames and Fiske (2010) stated, the findings from cultural neuroscience may help educators develop more effective teaching strategies and improve education worldwide.

Although unsatisfactory outcomes of intercultural training bring frustration to human resource developers, these results provide signals for training designers to carefully examine instructional approaches and the potential contradiction between what we mean to deliver and what we do, in fact, deliver in practice. The more sensitivity that is placed on these unexpected results, the more we may discern a path to continually improve intercultural training at a fundamental level.

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