Culture wires the brain: A cognitive neuroscience perspective

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Where you grow up can have a big impact on the food you eat, the clothes you wear, and even how your brain works. In a report in a special section on Culture and Psychology in *Perspectives on Psychological Science*, a journal of the Association for Psychological Science, psychological scientists Denise C. Park from the University of Texas at Dallas and Chih-Mao Huang from the University of Illinois at Urbana-Champaign discuss ways in which brain structure and function may be influenced by culture.

There is evidence that the collectivist nature of East Asian cultures versus individualistic Western cultures affects both brain and behavior. East Asians tend to process information in a global manner whereas Westerners tend to focus on individual objects. There are differences between East Asians and Westerners with respect to attention, categorization, and reasoning. For example, in one study, after viewing pictures of fish swimming, Japanese volunteers were more likely to remember contextual details of the image than were American volunteers. Experiments tracking participants' eye movements revealed that Westerners spend more time looking at focal objects while Chinese volunteers look more at the background. In addition, our culture may play a role in the way we process facial information. Research has indicated that when viewing faces, East Asians focus on the central region of faces while Westerners look more broadly, focusing on both the eyes and mouth.

Examining changes in cognitive processes—how we think—over time

can provide information about the aging process as well as any culture-related changes that may occur. When it comes to free recall, working memory, and processing speed, aging has a greater impact than does culture—the decline in these functions is a result of aging and not cultural experience. Park and Huang note that, "with age, both cultures would move towards a more balanced representation of self and others, leading Westerners to become less oriented to self and East Asians to conceivably become more self-focused."

While numerous studies suggest that culture may affect neural function, there is also limited evidence for the effect of cultural experiences on brain structure. A recent study conducted by Park and Michael Chee of Duke/National University of Singapore showed evidence for thicker frontal cortex (areas involved in reasoning) in Westerners compared to East Asians, whereas East Asians had thicker cortex in perceptual areas. Park and Huang observe that using neuroimaging to study the impact of culture on neuroanatomy faces many challenges. They write, "The data are collected from two groups of participants who typically differ in many systematic ways besides their cultural values, rendering interpretation of any differences found quite difficult." In addition, for each study, it is important that the MRI machines use identical imaging hardware and software.

The authors conclude, "This research is an important domain for understanding the malleability of the human brain and how differences in values and social milieus sculpt the brain's structure and function."

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