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How to Identify Mechanisms of Cultural Influences on Human Brain Functions

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A key goal of cultural neuroscience research is to identify causal effects of culture on functional organization of the human brain. An early approach to this goal employed transcultural neuroimaging (Han & Northoff, 2008; Han et al., 2013) that compared brain activities involved in a specific cognitive or emotional task in two cultural groups. This line of research has shown ample evidence for differences between individuals from two cultural groups in neural correlates of visual perception (Goh et al., 2007; Goh et al., 2010; Gutchess, Welsh, Boduroglu, & Park, 2006; Jenkins, Yang, Goh, Hong, & Park, 2010), visual attention (Hedden, Ketay, Aron, Markus, & Gabrieli, 2008; Lewis, Goto, & Kong, 2008), causal attribution (Han, Mao, Qin, Friederici, & Ge, 2011), semantic processing (Gutchess, Hedden, Ketay, Aron, & Gabrieli, 2010), musical processing (Nan, Knösche, & Friederici, 2006; Nan, Knösche, Zysset, & Friederici, 2008), mental calculation (Tang et al., 2006), recognition of one's own face (Sui, Liu, & Han, 2009), self-referential processing of personality traits (Han et al., 2010; Han et al., 2008; Ma et al., 2013; Zhu, Zhang, Fan, & Han, 2007), perception of bodily expression (Freeman, Rule, Adams, & Ambady, 2009),

Chinese participants while they made race judgments on Asian and Caucasian faces with pain or neutral expressions. We found that, relative to neutral expressions, pain expressions increased frontal/central neural activity at 128 to 188 ms (P2) after stimulus onset, but this effect was evident for Asian faces but not for Caucasian faces. We hypothesized that an other-race person may be perceived as a symbol of a racial group rather than an individual person and the lack of individuation decreases references to an individual's personal situation and consequently weakens empathy for that person. We tested whether individuating other-race persons by increasing attention to each individual's feelings or enclosing other-race individuals within one's own social group can increase empathic neural responses to other-race individuals. Thus, in Experiment 2, we asked participants to judge whether a model was feeling pain so as to enhance participants' attention to each individual model's feeling. This manipulation resulted in increased P2 amplitudes to pain versus neutral expressions of both Asian and Caucasian faces and thus eliminated the racial bias in neural responses to others' suffering. In Experiment 3, we employed a group manipulation by assigning participants to a team consisting of both Asian and Caucasian models (a fellow-team) for a competition game

others between individuals from East Asian and West-

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