Current Opinion in Behavioral Sciences

Understanding cultural differences in human behavior: a cultural neuroscience approach

Shihui Han

Cultural differences in human behavior have been widely documented and interpreted by various psychological theories that emphasize cognitive or affective mechanisms. However, it remains a challenge to provide a coherent neuroscience understanding of culturally discrepant behaviors. Cultural neuroscience research has shown increasing evidence for culturally specific patterns of brain activity such as stronger activity in the dorsal medial prefrontal cortex, lateral frontal cortex and temporoparietal junction in East Asians but stronger activity in the anterior cingulate, ventral medial prefrontal cortex, bilateral insula and temporal pole in Westerners. These findings help to create a coherent neural account of behavior differences between Western and East Asian cultures.

Addresses
Department of Psychology, PKU-IDG/McGovern Institute for Brain Research, Peking University, Beijing 100871, China

Corresponding author: Han, Shihui (shan@pku.edu.cn)

Current Opinion in Behavioral Sciences 2015, **3**:68–72

This review comes from a themed issue on **Social behavior**

Edited by **Molly J Crockett** and **Amy Cuddy**

For a complete overview see the Issue and the Editorial

Available online 7th February 2015

http://dx.doi.org/10.1016/j.cobeha.2015.01.013

2352-1546/© 2015 Elsevier Ltd. All rights reserved.

Cultural differences in human behavior

People are often surprised by witnessing how others behave unexpectedly when traveling across cultures. In one culture parents may split bills with their adult children after having dinners at a restaurant whereas this never happens in another culture. A child may sleep in an independent bedroom after birth in one culture whereas a child may share a bedroom with his/her parents until early adulthood in another culture.

Apart from these daily observations, cultural differences in behavior have been widely documented by psychological research in laboratories. For example, Chinese compared to Canadian toddlers spent more time in direct physical contact with their mothers during free play and took longer time before they approached to strangers to play together [1], indicating cultural differences in behavioral inhibition in early childhood. In a perceptual task requiring judgments on orientations (left versus right) of faces, American college students responded equally faster to their own faces regardless whether their own faces were presented alternately with their friends' or supervisors' faces [2]. Nevertheless, for Chinese college students, responses to their own faces were significantly slowed by the presence of

[13] and in perception/attention [14]. While these theories have been used to interpret cultural differences in human behavior, it is a challenge to provide a coherent understanding of culturally discrepant behaviors from a neuroscience perspective.

Cultural neuroscience approach

Human behavior is underpinned by brain activity that has been demonstrated to be highly flexible and can be modified by life experiences [15]. Therefore, the well-

enhanced neural activity in the brain areas related to self-relevance encoding and emotional responses during social cognitive/affective processes.

How do cultural neuroscience findings help us to understand cultural differences in behavior? East Asian cultures are characterized by enhanced activity in the social brain network underlying perception and inference of others' mind in the dMPFC and TPJ. The hyperactivity in the these brain regions may provide a neural basis of increased sensitivity to contextual social information including others' mental states. This pattern of brain activity may then result in improved social performances by successively taking others' perspective, mediate influences of social relationships on social behavior, and facili69 Tm(of3038 -1.1609 TD(tate)Tj/F2 1 Tf.5669 0 0 -.5669 69.9282 111.4016

Finally, although current cultural neuroscience research has demonstrated modulations of brain activity by cultural experiences, it remains unspecified how cultures interacts with neural mechanisms at cellular and molecular (e.g., neurotransmitter) levels. To clarify these questions is extremely important for understanding human specific neural plasticity and has critical practical significance. For instance, it has been taken for granted that medicines tested in one cultural group also work for other cultural populations. However, it is unclear whether a drug affects brain activity in a similar vein across different cultures. This should be taken considerations in future research.

Acknowledgements

This work was supported by the National Natural Science Foundation of China (Projects 31421003, 31470986, 91332125, 81161120539) and the Ministry of Education of China (Project 20130001110049).

References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- • of special interest
- •• of outstanding interest

1. Chen X, Hastings PD, Rubin KH, Chen H, Cen G, Stewart SL: **Child-rearing attitudes and behavioral inhibition in Chinese and Canadian toddlers: a cross-cultural study**. *Dev Psychol* 1998, **34**:677-686.

2. Liew SL, Ma Y, Han S, Aziz-Zadeh L: **Who's afraid of the boss: cultural differences in social hierarchies modulate self-face recognition in Chinese and Americans**. *PLoS ONE* 2011, **6**:e16901 http://dx.doi.org/10.1371/journal.pone.0016901.

3. Ma Y, Han S: **Self-face advantage is modulated by social threat—Boss effect on self-face recognition**. *J Exp Soc Psychol* 2009, **45**:1048-1051.

4. Ma Y, Han S: **Why respond faster to the self than others? An implicit positive association theory of self advantage during implicit face recognition**. *J Exp Psychol Hum Percept Perform* 2010, **36**:619-633.

5. Wu S, Keysar B: **The effect of culture on perspective taking**. *Psychol Sci* 2007, **18**:600-606.

6. Tsai JL: **Ideal affect: cultural causes and behavioral consequences**. *Perspect Psychol Sci* 2007, **2**:242-259.

7. Wierzbicka A: *Emotions Across Languages and Cultures: Diversity and Universals*. Cambridge University Press; 1999.

8. Matsumoto D: **Are cultural differences in emotion**

31. Han S, Mao L, Qin J, Friederici AD, Ge J: **Functional roles and cultural modulations of the medial prefrontal and parietal activity associated with causal attribution**. *Neuropsychologia* 2011, **49**:83-91.

32. Gutchess