

Culture, Smiles, and Social Connections:

Brain Responses to Excited Smiles Predict Friendships

European Americans value excited emotions more than many East Asians (Tsai et al., 2006). Do these cultural differences in emotional values influence how the brain responds to different types of smiles? And can differences in brain activity reveal something meaningful about people's social preferences and relationships out in the real world? Here we examined whether culture shapes brain activity in regions associated with reward as people viewed different smiling faces, and whether this activity might be associated with people's friendships.

Approach

To measure brain activity in European Americans and Chinese who had recently moved to the United States, we combined brain imaging with a social reward task where participants viewed smiling and angry faces. Afterwards, we asked participants to describe their friends' emotional expressions on their social media profiles.

More specifically, we used functional magnetic resonance imaging (fMRI) to measure brain activity as European Americans and Chinese played two reward tasks inside the scanner. In the social reward task, participants viewed smiling faces that varied

in intensity (calm, excited) and avoided viewing angry faces that varied in intensity (low, high). In the monetary reward task, participants received monetary incentives or avoided monetary losses that varied in magnitude (\$1, \$5). To probe for cultural differences, we averaged brain activity in the nucleus accumbens (NAcc), a region associated with reward and positive feelings, when participants viewed smiling faces, angry faces, and received money. Once outside of the fMRI scanner, participants identified six friends on social media and rated their friends' emotional expressions in their profile photos.

Based on previous research (Park et al., 2016, 2018), we hypothesized that European Americans would show greater activity in the NAcc than Chinese when viewing excited smiles. We did not expect to find cultural differences in NAcc when European Americans and Chinese viewed angry faces or received money. Further, we hypothesized that, across cultures, participants' NAcc activity in response to excited smiles in the scanner would predict the intensity of their friends' smiles on social media.

Results

Both European Americans and Chinese showed greater NAcc activity when they viewed excited smiles than when they viewed calm smiles.

However, consistent with our hypotheses, European Americans showed greater NAcc activity in response to excited smiles than Chinese. There were no cultural differences in NAcc activity for angry faces or monetary incentives.

Consistent with prior work on cultural differences in smiles, European Americans had friends who showed more intense smiles in their social media profile photos than Chinese. Across cultures, the greater participants' NAcc responses to excited smiles, the more likely they were to have friends who showed intense smiles in their profile photos (Figure 1). There were no significant associations between people's NAcc responses to earning money and their friends' expressions on social media.

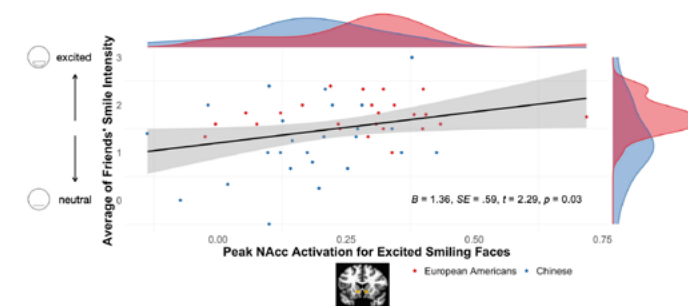


Figure 1: Association Between Nucleus Accumbens (NAcc) Activity and Friends' Smile Intensity on social media. Across cultures, differences in NAcc responses to excited smiles in the scanner were associated with greater intensity of friends' smiles in their profile photos on social media.

Conclusions

Our findings demonstrate that cultural differences can be detected at multiple levels, from activity deep within the brain to people's social preferences, including the friendships people form in their everyday lives. Importantly, we showed that these two levels were linked. Consistent with the "brain-as-predictor" approach (Berkman & Falk, 2013), people's NAcc responses to excited smiles predicted the smiles of their own friends on social media. Further, we were able to demonstrate the specificity of this effect by ruling out cultural differences in response to viewing other emotional expressions like anger and to receiving other types of incentives, like money.

In our other work, we have shown that these cultural differences matter for people's preferences in other domains. For instance, members of different cultures vary in their preferences for stimulating or soothing consumer products (Tsai et al., 2007, 2015) and even excited or calm job applicants (Bencharit et al., 2018). Moreover, we have found that these differences are related to people's emotional values. Thus, marketers, publicists, and business leaders might want to consider cultural differences in emotional values when designing marketing appeals for products and people, and when evaluating others in workplace settings.



Final Thoughts

These cultural neuroscience findings raise interesting new questions for future research. For example, do people who find excited smiles more rewarding seek out excited friends, or does having excited friends increase how rewarding excited smiles are? Do brain responses to different types of smiles change after spending more time in another culture? Do these differences result in unintended biases in applied settings, and if so, how can we mitigate them? By addressing these questions, we can better understand how cultural influences span multiple levels, from brain activity to people's behavior out in the real world.

REFERENCE

Blevins, E., Ko, M., Park, B., Qu, Y., Knutson, B., & Tsai, J. L. (2023). Cultural variation in neural responses to social but not monetary reward outcomes. *Social Cognitive and Affective Neuroscience*, 18(1), nsad068.

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