Supporting Information

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SI Observer Questionnaire

Each potential observer completed the following (culture appropriate) questionnaire. We selected only those answering "no" to all questions for participation in the experiment.

Western Caucasian Observers. Have you ever:

i) lived in a non-Western* country before (e.g., on a gap year, summer work, move due to parental employment)?
ii) visited a non-Western country (e.g., vacation)?
iii) dated a non-Westerner?
iv) had a very close friendship with a non-Westerner?
v) been involved with any non-Western culture societies/groups?

East Asian Observers. Have you ever:

i) lived in a non-East Asian† country before (e.g., on a gap year, summer work, move due to parental employment)?
ii) visited a non-East Asian country (e.g., vacation)?
iii) dated a non-East Asian person?
iv) had a very close friendship with a non-East Asian person?
v) been involved with any non-Eastern culture societies/groups?

*By Western groups/countries we are referring to Europe, North America, and United Kingdom.

†By East Asian groups/countries, we are referring to China, Japan, Korea, Mongolia, Thailand, and Taiwan.

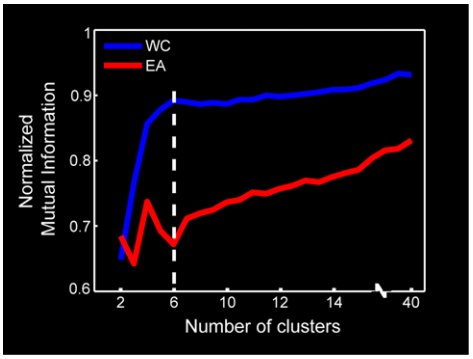

Fig. S1. Mutual information between facial expression model emotion labels and cluster membership for Western Caucasian and East Asian culture. Color-coded lines plot the averaged mutual information (MI) calculated across a range of cluster numbers (i.e., k = 2–40 inclusive) for each culture (WC, blue; EA, red). For each culture, we measured MI by randomly selecting 90 models (15 models per emotion category) and applying k-means cluster analysis (Euclidean distance; 1,000 repetitions). Using the resulting k centroids, we then cluster assigned the remaining 90 models on the basis of shortest Euclidean distance, and calculated MI. We repeated the computation 100 times for each cluster number, calculated the average MI, and normalized by an ideal MI (i.e., perfect association between cluster and emotion label). Thus, MI reflects the emotional homo/heterogeneity of the corresponding clusters where high values indicate homogeneity and low values indicate heterogeneity. As shown by the dashed line, MI is optimal when six clusters are applied to the WC models. In contrast, EA models show a low MI value, reflecting considerable overlap between these six categories. In addition, MI in the EA group could not be improved by increasing (or decreasing) the number of clusters, as would be expected if the models comprised several (or fewer) emotionally homogeneous subgroups.

Movie S1. Randomly generated facial animation. An example of 4D stimulus generated by the computer graphics platform on one experimental trial. In this example, the platform randomly selected AUs 2L, 7R, 39, and 14L and random values for each of the six temporal parameters, then combined these parameters with shape and texture information of a Western Caucasian male identity.

Movie S1

Movie S2. Dynamic models of the mental representations of facial expression reveal cultural specificity. Each row shows the mental models of facial expressions "happy," "disgust," and "anger" for one Western Caucasian (WC, left column) and one East Asian (EA, right column) observer. For ease of viewing, set your media player to "repeat." Each dynamic facial expression model is repeated four times. Mouth is more informative in WC. The top of each face is occluded to aid viewing of the mouth. Note that for WC disgust and anger are easily distinguished from the mouth, whereas for EA they are not. Eyes are more informative in EA. The bottom of each face is occluded to aid viewing of the eyes. Note that for EA mental models of disgust and anger are easily distinguished from the eyes, whereas for WC they are not.

Movie S2