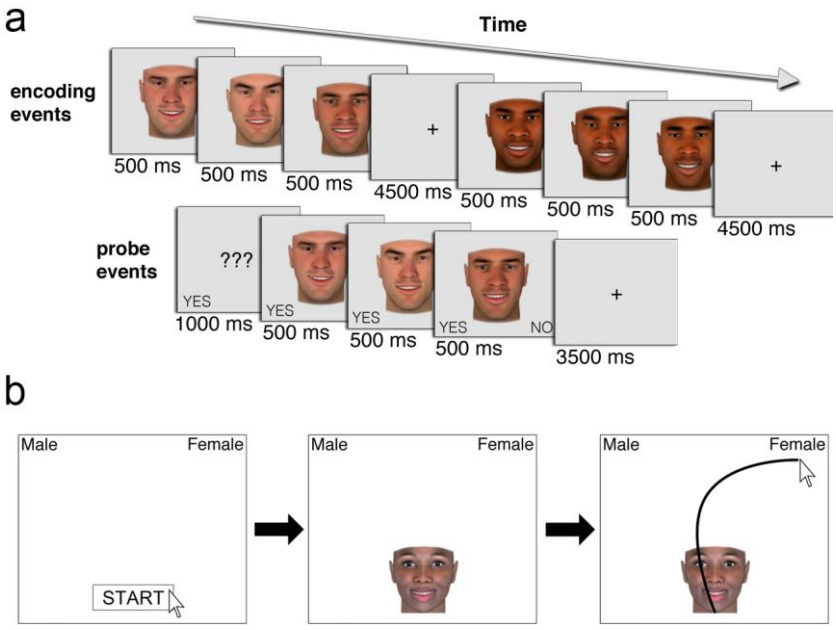
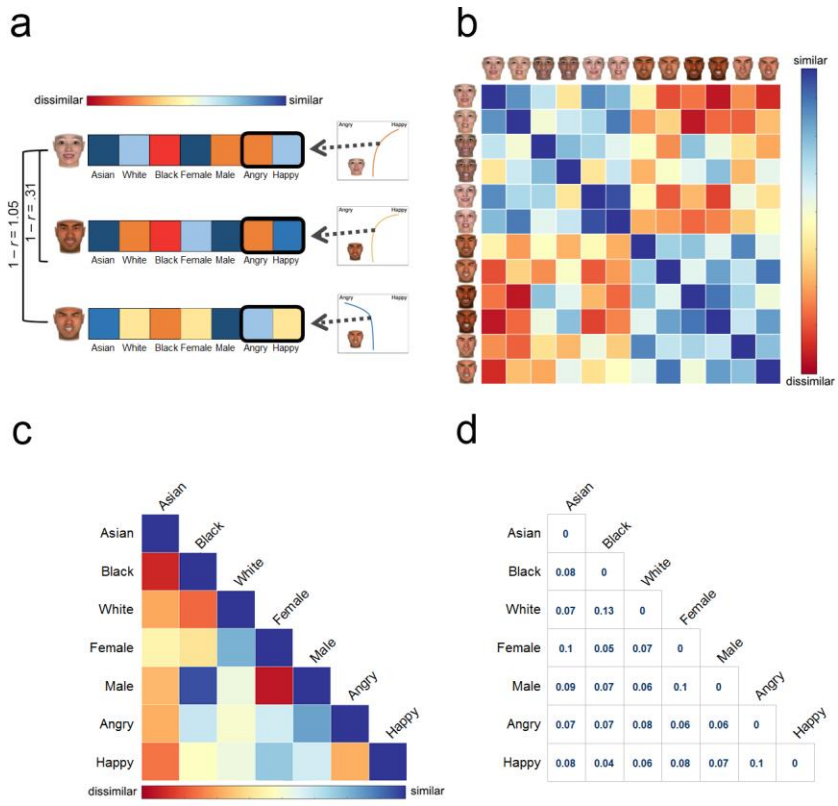


Supplementary Figure 1

Task design

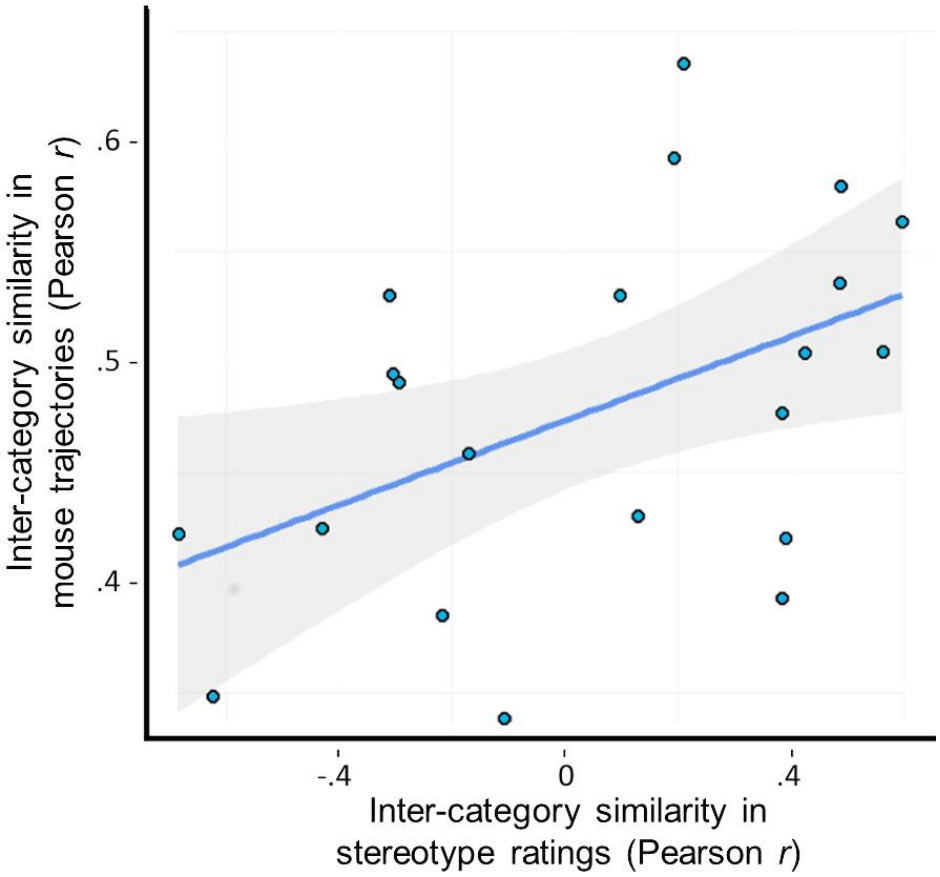
Task design for Study 1 (*N* = 17) and Study 2 (*N* = 26) in expanded form (see also Fig. 1 in main text). (a) Event-related fMRI task. Each encoding event included 3 exemplars from 1 condition. Additional probe events ensured participants' visual attention (see Online Methods). (b) Mouse-tracking behavioral task. On each trial, subjects click a 'Start' button, after which a face appears and they make a categorization response. The trajectory of their hand movement is recorded en route to the selected response. A trajectory's maximum deviation toward the opposite category response (on the opposite side of the screen) indexes the degree to which that category was activated during perception. In this hypothetical example, a Black female face elicits a trajectory that initially deviates toward the 'Male' response, because shared stereotypes between Black and male categories bias perceptions of Black faces toward male categorization. For this example, in our RSA framework, a hypothetical bias to perceive Black faces more similarly to male faces would correspond to a greater similarity between Black and Male categories in the subjective DM.



Supplementary Figure 2

Creation and summary of subjective DM in study 1

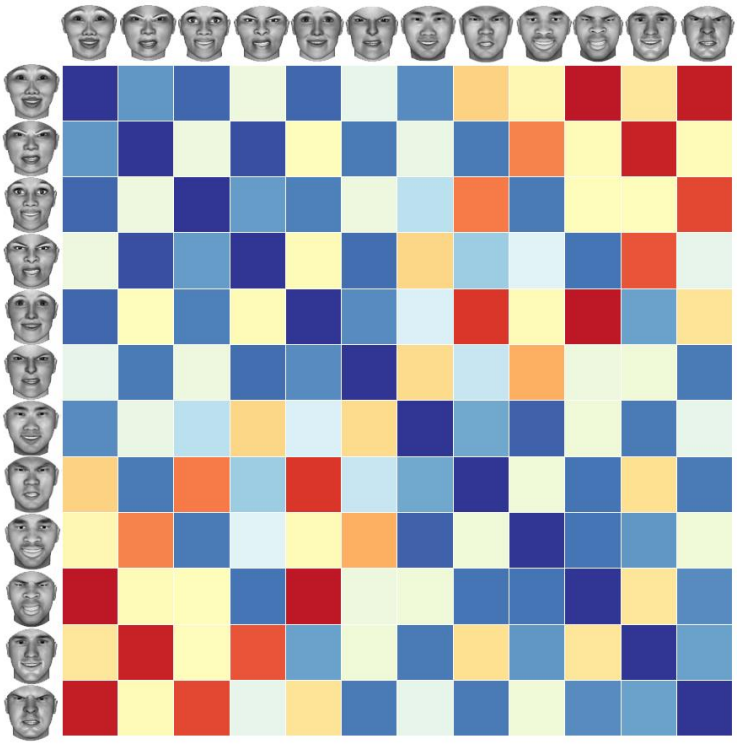
Study 1 subjective DM creation and summary (*N* = 17). (a) Mouse-trajectories were used to compute similarity vectors of each condition to the 7 main categories (e.g., trajectory-deviation towards Angry vs. Happy measures similarity to each category). Dissimilarity between all 12 conditions was computed as correlational distance (1 – Pearson *r*) between each of their vectors (see Online Methods). An example computation finding Happy-Asian-Females to be more similar to Happy-Asian-Males than Angry-Asian-Males is depicted. For ease of understanding, similarity (Pearson *r*) rather than dissimilarity (1 – Pearson *r*) values are depicted. (b) The resulting 12×12 subjective DM. (c) Means and (d) variability (*SD*) of the subjective 7×7 DM showing similarity of the 7 main categories underlying the subjective 12×12 DM.



Supplementary Figure 3

Study 1 behavioral RSA results

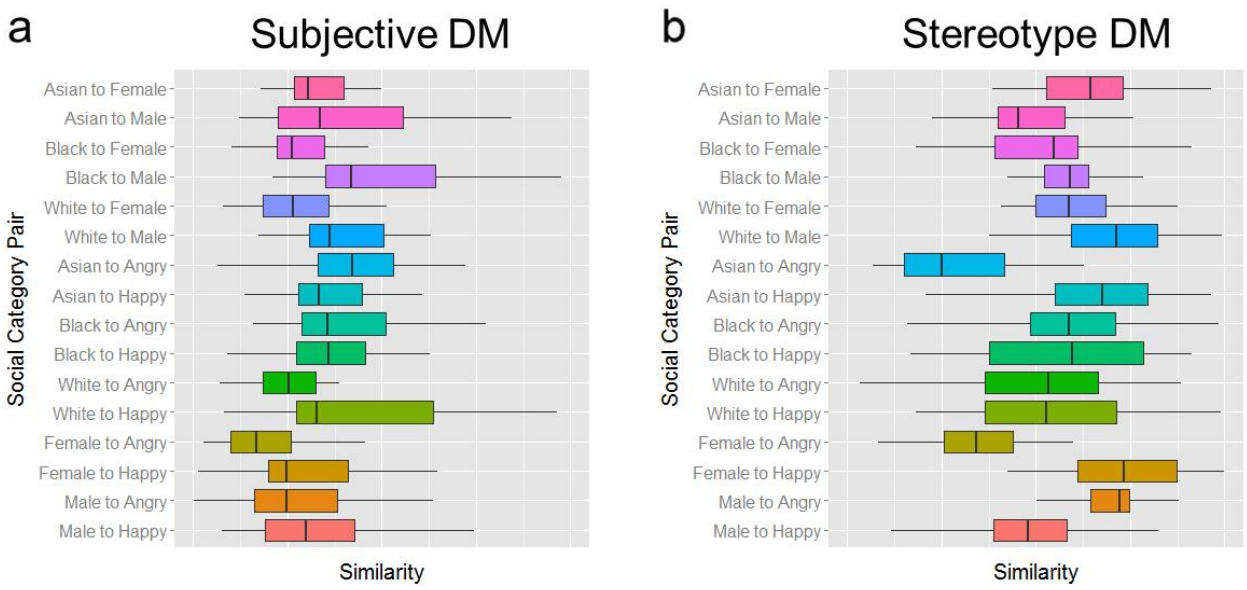
Study 1 behavioral RSA results (N = 17). To visually illustrate the positive linear relationship, a scatterplot of the Pearson correlation from Fig. 2a is depicted (identical to the Spearman correlation; r_{19} = .474, p = .023). For ease of understanding, we depict similarity (Pearson r) rather than dissimilarity (1 – Pearson r) values.



Supplementary Figure 4

Study 2 group-level normative subjective DM

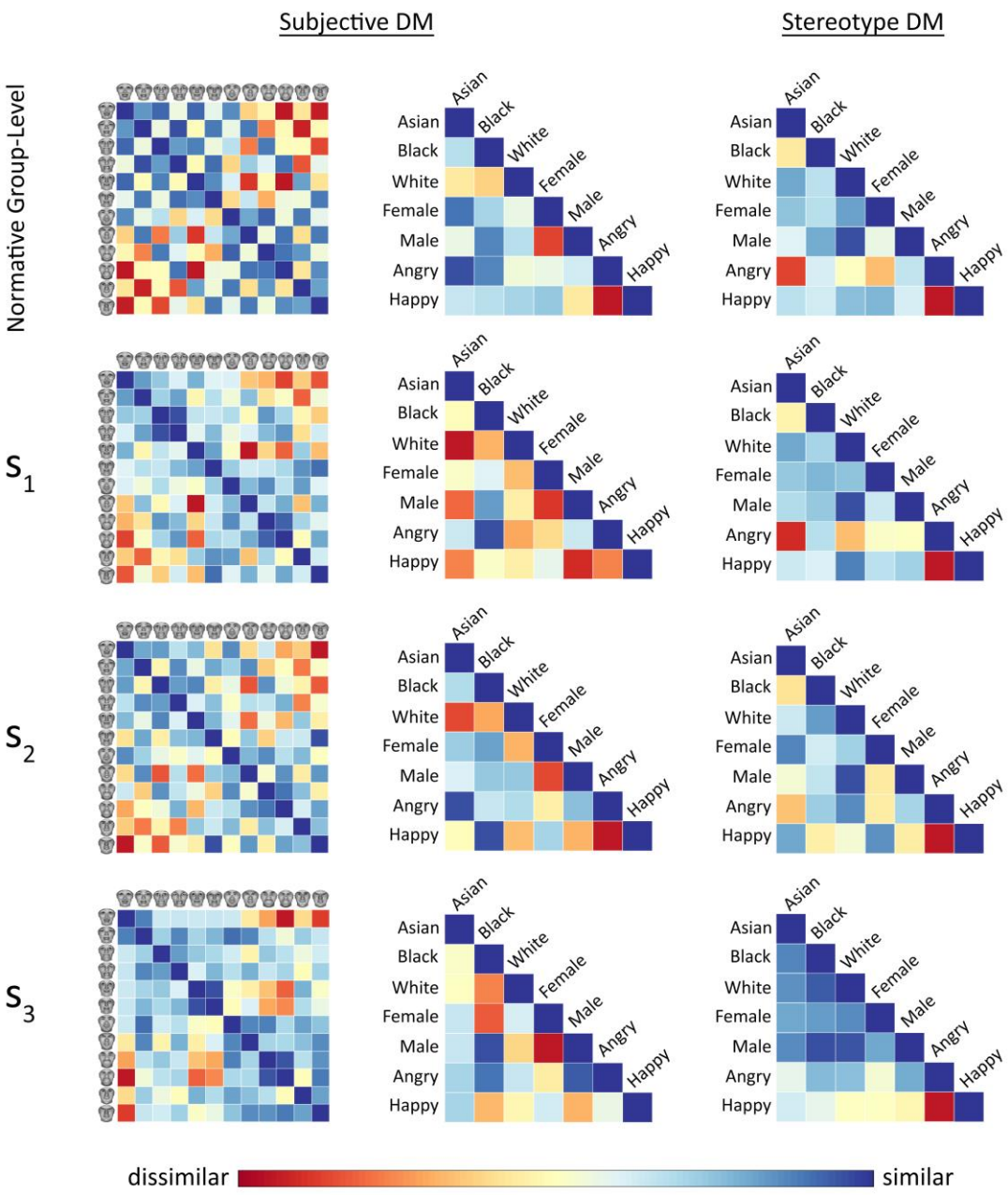
Study 2 group-level normative subjective DM (*N* = 26). Average of 26 subjects' idiosyncratic subjective DMs. Idiosyncratic subjective DMs (Supplementary Fig. 6) were used to predict neural pattern similarity in Study 2 over and above visual DMs and this group-level normative DM to assess their unique contributions. This figure also demonstrates stimuli from each condition in Study 2. To reduce confound of visual similarity between social categories, all stimuli were gray-scaled then matched on luminance and contrast. For each category (Race × Sex × Emotion), 32 exemplars were used as stimuli in the scanner. Analyses additionally controlled for visual similarity through visual model DMs (see Online Methods and Supplementary Fig. 7).



Supplementary Figure 5

Variability in inter-category similarities (Pearson *r*) in subjective and stereotype DMs in study 2

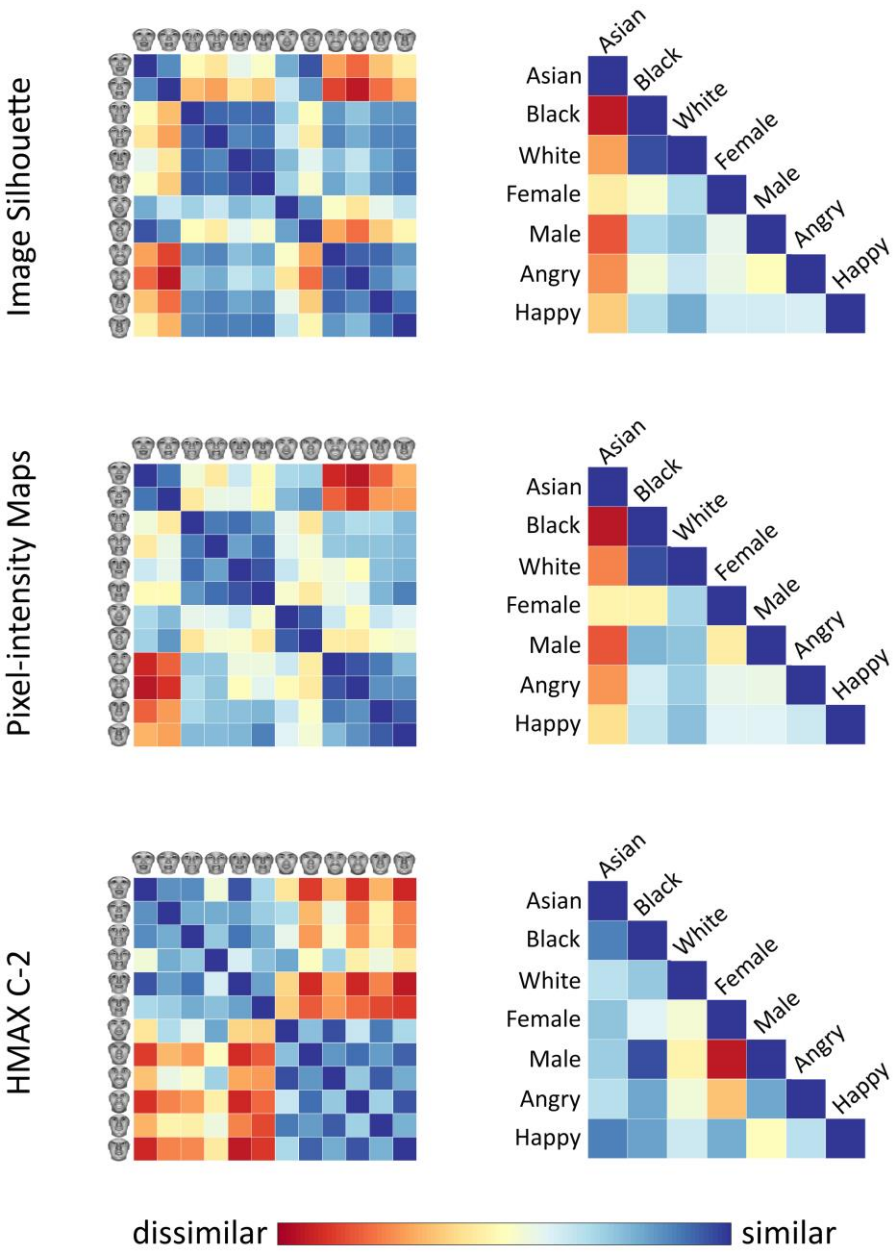
Variability in inter-category similarities (Pearson *r*) in subjective and stereotype DMs in Study 2 (*N* = 26), where subjects' unique stereotype DMs were used to predict their subjective DMs. The subjective DMs, in turn, were used to predict neural-pattern similarity structure. (a) Variability in inter-category similarity in subjective perceptions as measured by mouse-tracking. (b) Variability in inter-category similarity in stereotype contents as measured by stereotype ratings.



Supplementary Figure 6

Study 2 subjective and stereotype DMs depicting inter-category similarities

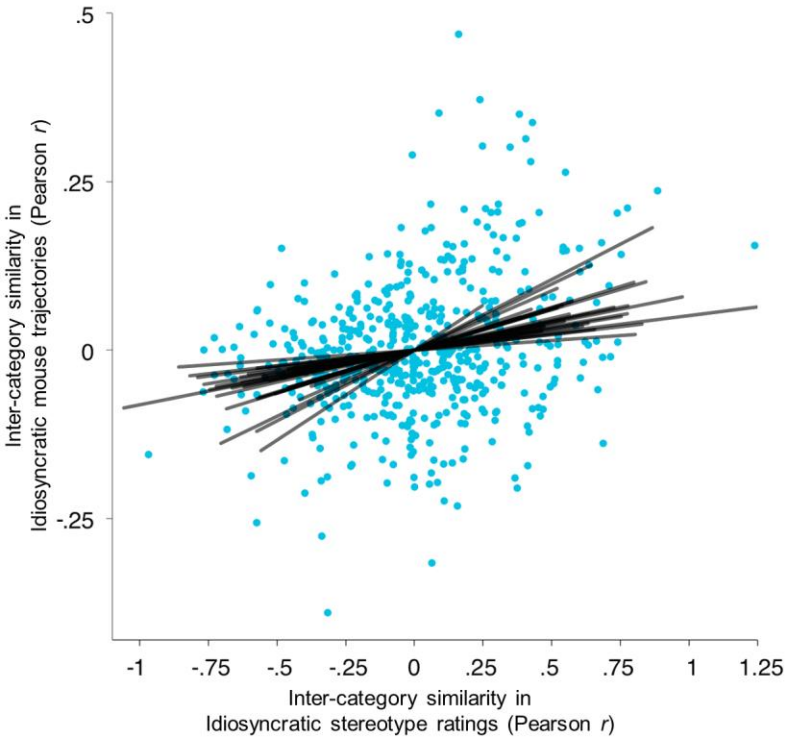
Study 2 subjective DMs (12×12 DMs, left; collapsed 7×7 DMs, middle) and stereotype DMs (7×7, right), depicting inter-category similarities (Pearson *r*). The normative group-level subjective and stereotype DMs (top row) are the average of these DMs across all subjects. The bottom three rows provide examples of individual DMs from several representative subjects (s_1, s_2, s_3). The central tendency and variance of subjective and stereotype DMs in Study 2 is summarized in Supplementary Fig. 5.



Supplementary Figure 7

Study 2 visual model DMs depicting inter-category similarities

Study 2 visual model DMs (12×12 DMs, left; collapsed 7×7 DMs, right), depicting inter-category similarities (Pearson *r*). These DMs model the inherent visual similarities between stimulus conditions, with the image silhouette DM modeling similarities in retinotopic outlines across conditions, the pixel-intensity map DM modeling pixel intensity similarities across conditions, and the HMAX C-2 output DM modeling high-level ventral-temporal representation of stimuli across conditions.



Supplementary Figure 8

Study 2 behavioral RSA results

Study 2 behavioral RSA results (N = 26). A positive relationship between idiosyncratic 7×7 stereotype and subjective DMs was obtained while controlling for three visual models (visual DMs) and the normative group-level stereotype DM (b = .28, SE = .11, z = 2.47, p = .014; tested with a multi-level regression model; see Online Methods). For illustrative purposes, each subject's stereotype and subjective DM data (inter-category similarities) are plotted alongside their linear slope (using ordinary least-squares), with subjects' intercepts equated to permit visual inspection of variability in slopes. For ease of understanding, similarity (Pearson r) rather than dissimilarity (1 – Pearson r) values are depicted.

Supplementary Table 1

Tests of stereotypical associations between categories in Study 1. Comparison of Pearson *r* coefficients from the Study 1 stereotype DM (see Fig. 2a in the main text). All DM *r* coefficients were Fisher *z* transformed. These cell values were then compared with *z* scores (see Online Methods), indicating which category pair was closest in stereotype ratings.

Category comparison	*z*	*p*
Angry similarity to Male vs. Female	3.53	< .001
Happy similarity to Male vs. Female	-4.02	< .0001
Black similarity to Male vs. Female	2.61	< .01
Asian similarity to Male vs. Female	-1.87	.061
Black similarity to Angry vs. Happy	5.60	< .0001
Asian similarity to Angry vs. Happy	5.90	< .0001

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Supplementary Table 2

Whole-brain searchlight RSA, revealing regions where neural-pattern similarity correlates with the subjective DM ($p < 0.05$, corrected) in Study 1 (see Online Methods).

Region	Side	*x*	*y*	*z*	Mean *t*	Voxels
Inferior occipital gyrus (early visual)	M	3	-88	-5	4.27	2,033
Middle frontal gyrus / Anterior insula	R	49	20	26	3.91	178
Fusiform gyrus	R	30	-55	-13	3.80	126
Inferior frontal gyrus	R	43	39	-2	3.76	86
Orbitofrontal cortex	M	-6	37	-19	3.95	57
Inferior parietal lobule	L	-61	-20	34	3.65	52

Abbreviations**:** L, left; R, right; M, medial

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