

Where are “We” Compared to “Them”? Neural Correlates of Social Identity Processes

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Introduction

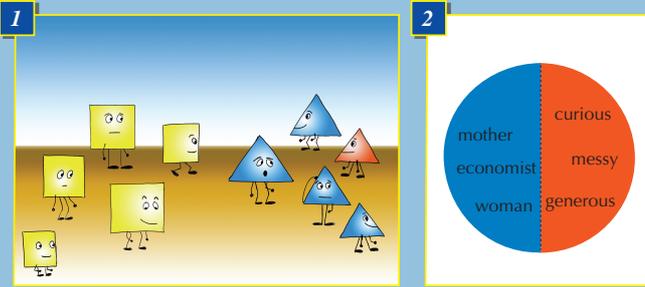


Figure 1: Schematic diagram of a character (red), its in-group (blue), and a relevant out-group (yellow).

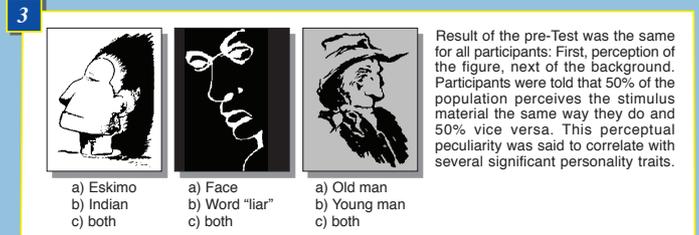
Figure 2: Distinction between social (blue) and personal (red) identity.

- Social categorizations can be conceived of as cognitive tools that segment, classify, and order the social environment, and thus enable the individual to undertake many forms of social action.
- But, social categorization do not merely systematize the social world, they also provide a system of orientation for *self-reference*: They create and define the individual's place in society. → Social groups, understood in this sense, provide their members with an identification of themselves in social terms¹.
- These identifications are to a large part relational and comparative: They define the individual as similar to or different from, as better or worse than, members of other groups.
- Social identity is suggested to consist of those aspects of an individual's self-image that sub-serve self-referential processes, particularly with personal identity^{3,4}. According to SIT, aFMC-activation should only be observed when individuals strive to achieve a positive social identity, i.e., by favorable comparisons for the in-group.

Methods

Employed Paradigm: Pre-Test to determine group membership on the basis of a dummy performance criterion; modified version of the Minimal Group Paradigm⁵.

Pre-Test: What do you perceive at first?



Result of the pre-test was the same for all participants: First, perception of the figure, next of the background. Participants were told that 50% of the population perceives the stimulus material the same way they do and 50% vice versa. This perceptual peculiarity was said to correlate with several significant personality traits.

Modified version of the Minimal Group Paradigm

Participants (20, 10 female, 25.4 years) were assigned a color (yellow/blue) so as to easily identify in-group and out-group members. The task was to award amounts of money to pairs of other subjects (excluding self). Recipients were anonymous except for their group-membership. Amounts were awarded individually and anonymously. No instruction how to assign the money.



Imaging

3T Siemens Trio (Siemens, Erlangen); 22 axial slices parallel to AC-PC (4mm thickness, 20% spacing); 2D anatomical images: MDEFT; functional images: EPI sequence (TE=30ms, 64x64 pixel matrix, flip angle 90°, field of view 19.2cm); TR=2s; 4ipt; separate session: high resolution whole-brain images: T1-weighted 3D segmented MDEFT sequence.

Data Analysis

Software: LIPSIA⁸; Preprocessing: 1/96 Hz highpass filter; correction for temporal offset between slices (spline); 5.65mm FWHM; linear scaling; non-linear normalization; scaling of slice gaps by interpolation, resolution 27mm³; Statistics: GLM: random effects model (contrast images); Bayes-analysis⁹; Visualization: threshold of 98.5% applied to probability maps.

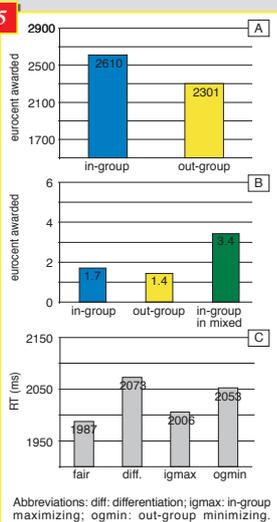
Results

Behavioral Results

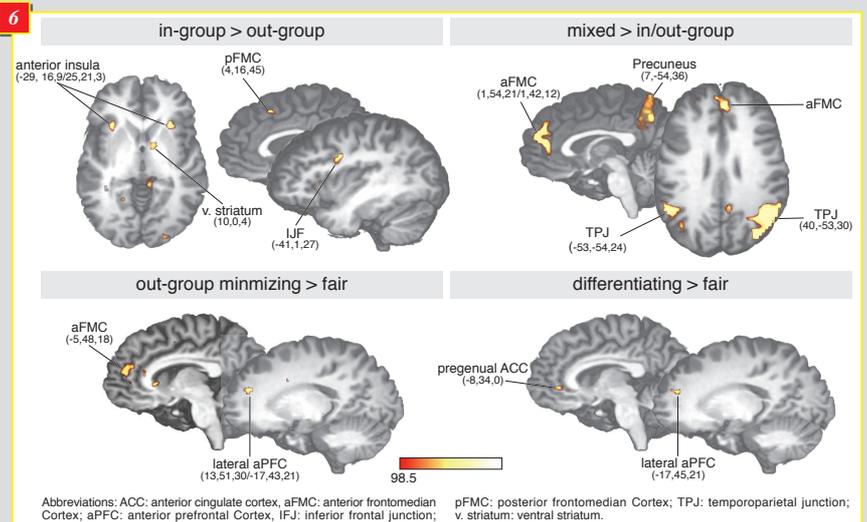
Participants showed in-group bias: Significantly more money was awarded to the in-group member (cf. 5A; $t(19)=4.6$; $p<.0001$).

In mixed trials, the in-group member was awarded significantly more money (cf. 5B; $F(2,18)=16.6$; $p<.0001$). Different strategies could be dissociated, yet, did not differ in response times (cf. 5C; $F(3,17)=.19$; $p=.78$).

Identification with the in-group, acquired by means of a questionnaire after the session, was high (significantly different from the scale mean (3); $t(19)=4.1$; $p<.0001$).



Abbreviations: diff: differentiation; igmax: in-group maximizing; ogmin: out-group minimizing.



Abbreviations: ACC: anterior cingulate cortex; aFMC: anterior frontomedian Cortex; aPFC: anterior prefrontal Cortex; IJF: inferior frontal junction; pFMC: posterior frontomedian Cortex; TPJ: temporoparietal junction; v. striatum: ventral striatum.

Results & Discussion

- Participants showed a clear in-group bias: Significantly more money was awarded to the in-group member, both in absolute terms and in mixed trials (cf. Fig. 5A,B).
- The time to award money differed significantly subject to the condition, i.e., in-group trials: 2162ms (SD: 524), out-group trials: 2053ms (SD: 542), and mixed trials: 1976ms (SD: 548), whereas reaction times did not differ subject to the employed strategy (cf. Fig. 5C).
- Activation within aFMC was observed when mixed trials were compared to both in-group and out-group trials, but not when contrasting in-group trials with out-group trials.
- According to our hypothesis and the SIT, aFMC-activation solely elicited when participants favored the in-group over the out-group, e.g., when the maximum difference was more important than the maximum in-group profit (differentiation), or when minimizing the economic gain for members of the out-group, but not for in-group maximization.
- Based on the assumption that the self concept comprises two parts, i.e., the personal identity and the social identity, we expected activation within aFMC for social identity processes parallel to the finding of aFMC-activation during personal identity processes¹⁰⁻¹². According

- to SIT, social identity processes are based to a large extent on favorable comparisons between the in-group and some relevant out-group. In the Minimal Group Paradigm, favorable comparisons are realized by out-group minimization and differentiation.
- In accordance with this assumption, aFMC-activation has only been observed when favorable comparisons for the in-group could be made (mixed trials) and were made (out-group minimization, differentiation).
- We conclude, that social identity processes, which are conceived of as positively discrepant comparisons between in-group and out-group, provide a system of orientation for self-reference.

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