The role of emotional labeling in categorization of inverted expressive faces

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Background

Face inversion effect (FIE): inverted face is more difficult to recognize, probably due to disrupted holistic perception. FIE occurs in basic emotions, but is greater for anger, disgust and fear than for happiness, sadness and surprise. Also, inverted faces lack categorical perception (CP): enhanced ability to perceive dissimilarities in objects from different categories compared to objects from the same category.

Questions: are inverted facial expressions perceived categorically and how large is the impact of emotional labeling into FIE?

ABX discrimination task

Participants: N = 20; age 18-42 (upright) N = 20; age 17-40 (inverted)
Task: which of the test images was equal to the target?

Predicting discrimination from identification results:

\[ R_{up} = 0.25(D_1 + D_2) + 0.25 \sum (P_{up} - P_{inv})^2, \]

\[ D_1 \text{, } D_2 = \text{observed discrimination rates in first and last stimuli pair; } \]

\[ i = \text{emotional categories; } P_{up} \text{, } P_{inv} = \text{rates of categorizing stimuli as } i \text{.} \]

Pearson’s \( \chi^2 \) to compare observed vs predicted functions. All differences non-significant.

Any CP? Discrimination functions for both upr and inv continua are non-uniform, but central peak appears only in upr surprised-sad.

Any FIE? Discrimination for upr vs inv faces differed significantly only in sad-neutral continuum.

Identification task

Participants: N = 23; age 19-51 (upright) N = 25; age 19-53 (inverted)
Task: select the emotions that present on the face (multiple choice of 7 basic emotions)

Fisher’s exact test to compare upr vs inv identification for each emotion. All differences non-significant except anger (p=0.0001) in sad-neutral continuum.

In inverted vs upright continua: anger identified up to 20% answers (on sad FE); correctly identified sadness fell to about 40%. Surprise identified as fear in up to 30% in both orientations.

Conclusions

• FIE was shown only for sad-neutral continua, no FIE was observed on happy-surprised and surprised-sad transitions (in line with ref. 2).
• Discrimination functions are equally well predicted from identification results both for upright and inverted faces.
• Classic CP peak was observed only on upright surprised-sad faces.

References


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