Deeper levels of processing improve recognition accuracy for inverted faces

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Research Question
Do deeper levels of processing improve recognition accuracy for inverted faces?
• Hypothesis: Deeper levels of processing will improve recognition accuracy of inverted faces.

Introduction
• The face inversion effect (FIE) is the significant decrease in face recognition accuracy that results from rotating a face 180 degrees.
• The depth of processing framework postulates deeper levels of perceptual analysis are correlated with stronger and more long-lasting memories of a stimulus.
• Upright faces processed at a deeper level have higher recognition rates compared to those processed at a shallow level.
• If deeper levels of processing result in higher recognition accuracy for upright faces, will the same effect be seen with inverted faces?

Method
• Participants: 34 students and staff from UTD (7 male, 26 female, 1 other, M_age = 20.82 years, range = 18 years to 36 years).
• Stimuli: 128 neutral expression faces from the Chicago Face Database.
• Procedure: Participants were randomly assigned to an upright OR inverted image condition.
  1. Study/exposure phase: Presented 64 faces and asked to answer a question about each face.
     • Shallow Questions: 1. Does this face have freckles? 2. Does this face have dark eyebrows?
     • Deep Questions: 1. Does this face look smart? 2. Does this face look friendly?
  2. Distractor task: 9 order-of-operation algebra questions.
    • 64 from study/exposure phase
    • 64 novel

Design

Hypothesis: Deeper levels of processing will improve recognition accuracy of inverted faces.

Results
A two-way mixed ANOVA found:
• Hit rate (HR) for upright faces > inverted faces (F(1,32) = 4.71, MSE = 43.50, p < .05, η² = .13).
• HR for deep questions > shallow questions (F(1,32) = 161.48, MSE = 6.94, p < .001, η² = .84).
• Significant interaction between orientation and question type: upright and inverted HR not different in shallow condition but significantly different in deep condition (F(1,32) = 5.30, MSE = 6.94, p < 0.05, η² = .14).

Conclusion
• Inverted face recognition accuracy can be modulated using levels of processing.
• Deeper levels of processing result in higher recognition rates for inverted faces.
• Future research will investigate how levels of processing interacts with inverted object recognition. Additionally, we will investigate what aspects of the face levels of processing are operating on to modulate recognition accuracy.

References