Individual Differences in Face Processing as Revealed with Priming

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Previous Research

The duration of a word prime has been shown to reverse the direction of its influence of an identical target for immediate priming of perceptual identification (Weidemann, Huber, & Shiffrin, 2005); using a two-alternative forced choice paradigm similar to the one presented in Figure 1, short duration prime words identical to a target word helped identification of the target, but long duration primes harmed identification of the target.

In the current line of experiments, we extended this paradigm to examine face priming, and additionally tested upright and inverted faces to assess configural and featural priming separately. In order to assess individual differences in face perception abilities, we broke our participants into two groups based on their perceptual threshold. For the low threshold group, there was a strong face inversion effect that interacted with priming; upright faces revealed the usual priming reversal with longer prime durations but this reversal was absent for inverted faces. For the high threshold group, face inversion effects were missing and priming was similar regardless of face orientation. Rieth and Huber (2005) produced a dynamic neural network model of these results by assuming the high threshold group responded based on a featural layer in a multi-layer network whereas the high threshold group responded based on a configural layer for upright faces.

Present Findings

Because different perceptual threshold require different target durations in order to maintain performance at the same level across participants, the previous results did not uniquely identify whether these priming differences were due to perceptual processing differences, or whether they were some sort of artifact of using different target durations. We ruled out this alternative by manipulating both target duration and prime duration for every participant.

In another experiment, we tested whether the high/low threshold effect resulted from different participants adopting different response strategies. This was achieved by intermixing blocks of same/different trials that were designed to induce different strategies for different groups of participants; different groups performed same/different trials with inverted faces (feature identification strategy), faces split horizontally (feature identification strategy), or blurred faces (configuration based strategy). We replicated the priming interaction as a function of threshold, but the same/different strategy induction trials failed to produce differences.

These face priming results suggest that people differ in their ability to process configural face information and that the rapidity with which positive priming transitions to negative priming is an indication of these perceptual differences.

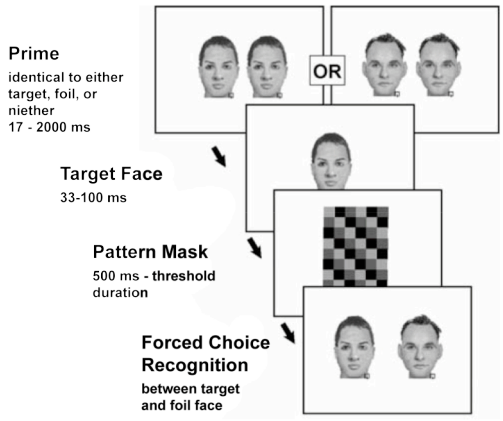

Figure 1: Presentation Sequence.

References

Weidemann, C. T., Huber, D. E., Shiffrin, R. M. (2005). Confusion and compensation in visual perception: Effects of spatiotemporal proximity and selective attention. *Journal of Experimental Psychology: Human Perception and Performance, 31,* 40-61.

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