

Effects of superfamiliarity on change blindness in a gradual change paradigm

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Introduction

Change blindness is an attentional deficit that affects everyone. Change detection rates among humans are surprisingly low, meaning the majority of changes happening in front of our eyes are not actually being noticed.

Change blindness is commonly investigated with a flicker paradigm, where an image is changed following a disruption (Rensink, O'Regan & Clark, 1997). The subject sees a continuous loop of the original image, a brief buffer, and then an altered original image until the subject detects the change. Buttle and Raymond (2003) used this method to find evidence of a superfamiliarity effect. Their study showed that changes to unfamiliar faces were less likely to be noticed than changes to familiar faces.

A lesser-used method of exploring change detection is the gradual change paradigm. Here, changes to an image occur slowly and without any kind of disruption. David, Laloyaux, Devue and Cleeremans (2006) demonstrated that change detection rates are even worse in gradual changes than in disrupted, or flicker, changes. They compared detection rates of slow changes and disrupted changes to unfamiliar faces and found more than a 50% decrease in slow change detections than in flicker detections.

The current study aimed to investigate the effect superfamiliarity has on gradual change detection. In order to do this, we compared detection rates for changes to familiar faces, unfamiliar faces, and colors in gradually changing scenes.

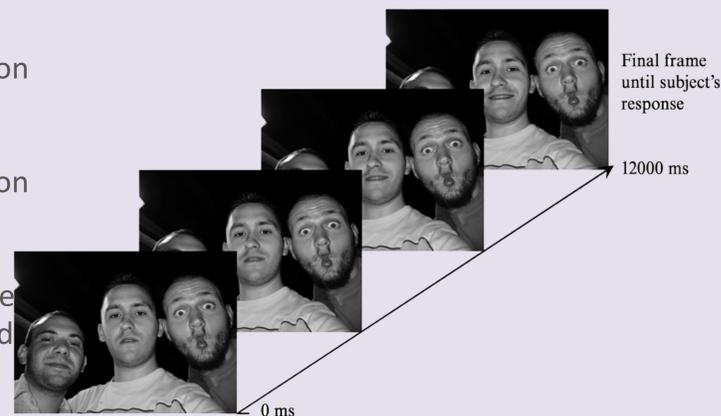
Hypothesis:

Gradual changes to familiar faces will be detected more often than changes to unfamiliar faces or colors.

Methods

26 participants saw a randomized sequence of the following video types:

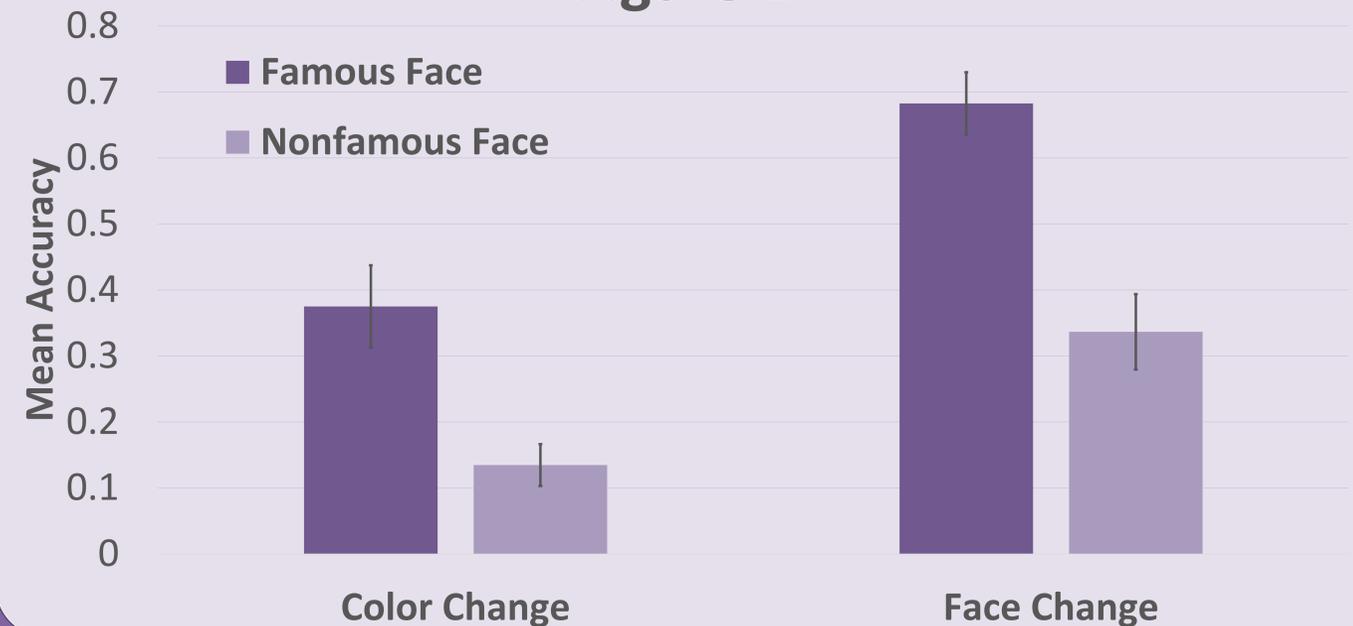
- 8 videos with nonfamous faces*
 - 4 included changes to a facial expression
 - 4 included changes to a color
- 8 videos with famous faces
 - 4 included changes to a facial expression
 - 4 included changes to a color



Participants were asked to identify and describe the gradual change occurring in each 12-second video.

*The 8 videos in the nonfamous face condition were taken from David, Laloyaux, Devue, & Cleeremans (2006)

Figure 1



Results

A two-way ANOVA showed that detection rates were higher for famous pictures than nonfamous ones, $F(1, 25) = 18.89, p < .001$, and higher for changes to expressions than colors, $F(1, 25) = 44.79, p < .001$. There was no interaction between familiarity and location, $F(1, 25) = 1.65, p = .21$.

Discussion

Our results are consistent with our hypothesis that changes to familiar faces are more likely to be detected than changes to unfamiliar faces. David et al.'s study (2006) was corroborated with our results, as changes in facial expressions were much better detected than changes in colors. Interestingly, color changes were more likely to be detected when the scene contained familiar faces than when it contained unfamiliar faces. While this was unexpected, it is consistent with the notion that familiar faces are recognized more easily, thus preserving attention which can then be used to see other changes in a scene. Our results align with those of Buttle and Raymond (2003) in this way, supporting the theory that superfamiliarity improves change detection by requiring fewer attentional resources than unfamiliar faces do.

References

- Buttle, H., & Raymond, J. E. (2003). High familiarity enhances visual change detection for face stimuli. *Perception & Psychophysics*, 65(8), 1296–1306.
- David, E., Laloyaux, C., Devue, C., & Cleeremans, A. (2006). Change blindness to gradual changes in facial expressions. *Psychologica Belgica*, 46, 253–268.
- Rensink, R. A., O'Regan, J. K., & Clark, J. J. (1997). To See Or Not To See: The Need for Attention to Perceive Changes in Scenes. *Psychological Science*, 8(5), 368–373.