Differences in the Perceptual Processing of Unfamiliar and Familiar Faces

Kasey McGinnessa, Jessica Taubertb, Deborah Apthorpa,c,∗

*aSchool of Psychology, University of New England, NSW, Australia*

*bSchool of Psychology, University of Queensland, QLD, Australia*

*cSchool of Computing, Australian National University, Canberra, Australia*

## Abstract

Evidence that familiar faces are processed differently from unfamiliar faces has important implications for our understanding of how we recognise the people around us. Although familiarity effects on face recognition performance have been extensively researched, the perceptual and cognitive processes that underlie these differences are comparatively unknown. Using a psychophysical staircase paradigm, we collected data from 28 female participants aged 18-65 years (𝑀 = 43.1, 𝑆𝐷 = 12.7) and probed perceptual processing by measuring the minimum amount of time required to recognise a previously seen face across three levels of familiarity (unfamiliar, familiar, and self). We also measured a second dependent variable, reaction time, which is thought to reflect both perceptual and cognitive processes. The results revealed that participants needed less time to recognise familiar faces compared to unfamiliar faces. Concomitantly, participants needed less time to respond when tasked with recognising faces compared to unfamiliar faces. As expected, inverted faces took longer to recognise than upright faces, but this effect was reduced for familiar and self- faces. Recognition times provide evidence for distinct perceptual processing based on level of familiarity and suggest that our ability to recognise familiar faces may be poorly characterised by current theories. Overall, the results emphasise the uniqueness of the self-face within the familiarity continuum, as all participants were able to recognise their own face significantly faster than other faces. In light of these results, it is clear that a full understanding of how face recognition is accomplished will require a better characterisation of how we respond to highly familiar faces.

*Keywords:* Face perception, Psychophysics, Face inversion effect

∗Corresponding author

*Email address:* [dapthorp@une.edu.au](mailto:dapthorp@une.edu.au) (Deborah Apthorp)