

The Face inversion Effect and Perceptual Learning: Features and Configurations.

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ABSTRACT

This thesis explores the causes of the face inversion effect, which is a substantial decrement in performance in recognising facial stimuli when they are presented upside down (Yin, 1969). I will provide results from both behavioural and electrophysiological (EEG) experiments to aid in the analysis of this effect. Over the course of six chapters I summarise my work during the four years of my PhD, and propose an explanation of the face inversion effect that is based on the general mechanisms for learning that we also share with other animals. In Chapter 1 I describe and discuss some of the main theories of face inversion. Chapter 2 used behavioural and EEG techniques to test one of the most popular explanations of the face inversion effect proposed by Diamond and Carey (1986). They proposed that it is the disruption of the expertise needed to exploit configural information that leads to the inversion effect. The experiments reported in Chapter 2 were published as in the *Proceedings of the 34th annual conference of the Cognitive Science Society*. In Chapter 3 I explore other potential causes of the inversion effect confirming that not only configural information is involved, but also *single feature orientation information* plays an important part in the inversion effect. All the experiments included in Chapter 3 are part of a paper accepted for publication in the *Quarterly Journal of Experimental Psychology*. Chapter 4 of this thesis went on to attempt to answer the question of whether configural information is really necessary to obtain an inversion effect. All the experiments presented in Chapter 4 are part of a manuscript in preparation for submission to the *Quarterly Journal of Experimental Psychology*. Chapter 5 includes some of the most innovative experiments from my PhD work. In particular it offers some behavioural and electrophysiological evidence that shows that it is possible to apply an associative approach to face inversion. Chapter 5 is a key component of this thesis because on the one hand it explains the face inversion effect using general mechanisms of perceptual learning (MKM model). On the other hand it also shows that there seems to be something extra needed to explain face recognition entirely. All the experiments included in Chapter 5 were reported in a paper submitted to the *Journal of Experimental Psychology; Animal Behaviour Processes*. Finally in Chapter 6 I summarise the implications that this work will have for explanations of the face inversion effect and some of the general processes involved in face perception.

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(Dante Alighieri said to Virgilio, Inferno, Canto I, vv. 1-12; 61-90, Divina Commedia).

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