# THE USE OF HORIZONTAL INFORMATION PREDICTS THE N170 INVERSION EFFECT

BY
ALI HASHEMI

A Thesis
Submitted to the Department of Psychology, Neuroscience & Behaviour
in Partial Fulfillment of the Requirements
for the Degree Honours Bachelor of Science

McMaster University
April 11, 2012

HONOURS BACHELOR OF SCIENCE (2012)
MCMASTER UNIVERSITY
Hamilton, Ontario

TITLE: The use of horizontal information predicts the N170 inversion effect

AUTHOR: Ali Hashemi

SUPERVISORS: Dr. Allison B. Sekuler and Dr. Patrick J. Bennett

NUMBER OF PAGES: vi, 27

**ABSTRACT**

The Face Inversion Effect (FIE) refers to the fact that identification accuracy decreases when faces are inverted, and the magnitude of the FIE is correlated with differential use of information conveyed by horizontal contours in upright and inverted faces (i.e., the detuning effect). Inversion also results in a delayed and sometimes larger N170, an ERP-signature of face perception. The current experiment tested the hypothesis that changes in the N170 caused by face inversion are associated with the detuning effect. Accuracy in a 10AFC face identification task was measured with horizontally- or vertically filtered faces and unfiltered faces. In both behavioural accuracy and N170 latency, the FIE was smallest for vertically filtered faces, and the detuning effect and N170 latency FIE were positively correlated. In addition to replicating previous behavioural results, the findings suggest an association between changes in the N170 and changes in the perceptual preference for horizontal information in faces.

**ACKNOWLEDGEMENTS**

I would like to give a special thanks to Matthew V. Pachai for his tremendous guidance, support, and patience throughout this project, and providing me with a unique and amazing learning experience. I would also like to thank Dr. Allison B. Sekuler and Dr. Patrick J. Bennett for providing me with this opportunity and for their invaluable guidance. Additionally, I would like to thank Donna Waxman for her incredible support and assistance throughout the entire project, without whom this would not be possible. Lastly, I would like to thank the entire Vision & Cognitive Neuroscience Lab, as everyone has showed me their entire support and helped me complete this project in one way or another.