The time course of horizontal tuning during face identification
Matthew V. Pachai, Allison B. Sekuler, & Patrick J. Bennett
Department of Psychology, Neuroscience & Behaviour, McMaster University

Background
The information conveyed by horizontally oriented frequency components is a highly diagnostic cue for face identification.\(^1,2\)

The time course of horizontal tuning during face identification
\(^2\) Pachai, M.V., Sekuler, A.B., & Bennett, P.J. (2013). Sensitivity to horizontal selectivity in upright face identification (left) and the face inversion effect (right).

Present Research
Given the rapid emergence of face-selective processing and the importance of horizontal structure for overall face identification, we expect horizontal selectivity to emerge in the earliest windows of face identity processing.

To explore this hypothesis, we employed a temporal classification image technique with dimensionality reduction (e.g. 5,6).

Methods

2000 trials/observer (N=14), 10AFC face identification
Faces masked with orientation-power-modulated dynamic noise (pre-filtering RMS contrast = 0.2)
Face contrast: 50% threshold in dynamic white noise

CIs measured using GAM and GLM approaches
GAM: \(\eta(E[Y]) = \eta_0(t)P_H + \eta_1(t)P_V\)
GLM: \(\eta(E[Y]) = \beta_1P_H + \beta_2P_V + \ldots + \beta_5P_{5s} + \beta_6\)

More accurate
Less accurate

Regression weights revealed by the GAM as a smooth function of time. More negative weights indicate a stronger effect of masking power in that band. Shading indicates +/- 2 SEM.

Left: Regression weights revealed by the GAM as a smooth function of time. More negative weights indicate a stronger effect of masking power in that band. Shading indicates +/- 2 SEM.

Conclusions
Sensitivity to horizontal structure is generally present early and throughout identity processing.

Initial sensitivity to vertical structure tends to decay rapidly during stimulus presentation.

Poster presented at the 14th annual meeting of the Vision Sciences Society, St Petersburg, Florida, May 18, 2014. For further information, please feel free to contact Matt Pachai at m.pachai@mcmaster.ca