

Changes in item representations following category learning

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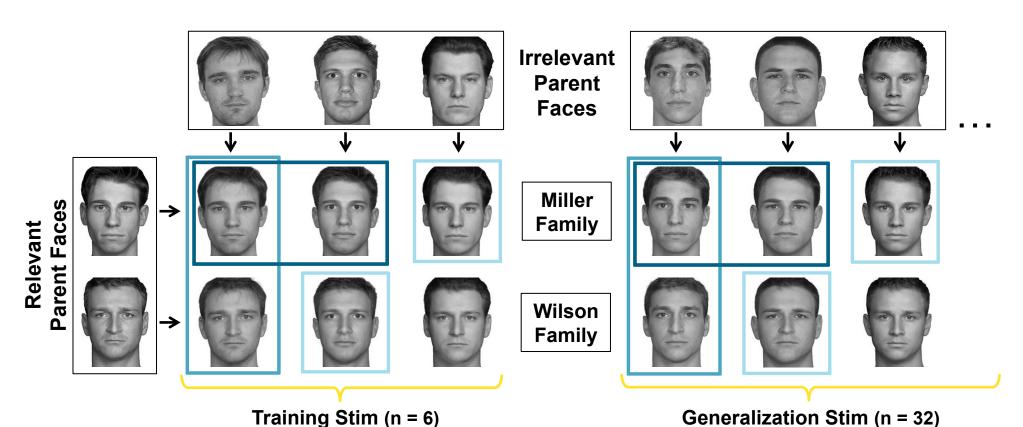
Introduction

- Learning about category membership of objects has been shown to:
 - 1) Increase perceived similarity of items within the same category^{1,2}
 - Decrease perceived similarity of items from different categories¹
- Few studies investigated changes in face perception following category learning, and utilized artificial faces that differed on specified features³.
- Exploring how category learning changes perceived similarity of naturalistic faces may help us understand how group membership influences perception of individuals.

Does category learning change how we perceive the similarity of naturalistic faces?

Methods

- ♦ 30 subjects were recruited, 6 were excluded for poor category learning performance
- → Face-blend stimuli were 50/50 blends of one face relevant and one irrelevant for family membership.



Training Stim (n = 6)

Pairs of faces may: Share parent face relevant for categorization

Share parent face irrelevant for categorization

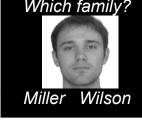
No shared parent face

EXPERIMENTAL PROCEDURE



Pre-Exposure 6 Stimuli 4 Exposures

Pre-Training Ratings 15 Comparisons

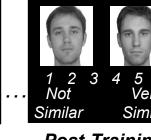


8 Exposures

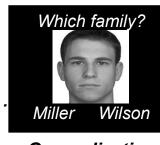
Feedback **Training** 6 Stimuli



Post-Exposure 6 Stimuli 4 Exposures



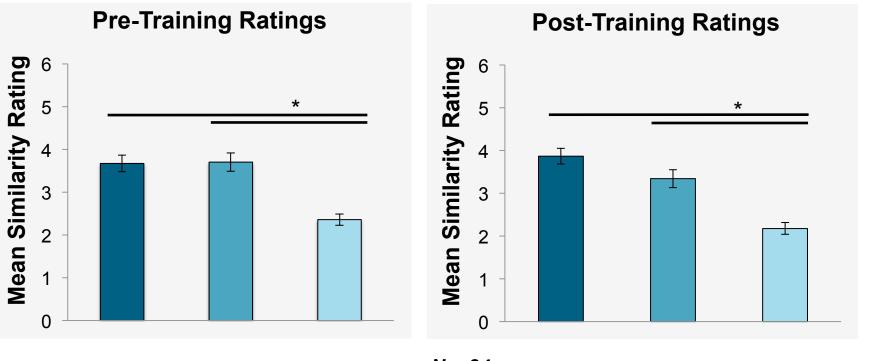
Post-Training Ratings 15 Comparisons



Generalization 32 Trials

Behavioral Results





~ p< .1, * p< .05

• After learning, perceived similarity of faces within and across category boundaries changes

Change in Similarity Ratings Rating Rating **Post Pre** -0.2 -0.6

p(correct) 8.0 0.7

Generalization

New

Preliminary MVPA in Ventromedial Prefrontal Cortex

Prior to learning, faces that

share a parent face are

perceived as similar to one

another.

Relevant Parent Face Irrelevant Parent Face VMPFC Mean Classifier 00 N = 5Pre **Post** Pre Post

Conclusions

Old

- Learning category membership increased perceived similarity of faces within a category and decreased perceived similarity of faces from different categories.
- Preliminary fMRI data suggest that neural patterns representing individual faces in VMPFC are altered after category learning to reflect category membership.

References

- ¹ Goldstone, R. (1994). Journal of Experimental Psychology: General, 123(2), 178–200.
- ² Clarke, A., Pell, P. J., Ranganath, C., & Tyler, L. K. (2016). Journal of Cognitive Neuroscience, 28(7), 1010–1023.
- ³ Goldstone, R. I. & Steyvers, M. (2001). Journal of Experimental Psychology: General, 130(1), 116-139.