

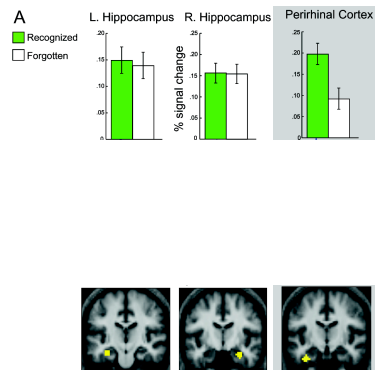
Neural Correlates of Recollection and Familiarity-Based Recognition Memory For Faces

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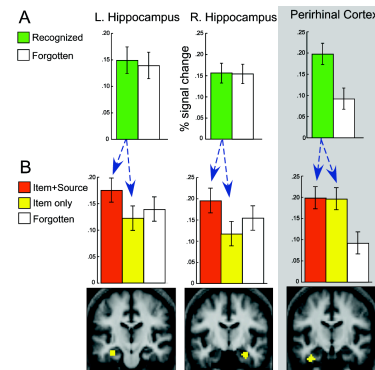
Overview

- Neural mechanisms of recollection (R) and familiarity (F) within and beyond medial temporal lobes
- Relationship between these mechanisms at memory encoding and retrieval
- Effects of perceptual similarity on R and F

Encoding Activations Associated With R and F



Encoding Activations Associated With R and F



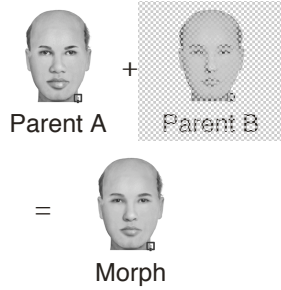
Retrieval Activations Associated With R and F

- Hippocampus associated with R but not K (Eldridge, et al. 2000)
- Dissociations in frontal areas (Henson, et al, 1999; Dobbins et al, 2002)
- Familiarity-related response suppression (Henson, et al, 2003)

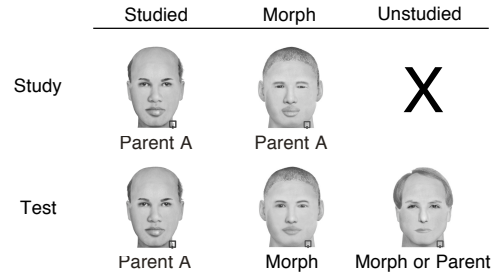
Goals:

- Expand on prior results by:
- 1) Exploring neural correlates of R and F in MTL and beyond
 - 2) Scanning at encoding and retrieval in the same set of subjects
 - 3) Including a similarity manipulation to test effects of perceptual similarity on R and F

Manipulating Perceptual Similarity



Conditions

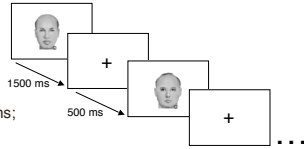


Experimental Procedure

Study Phase

Task: Detect target face and intentional encoding

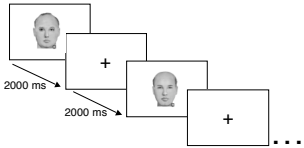
60 Parents later tested;
60 Parents later tested as Morphs;
15 Targets



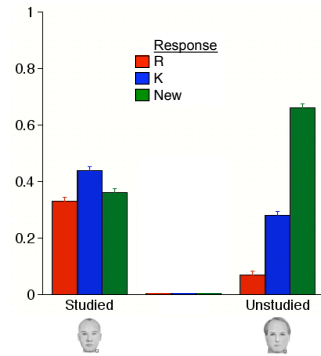
Test Phase

Task: Face recognition - "Remember", "Know", or "New"

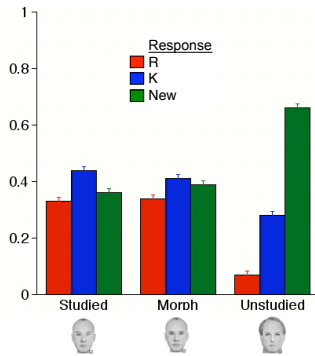
60 Studied Parents;
60 Morphs
60 Unstudied



Behavioral Results



Behavioral Results



Overview of fMRI Results

- Effects within MTL for R and F at encoding and retrieval
- Effects beyond MTL for R and F at encoding and retrieval

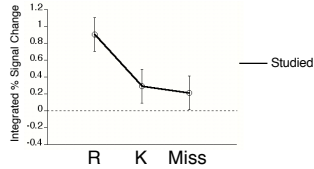
Hippocampal R-Selective Response

R. anterior hippocampus/amygdala



18, -3, -24

Encoding



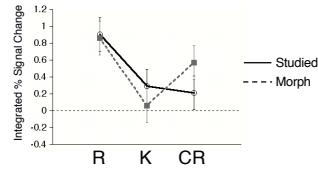
Hippocampal R-Selective Response

R. anterior hippocampus/amygdala



18, -3, -24

Encoding



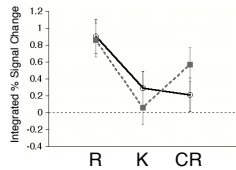
Hippocampal R-Selective Response

R. anterior hippocampus/amygdala

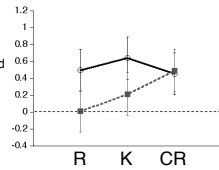


18, -3, -24

Encoding



Retrieval



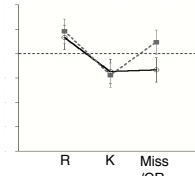
Familiarity-Related Retrieval Response

L. parahippocampus

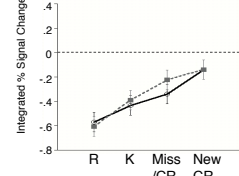


-27, -30, -18

Encoding



Retrieval



Overview of fMRI Results

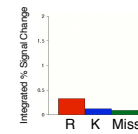
- Effects within MTL for R and F at encoding and retrieval
 - Hippocampus: R-selective at encoding
 - » Supports recall-to-reject
 - MTL cortices: Familiarity-like response at retrieval
 - » R-selective at encoding
- Effects beyond MTL for R and F at encoding and retrieval

Other R-Selective Regions at Encoding

L. inferior frontal gyrus



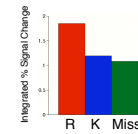
-51, 36, 18

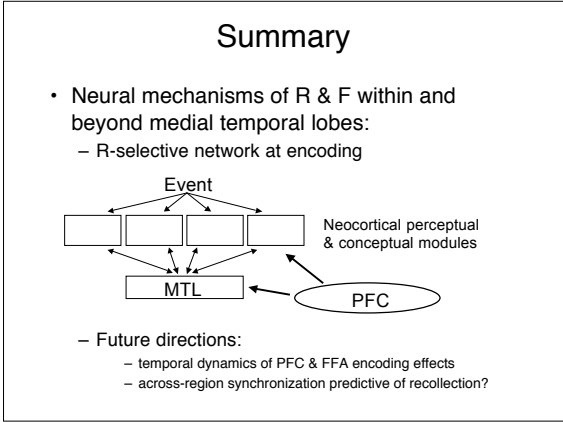
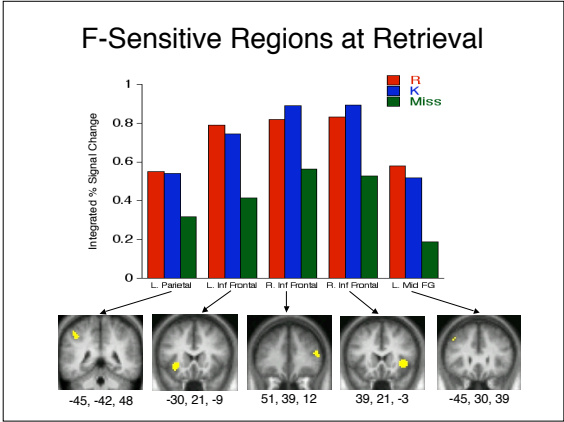


R. fusiform



45, -57, -18





Summary

- Neural mechanisms of R & F within and beyond medial temporal lobes:
 - F-related response reduction at retrieval
 - Future directions:
 - Parametric manipulation of levels of familiarity
 - Relationship between familiarity-related response reductions and similar priming reductions

Summary

- Encoding and retrieval:
 - Process-specific activations at encoding and retrieval are neurally distinct
- Effects of perceptual similarity on R and F:
 - Similarity manipulation unsuccessful
 - Future direction: parametric similarity manipulation