



THE INFLUENCE OF VARIABILITY ON NEURAL UNDERPINNINGS OF CATEGORIZATION

MAYA E. LEE, JUSTINE C. IZAH, DANIEL J. PLEBANEK & KARIN H. JAMES

INDIANA UNIVERSITY BLOOMINGTON, DEPARTMENT OF PSYCHOLOGICAL AND BRAIN SCIENCE

BACKGROUND

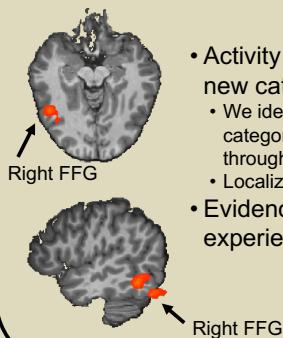
- Categorization is an essential building block of everyday cognition.
- A common facet of category learning is that it changes with experience, moving from similarity-based to rule-based methods¹.
- One factor involved in this shift may be the structure of the categories themselves, with categories of different structures invoking different systems of learning.²

RESEARCH QUESTIONS

- What neural mechanisms are at play during categorization in adults?
- Can variability shift the patterns of neural activity diagnostic of different category structures?

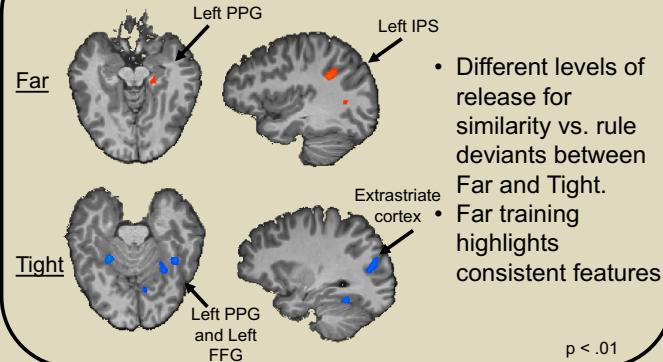
FMRI RESULTS

Differences in Learning: Far > Tight



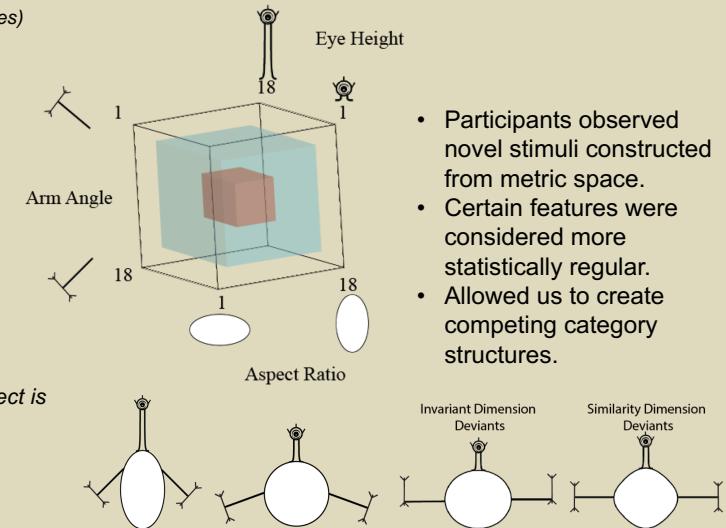
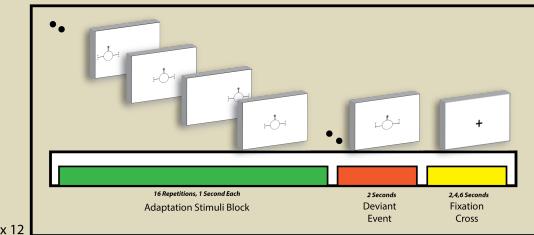
- Activity differences during learning of new categories.
 - We identified a greater response to variable categories in the ventral temporal cortex through learning.
 - Localized on right side.
- Evidence that category structure and experience affect neural correlates.

Differences in Adaptation: Deviant > last 3 sec



METHODS

- 14 Adults completed the study (18-28 years of age, 7 females)
- fMRI adaptation study



- Participants observed novel stimuli constructed from metric space.
- Certain features were considered more statistically regular.
- Allowed us to create competing category structures.

DISCUSSION

Effect of Variability on Neural Representation

- We found that experience with variable stimuli utilizes attentional processes due to rule-based categorization.

Effect of Variability on Learning

- Variability of exemplars affects how categories are formed, with the right fusiform gyrus being activated for novel learning.
 - Future analysis will examine the amount of training that is required to shift activation from the right FFG to the left FFG, to investigate what is considered novel vs. expert.