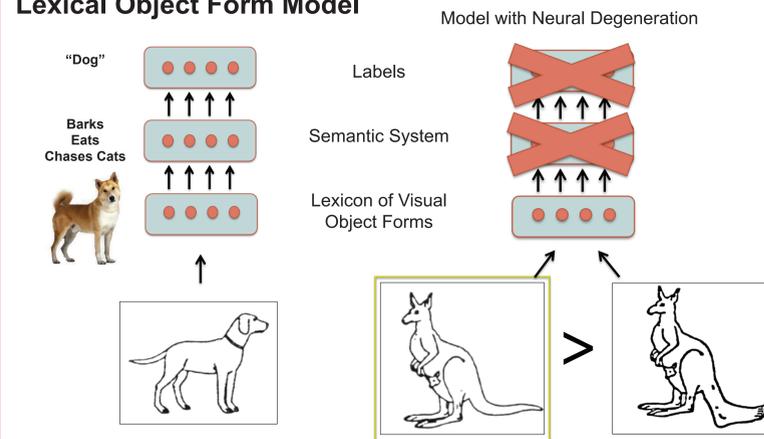


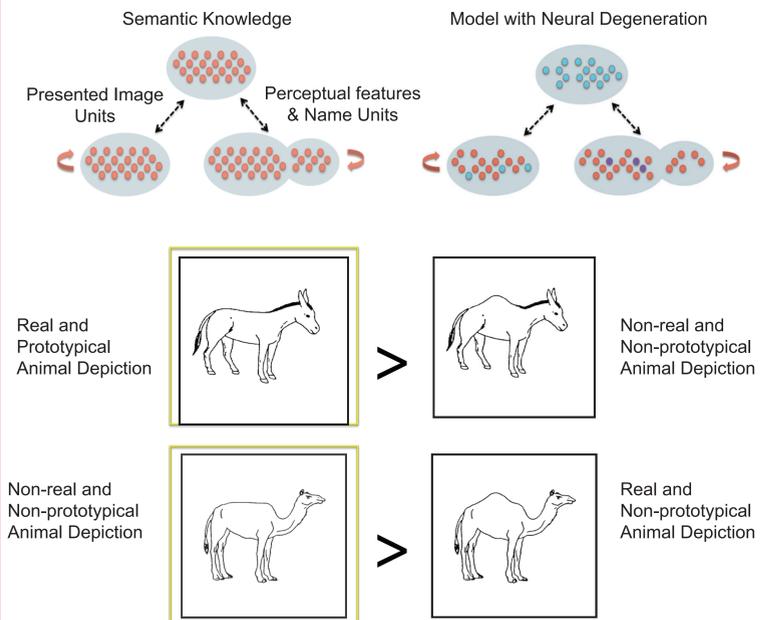
## Introduction

The degree to which perceptual and recognition processes are independent of conceptual knowledge remains an open question. Studies of patients with semantic dementia, a neural degenerative disorder characterized by the progressive loss of conceptual knowledge, suggest that the prototypicality of target images influences recognition, even when the recognized object cannot be named. However, in patient populations both recognition and knowledge systems may have been impacted by the disease process. By adapting the "over-regular animal task" (OAT) used in studies of semantic dementia for a developmental population, we assessed recognition and naming in 3- and 5-year-olds. By comparing children's performance, we can evaluate the effect of gaining knowledge in a population with unaffected recognition processes. We found that young children's performance mirrored that of patients, with incorrect choices of visually prototypical chimeras as "real" over less prototypical counterparts. These results provide evidence for the interdependence of perception, recognition and knowledge.

## Lexical Object Form Model

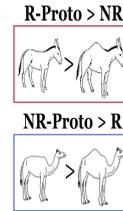
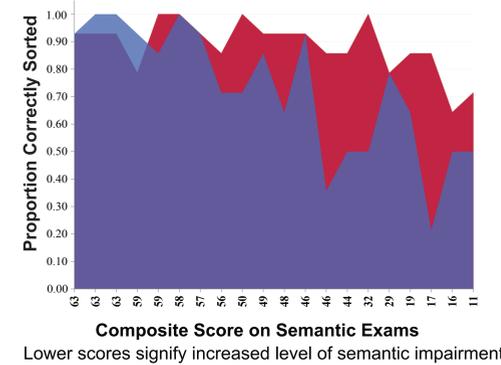


## Parallel Distributed Processing Model



## Results - Adults with Semantic Dementia

### OAT Semantic Dementia Patient Data



### Finding:

Semantic dementia patients' exhibit increased errors in performance in recognition task when the image depicts a prototypic but non-real animal. Suggests selection is influenced by semantic regularities within animal depictions.

### Considerations:

#### Patient Populations

The disease process may have conjointly affected both recognition and knowledge systems.

#### Developmental Studies

Children have intact recognition processes but relatively immature conceptual knowledge.

## What can kids tell us about the structure of knowledge?

## Expectations:

If patients' performance arose through:

### Impaired visual recognition

Different pattern of performance in children

### Loss of semantic knowledge

Similar pattern of performance in children



## Method

Participants (N = 42)  
3-year-olds (n = 26)  
5-year-olds (n = 16)

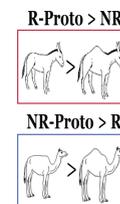
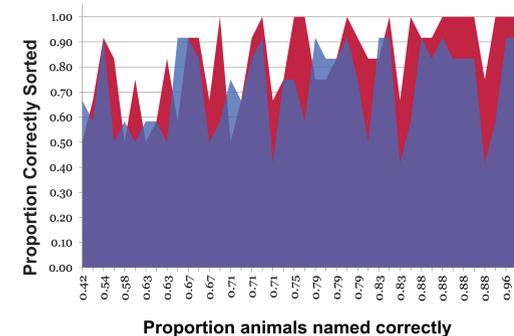
Explanation of game

Three matched-pair practice examples

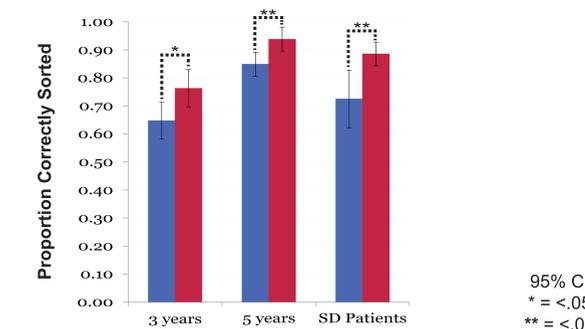
Part 1) Twenty four matched-pair experimental trials, label asked for images selected as "real"  
Part 2) Labels asked for images incorrectly sorted as "real".

## Results - Children 3 and 5 years of age

### OAT 3 and 5-year-old Participant Data

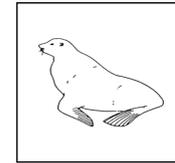


### OAT 3 and 5-year-old Participant Performance and OAT Semantic Dementia Patients

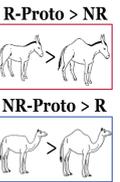


## Recognition & Naming

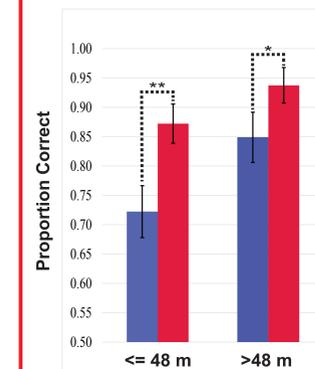
"penguin"



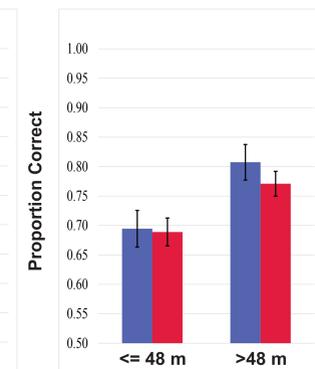
"seal"



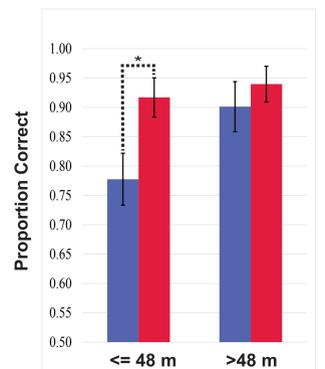
### Recognition (all items)



### Naming Accuracy



### Recognition (items named correctly)



Child participants reliably above chance (67% or better,  $p < 0.1$  against chance on binomial test) and below ceiling (at least one error). Resulting in thirty one participants, fifteen 48 months old or less and sixteen older than 48 months.

95% CI  
\* = <.05  
\*\* = <.01

## Conclusions

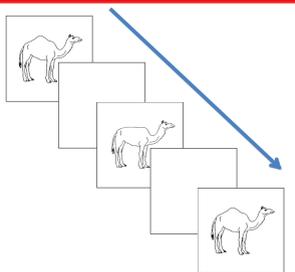
Performance of children aged 3 to 5-year-old mirrors selections of semantic dementia patients; favoring more prototypic depictions

Support found for model wherein semantic knowledge informs visual recognition

## Current and Future Directions

Remove need for children to understand "real" vs "silly" distinction through touch selection in change detection paradigm on tablet computer

Incorporate eye-tracking methodologies to model gaze paths during selection



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