

Category discrimination by infants

A talk on *Basic-level category discriminations by 7- and 9-months-old in an object examination task* by Denis Mareschal, Daisy Powell and Agnes Volein

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Abstract

- Infants can separate cat and dog figures
- Cats are easier to distinguish from dogs than vice versa
- Categories are based on feature distributions

Introduction

A basic-level category is maximally informative:

- most common attributes shared with its members
- least attributes shared with other categories

“Conceptual structure” might be in place at birth

Open question: are initial concept broad and narrowed down gradually, or the other way around?

Some research claims the former; only after 11 months cats and dogs would be distinguished

However, *preferential looking* methods suggest the contrary.
(Eimas et al, 1994)

Infants are shown photos. On the basis of attention the category forming is revealed.

- According to research, 3- to 4- month-olds can discriminate between basic level objects
- A category of cats excluded dogs birds, dogs, horses and tigers
- Mammals were excluded from birds and fish

Critics argue that visual preference says nothing about conceptual capabilities:

- perceiving is different from acting upon

However, the paper to be discussed (Mareschal et al, 2002) argues that whether visual or tactile, *feature-based recognition occurs*

- Discrimination seems to correlate with variability of stimuli
- Cats and dogs are familiarized in separate experiments

The experiments:

- Each experiment: 30 infants (7 and 9 month-old)
- Experiment 1: 4 cats during familiarization
- Experiment 2: 4 dogs during familiarization
- Remaining figures presented in test trials
(more cats & dogs, and an eagle)

During test trials, the examining times were measured. Longer means more novel.

Analysis of data reveals these results for cats (experiment 1):

- Significant decrease in examination time between first and second trial
- Examination times correlate negatively with similarity

Also, analyzing the figures and their features shows:

- Only external body features contribute to discrimination
- ...whereas head and facial features do not contribute significantly to discrimination.

Analysis of data reveals these results for dogs (experiment 2):

- First and second trial do not differ significantly
- Category includes both dogs and cats, but excludes eagles



Also, analyzing the figures and their features shows:

- Facial features contribute to discrimination
- ...whereas the other features do not contribute significantly to discrimination.

Conclusion

- Cats are 'more similar' to dogs than vice versa (dogs subsume cats)
- Children use bottom-up strategies for discrimination (hence the asymmetry)
- ... unlike adults, who (presumably) use top-down approaches
- Object-examination tasks do not necessarily require conceptual processing (alternative: feature distribution)

Bibliography

-  Denis Mareschal, Daisy Powell and Agnes Volein, *Basic-level category discriminations by 7- and 9-months-old in an object examination task*, *Journal of Experimental Child Psychology*, 86, 87-107 (2002).
-  Peter D. Eimas, Pail C. Quinn and Pamela Cowan, *Development of Exclusivity in Perceptually Based Categories of Young Infants*, *Journal of Experimental Child Psychology*, 58, 418-431 (1994).