



Influences on the Visual Categorization of Naturalistic Structures in Infancy and Early Childhood

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Background

- The discrimination and identification of elements within the environment are important visual tasks for humans (Geisler, 2008; Schmidt et al., 2017).
- Categorization ability already starts within the first year of life (Madole & Oakes, 1998; Pauen, 2002), when visual abilities are still developing (Siu & Murphy, 2018).
- Categories and their visual properties with significance for humans may play a particular role during categorization development (Pauen & Hoehl, 2015; Wertz, 2019).

Current Project (Fig. 1)

- 2 Studies addressing aspects of visual categorization: **scene segmentation, similarity judgments, classification** in infants, preschoolers, and adults. (Schlegelmilch & Wertz, 2020, under review)

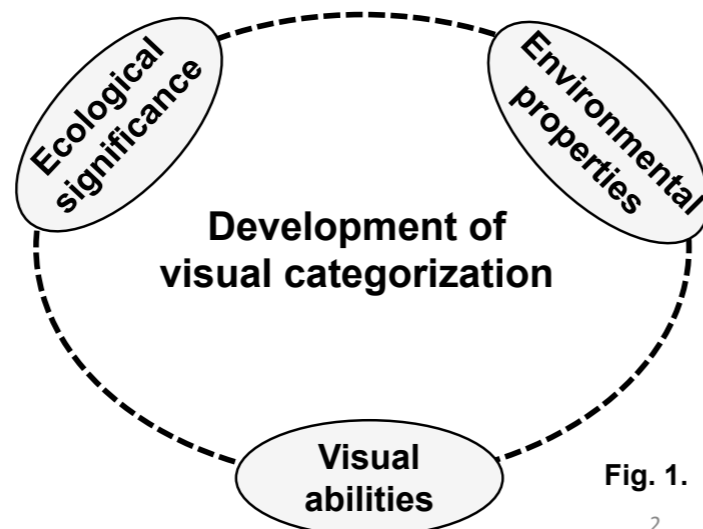


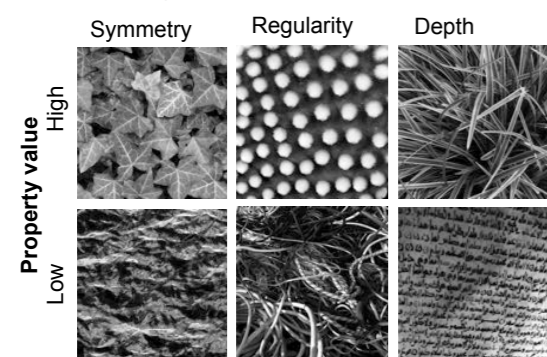
Fig. 1.

Study 1: Card-sorting Tasks

76 preschoolers (age: 4-5 years), 72 adults

- Sorting 30 images into groups according to visual similarity.
- Classification: **Vegetation, natural elements, artifacts.**

A Sorting Cards



Study 2: Eye-tracking Search Task

39 infants (age: 8 month)

- 261 Search stimuli variants:
- Target image patch on background image, 10 possible locations, saliency controlled.
 - Congruent or incongruent in category membership.

B Search Stimuli

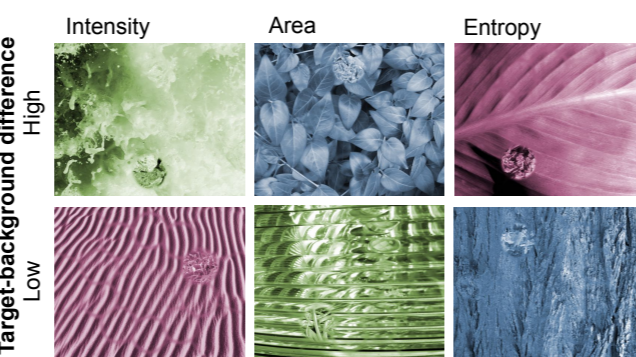


Fig. 2. Stimuli examples and their property levels. (A) 10 x 10cm, 10 properties (B) Full screen size, alternating in 3 monochromatic colors. Search stimuli properties (N = 9) were difference variables or rated for background image.

General Results

Fig 2. Visual properties predicted task performance

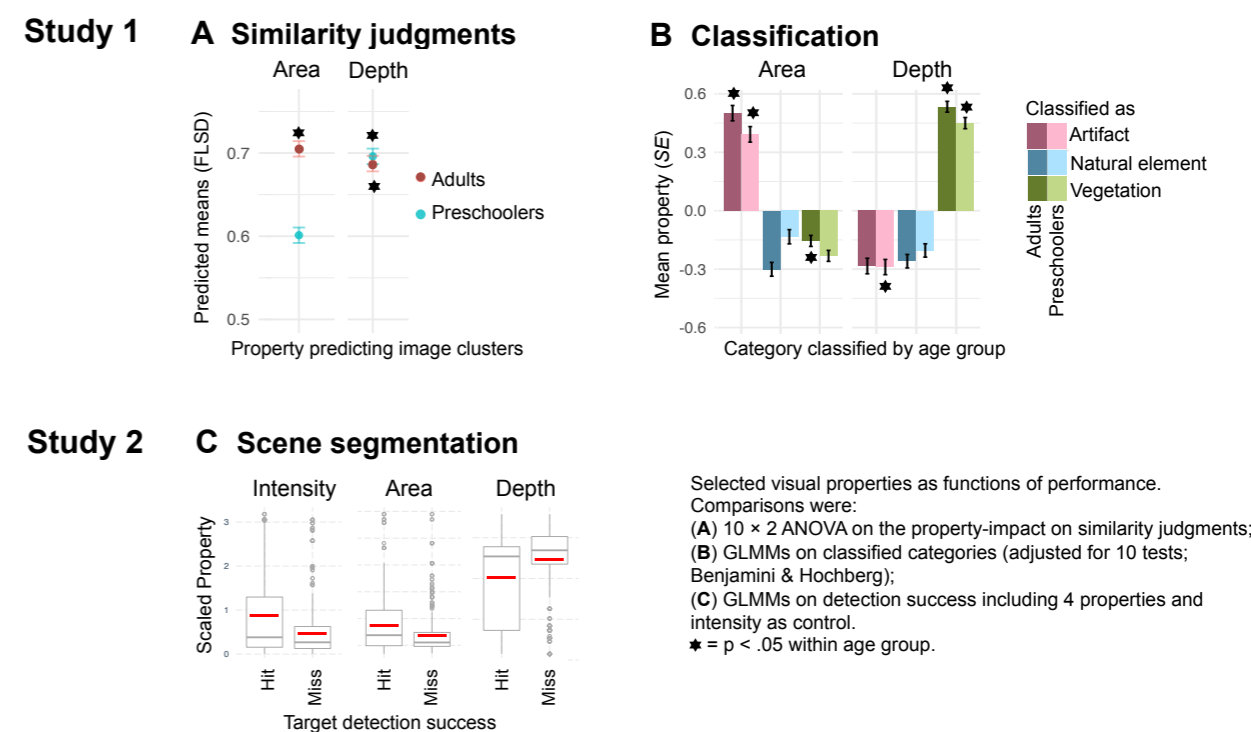
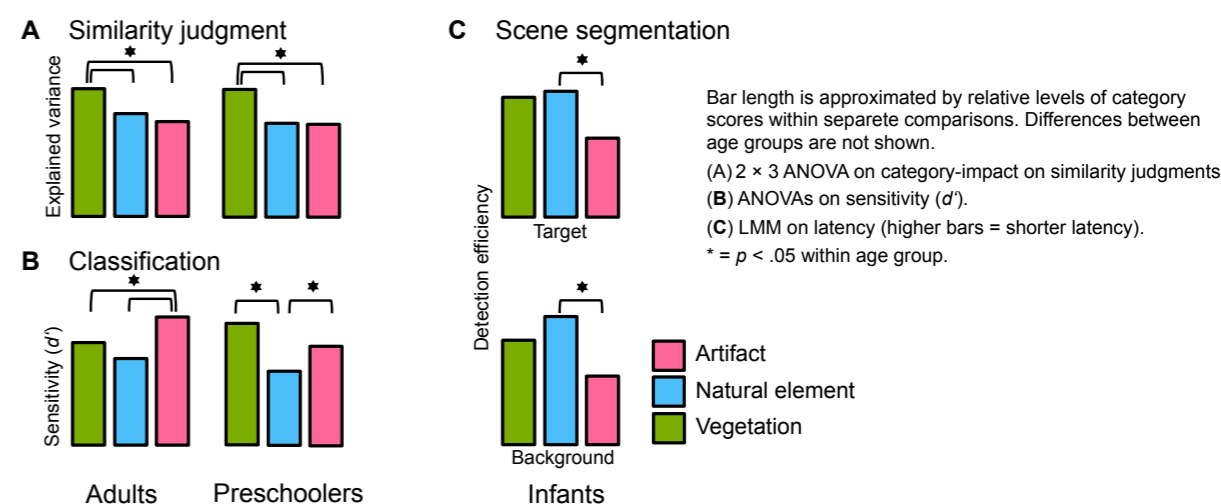


Fig 3. Category impact modulated by task and age group.



Conclusion

- Age-dependent impact of ecologically significant characteristics on young children's performance (i.e., depth cues, naturally occurring low-level complexity, category impact).
- Visual abilities affect categorization: Attention to properties is modulated by task and age.
- This highlights the importance of further developmental research on visual categorization with naturalistic, structure-like stimuli.