Distributional learning of visual object categories in school aged children

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**RESEARCH QUESTION**
Do school-aged children learn novel object categories based on distributional information?

**METHOD: FAMILIARIZATION PHASE**
Experiment based on Junge et al. (2018), adapted to school-aged children. Design familiarization phase based on Chládkova et al. (2020).

- **Participants**
  49 neurotypical Dutch-speaking children (7-9 years old)
  - An 11-step novel object continuum was constructed
  - Participants were familiarized with tokens from the continuum (288 tokens in total, duration +/- 8 minutes)
  - Between-participant design: PPs did one of two familiarization conditions
  - The conditions differed in the position of the distribution peaks along the continuum

**METHOD: TEST PHASE**
Eight 2AFC test questions
- Does token D1 or D2 look more like token S?

**PREDICTION**
PPs in Condition 1 will choose token D2 more often than PPs in Condition 2.

**RESULTS**
A generalized logistic linear mixed effect model in R was used to test whether familiarization condition influenced stimulus choice.

In line with our prediction, participants in Condition 1 were 3.29 (95% CI 1.26 ... 9.54) times more likely (odds ratio) to choose stimulus D2 than participants in Condition 2, and this effect of Condition was significant: $z = 2.385, p = 0.0171$.

Familiarization condition significantly influenced whether participants preferred the combination S + D1 or S + D2.

**DISCUSSION**
- Familiarization condition influenced the preference for combining token S with token D1 or D2, indicating that the distributional properties of the input in the familiarization phase influenced categorization of the stimuli.
- Distributional learning seems to play a role in categorizing new visual stimuli in school-aged children.
- There seems to be an inherent preference for the combination S + D1. Perhaps the visual continuum should be changed in future studies.
- Currently, children with developmental language disorders (DLD) participate in this research. As children with DLD have difficulties with statistical learning (e.g. Obie et al., 2016), we are analysing their performance on the same task to investigate their distributional learning in the visual domain and to understand whether this ability correlates with vocabulary knowledge.

**REFERENCES**

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