Distributional learning of visual object categories in children with and without DLD

Broedelet, I.R.L.; Boersma, P.P.G.; Rispens, J.E.

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Does Condition (1/2) influence stimulus choice of effect of Maye, J., = 0.006. However, there was no significant effect of Group: knowledge peaks 2 et al. 2017 with familiarization = 0.994. distributional old learning type of Siegelman, N., Bogaerts, L., (Word Classes CELF) No evidence for or against a visual distributional learning deficit in children with learning to categories et al. (2018) that An 11 \[2 \text{tokens S} \] choose children conditions familiarized DLD organization tokens S size Eight category show a object TD Two et al. (2020). There seems to be an inherent preference for the combination S + D1. Perhaps on DLD have learning disorder (DLD) have Is there an interaction between Condition x Group (DLD/TD)? Chládkova De Vos, J. (2012). analyses DLD vocabulary statistical the with DLD. e.g. in information = 2.758, than category D1 knowledge with development with a developmental language disorder (DLD) have difficulties with statistical learning (SL) e.g. Siegelman et al. 2017. Conditions D2 unknown Condition - - Based on Junge et al. (2018) and Chidilova et al. (2020). • An 11-step novel object continuum was constructed • Participants were familiarized with tokens from the continuum (288 tokens in total, duration +/- 8 minutes) • Two learning conditions: distributional peaks at different positions in the continuum \( \rightarrow \) Between-participant design: PPs did one of two familiarization conditions

METHOD: FAMILIARIZATION PHASE

Based on Junge et al. (2018) and Chidilova et al. (2020).

• An 11-step novel object continuum was constructed
• Participants were familiarized with tokens from the continuum (288 tokens in total, duration +/- 8 minutes)
• Two learning conditions: distributional peaks at different positions in the continuum (between-participant design: PPs did one of two familiarization conditions)

Hypotheses
PPs in Condition 1 learn that tokens S and D2 belong to one category
PPs in Condition 2 learn that tokens S and D1 belong to one category

METHOD: TEST PHASE

• Eight 2A-FC test questions
• Does token D1 or D2 look more like token S?

Predictions
• PPs in Condition 1 will choose token D2 more often than pps in Condition 2
• Children with DLD will show a weaker effect of Condition than TD children

METHOD: PARTICIPANTS

• 25 children with DLD and 25 TD children (7-9 years old)
• The children with DLD were tested on receptive/productive vocabulary size (PPVT, CELF), semantic knowledge (Word Classes CELF) and lexical-semantic organization (Word Associations CELF)

RESULTS

A generalized logistic linear mixed effect model in R was constructed to test:
• Is there an interaction between Condition x Group (DLD/TD)?

Children in Condition 1 were significantly more likely to choose stimulus D2 than children in Condition 2: \( z = 2.758, p = 0.006 \). However, there was no significant effect of Group: \( z = 0.007, p = 0.994 \).

Familiarization condition significantly influences whether viewers prefer the combination \( S + D1 \) or \( S + D2 \). No evidence for a difference between children with and without DLD.

Linear regression analyses showed no significant relationships between visual distributional learning lexical knowledge in children with DLD.

DISCUSSION

• Familiarization condition significantly influenced our participants’ preference for the combination S and token D1 or D2, indicating that distributional properties of the input influence the categorization of visual stimuli
• No evidence for or against a visual distributional learning deficit in children with DLD (see also Lammertink et al., 2020)
• No evidence for or against a relationship between visual distributional learning and lexical knowledge in children with DLD
• There seems to be an inherent preference for the combination S + D1. Perhaps the visual continuum should be changed in future studies

REFERENCES


CONTACT
Iris.Broedelet@uva.nl