Can categorization and generalization difficulties explain word learning characteristics in Developmental Language Disorders?

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Introduction

- Children with **Developmental Language Disorders** (DLD) cope with :
  - difficulties in word learning (Kan & Windsor, 2010);
  - limited processing resources (Im-Bolter, Johnson & Pascual-Leone (2006).
- Categorization and generalization processes are involved in word learning.
  - The rules (bias) a learner has acquired could accelerate word learning and **help generalization** (Perry & Samuelson, 2011);
  - Generalization can be defined as a multi-level process (Perry & Samuelson, 2011);
- Bayesian theories of cognition offer an interesting approach to study word learning (Xu & Tenenbaum, 2007), which can be understood as the result of an inductive inference mechanism.

Aims & Objectives

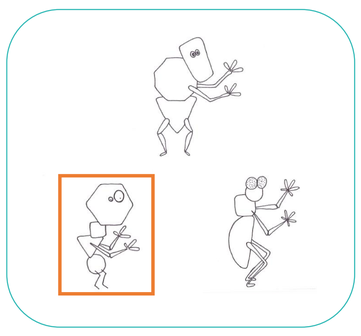
? Can children with DLD use inductive inference in order to acquire and **generalize new biases** in a categorization task ?

? Are children with DLD sensitive to the nature (perceptual vs relational) and/or number of features which define a category ?

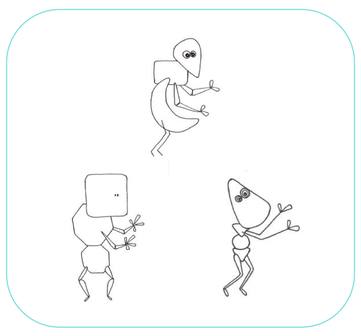
Methods

- **Participants**
  - DLD: N = 20; Special schools; French-speaking
  - Age-matched controls: N = 20; Similar non verbal IQ; French-speaking
- **Materials and procedure**

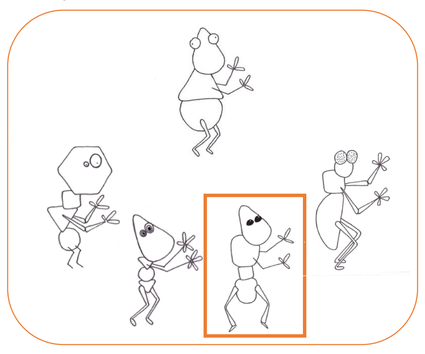
Word learning task – 1 feature	Generalization – 1 feature	Word learning task – 2 features	Generalization – 2 features
• 2 categories • « This is a *mopi*. Can you find another *mopi* »?	• 3 unfamiliar categories • « Let's try the same with new families. This is a *baté*. Can you find another *baté*? »	• 4 subcategories • « We grouped *mopi* together and *dufan* together, but all *mopis* are not the same and all *dufans* are not the same. Can you help them to split them apart? This is a *boussu*. Can you find another *boussu*? »	• Unfamiliar categories



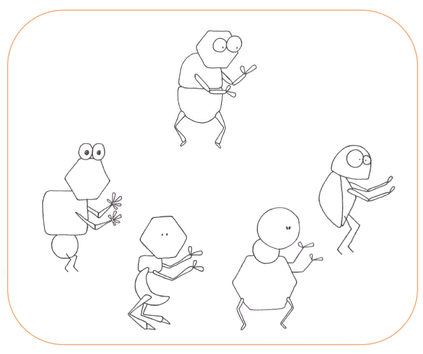
Word learning task – example of an item defined by one perceptual feature



Generalization task – one perceptual feature



Word learning task – example of an item defined by two perceptual features



Generalization task – two perceptual features

- 2 conditions : categories perceptually (e.g. : number of fingers) or relationally (e.g. : spatial relation : big part above small part) defined
- Word learning task :
  - Rule/Bias acquisition via inference mechanism with feedback
  - Generalization of the learned rule: Extension of the category
- Progressive learning :
  - When the classification rule defined by one feature is acquired, a second feature is introduced

Predictions

- DLD children :
  - Will be **able**
    - to discover a categorization rule based on 1 perceptual feature (Dauvister & Maillart, 2019);
    - to abstract this rule and apply it at a second level of abstraction in order to extend the category further.
  - Will encounter **difficulties**
    - With relational features;
    - With the introduction of a second feature, as the learning of a category based on two features will recruit more processing resources.

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