

# Learning words and categories:

## Lexical acquisition and Bayesian inference in children with Developmental Language Disorders

### Introduction

- Children with **Developmental Language Disorders (DLD)** have difficulties in **word learning** (Kan & Windsor, 2010).
- **Bayesian theories of cognition** offer an interesting approach to study word learning (Xu & Tenenbaum, 2007):
  - Based on the idea of a strong mechanism of inductive inference as a core mechanism of learning processes, they highlight the importance of:
    - **Prior knowledge**, such as semantic biases,
    - **Environmental data** to which the learner is exposed,
    - The **interaction** between prior knowledge and environmental data;
  - They can account for quick abstract acquisitions (Tenenbaum, Griffiths, & Kemp, 2006).
- Categorization and generalization processes are involved in word learning. The **biases** a learner has acquired could accelerate word learning and **help generalization** (Perry & Samuelson, 2011).

### Aims & Objectives

Our aim is twofold:

- Determine if children with DLD can **use inductive inference** in order to acquire and **generalize new biases** in a categorization task;
- Explore if children with DLD can identify and use **relevant prior knowledge** in a categorization task.

### Methods

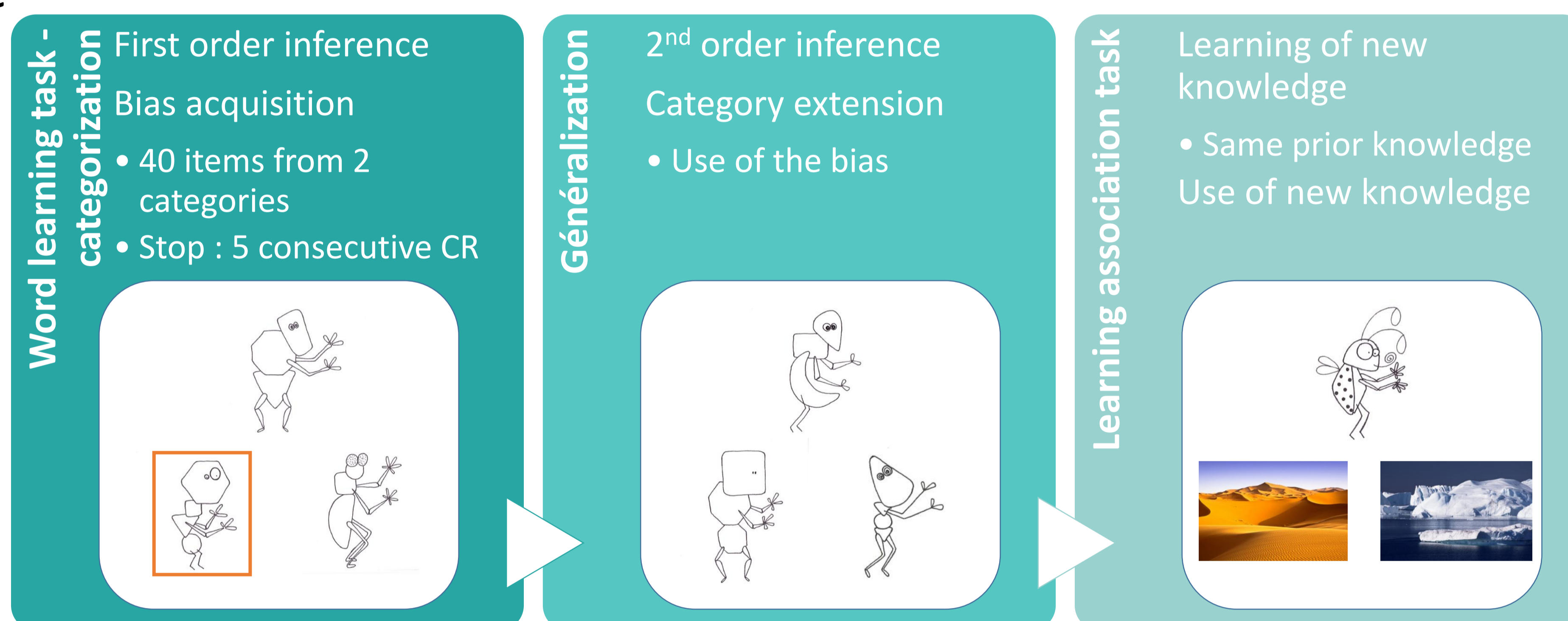
#### Participants

	Age	QI NV	ELDP	Repmots	Evip	LexProd	E.CO.S.SE	ProdE
Mean	120 months	93	-2,73	-7,73	81,9	-1,05	-2,075	-3,19

• DLD (N = 23)  
Special schools  
Language profile

• Age-matched control (N = 17)  
Similar non verbal IQ

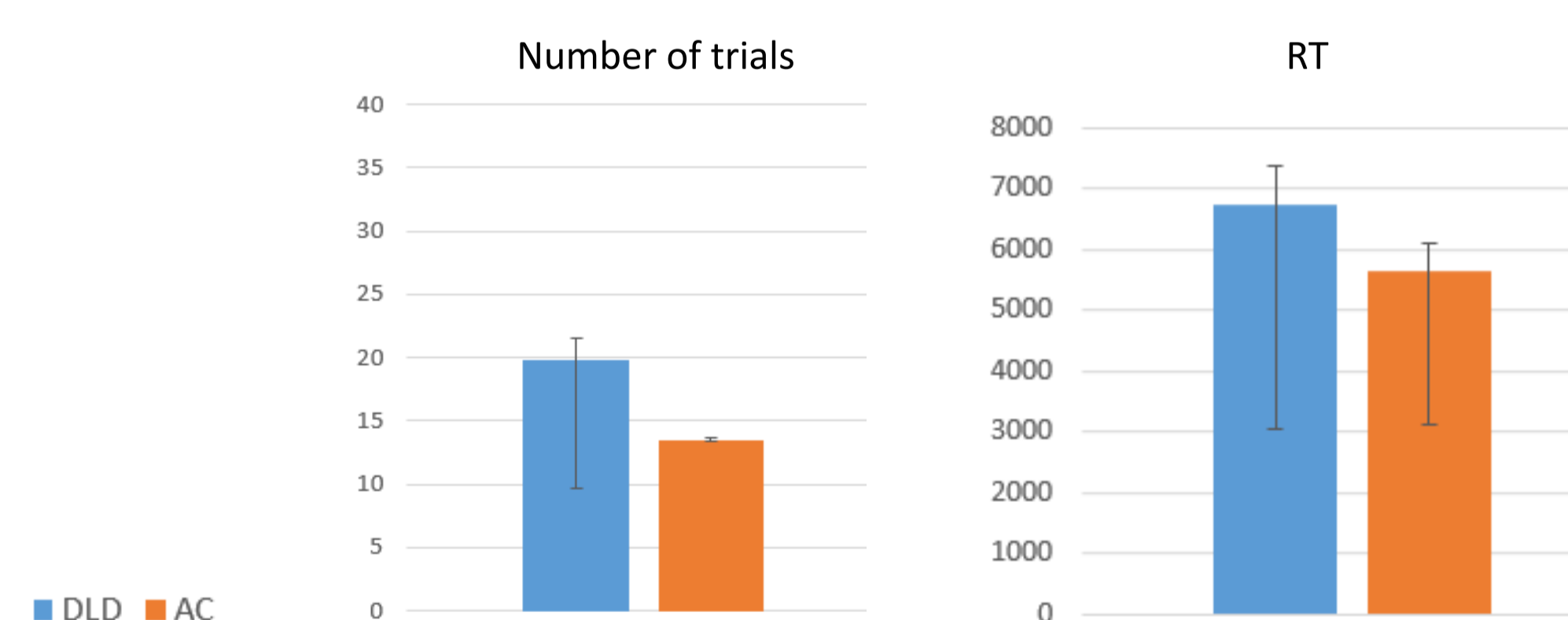
#### Materials and procedure



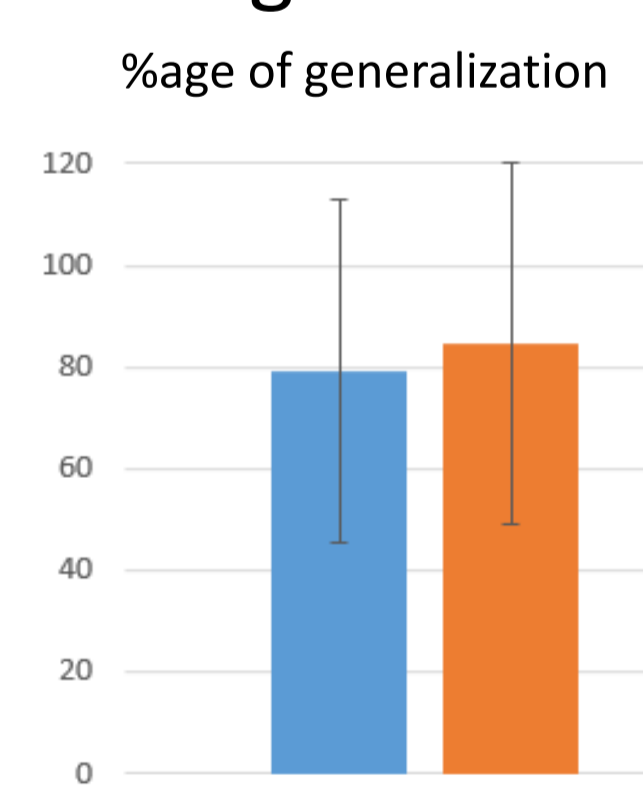
### Results

- No significant differences (t student tests, Mann-Whitney, bayesian t tests)

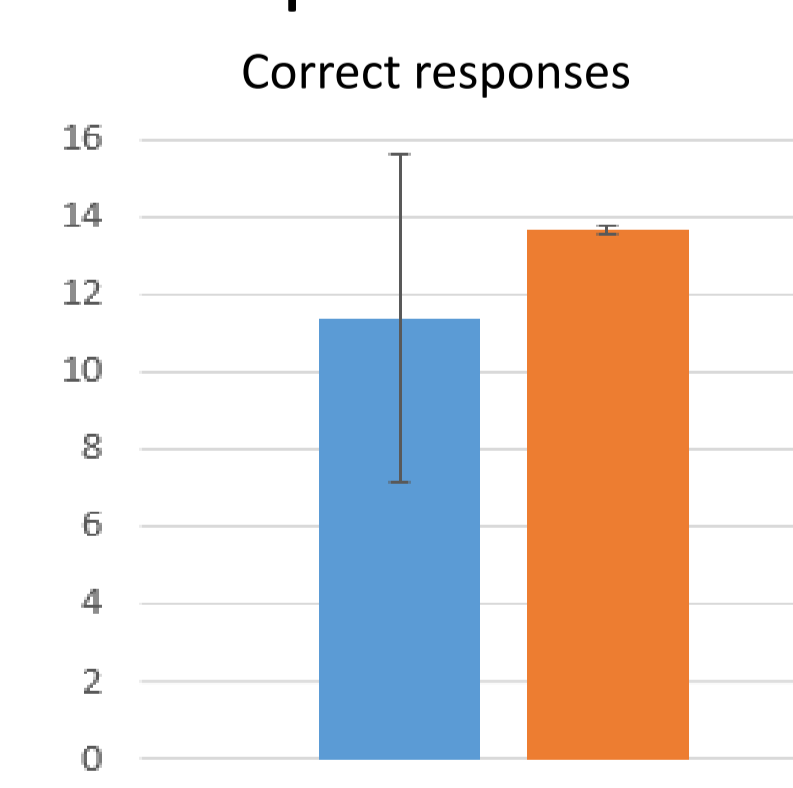
a. to learn the bias



b. to generalize



c. to use prior knowledge



### Conclusion

- DLD children seem able to:
  - Discover a categorization rule based on **1 perceptual feature** when resorting to prior knowledge is unable;
    - What about the **quantity** (one vs several) and **nature** (functional/relational) of the relevant features ?
  - **Abstract the rule at a 2<sup>nd</sup> level** in order to generalize and extend it at a larger superordinate category;
    - As they can verbalize it: what about children who reach the stopping criteria but fail to generalize ?
  - Identify and **use relevant semantic knowledge** in order to classify items;
    - Further investigations with eye-tracking
- Results are in line with Bayesian models of cognition but
  - Difference between inference and generalization : What about this mechanism when the rule has to be **modulated by prior knowledge**?