The perceptual and verbal analogical reasoning in children with specific language impairment (SLI)

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INTRODUCTION

Usage-based theories (Bybee, 2010) consider analogical reasoning as a cognitive process underlying construction of more abstract linguistic schemas. When children hear two utterances such as “John eats an apple” and “She sees a bird”, they can infer the abstract schema [S V O] by realizing analogies between the two utterances. According to Gentner and Markman (1997): “Analogy occurs when comparisons exhibit a high degree of relational similarity with very little attribute similarity”. So, we distinguish perceptual similarity (easier but less important) from relational similarity.

If children with specific language impairment (SLI) have difficulties to detect relational similarity between forms, we predicted morphosyntactic disorders, what would hinder their abstraction of construction schemas. Consequently, children with SLI would be less productive with their language and would use more fixed linguistic forms. Consequently, their morphosyntactic development would be slow down.

GOAL AND PREDICTIONS

Goal
To test performance of children with SLI to:
- a linguistic (syllables) analogical reasoning task
- a non linguistic (pictures) analogical reasoning task

Predictions
- Children with SLI would preferentially use perceptual similarity rather than relational similarity to solve analogical reasoning tasks
- Children with SLI would have more difficulties to detect relational similarity between sequences when perceptual cues decrease

PARTICIPANTS

20 children with SLI
- Aged from 8 to 11
- Monolingual French speakers
- QIP (WISC IV) > 82
- Language skills below 1.25 SD from the mean in 2 or more of 5 language areas
- No neurological or auditory disorders

20 children with NL
- No history of language disorders
- Monolingual French speakers
- Matched with children with SLI based on: (1) Chronological age; (2) IQ performance; (3) Sex; and (4) Socioeconomic background

METHODOLOGY

Task
Children have to complete a test sequence by choosing which picture among three others "goes best" in comparison with the two reference sequences.

Placement of a typing mask (to avoid the child pressing an undesired key)

RESULTS

Four variables:
- Group: SLI vs NL
- Modality: linguistic vs non linguistic
- Inter-sequences similarity: with vs without
- Intra-sequence similarity: two vs one vs no common feature

No significant interaction effect between:
- Modality - Group
  F(1,36) = 3.4, p > .05
- Inter-sequences similarity - Group
  F(1,36) = 1.4, p > .05

Significant interaction effect between:
- Intra-sequence similarity - Group
  F(2,72) = 10.010, p < .001

No significant difference of modality: difficulties not specific to language
Children with SLI more dependent on perceptual cues, as well in non linguistic task as in linguistic task
- Problem with detection of relational similarities without perceptual cues
- Generalization from exemplars without perceptual similarity could be difficult, what could explain a slowed down morphosyntactic development
- Role plays by working memory and inhibitory control in analogical reasoning (Thibaut, French & Verzeva, 2010)

REFERENCES


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