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Online implicit learning of nonadjacent dependencies in children with and without Specific Language Impairment

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Background

NADL: Nonadjacent dependency learning
Examples: He walks; Yesterday we walked

Sensitivity to NADs is fundamental to language acquisition[1]

Measuring implicit NADL in children:
> Offline: accuracy on grammaticality judgment task
> Online: response times (RT) to NAD-rule items versus non NAD-rule items reflect learning dynamics [2,3,4]

NADL in SLI:
> Offline: not as effective as in people without SLI [5]
> Online: no data available as yet

RQ: Do the speed and degree of learning nonadjacent dependencies differ between children with and without SLI?

Methods

Training: 3 rule blocks
Tep X lut (12)
sot X mip (52)
F X F (56)

Disruption: no-rule block
F X lut: no rule (12)
F X mip: no rule (12)
F X F (12)

Recovery: rule block
Tep X lut (24)
sot X mip (24)
F X F (12)

Feedback

Proportion utterances correct

Online NADL (word monitoring)

Preliminary Results

Mean = 0.51 (SD = 0.08)
Range = 0.37 - 0.69

Offline NADL (grammaticality judgment)

Mean = 0.52 (SD = 0.13)
Range = 0.25 - 0.87

Visual inspection: no evidence of learning in both groups. Wider range of scores obtained in TD group.

Preimmary analysis (lmer): No evidence that children as a group scored above chance level (estimate= 51.4% ; z = 0.80 , p = 0.43) or that the groups differed in performance (estimate = 1.03 odds; z = 0.24; p = 0.81).

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References

Acknowledgements
Recruitment SLI: Viertaal; Pento Amersfoort; Auris Leiden, Haarlem & Breda, FOSS Oudervereniging TOS. Recruitment and testing elementary schools TD: Binnenmeer, Startnest & Wheermolen, Darlene Keydeniers & Iris Broedelet

Online Tests Phase (Word Monitoring Task)

Participans
27 children with SLI (M = 9.1 years; F = 6)
27 age-matched controls (M = 9.1 years; F = 10)
SLI and TD group did not differ in age and were matched on nonverbal IQ.

RQ: Do the speed and degree of learning nonadjacent dependencies differ between children with and without SLI?

Preliminary analysis (lmer): No evidence for a difference in RT between rule and no-rule blocks between TD and SLI group (Block*Sample: estimate = 89.57; z = 1.67). Large individual differences in both groups.

The SLI group showed no disruption of the NADL rules during the disruption phase, while the TD group showed a significant disruption.

Visual inspection suggests different NADL dynamics between children with and without SLI. Preliminary analysis do not support this claim, however.

There exist large individual differences in children's sensitivity to nonadjacent dependencies.

More research is needed to evaluate how NADL relates to language performance and developmental language disorders.

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