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

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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 (32)
sot X mip (52)
F X F (36)

Disruption: no-rule block
F X lut no rule (12)
F X mip no rule (12)
F X F (6)

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

Online Tests Phase (Word Monitoring)

Offline Tests Phase (Grammaticality Judgment Task)

Measures

Online: Press green button upon hearing [target] and press red button when third word is not [target]

Offline: Grammaticality judgment task

Participants

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.

Preliminary Results


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.

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

Preliminary analysis (glmer): 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).

Conclusion

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 non-adjacent dependencies.

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

Contact

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References

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Online NADL (word monitoring)

Offline NADL (grammaticality judgment)

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

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

Target NonTarget Filler

Online NADL (word monitoring)

Offline NADL (grammaticality judgment)