Kindergarteners’ statistical learning is influenced by instruction

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Statistical learning

Inferring word boundaries (Safran, Johnson & Aslin, 1996; Endress & Bonatti, 2007; Gomez & Gerken, 1999)

Learning words and referents (e.g. Vouloumanos, 2008; Yu & Smith, 2007; Smith, Suanda & Yu, 2014)

Acquiring agreement markers (e.g. Lany, 2014; Lany & Safran, 2013; Monaghan, Mattick, Davies & Smith, 2015)

Learning a meaningful agreement marker (Spit, Andringa, Rispens & Aboh, under review)

Explicit instruction and replication

Lack of replication in general (Cumming, 2014), and in linguistics in particular (Marsden, Morgan-Short, Thompson & Abugaber, 2018)

Reported positive effects of explicit instruction in adults (Spada & Tomita, 2010), but no studies with children

Research questions

Can we replicate our findings that kindergarteners learn a meaningful agreement marker on the basis of distributional properties?

Does explicit instruction influence the acquisition of such a marker?

Participants

102 Dutch speaking children (51 females, $M = 5.7$), 50 were explicitly instructed, 52 were not instructed

Method

Exposure

Miniature language:

Four proper names, three verbs, two grammatical markers, six frequent nouns and twelve infrequent nouns

Exposure: 108 training sentences (+ 12 fillers)

Rule

Pli: probability that the noun has multiple referents = 1

Tra: probability that the noun has multiple referents = .5

Test

Picture matching task with eye tracking

'Maria rigarda tra nutro’

‘Maria rigarda pli wiro’

Results

Eye tracking

Replication?

Effect OR 95% CI $z$ $p$

Study 1 9.6% 1.515 1.071…2.157 2.178 0.029

Study 2 7% 1.347 0.975…1.863 1.843 0.065

Current study 7.4% 1.370 0.927…2.023 1.614 0.107

Conclusion

Explicit instruction did not increase accuracy, but it did lead to earlier predictive eye movements

In a follow-up experiment, we will test children on a delayed post-test, to investigate the effect of sleep on the development of kindergarteners’ knowledge

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