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, Mattock, 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

Picture matching task

Eye tracking

Picture matching task with eye tracking

Marker Cram (.OR: 1.29; 95% CI: 0.96–1.73; p = .098)

Marker ‘Instruction: GLMER, OR = 1.25, 95% CI = 0.87...1.79, z = 1.268, p = 0.205

Marker * Instruction : GLMER, OR = 0.83, 95% CI = 0.59...1.17, z = -1.085, p = 0.278

Effect OR 95% CI z p
Study 1 9.5% 1.515 1.071...2.257 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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References