

## **Testing the (Extended) Optional Infinitive Hypothesis: From Corpora to Elicitation Experiments**

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Understanding how children learn the pattern of verb marking in their language and how this process goes wrong in children with Developmental Language Disorder (DLD) is fundamental to our understanding of language acquisition. One model of this process is the (Extended) Optional Infinitive ((E)OI) Hypothesis (Wexler, 1994; Rice et al., 1995). According to this model, children's verb-marking errors reflect a stage in which their grammars allow non-finite forms (e.g. 'build') in contexts in which finite forms (e.g. 'builds') are required. This stage extends further up the MLU range in children with DLD, such that children with DLD produce OI errors at higher rates than both age-matched and language-matched controls. An alternative model is the Dual-Factor Model (Freudenthal et al., 2007, 2015). According to this model, children's verb-marking errors reflect the learning of infinitives from compound finite structures in the input (which, in German, take the form 'He can a house build-INF'), and the tendency to default to high-frequency non-finite forms in simple-finite contexts — with children with DLD being more likely to default than typically developing children.

In a first study, we analysed data from two rich German corpora, one from a child with DLD (Bastian) and one from a typically developing child (Leo). Our analysis showed that there was a relatively short period in which the child with DLD showed higher rates of OIs than the typically developing child at equivalent MLUs. This finding provides some evidence for an MLU-matching effect and is therefore consistent with the EOI Hypothesis. However, we also found higher rates of agreement and positioning errors in Bastian's speech than the EOI Hypothesis would predict. We also found a relation between the by-verb rate of OIs in Bastian's speech and the by-verb rate of infinitive versus finite forms in the input, which is consistent with the Dual-Factor Model (Freudenthal, et al., 2007, 2015).

In a second study, we followed up on these findings by conducting an elicitation experiment on 50 German-speaking children with DLD (aged 3;0 to 5;6) and 50 language-matched controls (aged 2;0 to 2;11). This study involved eliciting a range of verbs that differed in the relative frequency with which they occurred in finite and infinitive form in two conditions: a simple-finite condition (e.g. 'Lisa builds a tower. Peter ... ') and a compound-finite condition (e.g. 'Peter can a house build-INF. Lisa ... '). The EOI Hypothesis and the Dual-Factor Model make different predictions about the pattern of results across the two conditions. The EOI Hypothesis predicts that children with DLD will make more OI errors than language-

matched controls, particularly in simple-finite contexts. The Dual-Factor Model predicts both groups will make more OI errors in compound-finite than in simple-finite contexts.

To test the models' predictions the rates at which the children produced correct responses (as opposed to OI errors) were entered into a 2x2 Mixed ANOVA, where the between-groups factor was Group (DLD, TD) and the within-groups factor was Condition (Simple-Finite, Compound-Finite). The results showed a significant main effect of condition, with higher rates of correct responses in simple-finite contexts and no significant main effect of group. There was also a marginally significant Condition x Group interaction, which reflected the fact that the DLD group performed better than the TD group in the compound-finite condition. These results count against the EOI Hypothesis, since they fail to show higher rates of OI errors in DLD children than in language-matched controls. On the other hand, they are broadly consistent with the Dual-Factor Model, since they show higher rates of OIs in the compound-finite than the simple-finite condition. Further analysis (using mixed effect models) showed a significant effect of relative input frequency in the predicted direction, which provides further support for the Dual-Factor Model.

## References

Freudenthal, D., Pine, J. M., Aguado-Orea, J. & Gobet, F. (2007). Modelling the developmental patterning of finiteness marking in English, Dutch, German and Spanish using MOSAIC. *Cognitive Science*, 31, 311-341.

Freudenthal, D., Pine, J. M., Jones, G. & Gobet, F. (2015). Defaulting effects contribute to the simulation of cross-linguistic differences in Optional Infinitive errors. In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings & P. P. Maglio (Eds.), *Proceedings of the 37th Annual Meeting of the Cognitive Science Society* (pp. 746-751). Austin, TX: Cognitive Science Society.

Rice, M. L., Wexler, K. & Cleave, P. L. (1995). Specific language impairment as a period of extended optional infinitive. *Journal of Speech and Hearing Research*, 38, 850-863.

Wexler, K. (1994). Optional infinitives, head movement and the economy of derivation in child grammar. In N. Hornstein & D. Lightfoot (Eds.), *Verb Movement* pp. 305-350. Cambridge: Cambridge University Press.