

Implicatures: production/comprehension asymmetries in language acquisition

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Despite the fact that children’s comprehension of Scalar Implicatures (SI) has been widely investigated in the literature with disparate designs and numerous task (Foppolo *et al.*, 2012; *i.a.*), hardly any study has been carried out on children’s *production*.

One exception to this trend is represented by the corpus study conducted by Eiteljoerge, Pouscoulous, and Lieven (2018): these authors analyzed the production of sentences containing the quantifier “some” and showed that even 2-years-old children can use it in a way that clearly triggers the generation of an implicature. These results seem to suggest the existence of an asymmetry between children’s well-known non-adult-like comprehension of this pragmatic inference (Guasti *et al.*, 2005; Noveck, 2001; Pouscoulous *et al.*, 2007) and their seemingly adult-like production (*cf.* Katsos & Smith, 2010).

Interestingly, other production/comprehension asymmetries have been observed in language acquisition. The classical example is the “Delay of Principle B Effect” (DPBE): children allow for a coreferential reading of the object pronoun (e.g., “Mama Bear_i is touching her_i”) at least until age 6 (Chien & Wexler, 1990; *i.a.*); however, children’s pronoun *production* is almost adult-like from the age 4;6, thus preceding significantly children’s pronoun comprehension (Spencer, Smits, & Hendriks, 2009). This comprehension/production asymmetry was accounted for in the framework of Bidirectional Optimality Theory (Bi-OT) by Hendriks and Spencer (2006): in a nutshell, according to these authors, the knowledge of linguistic constraints governing pronoun distribution is already in place in young children. However, some constraints may have an effect in production, but not in comprehension; thus, if listeners are not able to take the perspective of speakers, i.e., take into account, as listeners, also the constraints on production (as it seems the case for young children), they may struggle to assign the correct interpretation.

This reasoning, we claim, can be applied not just to pronouns, but also to SI (*cf.* Blutner, 2000, 2006; Krifka, 2002): in this case, speakers follow an informativity constraint (something akin to Quantity-1 maxim: “Make your contribution as informative (strong) as possible”, Matsumoto, 1995). Notably, this constraint applies *only in production*. Consequently, we can predict that even very young children, simply following the requirement of being adequately informative, are able to use the form “some” in a pragmatically felicitous way (a prediction that explains Eiteljoerge *et al.*, 2018’s findings). Adopting such a perspective has a significant consequence: it is not the case that *speakers* produce scalar implicatures; to the contrary, SI computation is a process carried out *by listeners*. Importantly, then, we have to assume that comprehension requires a higher level of Theory of Mind (ToM) than production (*cf.* Franke & Degen, 2016; Franke & Jäger, 2016): in fact, speakers simply need a first-level ToM to use “some” adequately (“I need to be as informative as possible, if I want my speaker to understand”), while listeners need (at least) a second-level ToM (“If the speaker wants me to understand but at the same time uses a term that is potentially ambiguous as “some”, it must be because she couldn’t use the more informative/strong term, namely “all”. So, assuming that she is knowledgeable, I have to infer that “not-all” is what she meant”). Clearly, this applies to *ad hoc* implicatures, too, even if, in this case, alternatives are not scale mates, but are given in the context.

In our project, we aim to test experimentally the prediction of a Bi-OT account such the one just sketched, testing children with and without Autism Spectrum Disorder (ASD). We will focus in particular on: 1) the similarities and differences between pronoun comprehension and implicature computation; 2) the potential correlation between cognitive functions (ToM, cognitive inhibition, cognitive flexibility), as well as verbal abilities, and the rate of implicature generation. The comprehension of SI and *ad hoc* implicatures (as well as their violation) will be tested with a visual world eye-tracking paradigm; children’s ability to be adequately informative (thus, creating sentences which trigger the generation of implicatures) will be assessed using a sentence completion task.

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