Can you learn hidden information?

Abstract, *Budapest Linguistics Conference*

The overt form of utterances conceal a substantial amount of structural information, as well-known from the inherently ambiguous nature of language. Less obvious is the impact of hidden information on the learnability of languages. In some cases, e.g., syntactic constituents (1) and coindexation (2), the intended structures should be discovered from the context; which may often not be clear to the learner. In other cases, no clue is provided (3).

(1)   a.   John loves Mary   *(ambiguous)*

        b. $\text{John}_{subject}$ loves Mary_{object} *(SVO)*

        c. John_{object} loves $\text{Mary}_{subject}$ *(OVS)*

(2)   a.   He looks like him   *(ambiguous)*

        b. He_i looks like him_j *(Principle B satisfied)*

        c. He_i looks like him_i *(Principle B violated)*

(3)   a.   banána   *(ambiguous)*

        b.   [baná]na   *(iambic feet)*

        c.   ba[nána]   *(trochaic feet)*

In Optimality Theory, error-driven learning algorithms update the learners' grammar after comparing their own outputs to the observed learning data. In the cases above, however, more candidates (those in the b. and c. rows) correspond to a single observed form (the a. rows). How do the learners know which candidate to aim for? Can they be misled by an erroneous choice?

Tesar and Smolensky (2000) introduce *Robust Interpretive Parsing* (RIP) to cope with this problem. Although inspired by Expectation-Maximization algorithms, RIP does not always converge on the target grammar. Recently, both Biró (2013) and Jarosz (2013) have developed alternatives to RIP that reduce the failure rate. The present talk introduces these proposals to a non-computational audience, and compares them on the conceptual level. While displaying comparable performance, the former approach reconsiders the notion of the 'winner form', and the latter exploits the variation introduced by stochastic grammars. Hence, only the former is relevant for deterministic models. Yet, the latter will be argued to be cognitively more plausible.

References

Biró, T. (2013). Towards a robuster interpretive parsing: Learning from overt forms in Optimality Theory. *JoLLI*, *22*(2), 139–172.

Jarosz, G. (2013). Learning with hidden structure in Optimality Theory and Harmonic Grammar: Beyond RIP. *Phonology*, *30*(01), 27–71.

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