
Inferring implicature from production: Interactive experiments and a model

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We discuss a series of experiments on scalar implicature of complex sentences and explain the findings on the basis of a production model. A frequently discussed example is the sentence (A-E) ‘*Each girl found some of her marbles*’, for which it has been claimed that it potentially gives rise to the inference that each girl found some but not all of her marbles (Chierchia et al., 2012). There exist a variety of theoretical accounts of implicature in complex sentences with conflicting predictions (e.g. Chierchia et al., 2012; Sauerland, 2004; Franke, 2009; Benz, 2012; Potts et al., 2016). In the standard neo-Gricean theory, conversational implicature are part of communicated meaning (Levinson, 1983, Ch. 3, p. 131). This means that they are communicated as reliably as semantic meaning. Such a strong claim did, until now, have no support in the experimental literature (e.g. Geurts and Pouscoulous, 2009; Chemla and Spector, 2011). We present experimental results showing that embedded implicature can be reliably communicated in situations in which they are made relevant by an action selection task. The experiments provide a corpus of production and interpretation data of utterances composed of sentences of the form (X–Y) ‘*X of the girls found Y of her marbles*’ with *X* and *Y* chosen from quantifier phrases ‘*none*’, ‘*some*’, ‘*any*’, ‘*some but not all*’, ‘*some and possibly all*’, and ‘*all/each*’. The theoretical issue is then to explain which of these utterances can reliably communicate the state of the world and which cannot do this. We provide a model that is inspired by computational (Reiter and Dale, 2000) and cognitive models (Levelt, 1989) of language generation. It consists of several coding strategies that lead from (abstract representations) of visual input via message selection to utterance generation. The coding strategies in their entirety produce all sentences produced by experimental subjects. A subset of these strategies is shown to produce exactly those utterances that reliably communicate the state of the world.