

Words are vague: A model of generic language

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Generic utterances are ubiquitous in natural language. Generic statements convey a generalization about the members of a kind (Carlson, 1977; Leslie, 2008). These statements are puzzling because their meaning is so flexible. On the one hand, generics would seem to suggest an almost universal quantification, as in “Dogs bark”. Others, like “Mosquitos carry West Nile virus”, involve a property that applies only to a small subset of the kind. Cimpian, Brandone, and Gelman (2010) (henceforth, CBG) carried out a series of experiments designed to examine the truth conditions and implications of generic statements. They found evidence for the influence of additional knowledge about a target property (e.g. its *distinctiveness*) on participants’ willingness to accept generic statements. This type of contextual information modified the truth conditions. CBG also found an asymmetry between interpretation and verification: in one task, participants interpreted a generic (e.g. “lorches have purple feathers”) as nearly universal; in a different task, they would endorse the same generic as true at a much lower prevalence (e.g. when “50% of lorches have purple feathers”).

Both context and asymmetry effects pose a puzzle for the semantics of generics: what could be the stable meaning of a generic given this extreme flexibility? In this work, we seek to explain both of these phenomena as the effects of pragmatic inference filling in a meaning that is underspecified in the semantics. In particular, we posit a scalar semantics for generics in which they express that the probability of the property given the kind—which we’ll refer to as its *prevalence*—is above a threshold (cf. Cohen (1999)). Following Lassiter and Goodman (2015), we treat this threshold as a free variable that is reasoned about by a pragmatic listener: what is the threshold likely to be, given that a speaker bothered to utter the generic? Context effects follow from differences in prior beliefs about the distribution of the property across categories. Asymmetry effects fall out of modeling task differences between the language understanding and answer-selection tasks faced by participants in the different experiments (cf. Degen and Goodman (2014)).

In this work, we first replicate the main effects reported by CBG. We use Bayesian data analytic techniques to further examine the effective truth-conditions of generic statements. In particular, we examine the explanations available from a fixed scalar-semantics. We conclude that a fixed scalar-semantics is untenable; there is far too much uncertainty in participants’ responses to posit a fixed-semantics for generic statements. In addition, context and asymmetry effects need to be postulated *a priori* in the data analysis, rather than accounted for in the language understanding model.

We then introduce a model of generic comprehension, within the probabilistic Rational Speech Acts framework (Frank & Goodman, 2012; Goodman & Stuhlmüller, 2013). We show that this model predicts both context and asymmetry effects, given appropriate prior distributions over prevalence. We experimentally elicit the prevalence priors in CBG’s experimental contexts, verifying the predictions of the model. Further simulations demonstrate that the model can capture additional cases of theoretical importance — accidental and low-prevalence generics.

References

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