Regular and irregular pseudoverb classification using XMOD

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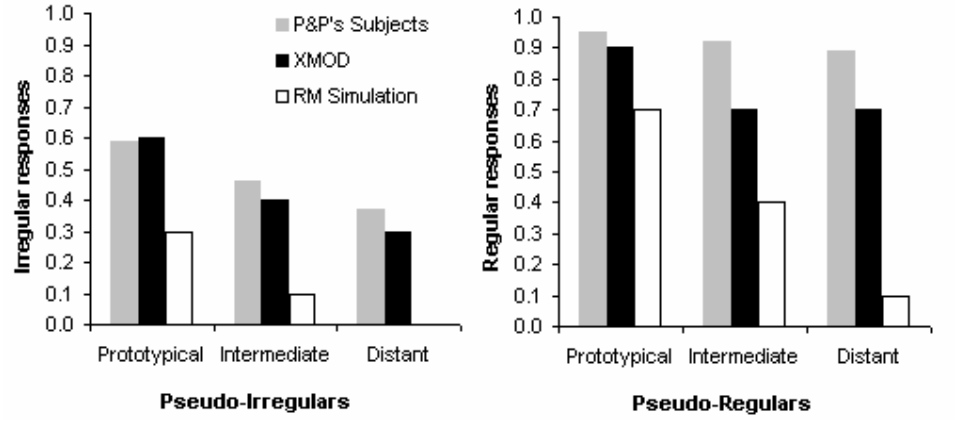
Paper only

Prasada and Pinker (1993) ran an experiment in which they asked people to inflect a set of pseudoverbs that varied in resemblance to actual English regular and irregular verbs. For the pseudoverbs designed to resemble existing irregular verbs, participants were more likely to provide an irregular response for stimuli that closely resemble an irregular prototype. For both the pseudoverbs consisting of phonotactically unattested onset-vowel-coda sequences and those designed to resemble existing regular verbs, participants consistently provided suffixed past tense responses. Prasada and Pinker simulated the results of this experiment with an implementation of Rumelhart and McClelland's (1986) two layer connectionist network, and interpreted its success in modeling the irregular inflection, but failure to model the regular inflection patterns, as evidence calling for a hybrid theory of verb inflection.

This paper reports the results of simulating Prasada and Pinker's study with XMOD (Johnson 1997a,b), a simple acoustic classifier that takes audio input and stores it in a representation close in information content to the original acoustic signal. XMOD's classification patterns (black bars) of Prasada and Pinker's stimuli closely mirror the production patterns of their subjects (grey bars), and provide a closer fit to their subject data than the Rumelhart and McClelland simulation did (white bars):



The XMOD simulation 1) calls into question Prasada and Pinker’s conclusion that a two-part theory is necessary to explain their subject data, 2) highlights the way in which the representation of speech input shapes the conclusions that can be drawn from simulations of language processing, and 3) suggests that it may be fruitful to explore psycholinguistic models that shift complexity away from processing and into information-rich representations of the input.

References

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