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Semantic Bootstrapping in Frames: A Computational Model of Syntactic Category Acquisition

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Abstract: Semantic Bootstrapping in Frames: A Computational Model of Syntactic Category Acquisition

According to the semantic bootstrapping hypothesis, children map certain (prototypical) semantic concepts to syntactic categories (e.g., objects as nouns, actions as verbs), which are then used to learn other elements of language. We report a computational model of syntactic category acquisition that combines semantic bootstrapping with the distributional learning of language. The model has access to a small set of “seed” words, with labeled categories. It then iteratively constructs syntactic frames from the seeds; sufficiently frequent frames are used to categorize non-seeded words which then contribute to the construction of additional frames, including frames that incorporate category information. The model is online and effective. Simulation on child-directed English corpus shows that with only 100 seed words, classification precision exceeds 70%.