Minimalist Theory of Human Sentence Processing

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Abstract

Research in the theory of human sentence processing can be characterized by 3 styles of explanation. Researchers taking the first track have tried to motivate principles of structural preference from extralinguistic considerations like storage capacity in working memory, or bounds on complexity of incremental analysis. Frazier and Rayner's (1982) Minimal Attachment and Right Association principles, and Gorrell's simplicity metric, are examples of this type of theory. The second track eschews "parsing strategies", replacing them with a fairly complex tuning by speaker/hearers to frequency in the hearer's linguistic environment. The difficulty of recovering an analysis of a construction in a particular case is a function of how often similar structures or thematic role arrays appear in the language as a whole. The work of Trueswell et al (1994), Jurafsky (1996) and MacDonald et al (1994) are examples of frequency or probability based constraint satisfaction theories. The third track takes a more repre ntational view and ties processing principles to independently needed restrictions derived from competence and language learning. This approach claims that the natural language faculty is extremely well designed in the sense that the same set of principles that govern language learning also contribute to a theory of sentence processing. This track is represented by the work of Gibson (1981), Gorrell (1995) Pritchett (1992), Philips (1995, 1996) and Weinberg (1992), who argue that processing can be seen as the rapid incremental satisfaction of grammatical constraints such as the Theta Criterion, which are needed independently to explain language learning or language variation. A variant of this approach, represented by Crain and Steedman (1985) among others constrains the grammatical source for parsing principles but locates these principles within a discourse or semantic, rather than a syntactic component. This paper proposes a model of the last type. We argue that a particular version of the Minimalist Program (Chomsky (1993), Uriagerek
(1998)) provides principles needed to explain both initial human preferences for ambiguous structures and provides a theory of reanalysis, explaining when initial preferences can be revised given subsequent disconfirming data, and when they lead to unrevisable garden paths. We compare our model to other linguistically motivated theories such as Philips (1995, 1996), arguing that Minimalist principles subsume the generalizations captured by Philip’s theory in a more empirically adequate way. Finally, we argue that the data presented argue for this theory over those motivated by extralinguistic principles.

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I. Introduction

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