

Processing

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I. Introduction

- Little psycholinguistic research has been guided by ideas from HPSG, so discussion of HPSG and human language processing is largely concerned with how well the theory's architecture comports with evidence about language comprehension and production
- This matters if one assumes the "competence hypothesis" -- that a theory of language use (performance) should incorporate a grammar (competence) representing the knowledge of language that is drawn on in comprehension, production, and other types of performance used in psycholinguistic experiments (e.g., reading, distinguishing words from non-words, etc.). See Sag and Wasow (2011, 2015)
- There is an empirical reason for preferring such a fit between competence and performance: statistical tendencies in some languages that have processing explanations get grammaticalized in other languages (see Bresnan, Dingare, Manning 2001; and Hawkins 2014)
- From the beginning computational tractability (processing by computers) was a design consideration. Despite obvious differences between computer processing and human processing, these design features of HPSG comport well with what is known about human processing

II. Key facts about processing

- Incrementality: Comprehenders construct partial representations as the input arrives. Production is obviously incremental, and speech typically is initiated before planning is complete.
- Non-modularity: All types of information (phonological, morphological, syntactic, semantic, pragmatic, social,...) that are available to the comprehender are used whenever they will aid comprehension. There is no "informational encapsulation" during processing.
- Importance of words: A great deal of information is associated with individual words, including their forms, their meanings, the environments in which they appear, and social associations with their use.
- Influence of context: Linguistic and non-linguistic context of use can influence the forms produced and how they are comprehended
- Speed and accuracy of processing: Despite the existence of many types of production errors and such comprehension problems as garden paths, language use is generally remarkably fast and accurate.

III. Design features of HPSG that are well-suited to be part of a model of processing

- Constraint-based: Well-formedness of HPSG representations is defined by the simultaneous satisfaction of a set of constraints. This lack of intrinsic directionality allows the same grammar to be utilized in production and comprehension.

- Surface-oriented: The features and values in HPSG representations are motivated by straightforwardly observable linguistic phenomena. It does not posit elaborate abstract structures.
- Informationally rich representations: The feature structures of HPSG include all types of linguistic information relevant to the well-formedness and interpretation of expressions. They can also incorporate non-linguistic contextual information (e.g. social information), though this has not been extensively explored.
- Strong lexicalism: Words are crucial units, and much of the information conveyed comes from the lexicon. There is no lexical decomposition beyond what is motivated by morphology.
- Underspecification: Feature structures need not be fully specified. This is particularly useful in the incremental construction of sentences.

IV. The fit between grammar and processor allows some phenomena to be handled as resulting from either one.

- Allowed Hofmeister and Sag to argue that certain island constraints are not encoded in the grammar (of English, in any event)
- Fits well with Hawkins's "Performance-Grammar Correspondence Hypothesis"

References

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