The Emperor's Psycholinguistics

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We discuss and debunk five common assumptions about the interrelation of semantics, syntax, and frequency during sentence processing. In the course of this, we explore the implications of the view that syntax is assigned as the last stage of comprehension rather than the first: Statistically based perceptual strategies propose an initial semantic representation, which then constrains the assignment of syntactic representations. This view accounts for a variety of facts, as well as suggesting some surprising new ones.

1 The reference section at the end of this paper includes the major works that represent various positions on the five issues we discuss. For this general paper, we do not ascribe particular positions to other individuals, because doing so accurately would add greatly to the length of the discussion: We are sure that we would still not satisfy the individuals that we had represented their positions fully. But we can succinctly represent our own contributions with some accuracy. The proposal concerning "syntax last" is part of a book in preparation by T. G. B. and D. J. T. M. S. developed the analyses of Spanish and suggestions about telicity; T. G. B. and M. S. carried out the priming research in Spanish and also formulated the predictions about the interaction of beliefs and telicity. John Kim assisted in an early study of unaccusative trace priming in English. Brian McElree was a collaborator on the original study of NP-trace priming in English; Kathy Straub, Ken Shenkman, and Caroline Carrithers participated in studying the contrast between NP-trace priming in lexical versus syntactic passive sentences. Andy Bars drew our attention to Example (25b), and has offered many helpful comments on other sentences discussed in this paper. We have also benefited from discussions on various germane topics with Ken Forster, LouAnn Gerken, Eloise Jelinek, Joel Lachter, Itziar Laka, Janet Nicol, Mark Seidenberg, and Mike Tanenhaus. Finally, various sources have supported the research reviewed in this paper: the National Science Foundation, Air Force Research Foundation, ONR, Montclair State University, The University of Arizona.

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The enduring questions about language processing involve the relation between syntax, semantics, and frequency information. Five assumptions on this issue have driven different lines of psycholinguistic research during the last decade. We plead guilty to having held many of these logistically convenient positions at one time or another, but it is time that we stop and reflect. Given the nature of this special journal issue, we do not document Who holds What position today: You know who you are. And so does everyone else.

The five assumptions are:

1. If sentence syntax processing is modular, unaffected by other kinds of knowledge, then semantic and contextual information cannot behaviorally affect it.
2. Syntactic processing proceeds without sensitivity to probabilistic information.
3. Sentence comprehension could be based entirely on distributed cues, without access to a sentence-level syntax.
4. If syntax assignment is necessary for comprehension, it is logically and factually prior to the assignment of semantic information.
5. Syntactic structural properties of sentences cannot be affected by conceptual beliefs.

Every one of these assumptions is a doubtful opinion at most.

MAKING MOUNTAINS OUT OF MODULES

In the 1960s, most structural psycholinguists followed the implications of Chomsky's Example Sentence (1): Syntactic processing proceeds independently of semantic information.

(1) Colorless green ideas sleep furiously

Forster and Fodor crystallized the concept of independent processing into the general idea that syntactic processing is modular—it proceeds autonomously, quickly, without reference to other sources of information. Modularity comes in various forms. The basic idea is that syntactic processing forms major compositional units of meaning, say propositions, and then the meaning of those propositions can interact with other meanings and context.

This set the scene for a decade of intense efforts to show that the modularity hypothesis is wrong: The focus is on demonstrating that semantic information does, in fact, inform ongoing syntactic processing. For example, there has been much argument about whether the misleading and incoherent