Semantics in Generative Grammar, Irene Heim & Angelika Kratzer, Blackwell Textbooks in Linguistics, Oxford: Blackwell Publishers Ltd, 1998. Price £18.99, pp 324.

Semantics in Generative Grammar is part of the Blackwell Series of "Textbooks in Linguistics". It shows a way in which semantic considerations can be integrated into a Chomsky-style generative grammar analysis and illustrates this by focusing on two key problems, quantification and the interpretation of anaphoric expressions. Chapter 1 gives a short introduction to truth-conditional semantics, set theory and functions. No traditional introduction to logic is given. Chapter 2 introduces "Frege's conjecture", the idea that semantic composition is functional application, and is the way in which Heim & Kratzer make their semantics compositional. This principle guides the rest of the book, influencing preferences in analysis. Chapter 3 introduces basic semantic ideas such as type-driven interpretation, well-formedness and interpretability. Chapter 4 extends a fragment of English with a treatment of adjectives, prepositional phrases and definite descriptions, including quite a long discussion of presupposition. Chapter 5 then introduces variable binding, paving the way for Chapters 6-8, three chapters that delve deeper into issues in quantification. Chapters 9-11 build on this by introducing a selection of other topics related to the interpretation of different types of anaphora, e.g. referential pronouns, bound variable interpretations of pronouns, and E-type pronouns. Finally, chapter 12 introduces some motivations for an intensional semantics and sketches how an intensional analysis would work with sentences expressing attitudes. The book concludes with a 12 page index. Additionally, each chapter is followed by extensive endnotes, which also contain references to cited or related work.

The book distinguishes itself from other introductions to semantics in both level and depth of analysis, and as a textbook is probably only appropriate for the stated targeted readership of graduate students and advanced undergraduates.

A close connection is kept between the syntactic analysis and the semantic analysis throughout. This is different from what is taught in many introductions to semantics, where the actual syntactic analysis leading to a logical form is sometimes treated as a detail to be worked out later, a common approach when semantic analysis is taught via predicate logic. Instead, *Semantics in Generative Grammar* uses a sophisticated syntactic analysis from the very beginning, and the interdependence between syntax and semantics is continually illustrated with cases where semantic considerations influence structural decisions, such as the treatement of quantified NPs in object position (section 7.3). Cases where syntactic constraints rule out certain interpretations are also given, such as the determination of indexing possibilities (section 5.5) and in the discussion of weak crossover effects where c-commanding based on the given tree-structure rules out syntactic binding and thus in turn semantic binding (section 10.3). Students familiar with generative grammar can concentrate on semantic and syntax-semantic interface issues immediately. Additionally, readers get the impression that from a correct syntactic analysis for surface structures, the semantic analysis can be determined in a rigorous way. This is a strength of the book compared to other introductions.

However, this also makes the book rather demanding for students with a weak background in generative syntax. Sometimes it was difficult to see the semantics for the syntax. Students can easily get the impression that the choice of syntactic theory for semantic analysis is less arbitrary than it actually is (despite the disclaimer made in section 3.2). For example, the guiding principle of functional application, applied throughout the book, is defined in such a way that daughters of the same node will need to be compatible types so one can be an argument to the other. Type compatibility is often achieved through the syntactic process of movement. In this way, syntactic movement decisions influence the applicability of functional application. Thus, if your students (or you) are unfamiliar with, or even sceptical of concepts like traces and movement you will probably find some of the analyses difficult to accept.

The advanced nature of the text is most clearly seen in the choice of exercises. The book contains a large number of problems which range from completing an analysis started in the text, to questions that have the scope of an entire dissertation. A case in point is the exercise on *there*-insertion contexts (section 6.6). This very topic is the subject of much on-going research, and the considerate teacher will need to point out which exercises are more advanced. No answers are given for any of the exercises, nor could they for most of them given their nature. Exercises that reinforce understanding are few, and unless you are teaching to a very advanced group most classes will have to be supplemented with additional assignments. The positive side is that the exercises introduce current semantic problems, and the endnotes in each chapter are good sources of suggestions for further reading. The reader gets the immediate impression that they are being invited to contribute to real work, which is inspiring.

The style is easy to read and the exposition of many difficult and confusing topics is very clear (e.g. the explanation of binding theory in Chapter 10 is an excellent example). Most sections have the following pattern: A problem is introduced. Intuitive solutions are presented and developed only to be discarded when further evidence shows them to be false starts. Earlier assumptions are then often revised and a new alternative solution is proposed, and the process continues. This method of presentation is not common in introductory textbooks, and students may be frustrated with the emphasis placed on knowing what analyses fail rather than simply being taught what the current consensus is. However, this style of presentation introduces students to the reality of the field; few problems have definitive solutions, and research often involves many false starts. But *Semantics in Generative Grammar* is an *advanced* introduction, and is an example of how advanced-level texts should be organized.

One negative aspect of the book is that the authors never go into the idea of model-theoretic semantics, choosing instead to use vaguer formulations such as talking about "the description of the facts" (p. 100) or whether or not something would be true in a given situation. This makes the semantic analysis seem imprecise, and may give readers the impression that there is no principled way in which to check the truth or falsity of sentences, or to test the predictions of a given analysis, other than by appealing to one's own intuitions. Students who go on to read about semantics from other traditions may be surprised at the emphasis placed on models, counter-models, and even entailment relationships etc., which are considered basic in other introductions. This omission also makes the introduction of intensional semantics in Chapter 12 less clear to readers unfamilier with the topic.

An introduction to models and syntactic and semantic inference is also important in computational semantic implementations, such as e.g. Johan Bos's DORIS (Discourse Oriented Representation and Inference System). Inferences in natural language and their treatment is an important part of computational semantic work, so these omissions are relevant to students working with implementations. Also, few students in computational linguistics will have had much experience with principles and parameters-style grammars in applications, and they may find it difficult to transfer an analysis presented in *Semantics in Generative Grammar* to another framework. For this audience then the book is not an ideal textbook, and can best serve as a supplement to understanding the results of more formal semantic work done within the Heim & Kratzer framework.

Indeed, Heim & Kratzer can be seen as founding a certain type of style of analysis, and its influence can be seen in much work in semantics from the eastern U.S. For a textbook, even an advanced one, it is surprising how frequently *Semantics in Generative Grammar* appears in reference lists for conference papers and even journal articles. This may in some cases be former students showing their colors but it is also a testament to the depth of the text, which for many topics, such as quantification issues, gives the best survey of are large body of the research available.

In summary, *Semantics in Generative Grammar* is a challenging guide to how semantic analysis can be integrated with a sophisticated syntactic theory, that forces the reader from the very beginning to deal with real problems, and is essential reading to understand a large body of current research in semantics and the syntax-semantic interface.

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