

MR3635300 03-01 03B65 68Q42 68T50 91F20

Winter, Yoad

★**Elements of formal semantics.**

An introduction to the mathematical theory of meaning in natural language.

Edinburgh Advanced Textbooks in Linguistics.

Edinburgh University Press, Edinburgh, 2016. xi+258 pp.

ISBN 978-0-7486-7779-5; 978-0-7486-4044-7; 978-0-7486-4043-0

The term “formal semantics” can refer to a direction of research in logic, since it was the logician Alfred Tarski who first employed formal methods in a manner that compelled logicians to refer to his approach as describing the “semantic theory of truth”. But *meaning* is not a concept of the discipline that was since ancient times viewed as “formal” logic and, probably, this is why formal semantics was always perceived by logicians as a domain distinct from logic. This attitude is conveyed by the title of one of the best books on this subject, *Formal semantics and logic* [Macmillan, New York, 1971] by B. C. van Fraassen.

The term “formal semantics” can also be used to refer to a chapter of semantics, a linguistic discipline, and this is the intended use of this term in Yoad Winter’s book—a textbook presenting several mathematical approaches to meaning in natural languages. With such a treatment of the term, one would expect to find in this textbook various applications of the formal methods originating in logic to natural languages—applications keeping separate the two aspects: the logic and the linguistic. However, the approach of this book is also different from presentations of this kind—here, Winter presents the semantics of language in a manner that practically shows that logic originates in language, and is not just “applied to language”. Due to this manner of presentation, the current book can be treated as a modern continuation of the book by van Fraassen. Therefore, the current book is and will be interesting to students of logic, especially undergraduates in mathematical logic, alongside the students and researchers in linguistics who, probably, were the book’s intended audience.

One can get an idea of the range of formal methods presented in this book from its table of contents: Chapter 2 is focused on semantic relations called “entailments”. They are described by abstract mathematical models and general principles of compositionality that connect forms with model-theoretic meanings. Chapter 3 introduces semantic types as a means of systematizing the use of models. A convenient notation of lambda-terms is introduced for describing semantic functions. Chapter 4 treats quantification by focusing on the semantics of noun phrases that involve counting and other statements about quantities. Chapter 4 directly introduces one of the best-known parts of formal semantics: the theory of generalized quantifiers. Chapter 5 extends the framework of the preceding chapters for treating meaning relations between expressions that appear a certain distance from each other. Chapter 6 treats intensional expressions: the expressions that refer to attitudes, beliefs or possibilities. Such expressions are treated in semantic models containing entities representing possible worlds.

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