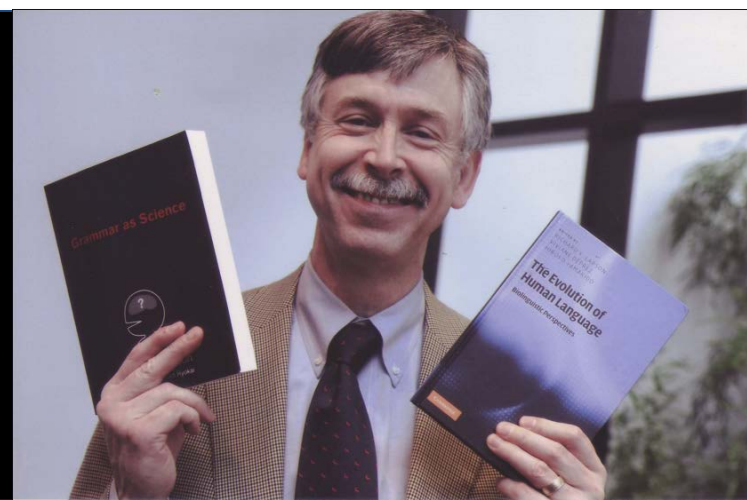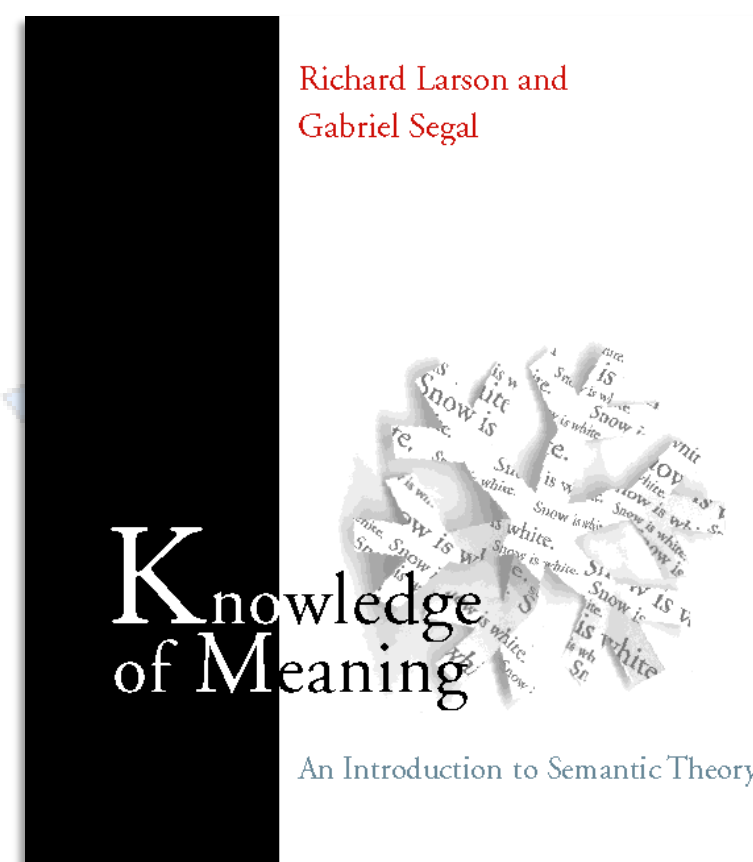# *Semantics Lab*

Richard Larson, Director

Linguistics studies a speaker's knowledge of language. **Semantics** studies one part of that knowledge: knowledge of meaning. Knowledge of meaning is what allows speakers to judge things like:
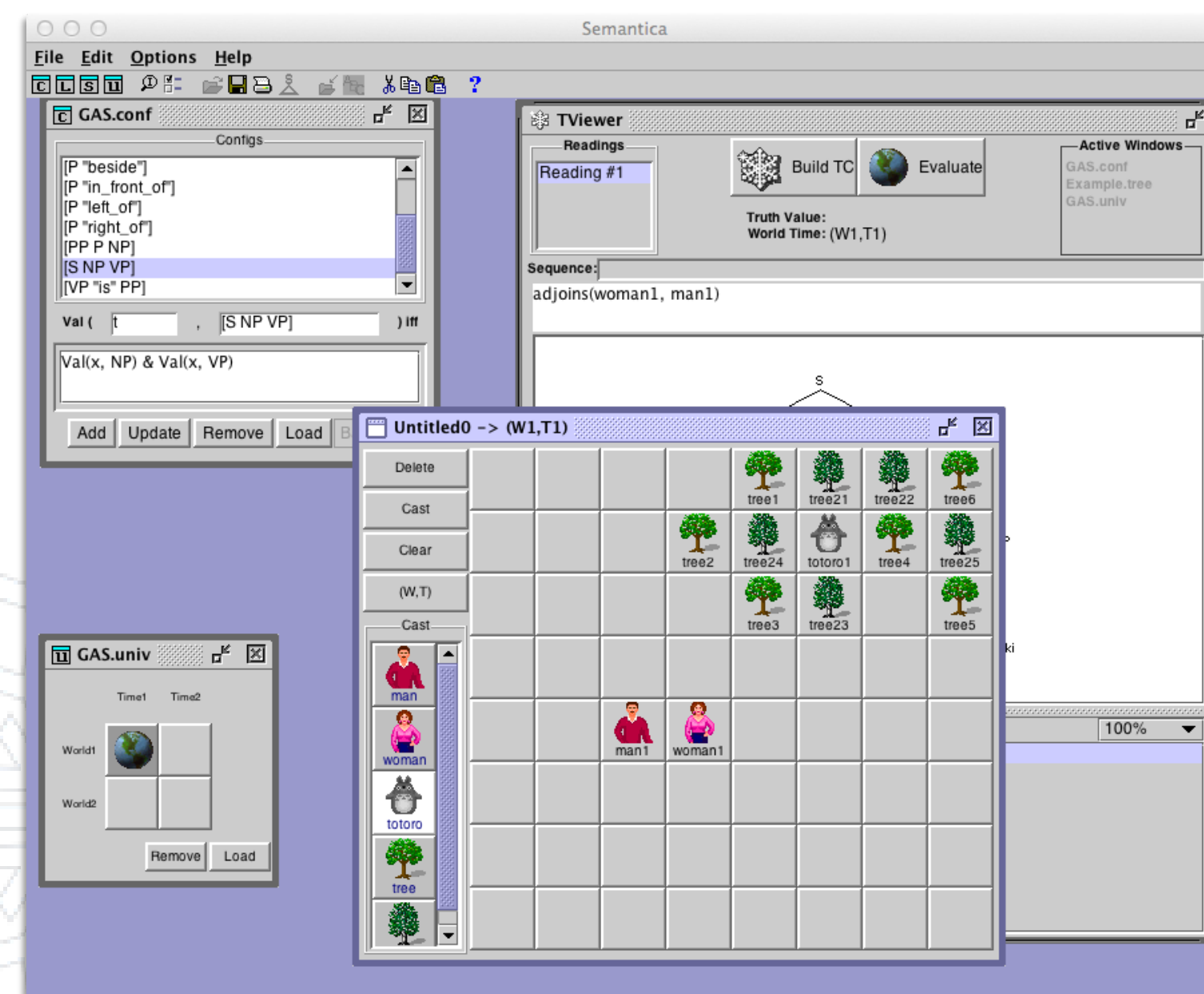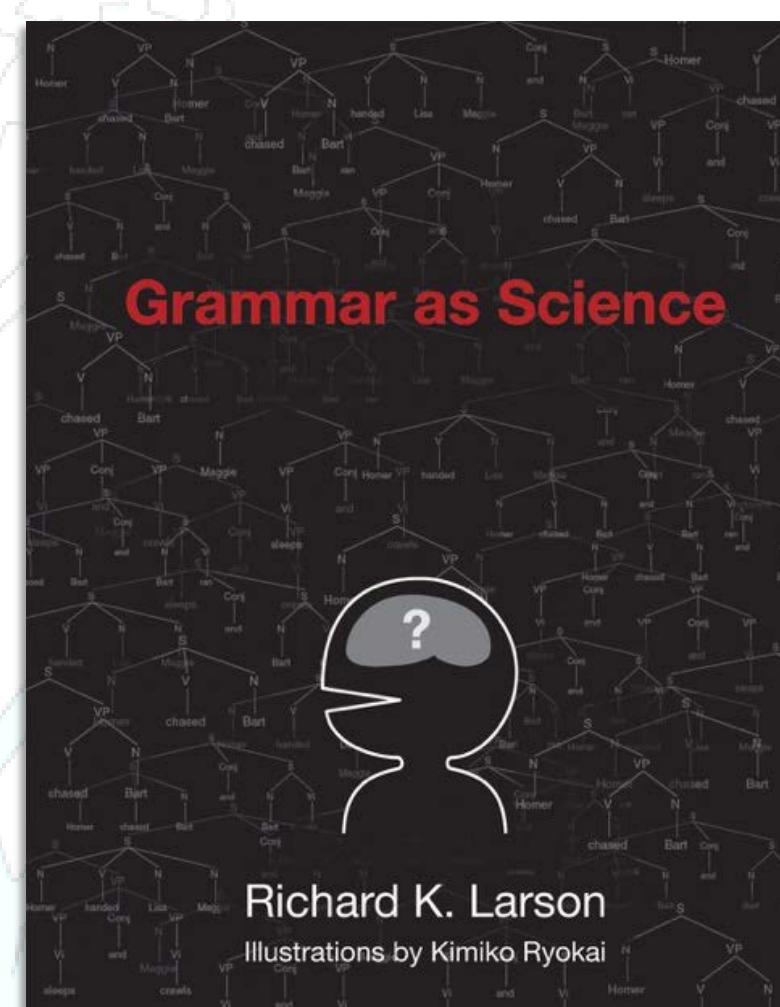
• ambiguity & anomaly; implication & contradiction relations
• the reference of terms; truth & falsity in sentences
• what people assert, query or deny given what they say, ask or write

Richard Larson and Gabriel Segal

Knowledge of Meaning

An Introduction to Semantic Theory

The semantics Lab was created in 1992 by Richard K. Larson (Linguistics) and David S. Warren (Computer Science) as part of the NSF-sponsored **Grammar as Science Project**. Along with primary research in semantics, a focus of the lab has been the creation of software tools for linguistics research and education. These include **Semantica**, a program for teaching truth-conditional natural language semantics, and **Syntactica**, a program for teaching transformational syntax.

Other GAS project participants included Kostis Sagonas (standing between Larson on left and Warren on right), Patricia Gomez (seated on left), and Juliana Freire (seated on right).

Semantica is a software application designed to let students explore natural language semantics in an interactive way. The program provides a simple graphical interface for:
• Creating a semantic theory (consisting of lexical and phrasal semantic rules)
• Deriving truth-conditions from that theory for natural language phrase-markers
• Testing those truth-conditions against a pictorially represented universe of worlds and times.
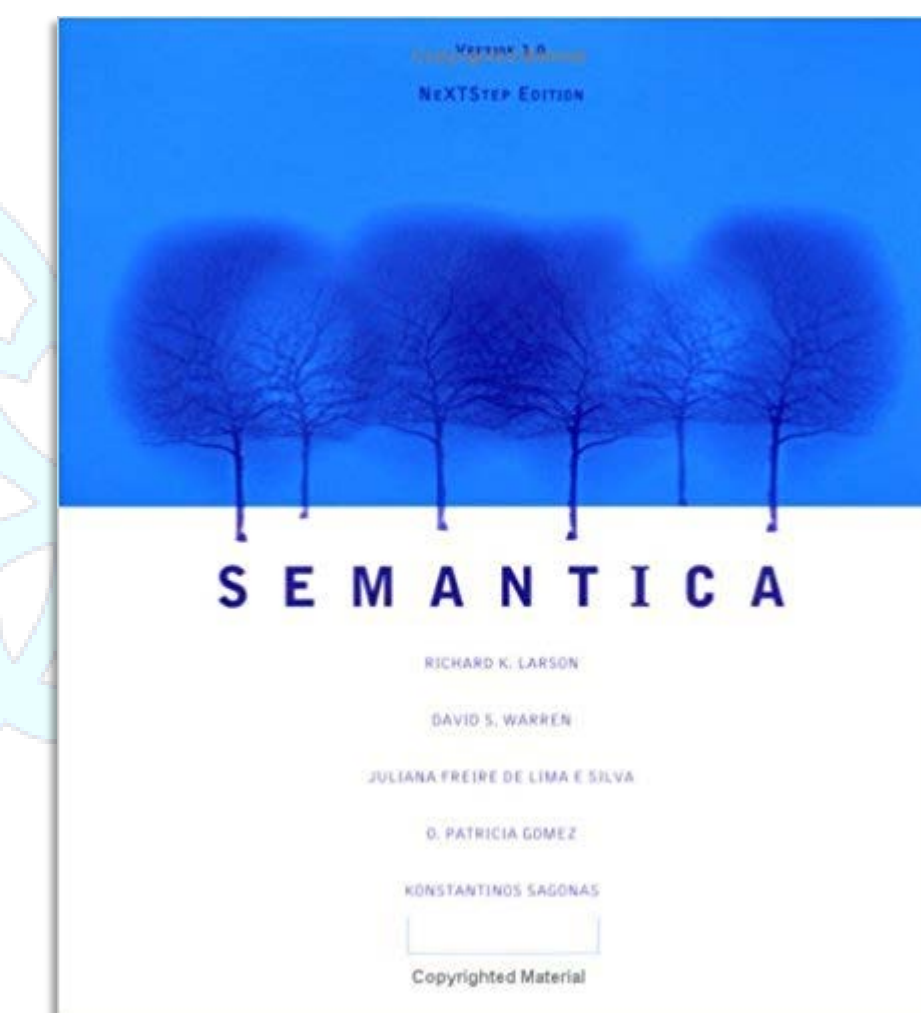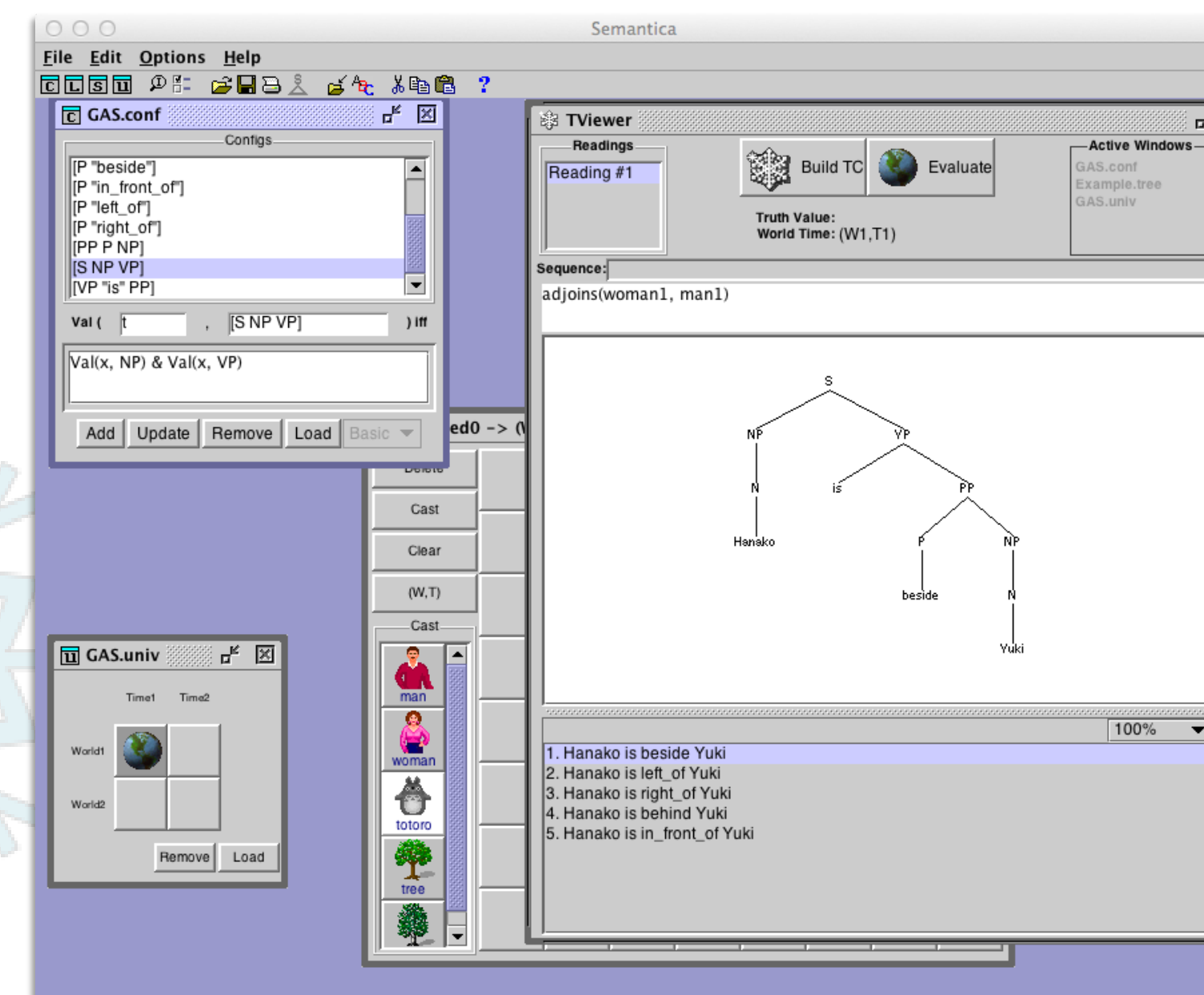
Semantica permits many aspects of semantic theory to be explored, including a wide variety of construction types such as predicates, proper nouns, demonstratives, quantifiers, tenses, and modal adverbs. Semantic theories can be built up step by step by students, with full control of their interpretive possibilities.

Syntax provides an excellent instrument for introducing students from a wide variety of backgrounds to the principles of scientific theorizing and scientific thought; it engages general intellectual themes present in all scientific theorizing as well as those arising specifically within the modern cognitive sciences. The **Grammar as Science** textbook introduces syntax as an exercise in scientific theory construction. It is constructed as a "laboratory science" course in which students actively experiment with linguistic data. **Grammar as Science** is designed to be used with **Syntactica**, a software application allowing students to create and explore simple grammars in a graphical, interactive.
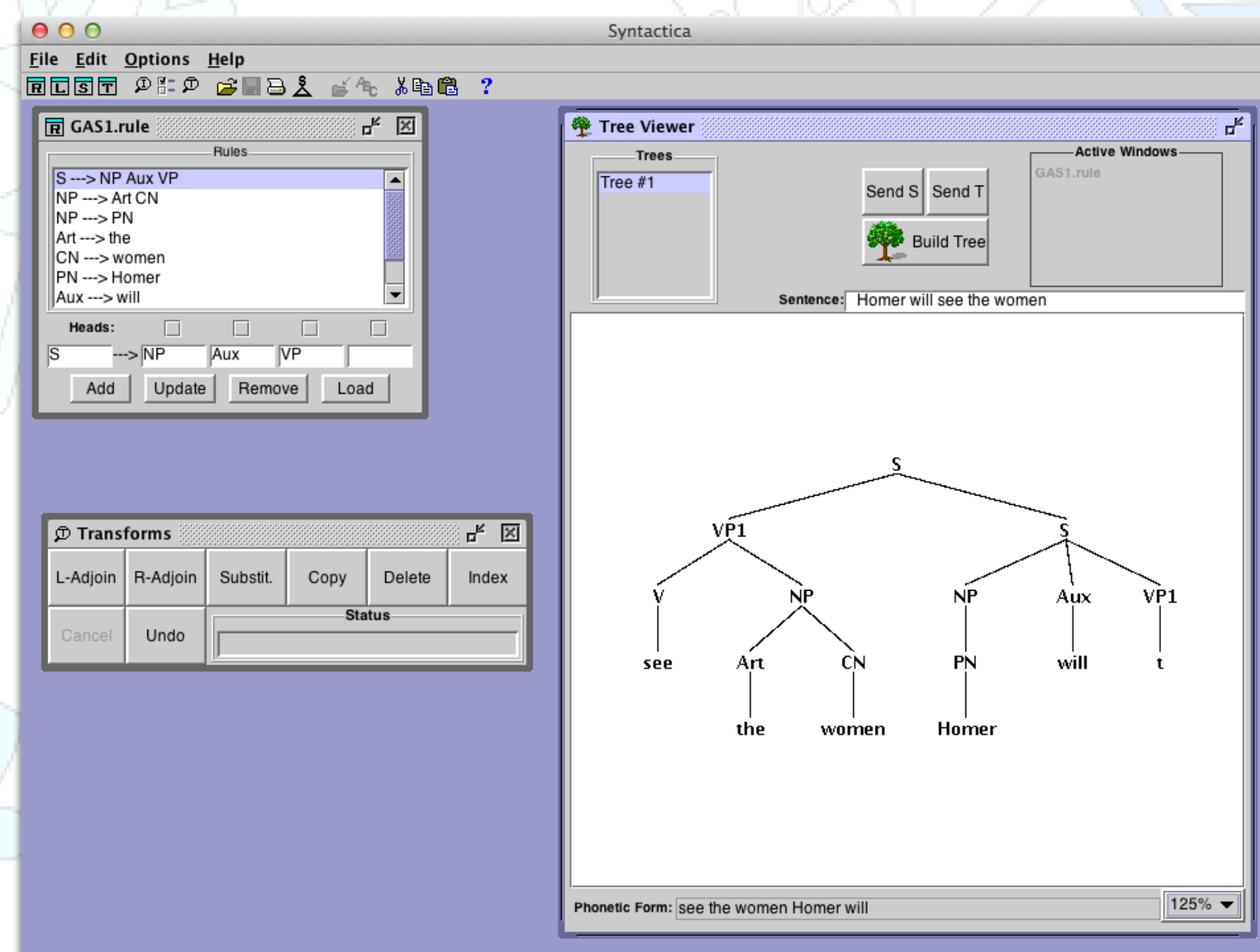
Grammar as Science

Richard K. Larson
Illustrations by Kimiko Ryokai

Syntactica is a software application designed to let let students explore natural language structure in an interactive way. The program provides a simple graphical interface for:
• Creating grammars (consisting of phrase-structure rules and lexicons)
• Viewing the structures they assign to natural language expressions
• Transforming those structures by syntactic operations such as movement, deletion and copying
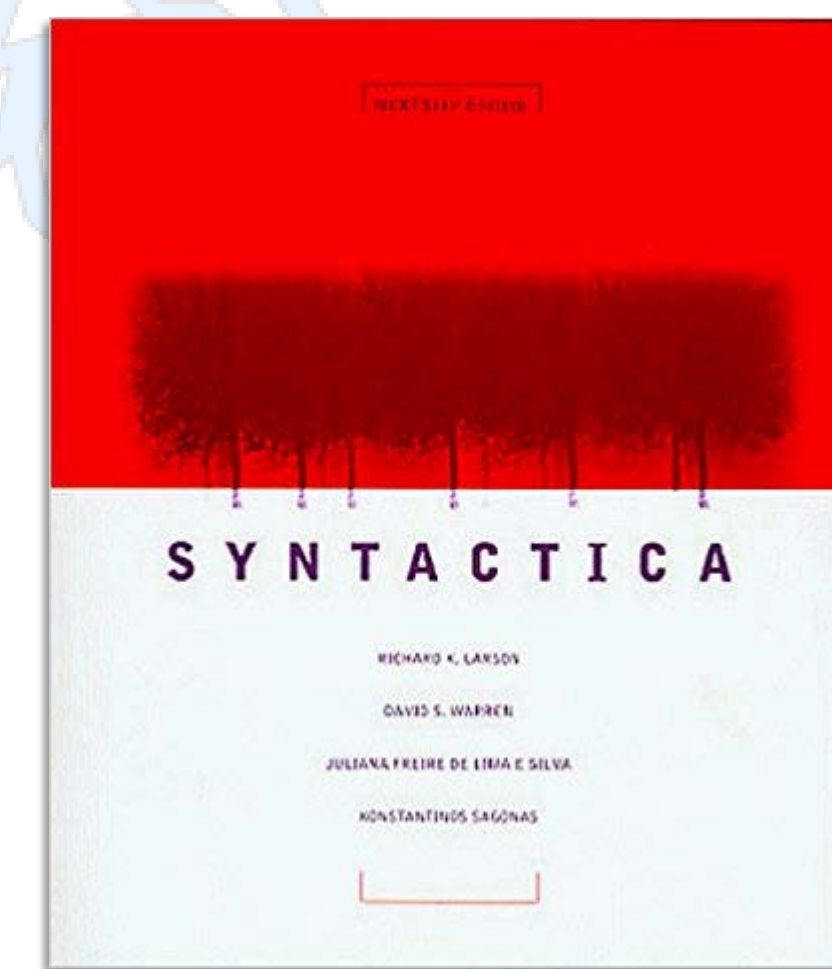
Syntactica permits many aspects of syntactic theory to be explored. The rule and lexicon windows allow one to assign and control the percolation of syntactic features. The **TreeViewer** window lets oneto perform a variety of formal operations on trees by simply pointing, clicking and using the Transforms panel. **Syntactica** also permits control of various constraints on operations, including an elementary version of Subjacency.
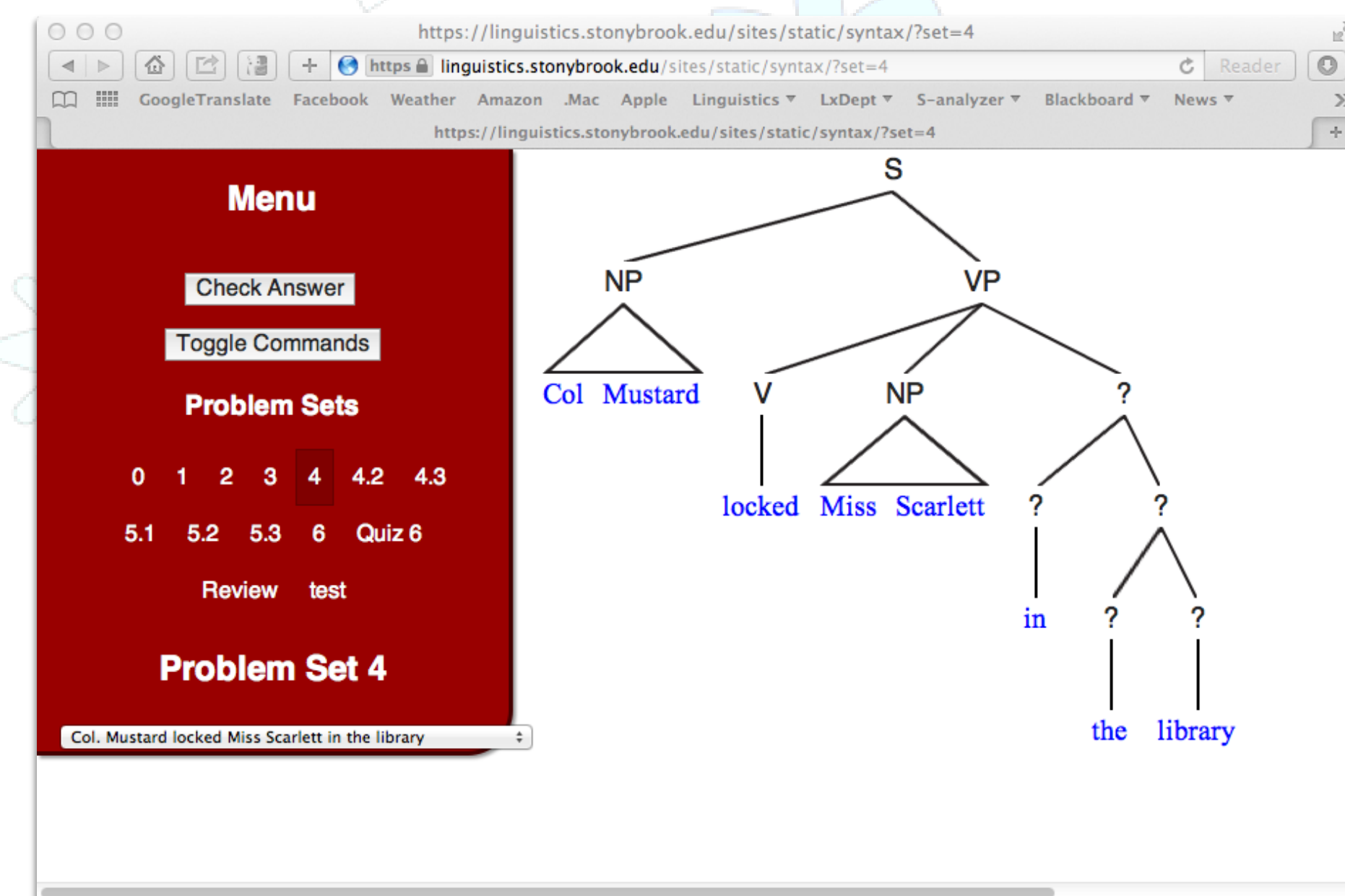
At present we are authoring a web-based application **S-Analyzer** to assist students in developing basic parsing skills using phrase structure trees. This work is part of a new departmental hybrid on-line course **The Anatomy of English** (developed in collaboration with M. Aronoff and M. Lindsay).

You can find additional material on the Semantics Lab website:
(http://semlab5.sbs.sunysb.edu/~rlarson/Semlab/semlab.html)