Preface
When I first got involved in computational modeling of psycholinguistic phenomena, I was very taken with the idea of directly modeling processing difficulty using quantitative distributions estimated on other data. A classic case of this is explaining garden path effects in terms of probabilistic grammars. This stage of my own development seems to have paralleled the one John Anderson was in during the late 1980s, at the height of his fascination with rational analysis. Since that time, I have retraced Anderson’s steps and returned to algorithmic models. I did this because I wondered what would I say to a person who walked in my door asking how people understand English sentences? An earnest questioner would not be satisfied with an explanation that starts with “well, people know these conditional probabilities and these equations show that the optimal thing to do is....” Real people want to know how it works. For them, a good explanation is a causal explanation.

I published an article in 2011 which I hoped would encourage more interest in mechanistic models of human sentence comprehension. But this article was relatively long and inscrutable. It presupposed familiarity with books like Newell and Simon (1972) and Anderson (1990). Not many linguists are equipped with this background.

However, I think that this kind of work is very important for linguistics as our field shakes off its self-imposed isolation. We must view ourselves as cognitive scientists of language, and discover the implications that our theories hold for things outside of the structural system of language.

To that end, I have tried to write a book that is more accessible to the linguistics community than that article was. Since 2011 my own perspective has matured as well: I realized that I had been spending a lot of time programming functionality that is built-in to the most well-known cognitive architectures. I started to see the foundational role that cognitive architecture will have to play in justifying linguistics as a valuable subfield of cognitive science.