CYCLES AND STABILITY IN LINGUISTIC SIGNALING

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I would like to thank ...

ABSTRACT

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No more than 350 words. It is normally a single paragraph, consists of four parts: the statement of the problem; the procedure and methods used to investigate the problem; the results of the investigation; and the conclusions. The abstract is published online by ProQuest in "Dissertation Abstracts International", providing information to interested readers about the general content of the dissertation.

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PREFACE (optional)

CHAPTER 1 : Introduction

> I am, however, enough of a rationalist to want to find a basis that underlies these facts, undeniable though they may be; I would like to be able to think of the standard type of conversational practice not merely as something that all or most do in fact follow but as something that it is reasonable for us to follow, that we should not abandon.
> –Paul Grice (**?**, 29)

Intuitively, everyone can agree that languages change. But, this intuition depends on exactly what we mean when we say *language*. On the one hand the term can be used to refer to the various nuanced ways that different linguistic forms are used in communication, and on the other hand it can also be used to refer to the unique human faculty that allows for the acquisition of that combinatorially rich set of linguistic forms. Broadly speaking then, change can refer to either a difference in the grammatical knowledge that learners internalize, or a difference in how that grammatical knowledge is externalized and put towards communicative ends. So, our intuitive agreement about change may persist, but we might seem to differ in what we take to be changing or, perhaps more importantly, how we can study and ultimately understand the causes of such change.

Indeed, much of linguistics, the generative tradition in particular, has focussed almost exclusively on characterizing how the grammatical knowledge internalized through the process of acquisition might lead to change. In the terms of **?**, language change proceeds as the process of language acquisition maps the externalized *E-Language* of one generation to the internalized *I-Language* of the next. We can visualize this schematically as in Figure **??** where the output from one generation serves as the input for acquisition in the next generation. The definition of change under this conception is expressed in terms of differences between subsequent grammars. In fact, as **?**, 249 put it, an observed change can only come about through a change in the underlying grammars in subsequent generations.

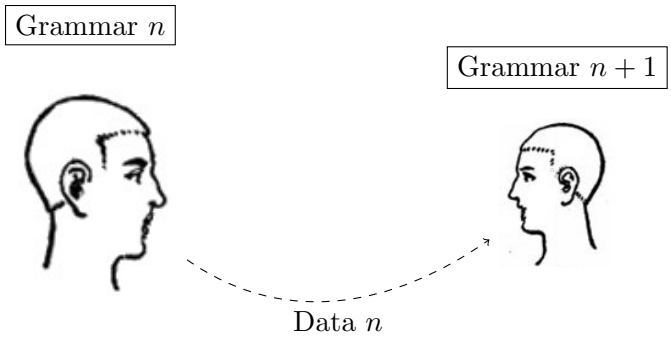

Figure 1: The process of language acquisition

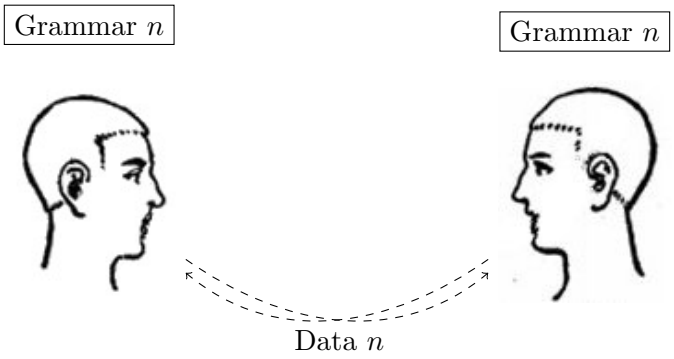

Figure 2: The process of language use

Yet, while this may be true, it does not necessarily reveal the underlying cause of the change. Crucially, the process of acquisition does not act in a vacuum. The output of one generation serves as the input to the next. And, while this input to acquisition arises from the interplay of many factors, it is not arbitrary. Rather, it is governed by a *pragmatic competence* that "underlies the ability to use [*grammatical competence*] along with the conceptual system to achieve certain ends or purposes" (**?**, 59). Or, in Gricean terms, the output from the previous generation arises from the rational use of an internalized grammar. We can visualize this schematically as in Figure **??** where the output of one generation arises through the strategic use of the forms made available by an internalized grammar. Where grammatical competence is formed by a mapping from one generation's *E-Language* to *I-Language* of the next, pragmatic competence is what governs the mapping from each generation's *I-Language* to its *E-Language*.

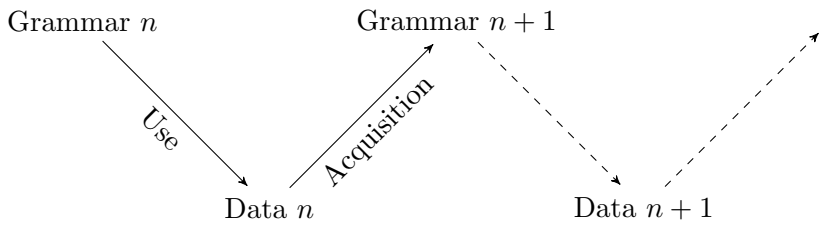

Figure 3: The iterated process of language change through acquisition and use

Taken together, we can summarize the interaction of these two processes as in Figure **??**, where both use and acquisition are entwined in the process of change. So, while we can certainly define change in terms of the internalized grammars of speakers at different points in time, the process of acquisition is not the only locus of change. That is, both the process of externalization, internalization, and the interaction between the two can lead to change in the grammars acquired over time. The central goal of this dissertation is to provide the mathematical tools for defining and analyzing models of change stemming from both use and acquisition. T In doing so, we aim to demonstrate that the notion of pragmatic competence can be integrated into broader theories of change, and is not only incredibly useful but sometimes necessary to explain linguistic change.

At the center of this endeavor will be a diachronic process that implicates both use and acquisition, the development in the expression of sentential negation over time known as *Jespersen's cycle* (**?**). The process is often described as the result of two transitions. The first transition occurs when a preverbal form of negation is replaced by an embracing form, which is initially characterized as being more emphatic. The second transition occurs when this embracing form is subsequently replaced by a purely postverbal form. In the history of English, we observe both of these two transition in Middle English from *ne* to *ne...not* and from *ne...not* to *not*. Our goal will be to determine the role of use and acquisition in each of these transitions.

In Chapter 2 we begin by distinguishing between two phenomena that have often been conflated in investigations of Jespersen's cycle. In particular, we argue that Jespersen's

cycle as it is often described consists of both a *formal* and a *functional cycle*. The formal cycle describes the change in the formal complexity of negation over time. It takes place as negation becomes more and then less formally complex, as can be seen in the transitions in the history of English from *ne* to *ne...not* to *not*. The functional cycle describes the way that different forms of negation are used to signal meaning. It takes place as one form of plain negation is replaced by another form. This can be seen in the history of English from *ne* to *ne...not* where the originally empathic *ne...not* displaces *ne* as it increases in frequency, loses its emphasis, and comes to signal plain negation. We note the logical and empirical relationship between the two cycles: the functional cycle can occur independently of the formal cycle. This result informs the structure of the rest of the dissertation; we start by addressing the functional cycle before turning to the formal cycle.

The first part of this dissertation addresses the functional cycle. In Chapter 3 we introduce the mathematical tools we will use to model the functional cycle. In particular, we show how we can use evolutionary game theory to describe how meaning is signaled in a population over time. Importantly, these tools allow us to model a qualified kind of Gricean rationality. That is, individuals are *boundedly rational* insofar as they have limited cognitive and informational resources (**??**). Yet, these tools allow us to show how the actions of individuals can give rise to change at the population level, even when those small decisions are not the product of conscious deliberation (**?**). This is particularly important when we turn to the functional cycle in Chapter 4, where we show that the first transition from *ne* to *ne...not* can be explained as the result of speakers' limitations in keeping track of common versus private knowledge. So, just as Gricean rationality has been used to explain particular patterns of synchronic use, a kind of bounded rationality allows us to explain the functional cycle. So, how we use these two forms explains why they change over time, and the transition from *ne* to *ne...not*.

However, the same model does not apply to the transition from *ne...not* to *not*, so we turn to the formal cycle in the second part of this dissertation. In Chapter 5 we describe a model of

syntactic acquisition and determine its predictions for both of the transitions of the formal cycle. In particular, we show that acquisition cannot explain either of the two transitions from *ne* to *ne...not* or from *ne...not* to *not*, other than as the result of a random change in the grammars acquired. In Chapter 6 we test this possibility using statistical methods developed in population genetics to test for random drift versus selection. We find that we can reject random drift in the case of the first transition from *ne* to *ne...not*, but we cannot reject drift in the case of the second drift from *ne...not* to *not*. This first result suggests that use is the driving force behind the first transition as part of the functional cycle. The second result shows that acquisition does not play a role in any of the observed transitions. So, insofar as we can offer an explanation of either of the observed changes, we need the notion of pragmatic competence to do so.

etc.

APPENDIX