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The emergence of complexity in prosody and syntax

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ABSTRACT

The relation between prosody and syntax is investigated here by tracing the emergence of each in a new language, Al-Sayyid Bedouin Sign Language. We analyze the structure of narratives of four signers of this language: two older second generation signers, and two about 15 years younger. We find that younger signers produce prosodic cues to dependency between semantically related constituents, e.g., the two clauses of conditionals, revealing a type and degree of complexity in their language that is not frequent in that of the older pair. In these younger signers, several rhythmic and (facial) intonational cues are aligned at constituent boundaries, indicating the emergence of a grammatical system. There are no overt syntactic markers (such as complementizers) to relate clauses; prosody is the only clue. But this prosodic complexity is matched by syntactic complexity inside propositions in the younger signers, who are more likely to use pronouns as abstract grammatical markers of arguments, and to combine predicates with their arguments within in a constituent. As the prosodic means emerge for identifying constituent types and signaling dependency relations between them, the constituents themselves become increasingly complex. Finally, our study shows that the emergence of grammatical complexity is gradual.

1. Introduction

Syntax and prosody are both central ingredients in human language, and they are clearly closely related. By imposing rhythmic structure on the language stream, prosody signals the division of our utterances into interpretable pieces or constituents. Intonation is superimposed on these rhythmic constituents, in part to convey semantic or pragmatic information, such as whether we are asserting or questioning. Together, rhythmic and intonational structure also signals relations between constituents. For example, in the two clauses of the complex conditional sentence, *If it rains, the fireworks are off*, the end of the first clause is typically marked by timing cues such as pause, phrase final lengthening, and the like, as well as by a rise in intonation. Of prosody and syntax, some researchers attribute to prosody the more basic role, providing the bootstraps to syntax for infants (Jusczyk et al., 1992; Nespor et al., 1996) and signaling relations between constituents in new languages like pidgins, before syntactic structuring arises (Givón, 1979).

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How are syntax and prosody related in the organization of language? One way to investigate this question might be to observe a new language as it emerges. But this is not an easy testing ground to find, as truly new languages are hard to come by. Even pidgin speakers are not *tabulae rasae* – they are also speakers of full-fledged native languages, making it difficult to determine the source of the structures they contribute to pidgins.

Nevertheless, new languages do exist, in communities of deaf people, and empirical data that bear on the emergence of language in modern humans is found through the study of nascent sign languages. Investigating such languages allows us to ask the question, What is the nature of the earliest kinds of structuring to arise in a human language? Here we report on the early stages of prosody and syntax in such a language, Al-Sayyid Bedouin Sign Language. We trace the emergence of prosodic and syntactic organization, and find that complexity in the two systems arises gradually and in tandem, although their grammatical domains do not overlap.

Sign languages, the natural languages that develop spontaneously in deaf communities, have grammatical organization, and many of their structural properties are remarkably similar to those of spoken languages (Sandler and Lillo-Martin, 2006). Once that has been established, it should not be surprising that the utterances of sign language have prosodic organization, devices for marking timing, stress, and the visual equivalent of intonation. The prosody of sign language – transmitted not only by the hands, but by the face, head, and body as well – is of general interest for two reasons. First, it holds out the promise of arriving at a core of universal prosodic properties: if some property is shared by spoken and signed languages, this implies that human language cannot do without it. Second, sign languages are the only languages that allow us to observe the way such a system emerges and more generally how complexity arises in human language. Not only are all known sign languages relatively young (most of them under 300 years old), but some have arisen quite recently, and their development can be observed in real time.

In this study, we report on the development of prosody and syntax in a new sign language that arose over the past 75 years in a Bedouin village with a high incidence of deafness. We find that neither complex syntactic structure nor systematic prosody arise overnight. Nor do we find that prosody develops entirely without syntax. Instead, they each develop gradually, and, in some respects, they develop hand in hand. As syntactic structure **within** clauses increases, we see that prosody marks complex relations **between** clauses before there are any overt syntactic markers of such relations.

We begin with a brief overview of prosody in more established sign languages, focusing particularly on Israeli Sign Language, which is the sign language used by most deaf people in Israel, but which has a very different social history from that of Al-Sayyid Bedouin Sign Language. After demonstrating in section 2 that sign languages have such properties as prosodic constituents and intonation, we move on in section 3 to describe the new sign language, Al-Sayyid Bedouin Sign Language (ABSL), as context for the present study.

Excerpts from narratives of four second generation Al-Sayyid signers are the object of this study. Two signers are older, in their 40s, and two are 12–17 years younger. Through detailed analysis of their narratives, the gradual appearance of prosodic and syntactic complexity in the language is revealed. Our methodology is described in section 4.

In the younger signers, relations among constituents are marked through prosody. The study indicates that signals such as manual timing cues, head position, and facial expression are recruited to cue types of constituents and the relations between them in a way that becomes more systematic as the language matures. The differences between the older and younger signers in their use of prosody are described in section 5. There are no overt markers of syntactic complexity, and we cannot see interaction between syntax and prosody on the surface. Nevertheless, as complex interclausal relations are signaled by prosody in the younger signers, syntactic complexity within the clause is also emerging, particularly in the content and distribution of noun phrases, explained and exemplified in section 6. These results and analyses come together in section 7, where the gradual evolution of grammatical structuring in this new language is illustrated through 'snapshots' of data from three different time periods: a short segment of narrative from a rare videotape of a first generation signer, compared with segments from an older and a younger signer of the next generation. A conclusion is offered in section 8, where we consider the implications of our findings in the context of current discussions about recursion.

2. Prosody in sign language

The sign language literature reflects just how closely prosody and syntax are interrelated, since there are still differences of opinion about whether certain signals are elements of the syntactic or the prosodic components in sign language grammar. Early work on such structures as interrogatives, topics, and relative clauses attributed a set of nonmanual markers accompanying them to the syntactic level of analysis. Differences in head position and facial expression were shown to systematically mark such structures in American Sign Language (ASL) (Liddell, 1978, 1980; Baker and Padden, 1978). This perspective was exploited to the fullest in a treatment of wh-movement and other syntactic phenomena in which the authors assumed that the distribution of such nonmanual markers directly reveals the underlying syntactic structure of ASL sentences (Neidle et al., 2000).

Other researchers have pursued the position that the suprasegmental system of facial expressions and head and body postures together with manual timing cues interacts with syntax but bears the earmarks of prosody rather than syntax.[1] This line of research claims in particular that facial expression is comparable to intonation (Reilly et al., 1990a; Nespor and Sandler, 1999; Wilbur, 2000; Sandler, 2011, in press). By studying the distribution of these markers, Nespor and Sandler

[1] The term suprasegmental applied to sign language is intended to mean above the level of the word.