

PROSODY AND LINGUISTIC COMPLEXITY IN AN EMERGING LANGUAGE

All existing human languages, spoken and signed, have prosodic structure (rhythm and intonation). We will discuss the possible role of prosody in language evolution. Any model of language evolution must address the question of how stretches of symbols were segmented once humans started combining units, and how the relations among these larger units were conveyed. Assuming that function words like *if* and subordinators like *when* are not likely to have been among the earliest forms available, might such relations have been instantiated by other means? We suggest that, early in the evolution of language, these functions may have been marked by prosody and we bring evidence for this view from a new language that arose *de novo* in a small, insular community.

It is impossible to observe a really new spoken language, because all modern spoken languages are either old or descended from old languages. But new sign languages can be found, if one is in the right place at the right time, because a sign language arises whenever deaf people come together and interact regularly. The language we are studying, Al Sayyid Bedouin Sign Language (ABSL), was born about 75 years ago in an endogamous community with a high incidence of genetically transmitted deafness (over 100 out of 3,500 villagers are deaf). This sign language emerged spontaneously, with no direct influence from other languages, and is used today by all the deaf people in the village and many of the hearing people as well. While the people involved are modern humans with fully evolved brains, and in that sense different from our ancestors in which language first evolved, the new language we are studying offers us a rare glimpse of the essential ingredients of language and of the way in which a language develops within a community. In this language, we find a robust but simple syntax, and prosodic marking which is becoming more complex and more systematic across the generations. Our findings indicate that prosody can go a long way in conveying the kinds of relations we've mentioned, and raise the possibility that human language may have benefited from prosody at a very early point in language evolution. We also find that studying prosody longitudinally at the community level provides a tool for tracing the development of grammatical complexity in the absence of explicit grammatical markers. Both the prosodic system and the syntactic and pragmatic organization it reflects become more complex and systematic as the language develops.

METHODOLOGY. The present study analyzes narrative data from four deaf Al-Sayyid villagers, two older signers and two younger signers. The investigation combines a model of sign language prosody developed in Nespor & Sandler (1999) with a method of analyzing grammatical structure through semantic, syntactic and prosodic cues developed in our work on ABSL (Sandler, Meir, Padden, & Aronoff 2005; Padden, Meir, Sandler, & Aronoff 2007). The narratives are glossed with the help of village consultants. First, major prosodic breaks (of the kind associated with syntactic clauses or extrapositional elements such as topics) are determined. These are typically marked by rhythmic lengthening and change in head or body posture, together with a change in facial expression, which is the sign language equivalent of intonation (Sandler 1999; Dachkovsky and Sandler 2007). The structure of the elements within these units is determined by identifying the predicate and its arguments, as well as the phrasal head and its modifiers, where these exist. The data are further analyzed through a detailed coding system which records the rhythmic behavior of the hands, as well as the specific actions of the head and body, and of each facial articulator, such as brows, eyes, and mouth. All this is aligned with the gloss, which in turn is assigned a more refined syntactic analysis.

RESULTS AND ANALYSIS. The signers use prosodic cues to separate clause-like constituents, typically with a change in head or body posture sometimes accompanied by changes in rhythm and in facial expression. When constituents are in a dependency relation with one another -- for

example, when a temporal adverbial expression precedes the description of an event -- the relation is marked by certain head and face actions, which we will describe. These markings provide crucial cues to constituency, both to interlocutors and to linguists. The basic phonetic cues to prosodic structure --rhythm, head and body posture, and facial expressions -- emerge very early in the life of a language. We find them in second-generation signers (the oldest signers still living). The prosodic structure of these older signers is substantially simpler and less systematic than that of the younger signers. The building blocks of prosody appear early, but its development into a complex conventionalized system takes place gradually.

We find clear signs of how the system develops from comparison of the older and younger signers. First, the prosodic marking of the younger signers is more salient because they use multiple cues of constituent boundaries (e.g., rhythm + change in head position + change in facial expression) and with greater intensity or size of the cues. Second, the younger signers have a larger repertoire of prosodic patterns, which they use consistently to mark particular kinds of structures. Third, the younger signers express dependency relations (e.g., for conditional sentences) significantly more often and in a more consistent way than older signers. They may even mark several clauses as forming a dependency chain (e.g., MAYBE SISTER PHONE SAY COME GO NO 'If your sister calls asking you to come, will he allow this?'). The clauses are both separated from one another and connected to one another by particular prosodic mechanisms. Such complex structures were not found in the older signers, whose narratives were more often characterized by a kind of iterating or stringing prosody.

In our narrative data, younger signers marked twice as many clauses for dependency, including complex expressions containing three or more dependent clauses (which we did not find among older signers). In neither the younger nor the older signers were morpho-syntactic markers of sentence complexity found, such as conditional operators or subordinators. These findings are in accord with our findings in the syntax, morphology, and phonology of this language, all of which indicate that language -- even in the modern human brain -- does not explode into existence full-blown, but develops over time.

These results are compatible with suggestions by Givon (1979) and Hopper & Traugott (2003), that prosody provides the sole marking of syntactic dependencies in earlier stages of pidgins and creoles. But while pidgin speakers are native speakers of other languages, which presumably have prosody, ABSL arose with no parent language and appears to be developing prosody on its own. The present study further demonstrates how a prosodic system itself develops and the interaction between prosodic structure and syntactic relations in a new language. It shows that prosody plays a crucial role in the development of a language, and teaches us that models of language evolution would benefit from the incorporation of a prosodic component.