

## **The riddle of geminate ejective fricatives.**

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*To produce a fricative consonant it is necessary to generate a sustained flow of air for the duration of the fricative. The ejective mechanism, which depends on raising the larynx to generate air flow, is inherently incapable of generating a large flow volume, and cannot produce a continuing flow comparable to that generated from the lungs. The occurrence of ejective fricatives in any language is therefore relatively surprising, and the occurrence of geminate ejective fricatives is even more surprising. Yet such geminates are described as occurring in several East African Semitic languages, most notably Amharic. In this paper several alternative hypotheses about how the segments described as geminate ejective fricatives might be produced will be evaluated. The evaluation will be based on acoustic analysis of audio recordings made by the author and of aerodynamic records published or made available by others. Four possibilities will be compared: 1) an extremely narrow fricative constriction restricts the flow volume past the oral constriction, thus conserving air to extend the duration; 2) the geminates are pre-stopped (i.e. they are affricates) so that no air escapes during the first part of their duration; 3) these segments are not true ejectives but a sequencing of a glottal constriction with a pulmonic (lung-air) fricative; 4) these segments involve a sequencing of a pulmonic fricative with an ejective one. These various alternatives are suggested by prior work on (1) Tlingit, (2) Hausa, (3) Yapese and (4) Tigrinya respectively. Acoustic and aerodynamic data converge towards suggesting that alternative (4) is most likely, but the absence of the expected acoustic signature of the change from open to closed glottis remains puzzling.*