

## Phonetics-Phonology of Geminate and Triplet Consonant in Blackfoot

Mizuki Miyashita, The University of Montana

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This paper investigates geminate and triplet consonants in Blackfoot (Algonquian, spoken in Alberta and Montana), and examines durational measurements of [s], [ss] and [sss]. Blackfoot exhibits geminate (or long) consonants except with glottals and glides. Interestingly, some long [s] and super-long [s] segments are derived by morphology. This study examines the following two conditions: (i) the three-way durational difference of short, long and super-long and (ii) the observance of super-long consonants only when [s] is underlyingly long and followed by a vowel.

The methodology involves the following steps. First, a list of words including /ks/ within a morpheme has been compiled. The listed words include the clusters: [ks], [kssV], [kssC], [ksssV] and [kssC]. Second, a native speaker's speech has been recorded. Third, the duration of [k] and [s] were measured using Praat and is shown by the ratio of the duration of [s] divided by the duration of [k]. This is because duration measurement differs depending on the speed of production. Finally, ratios were computed from the raw data.

As in (1), the mean ratio of the duration of the long [s] ranges from between 1.22 to 1.82; super long is about 2.33. The result is interpreted as (i) duration of the singleton [s] is almost the same as another single consonant [k], and therefore [s] is short; (ii) [s] of [kssV], [kssC] and [kssC], which is phonologically long, is longer than, but not twice as that of a short [s]; and (iii) [s] of [ksssV], which is phonologically super-long, is the longest at the phonetic level as well.

(1)	Ratio	Example	
a. [ks]	0.96	<i>mátssiksipiiwats</i>	'He didn't bite him'
b. [kssV]	1.82	<i>áakssiksipiiwayi</i>	'He will bite him'
c. [kssC]	1.22	<i>omahksspatsiko</i>	'desert'
d. [ksssV]	2.33	<i>áaksssikopiiw</i>	'He will rest'
e. [kssC]	1.57	<i>áaksskimayi</i>	'He will break it'

Acoustic studies of Blackfoot are relatively new and limited (Derrick 2006, Bliss 2009, Van der Mark 2002), and the current study adds an additional resource for Blackfoot phonetics-phonology. This study is important in perceptual phonology and phonological theory. First, it observes that the long [s] has a wide range in duration that may be perceived as the same (long). Second, it also questions the application of two rules, *s-connection* and *sss-shortening*, to derive [kssC]. This process could be extraneous. Further research in experimental phonology will provide more information.

### References:

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