A Computational Model for Blackfoot Demonstratives

We present a morphological model for Blackfoot demonstratives, test its effectiveness, and examine the occurrence of demonstratives in a small corpus of Blackfoot. This model complements ongoing development of models for verbal and nominal morphology and morphophonology in Blackfoot (Kadlec fc; Schmirler et al. fc).

Morphological modelling. To model Blackfoot demonstratives, we use a Finite State Transducer based model (e.g. Beesley and Karttunen 2003), which is well-suited to the relatively straightforward agglutinative morphology, as shown in (1). To simplify the modelling process, we "chunk" the stem morphology into its possible permutations and dynamically model only the suffixes.

(1) Structure of Blackfoot demonstratives (adapted from Bliss 2013; Bliss and Wiltschko 2020; Frantz 2017; Schupbach 2013)

Root	Diminutive	Restrictor	Inflection	Post-inflectional	Verbalizer
am ann om	-sst	-o	-wa -yi -iksi -istsi	-ma -ya -hka -ka	-o'ka -áyi
Stem			Suffixes		

Testing the model. To test the model, we apply it to a partially annotated corpus of written Blackfoot to determine how well it performs on orthographic variants, e.g. with deleted initial and final vowels.

Examining demonstratives in a corpus. The demonstrative system of Blackfoot is considerably more extensive than that of most other Algonquian languages, with up to nine hundred theoretically possible forms according to some counts (Bliss 2013:138) (cf. Plains Cree with fifteen, twelve with syncretism, e.g., Okimâsis 2018:43, 181). Through a small corpus exploration we determine how often the various stem and suffix types occur and in what combinations, resulting in a much smaller set of forms found in regular language use.

Bibliography

Beesley, Kenneth R., and Lauri Karttunen. 2003. *Finite State Morphology*. CSLI Publications.

Bliss, Heather. 2013. The Blackfoot configurationality conspiracy: Parallels and differences in clausal and nominal structures. PhD dissertation, University of British Columbia.

Bliss, Heather, and Martina Wiltschko. 2020. *Stsíkiistsi ki stsíkiistsi*: The ubiquity of Blackfoot demonstratives in discourse. In *Demonstratives in discourse*, edited by Åshild Næss, Anna Margetts, and Yvonne Treis, 123–147. Berlin: Language Science Press.

Frantz, Donald G., and Norma Jean Russell. 2017. *Blackfoot Dictionary of Stems, Roots, and Affixes*. Toronto: University of Toronto Press.

Kadlec, Dominik. Forthcoming. A computational model of Blackfoot noun and verb morphology. MA thesis, University of Lethbridge.

Okimâsis, Jean L. 2018. *Cree: Language of the Plains / nêhiyawêwin: paskwâwi-pîkiskwêwin*. Regina: University of Regina Press. https://ourspace.uregina.ca/handle/10294/8401.

Schmirler, Katherine, Antti Arppe, and Inge Genee. Forthcoming. Morphophonological rule development and real-time rule testing with XFST: A model for Blackfoot. In *Papers of the 53rd Algonquian Conference*, edited by Inge Genee, Monica Macaulay, and Margaret Noodin. East Lansing: MSU Press.

Schupbach, S. Scott. 2013. The Blackfoot demonstrative system: Function, form, and meaning. MA thesis, University of Montana.