Constituency of demonstratives in Blackfoot: Evidence from the phonology, syntax, and semantics*

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Abstract: Using evidence from the interface with PF and LF, we argue that demonstratives in Blackfoot must associate with the syntactic spine in a position higher than the D^0 (similar to Bliss 2013 and Wiltschko 2014). However, we find no evidence to support a raising analysis to move the DemP to Spec, KP. Instead, we posit an intermediate functional projection between DP and KP/LinkP with which the demonstrative is associated without requiring syntactic movement operations.

Keywords: Blackfoot, Demonstratives, Phase Theory, PF interface, LF interface

1 Introduction

Demonstratives in Blackfoot are morphologically complex syntactic elements; demonstrative roots have been analyzed as being able to take up to five suffixes for: the diminutive, restriction, case/animacy/number agreement, motion, and a verbalizer:

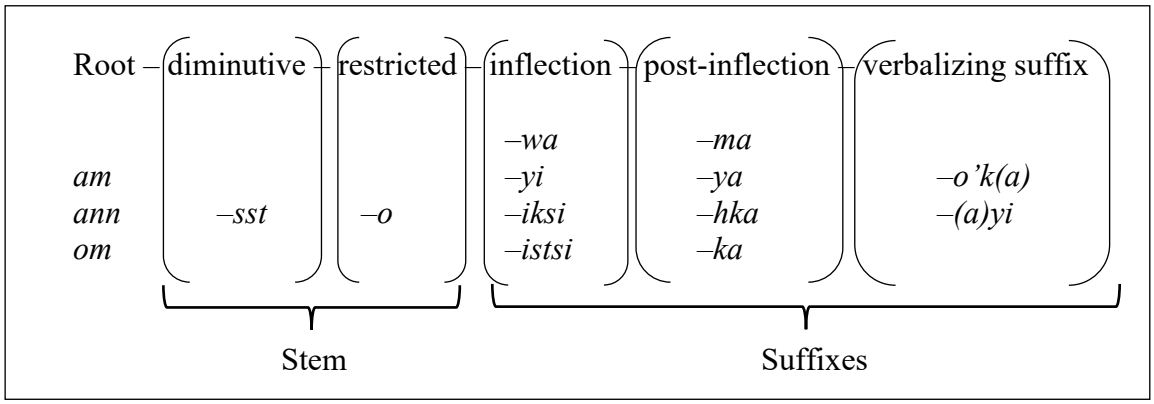

Figure 1 Demonstrative template (Bliss 2013:138)

* Unless otherwise noted, all Blackfoot data and translations have been generously provided by our four language consultants, *Piitaikiihtsipiimi, Aistanskiaki, Issapoikoan, kii Ainootaa – nitsíniiyi'takihpinnaan*. Any errors in transcribing or glossing the data are our own. The authors also wish to thank the participants and organizers of WSCLA 21 for their helpful questions and feedback on this ongoing research. Part of this research was also presented at ETI 3 at McGill University and benefited substantially from audience and reviewer feedback at that workshop as well. This research was supported by the Social Sciences and Humanities Research Council of Canada.

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Syntactically, within the clause, several word orders are attested, however it is always the case that the demonstrative precedes the noun that it specifies:[1]

(1) a. áóhkiwa oma imitááwa [V > Dem > N]
a-ohki-wa om-wa imitaa-wa
IMPF-bark.AI-PROX DEM-PROX dog-PROX
'that dog is barking'

b. óóma áóhkiwa imitááwa [Dem > V > N]
om-wa a-ohki-wa imitaa-wa
DEM-PROX IMPF-bark.AI-PROX dog-PROX
'that dog is barking'

c. omi ponokáómitaayi iksíkkaayiyináyi [Dem > N > V]
om-yi ponokaomitaa-yi ik-ikkaayi-yini-ayi
DEM-OBV horse-OBV INTNS-canter.AI-OBV-3.SG.PRN
'that horse is naturally swift' (lit: canters)

d.*ponokáómitaayi omi iksíkkaayiyináyi [N > Dem > V]

(adapted from Bliss 2013:150, 157)

Data such as those in (1) give rise to the analysis that demonstratives (which are argued to map onto Spec, DP *cf.* Bliss 2013; Wiltschko 2014) must raise to a position above the noun – which is argued to be spelled out in a complex K^0 after head movement for case (*ibid*). However, the syntactic location of demonstrative elements is no small cross-linguistic debate with no consensus yet emerging (Giusti 1992, 1996; Cinque 1994, 2005; Szabolcsi 1994; Bernstein 1997 *et seq.*; Diessel 1999; Lyons 1999; Rosen 2003; McCloskey 2004; Leu 2008; Wiltschko 2009, 2014; Adger 2013; Bliss 2013; Roehrs 2013; Windsor 2014; Lewis 2015; and, Roberts to appear).

In what follows, we re-examine the syntactic data which has led authors such as Bliss (2013) and Wiltschko (2014) to analyze Blackfoot demonstratives as raising to Spec, KP in order to ask: given the substantial variation in demonstrative analyses within the syntactic literature, is there positive evidence in the phonology or semantics which can help determine the syntactic constituency of demonstratives in Blackfoot? If so, what consequences does that evidence have for existing syntactic analyses? We argue that our new phonological and semantic fieldwork data provide evidence in favour of a high association with the syntactic spine over a raising analysis. The remainder of this paper is organized as follows. In section 2, we outline the ongoing debate over the status of demonstratives, including previous work on demonstratives in Blackfoot. In section 3, we examine phonological boundaries in Blackfoot utterances and measured phonetic correlates to provide evidence for prosodic constituency. In section 4, we discuss how our analysis can be accounted for in the semantics with the emergence of a Blackfoot article, which co-occurs with demonstratives. Section 5 concludes.

[1] The abbreviations used in this article are: IMPF/DUR = imperfective/durative, AI = animate-intransitive, TA = transitive-animate, PROX = proximate case, OBV = obviative case, INTNS = intensifier, 1, 2, 3 = first, second, and third persons, 21 = 1st person plural inclusive, SG = singular, PRN = attached pronoun, DIR/INV = direct/inverse, POSS = possessive, ANIM.PL = animate plural, IMP = imperative, DEM = demonstrative, DET = determiner.

2 Syntactic evidence

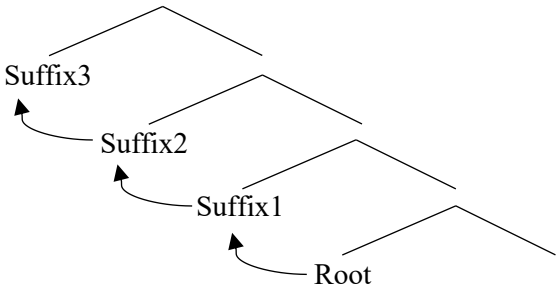
At the core of the debate over where demonstratives associate with the syntactic spine before being spelled out to PF and LF is the question of what are demonstratives? In earlier work on differences between Austrian German, Blackfoot, and Halkomelem, Wiltschko (2009) argued that demonstratives were complex D elements which could merge a locative feature in one of two ways (obligatory or optional) depending on the language. That analysis predicted two types of languages – those with demonstratives but no articles, or those in which demonstratives and articles competed for the same syntactic position ensuring they always exist in complementary distribution. However, in subsequent work, Bliss (2013) and Wiltschko (2014) argued that Blackfoot demonstratives must be merged in Spec, DP; this is because Blackfoot demonstratives seem to be phrasal in nature and form a constituent separate from the noun (see the various word orders in example (1) for example). This analysis is a departure from much of the previous work on demonstratives cross-linguistically which has suggested that: demonstratives are possibly D^0s themselves (Wiltschko 2009) taking a DP compliment (McCloskey 2004); that they are the external argument of *n*P (Roberts to appear); or, that they are adjectival elements which combine with a definite element after raising (Leu 2008; Roehrs 2013). However, even if demonstratives can be taken to be a homogenous cross-linguistic category (*cf.* Dryer 1992; Panagiotidis 2000), Bliss (2013:156) argues that there is a lack of evidence in Blackfoot to suggest that they associate with the syntactic spine any lower and instead map directly onto Spec, DP. The raising analysis from Spec, DP to Spec, KP then comes from word order facts.

In their analysis, Bliss (2013) and Wiltschko (2014) utilize Baker's (1985) Mirror Principle:

(2) **The Mirror Principle (Baker 1985)**
Morphological derivations must directly reflect syntactic derivations (and vice versa).

This principle is a key diagnostic to the Universal Spine Hypothesis (USH) (Wiltschko 2014) framework that Bliss and Wiltschko each adapt for their analyses. It is used to determine relative height within the syntactic spine for a given syntactic element. Because of this basic assumption, Bliss (2013:12) develops a linearization algorithm for Blackfoot suffixation which relies on successive head movement to order suffixes relative to a root where the closer an affix is to the root, the lower it must associate with the syntactic spine:

(3) a.

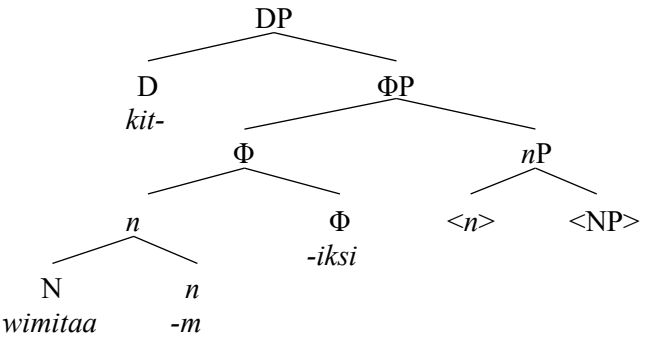


b. [Root – Suffix1 – Suffix2 – Suffix3]

Given the assumed location of various affixes in Blackfoot by Bliss (2013) and assuming the person prefix *kit-* is able to associate with a higher functional projection such as D^0, or move

higher,[2] this principle can successfully account for the affix ordering in an example such as *kitomitaamiksi* 'your dogs' as depicted in (4):

(4) kitomitaamiksi
kit-omitaa-m-iksi
2.SG-dog-POSS-ANIM.PL
'your dogs'



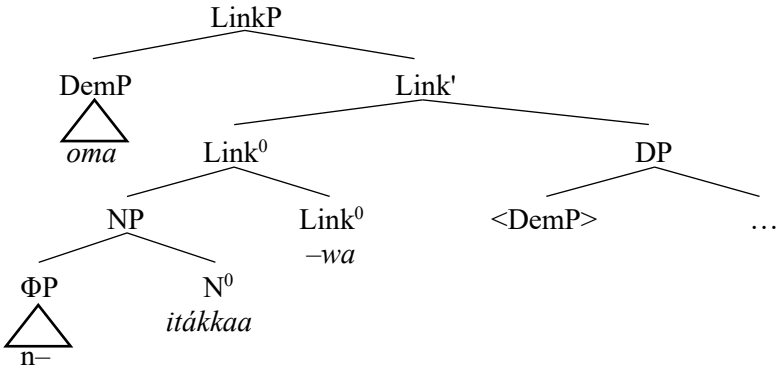
In an example such as (4), the mirror principle correctly captures the linearization of the morphemes as a result of successive head movement: the N^0 first moves to n^0 gaining the possessive suffix *-m*, followed by movement of the incorporated n^0 to the Φ^0 to gain the animate plural suffix *-iksi.* However, we soon learn that under this analysis, definite singular nouns must raise even higher in the nominal spine, incorporating into the K^0/$Link^0$ in order to be case marked, presumably moving the entire DP since nominal prefixes are still linearized to the left of the nominal root as schematized in (5):[3]

(5) oma nitákkaawa (inóókawa)[4]
om-wa n-itákkaa-wa ino-oka-wa
DEM-PROX 1-friend-PROX see.TA-INV-21
'that friend (sees us)'

[2] Bliss (2013:§3.4.4.) argues that long form person prefixes such as *kit-* are DPs in Spec,*n*P, but given that the noun must minimally raise higher than the *n*P, to the Φ^0 to gain the plural suffix, *kit-* must either be able to raise to, or associate, with a higher projection. For simplicity, we suggest that this is possibly a D^0, but providing evidence for this is beyond the scope of the current article.

[3] For Bliss (2013), KP is used when an argument is proximate and LinkP is used when the argument is obviative. There is no structural difference between the two.

[4] As opposed to long form person prefixes, Bliss (2013:3.4.4.) argues that short form person prefixes, or inalienable possession, belong to a ΦP in Spec, NP. Because 'singular' is not morphologically marked, we have left out the incorporated n^0 and Φ^0 in this example for reasons of space, but presumably the NP has undergone successive head movement to the n^0 and Φ^0 in this example in the same manner as in (4).



Although the motivation for DemP raising to Spec, LinkP is not currently known, Bliss (2013:157) suggests that the fact that demonstratives obligatorily precede nouns, and since — because she assumes the mirror principle— the noun must move to the case-assigning K^0/$Link^0$, movement of the demonstrative to the higher specifier must be obligatory.

As stated above, the reason that Bliss does not associate demonstratives with the nominal spine in a lower position (such as Spec, *n*P as proposed by Roberts to appear) is that she finds no evidence to do so. On the contrary, because she assumes the USH framework, she finds evidence to suggest that they associate with the spine in Spec, DP through parallelism with person prefixes in Spec, IP in the verbal domain. She argues that both person prefixes and demonstratives encode similar deictic information (person contrasts and temporality, for example) and perform the function of anchoring; in the verbal domain person prefixes are analyzed as anchoring the clause to the utterance situation, and in the nominal domain demonstratives are argued to anchor the argument to the utterance situation. This parallelism in function provides evidence that demonstratives associate with the spine at the level devoted to the *κ:anchoring* function (DP/IP according to Bliss – see also Wiltschko 2014 for a full discussion).

We too adapt the USH framework for our analysis of Blackfoot demonstratives, however, rather than arguing that demonstratives associate with the *κ:anchoring* level of the nominal spine, we follow the conclusions of Windsor (this volume) who argues that the syntactic function of the demonstrative in Blackfoot is actually *κ:referential*, which situates it above the DP. For reasons of space, we will not go further into that argument for the syntactic position of demonstratives, but let it stand that the syntactic evidence does not provide a concrete conclusion. Instead, we will turn our attention to examining evidence from the interfaces with PF and LF through cyclic spellout phases. This evidence suggests that demonstratives associate with a high position in the nominal spine, but do not move to that position from a lower one.

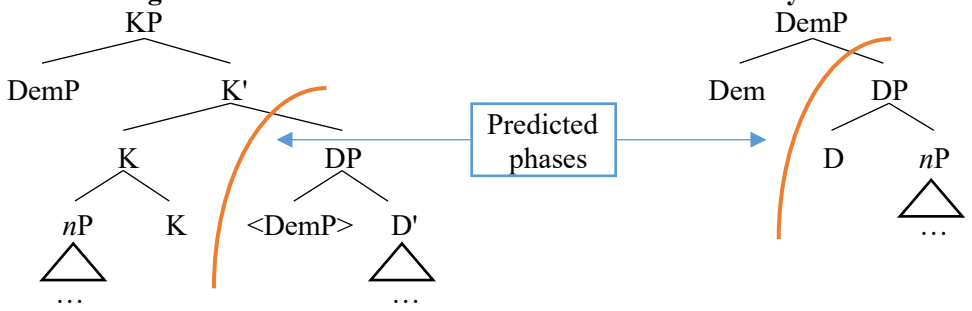
2.1 Phases

Cyclic spellout phases are not currently part of the USH framework, however, there is no reason to think that the USH and Phase Theory (Chomsky 2000, 2001, 2008; Gallego 2010) should be incompatible. Central to the present article, the phonological evidence we present relies on phases to decide between previous analyses of Blackfoot demonstrative constituency (Bliss 2013 and Wiltschko 2014) and the analysis put forward here.

Phonological phrases have been argued to align with the cyclic spellout of syntactic structure in consecutive phases (*i.e.,* Kratzer & Selkirk 2007). According to phase theory, phase heads spellout their complements to PF. Commonly, the major phase heads are believed to be v^0 and C^0. Chomsky (2008:143) argues that "[s]imilarities between CP and DP suggest that DP too may be a

phase." The conclusion that parallelism between the nominal and verbal spines suggests that the D^0 must be a phase head is reliant on the assumption that D^0 is the nominal parallel of C^0. However, this is not a foregone conclusion. It has been argued that D^0 is the nominal parallel of T^0, not C^0, (Abney 1987), and this is certainly the case in the USH framework used in previous analyses of Blackfoot demonstratives (Bliss 2013, Wiltschko 2014). Under the USH, the parallel of the verbal phase head, C^0 is the projection above D^0, the K^0 in the analysis advanced by Bliss (2013) and Wiltschko (2014), and the Dem^0 in the present analysis.

(6) a. **Dem-raising structure** b. **Present analysis**



The distinction as to which nominal head is a phase head is not inconsequential to the present analysis as the two syntactic structures under consideration make different predictions to their phonological realizations. In the analysis of Blackfoot demonstratives by Bliss (2013) and Wiltschko (2014), the nominal counterpart, and therefore the phase head, is K^0. However, because the nominal elements are argued to undergo successive head movement into K^0 to get case, the nominal must escape the lower phase, and would thus be spelled out at the same time as the demonstrative in Spec, KP. In the raising analysis where the demonstrative and nominal are spelled out in the same phase, we predict that they would be parsed into the same phonological phrase. Under the present analysis, which does not assume movement outside of the DP, the nominal parallel of C^0, and therefore the phase head, is the Dem^0. Our analysis predicts that the demonstrative and the nominal complex would be realized in separate phonological phrases which we now show is borne out.

3 Phonological evidence for the constituency of demonstratives in Blackfoot

In order to understand the constituency of demonstratives relative to other nominal elements after spellout to PF, we conducted elicitations with native speakers and measured phonetic correlates to provide evidence for prosodic constituency. We began with the frequently observed fact that vowels at the ends of (orthographic) words are frequently aspirated (*cf.* Frantz & Russell 1995; Elfner 2006; Frantz 2009; Gick *et al* 2012; Bliss 2013).[5] Hypothesizing that aspiration is a positional effect, we sought to determine what the conditioning environment is by measuring the amount of aspiration present in final vowels by eliciting target vowel-final nouns in two sentential positions: utterance-final, and utterance medial:[6]

[5] Following Windsor (2016), we will assume that the final devoicing described in the literature is the result of the phonological feature [spread glottis], and is better characterized as aspiration, rather than devoicing (see also Reis Silva 2008 for a discussion of how [spread glottis] is an active feature in Blackfoot).

[6] This study was first reported in Windsor & Cobler 2013 but has been updated for the present article. See also Windsor 2017.

(7) a. ámo anistápssiwa **pííta** [utterance-final target]
amo anistapssi-wa piita-wa
DEM be.called.AI-PROX eagle-PROX
'this is an eagle'

b. ámo **pííta** nitsináána [utterance-medial target]
amo piita-wa n-itsinaan-wa
DEM eagle-PROX 1.SG-possession-PROX
'this eagle is my pet'

The amount of aspiration observed on the target nouns in the two carrier sentences provided in (7) was measured using Praat (Boersma & Weenink 2016) and analyzed using a two-sample t-test with Welch correction with the following result: [$t(91.207) = -6.0408$, $p < 0.001$].

These results clearly demonstrate that final aspiration is a positional effect and that the (orthographic) word (whatever level of the prosodic hierarchy that mapped onto) is not the correct domain for describing this sound change – since the target vowels showed little-to-no aspiration when removed from the right edge of the utterance. However, this first phonological test also does not support a conclusion as to which prosodic domain is responsible for the application of final aspiration. In order to answer that question, we conducted a second elicitation experiment to examine the correlates of prosodic boundaries at the edges between demonstratives and adjectives/nouns, between adjectival prefixes and nouns, and between nouns and plural morphology. Once again, native speakers were recorded providing sentences such as those in (8), and the boundaries between the various targets were examined for evidence of final aspiration or vowel-coalescence – another well-known phonological process which is active in Blackfoot (Frantz & Russell 1995; Elfner 2006; Frantz 2009; Bliss 2013).

(8) a. ann**a** **i**mitááwa inóókawa
ann-wa imitaa-wa ino-oka-wa
DEM-PROX dog-PROX see.TA-INV-21
'that dog sees us'

b. anniks**i** **a**k**áí**mahkihkin**ai**ksi inóókawa
ann-iksi aka-iimahkihkinaa-iksi ino-oka-wa
DEM-ANIM.PL old-sheep-ANIM.PL see.TA-INV-21
'those old sheep see us'

We observed that in 95% of tokens, demonstratives showed aspiration at their right edge, and never showed vowel coalescence with a following adjective or noun. Conversely, between an /a/-final noun and the plural suffix *-iksi*, vowel coalescence occurred in 97% of tokens. Between an adjectival prefix and a vowel-initial noun, vowel coalescence occurred in 75% of tokens and aspiration was never observed. Of special importance in this last environment is that words such as *akáímahkihkinaiksi* 'old sheep' was variably pronounced both with and without coalescence as [ak**ɛ**ːmaxkiçkinɛːksi^{h}] or [ak**ai**maxkiçkinɛːksi^{h}] by the same speaker. Additionally, when the recordings were played for speakers, both were judged to be equally acceptable. The results of these observations and a Generalized Linear Model (GLM) are presented in Table 1:

Table 1: Phonological boundary correlations

Syntactic position	Hypothesized prosodic boundary	Obligatory right-edge aspiration	Non-obligatory vowel coalescence	Obligatory vowel coalescence
Dem_(A)N	φ (p-phrase)	✓ [G^2 (70) = 84.143, $p < 0.001$]	×	×
A_N	ω (p-word)	×	✓ [G^2 (69) = 5.24, $p = 0.022$]	×
N_–iksi	σ (syllable)	×	×	✓ [G^2 (69) = 11.852, $p < 0.001$]

As can be seen in Table 1 above, there are three different and statistically significant correlates to the three examined syntactic boundaries. Observationally, because tokens such as 'old sheep', as mentioned above, could be pronounced both with and without coalescence, we can describe the sound change at the boundaries between adjectival prefixes and nouns as being non-obligatory, or, optional. This is statistically backed up as well. A two-sample test of proportion reveals that the results of the GLMs were also significantly different from one another ([z = 2.7226, $p = 0.007$]). The evidence from optional vowel coalescence will ground our discussion of prosodic categories in Blackfoot. Russell (2008), argues that gradient sandhi phenomena occur at the boundary between prosodic words where (for example vowel coalescence in the related Cree language) alternations are shown to be more variable than coalescence observed within the prosodic word. In fact, Sadock (1980) argues that it is exactly this prosodic environment where not just gradient phonetic effects can be observed (see also Zsiga 2000 *et seq.*) but also, optional sound alternations. Therefore, we take the optionality of vowel coalescence between adjectival prefixes and the nouns that they modify as evidence that the adjectival prefix belongs to a separate prosodic word from the noun.[7] Crucially, even when coalescence was not observed between the adjectival prefix and the noun, aspiration was also not observed at the right edge of the adjective suggesting that the domain of aspiration was separate from the prosodic word.

Anchoring our analysis on the observation that optional sound alternations occur at the boundaries between prosodic words (Sadock 1980), and that the optional sound alternations that occur between prosodic words strongly resemble word-internal processes (Russell 2008), we can only conclude that the boundary between the noun and the plural *-iksi* must be word-internal, most likely a syllable. This follows exactly from Russell's (1999) study of two polysynthetic languages (the related Plains and Swampy Cree dialects, and Dakota) where he concludes that there is a difference in prosodic representation between affixes which are agglutinated due to syntactic movement (à la Baker's mirror principle) and those which are morphologically derived, such as plural morphology. Importantly, the distinction described by Russell manifests as linearization effects: syntactic heads which are realized as separate prosodic words and morphological affixes which are parsed inside the prosodic word headed by the lexical root are linearized on opposite sides of the root. We argue that the evidence presented here suggests that Blackfoot, unsurprisingly,

[7] Elfner (p.c. 2016) suggests an alternate analysis, that the variability in the application of coalescence may be due to variable prosodic representations: When vowel coalescence is evidenced, it is because the adjectival prefix has been parsed as part of the prosodic word that encompasses the noun; when vowel coalescence is not evidenced, it is because the adjectival prefix has been parsed as a prosodic word separate from the noun.

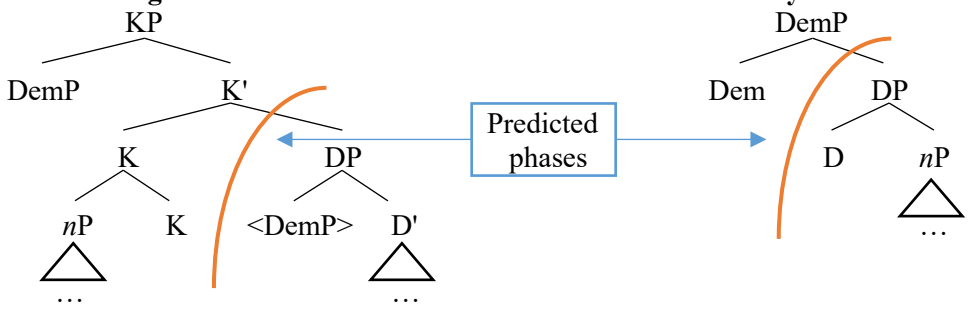
patterns the same as the related Cree language; that separate syntactic heads are linearized to the left of the lexical root – making the adjectival elements prefixes to the nominal root, and morphological inflections are linearized to the right of the lexical root – making plural morphology suffixed to the nominal root. Given the conclusions by Russell (1999) and the fact that left- vs. right- affixed elements in Blackfoot show different phonological realizations, we conclude that suffixation in Blackfoot is due to morphological inflection and not syntactic movement pace. Baker's (1985) mirror principle.

Now that the prosodic constituency of adjectival prefixes, nominal roots, and morphological suffixes has been established, we turn our attention to the question of what prosodic unit is the domain of right-edge aspiration. Given that there is no evidence to suggest that aspiration occurs within the prosodic word since removing a lexical root (argued to correspond to a prosodic word above) from the right edge of an utterance was shown earlier to significantly reduce, if not eliminate, aspiration from the right edge of that element, we argue that the domain of aspiration is the phonological phrase. Although the right edge of an utterance was seen as the domain of aspiration in the first elicitation experiment, we note that the right edge of demonstratives within the nominal projection are significantly correlated with aspiration as well. There is no reason to suggest that a demonstrative by itself should instantiate a prosodic unit larger than the phrase (i.e., an intonational phase or utterance). The next question to be answered then, is what would cause demonstratives to be parsed into their own phonological phrase rather than prosodic words as the adjectival prefixes and nominal roots are?

3.1 Phonological phrasing and phases

In §2.1, we predicted that if we accounted for cyclic spellout phases as determining phonological phrases we could find a measurable difference between the DemP raising analysis advanced by Bliss (2013) and Wiltschko (2014) and the current analysis that does not rely on raising. Specifically, we predicted that under the raising analysis, the nominal complex and the demonstrative would belong to the same phase and would be realized in a single phonological phrase. Contrastively, if the complement of the Dem^0 was spelled out in the lower phase and the demonstrative itself was spelled out as part of a separate phase, the nominal complex would be phonologically phrased separately from the demonstrative as depicted in (9), repeated from (6):

(9) a. **Dem-raising structure** b. **Present analysis**



As demonstrated in the previous section, there is a significant correlation between the right edge of phonological phrases and aspiration, a phonological alternation which was positively correlated to the right edges of demonstratives. This aspiration evidence suggests that demonstratives are parsed into a phonological phrase separate from the nominal complex. Having the demonstrative be spelled out in a separate phase from the nominal complex, and thus

phonologically phrased separate, was the prediction of the present analysis which does not rely on raising the nominal complex outside of the lower phase, and thus provides strong evidence for the structure provided in (9b) above.

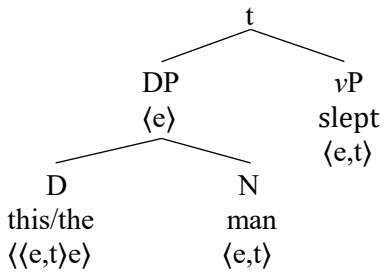
3.2 Summary

The evidence from the phonology of Blackfoot nominal expressions gives us reason to suggest that suffixation is not achieved through successive syntactic movement (pace. Bliss 2013 and Wiltschko 2014), but rather through morphological inflection since it is not recognized as separate prosodic units in the same way that other syntactic heads are. In other words, while adjectives, nouns, and demonstratives create separate prosodic units (words and phrases), suffixes in the language do not have the same prosodic status suggesting that the input to the phonological component is different for prefixes as opposed to suffixes. Because we find no prosodic evidence to suggest a raising analysis that would move the nominal into the K^0 for case, we have no reason to posit that the DemP must raise to Spec, KP for reasons of word order. Further, the evidence from prosodic phrasing suggests that the demonstrative and the nominal must be spelled out in separate spellout phases. If both the demonstrative and nominal raised outside of the DP, they would be spelled out in the same phase and thus create a single prosodic phrase. Therefore, based on the phonological evidence, we conclude that rather than raising the DemP to a higher position, it is simply associated with the syntactic spine in a position external to the DP without relying on additional ad hoc movement operations. This conclusion is further supported by a semantic account at the interface with LF.

4 A semantic account for the constituency of demonstratives in Blackfoot

In order to posit a semantic account of demonstratives relative to other nominal elements after spellout to LF, we assume a Montague Type Theory framework (Cooper 1975, Heim & Kratzer 1998). Normally, articles are understood to be of the type ⟨⟨e,t⟩e⟩ and verbs require an argument of type ⟨e⟩ (Heim & Kratzer 1998). If demonstratives are analyzed in the same way, then they should also be able to take a nominal argument of the type ⟨e⟩ via functional application and project something of the type ⟨e,t⟩, which could then be taken by the verb and return a truth value. This approach seems to be borne out for English sentences:

(10)



Regardless of whether it is a demonstrative or an article that takes the noun, a truth value is still projected.

However, not all languages have demonstratives and articles in complementary distribution. In our Blackfoot fieldwork, we have found the emergence of an article, which co-occurs with a demonstrative. All of our consultants, except for the eldest, obligatorily uses the element *na*/*ni* in

animate constructions, which marks the argument as a subject/object.[8] Based on discussions with our consultants, we analyze the elements *na*/*ni* as articles. These articles co-occur with demonstratives in a position between the demonstrative and noun. The choice of demonstrative in such a construction is not limited the proximal demonstrative *amo.* The distal demonstrative *oma* can also be used in this context. However, as shown by the example in (11a) the order of the demonstrative and article are fixed. Furthermore, it is not possible to have a second article precede the noun, as shown in (11b). Finally, the article is not dependent on the presence of a demonstrative and can occur with the noun alone, as in (11c).

(11) a.*na amo imitáá i'nitsii ni poos
na amo-wa imitaa-wa i'nit-ii-wa ni poos-yi
DET DEM-PROX dog-PROX kill.TA-DIR-PROX DET cat-OBV

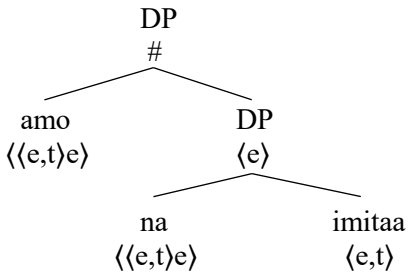
b.*na na imitáá i'nitsi ni poos
na na imitaa-wa i'nit-ii-wa ni poos-yi
DET DET dog-PROX kill.TA-DIR-PROX DET cat-OBV

c. na imitáá i'nitsi ni poos
na imitaa-wa i'nit-ii-wa ni poos-yi
DET dog-PROX kill.TA-DIR-PROX DET cat-OBV
'the dog killed the cat'

It should also be noted that (11c) can be used whether the dog is proximal or distal and is not dependent on demonstrative properties, further reinforcing the idea that *na/ni* acts as an article.

Since the demonstrative *amo* and the article *na/ni* can co-occur, denoting Blackfoot demonstratives as the type ⟨⟨e,t⟩e⟩ would be problematic. Under such a definition, we would be left with the semantic structure provided in (12):

(12) amo na imitáá (i'nitsi ni poosi)
amo-wa na imitaa-wa i'nit-ii-wa ni poos-yi
DEM-PROX DETdog-PROX kill.TA-DIR-PROX DET cat-OBV
'this dog killed the cat'

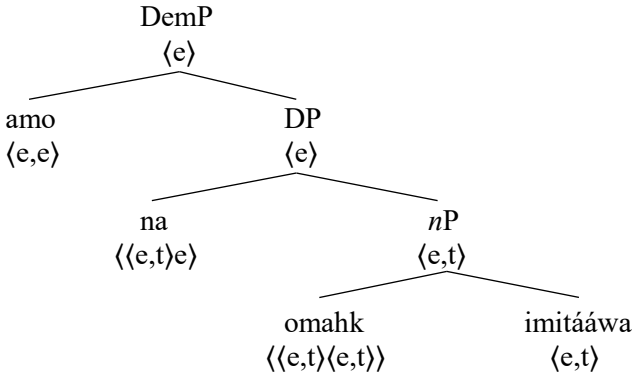


As it stands, the structure in (12) would start by combining *na* and *imitáá* by functional application, projecting something of the type ⟨e⟩. We are then left with the higher demonstrative of the type ⟨e,t⟩e⟩, which cannot combine with the lower DP and the derivation would crash.

[8] It is likely, and not unexpected, that an article will emerge from demonstratives in a language with no articles, which was the case in the change from Homeric Greek to Attic Greek (Rix 1976). We suggest that *na*/ni came from *ann-wa/ann-yi*, in a similar fashion to Greek.

To remedy this issue, we are left with limited choices; this is because the lower element must be able to take something of the type ⟨e,t⟩ and project something of the type ⟨e⟩, which is required in order to take a noun and project an entity for the verb. The first option is to propose a different denotation for articles. However, this would involve re-analyzing the denotation of nouns and/or verbs and is therefore ruled out. Secondly, we could denote both *amo* and *na/ni* as something of the type ⟨e,e⟩. This would require the existence of a null determiner in D^0 to take the noun (Roberts to appear). However, since we have already claimed that *amo* and *na/ni* are different elements, and cross-linguistically there are other examples of a demonstrative and article co-occurring, such as Hungarian, Greek, or Irish (Szabolcsi 1994; Lewis 2014; and, Windsor 2014 respectively), we rule this option out as well. This leaves one other option, namely that *na/ni* directly takes a nominal as a function, preserving the denotation of ⟨⟨e,t⟩e⟩ and giving the demonstrative the type ⟨e,e⟩. Under this approach demonstratives would have a similar assignment as adjectives, which is standardly analyzed as a semantically recursive element of the type ⟨⟨e,t⟩,⟨e,t⟩⟩ (Kratzer 1998). However, rather than being functions from entities to truth values, demonstratives are only functions from entities. The proposed semantic structure of demonstratives is shown in (13). We use an example with an adjective for comparison.

(13) amo na omahkómitaawa (áóhkiwa)
amo-wa na omahk-wimitaa-wa a-ohki-wa
DEM-PROX DET big-dog-PROX DUR-bark.AI-3.SG
'that big dog (is barking)'



By assigning demonstratives the semantically recursive type ⟨e,e⟩, it requires that they take something of the type ⟨e⟩, suggesting that demonstratives must be external to an article. Once a demonstrative takes the lower nominal projection, it assigns a referential function to the argument. The standard denotation of adjectives and our denotation of demonstratives require them to be on different sides of an article, which is borne out by the word order data.

4.1 Summary

Blackfoot demonstratives are of the type ⟨e,e⟩, which is a semantically recursive function that takes an article and nominal. We base this analysis on the fact that demonstratives co-occur with the elements *na/ni*, which we analyze as articles. If both demonstratives and articles were given the same function, a derivation with both a demonstrative and article would cause the derivation to crash. Although demonstratives have a similar function to adjectives, adjectives require a noun of

the type ⟨e,t⟩, as a function, while demonstratives only require an entity. This approach allows for the co-occurrence of demonstratives and articles.

5 Conclusion

Demonstratives in Blackfoot must associate with the syntactic spine in a position higher than the D^0. We have posited the intermediate functional projection, DemP, between the DP and KP. This approach provides the correct linearization patterns without requiring additional syntactic movement operations. Blackfoot Demonstratives are distinct from articles. The proposed analysis is supported by PF and LF interfaces. Via phonological evidence, we have found prosodic boundaries that indicate that demonstratives instantiate a separate prosodic phrase from other nominal elements. As the phase head, demonstratives can still copy nominal Φ features through agreement. Finally, due to the presence of an article, which co-occurs with demonstratives, demonstratives must have a different semantic denotation than articles. Blackfoot demonstratives are of the type ⟨e,e⟩, which is a semantically recursive function above an article and nominal, which, based on the phonological evidence, is in its own external phrase (DemP).

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