Mutation in Spatial Deixis (Dx): “PPs” in Blackfoot and Plains Cree

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1 Introduction

This paper presents a syntactic analysis of spatial expressions in two Algonquian languages, Blackfoot and Plains Cree.\textsuperscript{1} While these two languages have a number of morpho-syntactic features in common and are geographical neighbors, how they express spatial relations differs notably.\textsuperscript{2} On the one hand, spatial “PPs” in Blackfoot are radically discontinuous: thus, the P element \textit{it}- occurs as a prefix within the verbal complex and the associate DP occurs outside, as in (1a).

(1) BLACKFOOT
\begin{itemize}
  \item \textit{Nitsítóyí omítáóyó'pi.}
  \begin{itemize}
    \item nit-\textit{it}-\textit{ioyi om-\textit{yi itaoyó’p-yi}
    \item 1-LOC\textit{-cat.AI DEM-INAN eating.place-INAN}
  \end{itemize}
  \end{itemize}

‘I ate \textbf{at the restaurant}.’

\textsuperscript{1} Unless otherwise indicated, data presented in this paper are from the authors’ fieldwork. We are grateful to Rachel Ermineskin and Beatrice Bullshields for assistance with Blackfoot, and to Toni Cardinal for assistance with Plains Cree. For comments and questions, we are indebted to M. Dufresne, E. Mathieu, M. Tremblay, N. Weber, M. Wiltshko, and to the audience at the workshop ‘Variation in P’, not to mention three reviewers. This research was supported in part by a SSHRC SRG Grant. Abbreviations used: 1 = 1st person, 2 = 2nd person, 3 = 3rd person; AI = animate intransitive, AN = animate, CNJ = conjunct, DEM = demonstrative, II = inanimate intransitive, IMPF = imperfective, INAN = inanimate, LCL = local (1st or 2nd) person; LOC = locative, NDI = inanimate dependent noun, OBV = obviative, PL = plural, POSS = possessive, PREV = previous, PROX = proximate, REL = relative, TI = transitive inanimate (object), TA = transitive animate (object), USC = unspecified subject construction.

\textsuperscript{2} Both Blackfoot and Plains Cree, along with their Algonquian kin, are polysynthetic in nature: full-fledged propositions are often conveyed in single phonological words. The reader will witness this morphological character throughout in the examples provided.

\textsuperscript{1} Blackfoot is spoken in southern Alberta and northwestern Montana. Plains Cree is spoken in the northern Plains, including northern Montana, central and northern Alberta, as well as central and southern Saskatchewan. The map appended to Goddard (1996) depicts the two languages’ geographical adjacency.
On the other hand, Plains Cree PPs are continuous, as the suffixal P element -ihk attaches directly to the associate DP, as in (2a).

(2) PLAINS CREE

a. Nimîcison mîcísokamkohhk.
   ni-míciso-n mícisowikamikw-ihk
   l-eat.AI-LCL eating.place-LOC
   ‘I ate at the restaurant.’

b.* Nimîcison mîcísokamk.
   ni-miciso-n mícisowikamikw
   l-eat.AI-LCL eating.place

Other than differences in surface order — prefixal it- on V in Blackfoot, suffixal -ihk on N in Plains Cree — that these affixes are indeed Ps is confirmed by the fact that they are obligatory when the relevant DPs are to be understood as spatial expressions: witness the ungrammaticality of (1b) and (2b), where it- and -ihk are missing, respectively. Note that these P elements are not case-assigners; objects are licensed independently of Blackfoot it- and Plains Cree ihk-, as illustrated in (3) and (4).

(3) BLACKFOOT

Nitsoyi napayín.
   nit-ioyi napayin
   l-eat.AI bread
   ‘I ate bread.’

(4) PLAINS CREE

Nimîcîn napayin.
   ni-mícîn napayin
   l-eat.AI-LCL bread
   ‘I ate meat.’

In fact, even when other morphemes that supply relevant spatial information are present in the clause, it- and -ihk cannot be dropped. To see this, consider the examples in (5) and (6) from Blackfoot, where a modifying locative prefix occurs left-adjacent to V: ohkit- ‘upon’ in (5)
and ssap- ‘inside’ in (6). Similarly, in (7) and (8) from Plains Cree, a locative-marked noun can be preceded by a spatially oriented expression: tahkóc ‘on top of’ in (7) and ciki ‘near to’ in (8).

(5) BLACKFOOT
a. Anna Leo itáóhkitopiwa otsinakáá’simiksi.
   anna Leo it-a-ohkit-opii-wa ot-inakaa’simiks-yi
   DEM L. LOC-IMPF-upon-sit.AI-PROX 3.POSS-car-OBV
   ‘Leo sat on top of his car.’

b.* Anna Leo ãóhkitopiwa otsinakáá’simiksi.
   anna Leo a-ohkit-opii-wa ot-inakaa’simiks-yi
   DEM L. IMPF-upon-sit.AI-PROX 3.POSS-car-OBV

(6) BLACKFOOT
a. Anna Leo itáissapiyo’kka otsinakáá’simiksi.
   anna Leo it-a-ssap-yo’kka-wa ot-inakaa’simiks-yi
   DEM L. LOC-IMPF-inside-sleep.AI-PROX 3.POSS-car-OBV
   ‘Leo slept inside of his car.’

b.* Anna Leo ãíssapiyo’kka otsinakáá’simiksi.
   anna Leo a-ssap-yo’kka-wa ot-inakaa’simiks-yi
   DEM L. IMPF-inside-sleep.AI-PROX 3.POSS-car-OBV

(7) PLAINS CREE
a. Apiw tahkóc nipêwinihk.
   api-w tahkohc nipewin-ihk
   sit.AI-3 top.of bed-LOC
   ‘S/he is sitting on the bed.’

b.* Apiw tahkóc nipêwin.
   api-w tahkohc nipewin
   sit.AI-3 top.of bed

(8) PLAINS CREE
a. Nipawiw ciki nipêwinihk.
   nipawi-w ciki nipewin-ihk
   stand.AI-3 near bed-LOC
   ‘S/he is standing near the bed.’
b. * Nipawiw ciki nipêwin.

nîpawi-w ciki nipêwin

stand.AI-3 near bed

Again, in Blackfoot, the examples lacking *it-, (5b) and (6b), are ill-formed. And in Plains Cree, the examples lacking -ihk, (7b) and (8b), are likewise ill-formed. We therefore conclude that Blackfoot *it- and Plains Cree -ihk are both P elements, and that they are responsible for introducing location-denoting DPs into the clause. We treat expressions such as Blackfoot ohkit- in (5) and ssap- in (6) and Plains Cree tahkohc in (7) and ciki in (8) as locative modifiers. We leave unsettled where locative modifiers occur in the clause and what their categorial status is. It is important to note that spatial modifiers external to the verbal complex are rare in Blackfoot, and when they do occur, *it- is nevertheless required. In other words, *it-is indeed the P element responsible for licensing spatial expressions. This is shown in (9).

(9) **Blackfoot**

Sáóóhstsi amika ponokáòmitaoyis *(it)sipssá’paissi.

saoohstsi amika ponoka-omitaa-oyis *(it)-ipsst-a’paissi

outside DEM elk-dog-house LOC-inside-stay.AI

‘Outside in the barn that’s where he’s spending time.’

If *it- and -ihk are analyzed as P elements in Blackfoot and Plains Cree respectively, several questions immediately arise:

(i) Why does the Blackfoot P element *it- occur within the verbal complex, discontinuous from its associate DP?

(ii) Why does Blackfoot *it- occupy the particular position it does, namely a position close to the left edge of the verbal complex?

(iii) Why does the Plains Cree P element -ihk surface as a suffix on the associate DP?

(iv) Most importantly from a comparative perspective, what inherent difference between Blackfoot *it- and Plains Cree -ihk, if identifiable, accounts for their surface distribution?
The goal of this paper is to provide a syntactic answer to the last question, namely to account for the surface distribution of P in Blackfoot and Plains Cree. In so doing, we will also be led to a deeper understanding of the radical discontinuity of PPs in Blackfoot, and of the broader typological significance of the specific position that Blackfoot it- and Plains Cree -ihk occupy. The fundamental difference between the two P elements, we claim, lies in their syntactic category. Specifically, we propose that while Blackfoot it- lexicalizes a functional head in the extended projection of P, Plains Cree -ihk lexicalizes the lexical head thereof. Consequently, the observed differences between the two languages relative to the syntax of P ultimately follow from which part of the prepositional spine (P-spine) is lexicalized.

The paper is organized as follows. Section 2 explores the idea that Blackfoot it-lexicalizes Dx \[^{\text{SPACE}}\] , while Plains Cree -ihk lexicalizes P, in the sense of den Dikken’s (2010) extended projection of P. In section 3, we argue that the suffixal nature of Plains Cree -ihk results from the phrasal movement of the locative DP, while the occurrence of Blackfoot it- within the verbal complex is attributable to a transcategorial shift or “mutation” with respect to Dx. We further argue that if mutation in Dx is responsible for the discontinuity of it- with its associate DP, its position within the verbal complex automatically ensues. Sections 4 and 5 discuss four more potential instances of mutation, two in Blackfoot (section 4) and two in Plains Cree (section 5), in further support of the mutation hypothesis. Finally, section 6 concludes.

2 Two lexicalizations of “P”

The idea that adpositional phrases (“PPs”) are composed not only of the projection of a lexical head, but also of those of associated functional heads, dates at least as far back as Koopman (2000). Such an approach gives rise to the possibility that the surface syntax of languages may differ according to which head (or heads) of the extended projection of P a given element lexicalizes. In this section, we propose that such variable lexicalization is what
distinctively characterizes Blackfoot *it* and Plains Cree *ihk*. In section 2.1, we introduce den Dikken’s (2010) theory of extended projections, and use it to model the differences in the “P grammar” of Blackfoot and Plains Cree. In section 2.2, we argue that Blackfoot *it* lexicalises $Dx^{[SPACE]}$ but that Plains Cree *ihk* lexicalizes P. This paves the way for our analysis of their morpho-syntactic behavior, which we develop in section 3.

### 2.1 den Dikken’s (2010) extended projection of P

In den Dikken (2010), three lexical categories — namely V, N, and P — project parallel functional layers. The idea that V and N have parallel extended projections in one form or another has been put forth in the literature (Jackendoff 1977, Abney 1987, Li 1999, amongst others), but den Dikken (2010), taking Koopman (2000) as a point of departure, extends the parallelism further to P. In particular, den Dikken (2010:100) gives V and N the following parallel extended projections:

(10) a. $[CP^{[FORCE]} [Dx^{[TENSE]} [Asp^{[EVENT]} [VP V ... ]]]]$  
    b. $[CP^{[DEF]} [Dx^{[PERSON]} [Asp^{[NUM]} [NP N ... ]]]]$  

Above the lexical projection, there are three functional layers, AspP, DxP and CP, whose semantic content is determined by the respective lexical core. As indicated by the diacritics in (10), AspP, the functional layer of aspect, defines event for V and number for N; DxP, the functional layer of deixis, defines tense for V and person for N; CP, the functional layer of typing defines force for V and definiteness for N. Likewise, the extended projection of P is as follows:

(11) $[CP^{[SPACE]} [Dx^{[SPACE]} [Asp^{[SPACE]} [PP P ... ]]]]$  

Diacritics aside, the functional layers above the lexical core of P are parallel to those of V (10a) and N (10b). In particular, while Aspect defines event for V, and number for N, on P it defines aspectual space (i.e., path, cf. Zwarts 2005). And while Deixis (Dx), defines tense on
V and person on N, on P it defines deictic space. And while Typing (C) defines force on V and definiteness on N, on P it defines case-marking. Defining in the extended projection of P in this way — and more particularly as in (11) — makes it meaningful to ask the following question: which head(s) among the four heads of the extended projection of P does a given P element incarnate?

Before showing how den Dikken’s (2010) proposal might be extended to Blackfoot and Plains Cree, we draw attention to the fact that we have selected his theory of the P-spine primarily because of its commitment to cross-categorial parallelism. Our analysis is also compatible with the theory put forth by Svenonious (2010). In particular, observe that den Dikken’s $Dx^{[SPACE]}$ and P correspond to Svenonious’s Deix and K respectively. In fact, the label K (rather than P), may be more appropriate for -ihk, given its semantic meagerness. With this terminological note in place, we now turn to the heart of the matter, namely the analysis of Blackfoot it- and Plains Cree -ihk.

### 2.2 Blackfoot it- lexicalizes Dx; Plains Cree -ihk lexicalizes P

We propose that Blackfoot and Plains Cree differ in that they lexicalize two different syntactic heads of the extended projection of P: it- lexicalizes the functional head $Dx^{[SPACE]}$, while -ihk lexicalizes the lexical head P. This is illustrated in (12) and (13).

\begin{align*}
\text{(12)} & \quad \text{BLACKFOOT} \\
& \quad [CP \ C^{[SPACE]} \ \ [DxP \ Dx^{[SPACE]} \ \ \ \ \ \ \ \ AspP \ Asp^{[SPACE]} \ \ [PP \ \ P \ \ \ \ ... \ ]]][]]
\end{align*}

\begin{align*}
\text{(13)} & \quad \text{PLAINS CREE} \\
& \quad [CP \ C^{[SPACE]} \ \ [DxP \ Dx^{[SPACE]} \ \ \ \ \ \ \ \ AspP \ Asp^{[SPACE]} \ \ [PP \ \ P \ -ihk \ \ \ \ ... \ ]]][]]
\end{align*}

$Dx^{[SPACE]}$ is the functional head of spatial deixis, which which the contrast between locative vs. directional P (den Dikken 2010:101–4). (We return to this n sections 4 and 5, where we make use of $Dx^{[PATH]}$, the directional sibling of locative $Dx^{[PLACE]}$.)

We designate Blackfoot it- as $Dx^{[SPACE]}$ because it conveys deictic semantics; Frantz
Blackfoot \textit{it}- is a member of the set of “linkers” (Frantz 1991), which are part of the inventory of “relative roots”. Relative roots are a class of proforms (locative, manner, temporal, etc.) found across all Algonquian languages (Bloomfield 1962, Wolfart 1973, Valentine 2001, Rhodes 1976). They are called “roots” because they can occur in the root position of a stem (even though they also occur in non-root positions). They are called “relative” because they lack an independent interpretation, and are instead interpreted relative to an antecedent that is obligatory for the utterance in which they occur to be well-formed (Bloomfield 1962, Wolfart 1973). For example, if no associate is present in the clause, Blackfoot \textit{it}- is understood anaphorically (Bliss 2012a); a demonstrative expression is needed to obtain a deictic meaning (e.g., with an accompanying ostensive gesture):

\begin{verbatim}
(14) BLACKFOOT *(Ôòmi) nitsîtsooyi.oom-yi nit-ìt-ooyi DEM-INAN 1-LOC-eat.A1 ‘I ate there.’ (pointing)
\end{verbatim}

More generally, relative roots are featurally unspecified variables: their specific function is determined by their position in the clause and by the nature of their antecedent.

By contrast, Plains Cree -\textit{ihk} lacks deictic information. In fact, it is semantically meager, and Cyr (1993:202) considers its Montagnais (Innu-aimun) cognate -\textit{it} to be “an inflectional suffix of case marking.” Since -\textit{ihk} plays neither typing nor deictic nor aspectual role, we assign it to the category P.

\textsuperscript{3} See Cook (2008) for a survey of the deictic, or more narrowly, “indexical” nature of Plains Cree relative roots.

\textsuperscript{4} Orthogonal to our analysis of Blackfoot \textit{it}- and Plains Cree -\textit{ihk} is the question of whether they have any case-related properties. In fact, the formal of case in these languages is not entirely clear. It is possible that Plains Cree -\textit{ihk} is a pure case-marking head K of Svenonius’ (2010) extended projection of P, in line with Oxford’s (2011) identification of the nominal locative suffix -\textit{i} in Innu-aimun (the cognate of Plains Cree -\textit{ihk}) as K. Our
Suggestive evidence that Plains Cree -ihk and Blackfoot it- occupy distinct positions in the P-spine comes from how the number of the associate DP is realized. Suffixation of Plains Cree -ihk triggers number neutralization (Wolfart 1973, 1996), as in (15); in contrast, no number neutralization is observable with Blackfoot it-, (16).

(15) PLAINS CREE
   a. oskîkohk          b. oskîkwa          c. oskîk  (cf. Wolfart 1973:31)
     o-skîkw-ihk         o-skîkw-a          o-skîkw
     3-eye.NDI-LOC       3-eye.NDI-PL       3-eye.ND
     ‘on her/his eye(s)’  ‘her/his eyes’      ‘her/his eye’

(16) BLACKFOOT
   Anno((i)stsi  miistâkistsi,  nitsîtokooyi.  (Frantz 1991:65)
   anno-istsi  miistak-istsi  nit-it-okooyi
   this-PL      mountain-PL      1-there-dwell.AI
   ‘Here in these mountains, I live.’

Number is a functional category that belongs to the N-spine (see Déchaine 1999 for Plains Cree). Number neutralization in Plains Cree locative DPs likely results from the interaction of -ihk with the locative DP, implying that -ihk occupies a fairly low position in the P-spine, most likely the P head, and that it merges with a DP, voiding number specification. The absence of number neutralization with Blackfoot locative DPs suggests that if Blackfoot it- ever occurs in the P-spine, its relatively high position is such that it never enters into a configuration where it merges with a DP. In other words, Blackfoot it- is “too high” to suppress the number specification of its associate DP.

The claim that Blackfoot it- and Plains Cree -ihk are Dx[^SPACE] and P respectively does not answer why Blackfoot it- occurs within the verbal complex, discontinuous from the associate DP and why Plains Cree -ihk is a nominal suffix. More needs to be said to capture these facts. In particular, a rather innovative idea is required to account for the occurrence of Blackfoot

treatment of Plains Cree -ihk as P predicts that its distribution will differ from its Innu-aimun counterpart. This remains to be confirmed. For related discussion, see Bliss, Déchaine, and Hirose (2013, 2015).
Dx[^SPACE] *it-* , a functional head of the extended projection of P, within the clausal domain.

What could that be?

3 Accounting for the surface position of *it-* and -ihk

The previous section introduced our hypothesis that Blackfoot *it-* is Dx[^SPACE] and Plains Cree -ihk is P in terms of den Dikken’s (2010) extended projection of P. The task of this section is to demonstrate how this helps explain the different morpho-syntactic behavior of the two P elements in question. In section 3.1, we show how the status of Plains Cree -ihk as a nominal suffix automatically follows. In section 3.2, we present our solution for the problem of accommodating the Blackfoot prepositional functional head *it-* in the verbal domain. As will be seen below, this more challenging yet more interesting piece of the puzzle can be solved by acknowledging a grammatical shift — what we call mutation — as part of the workings of Universal Grammar. In section 3.3, we argue that mutation, though a marked option, offers a better account of the Blackfoot data than do obvious alternatives such as remnant movement, cliticization, or PP movement.

3.1 DP movement for Plains Cree -ihk

If -ihk is the lexical head P of the extended projection of P and if P takes a DP complement, the fact that -ihk is continuous with the associate DP straightforwardly follows. Somewhat bewildering, however, is the fact that -ihk is a suffix, not a prefix, on the reasonable assumption that Plains Cree is a prepositional language. The latter is consistent with the fact that other parts of the grammar — e.g. the relative order of C and T relative to V; the relative order of D relative to N — are head-initial and have a right-branching structure (Blain 1997; Hirose 2003; Cook 2008; Muehlbauer 2008). Why is locative -ihk a suffix, then? We propose that surface order is derived by movement of the associate DP to SpecPP, as depicted in (17).
Leftward phrasal DP movement in Plains Cree has already been introduced by Déchaine (1999) to describe the suffixes that represent DP-internal functional categories such as Pers(on) and Num(ber). If P — or K for that matter — is a juncture category that sends the nominal extended projection to the P domain, or even if it constitutes part of the nominal extended projection (Grimshaw 1991), it is not far-fetched to expect syntactic operations operative in the N domain — such as leftward phrasal DP movement — to be operative within PP (qua KP) as well.

A question that naturally arises relative to Plains Cree is whether other parts of the P-spine are unambiguously head-initial. Relevant are the locative modifiers in (7) and (8), which precede the locative DP. We believe that some, if not all, of them may turn out to head a functional projection, instantiating either Asp[^SPACE] (à la den Dikken 2010) or AxPart (à la Svenonious 2010; cf. Oxford 2011). Accordingly, tahkôc nipêwinihk ‘on the bed(s)’ would instantiate the structure in (18).

(18) **PLAINS CREE**

\[
\begin{array}{c}
\text{Asp} \quad \text{Asp}[^\text{SPACE}] \\
\text{tahkôc} \quad \text{[PP [DP nipêwin ] [P' -ihkP tDP ]]}
\end{array}
\]

\[
\begin{array}{c}
\text{on} \quad \text{bed} \quad \text{LOC}
\end{array}
\]

### 3.2 Mutation in Dx for Blackfoot it-

One candidate solution for the clause-internal occurrence of Blackfoot it- that is immediately available is the syntactic operation of head movement, generally called “incorporation” in the context of polysynthesis. In fact, P incorporation into V has been proposed to describe some applicative constructions that encompass the semantics of spatial Ps (Baker 1988, 1996, 2003). Is such a P incorporation analysis applicable to Blackfoot it-?

There are three reasons to reject a P-incorporation analysis. First, Blackfoot crucially
lacks “unincorporated” spatial Ps; P-incorporating languages typically show an alternation between incorporated versus unincorporated Ps. Second, spatial modifiers in Blackfoot are never “stranded” outside the verbal complex, an expected phenomenon if only the P-head undergoes incorporation into the V domain. Rather, Blackfoot spatial modifiers, along with it-, occur inside the verbal complex, see (5) and (6) above. Third, the incorporation analysis fails to account for the relatively “high” position that it- occupies within the verbal complex. To see this, consider (19), which shows that it- occurs to the right of the person prefix nit- but to the left of imperfective a-. Minimally, this implies that Blackfoot it- is positioned outside of vP.

On independent grounds, Bliss (2013), as well as Déchaine and Wiltschko (2014), argue that Blackfoot person prefixes occupy SpecIP, and Ritter (2014) argues that imperfective a- adjoins to vP. On the assumption that the Blackfoot verbal complex has a right-branching structure, it is to be concluded that it- occurs somewhere in the IP domain. For one thing, the IP domain is an unlikely target of incorporation; it is too high up for P, which arguably originates in a VP-internal position, to be incorporated into.5 For another, if INFL could be targeted by an incorporating P, the target status would have to be stipulated; why INFL and not V or some other head? Thus, a P incorporation analysis does not provide a viable account for the occurrence of it- within the verbal complex. But if P-incorporation doesn’t account for

5 Baker (2003, Appendix 1) argues that P incorporates into Tense in the applicative constructions of Abaza (Northwest Caucasian) and Slave (Na-Dene). However, in both languages, the putative incorporated P is accompanied by a pronoun that, Baker claims, is incorporated into the P head. It may be that what we are witnessing in Abaza and Slave is not P incorporation, but movement of PP into the Tense domain. In Baker 1996, §9.3.2, P incorporation targets Asp (and then Asp raises to 1), again in the analysis of applicative constructions.
the appearance of *it-*, then what does?

We claim that Blackfoot *it-* occurs in the IP domain because it lexicalizes the category of $Dx^{[SPACE]}$. Recall that INFL is $Dx^{[TENSE]}$ for den Dikken (2010); this means that locative *it-* occurs in the projection of its verbal counterpart. In other words, in Blackfoot, $Dx^{[SPACE]}$ and $Dx^{[TENSE]}$ realize one and the same functional category, namely Dx. We conjecture that this categorial identity facilitates “mutation” in the grammar of Blackfoot, so that the lexical item realizing $Dx^{[SPACE]}$ in the P domain, namely *it-*, is transferred to the domain of its verbal counterpart, i.e., $Dx^{[TENSE]}$. This process, which we call “mutation,” is a transcategorial shift that is defined as follows:

(20) MUTATION

Transposition of an F(unctional) head of one L(exical) category to the counterpart F domain of another L category.

Mutation is the name of a process or phenomenon, not of an operation on a par with Merge or Agree. Just like mutation occurring to the DNA sequence, it just “happens.” If we are on the right track, mutation occurs only within the functional domain of a lexical category in a rather restrictive manner as described in (20). We assume that in terms of operation, mutation only takes the form of external Merge. In Blackfoot, $Dx^{[SPACE]}$ of the P domain mutates into the counterpart $Dx$ of the V domain, namely that of $Dx^{[TENSE]}$, as schematized in (21):

(21) MUTATION IN $Dx$: INSERTION

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(21) MUTATION IN $Dx$: INSERTION

a. $Dx^{[SPACE]}$ $C^{[SPACE]}$ $Asp^{[SPACE]}$ $Dx^{[SPACE]}$ $C^{[FORCE]}$ $Asp^{[EVENT]}$ $Dx^{[TENSE]}$ $V$ ... $P$ ...
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This is a mutation via insertion: (21c) is the outcome of transposing $Dx_{[\text{SPACE}]}$ into the domain of $Dx_{[\text{TENSE}]}$, whereby $Dx_{[\text{SPACE}]}$ has been inserted into the extended projection of $V$. The mutation analysis explains not only the occurrence of $it$- within the verbal complex and the concomitant discontinuity with the associate DP, but the relatively high position it occupies in the clausal structure.

The process of mutation does not presuppose the initial existence of the extended projection of $P$ in Blackfoot grammar. Rather, the extended projection of $P$ exists only in UG as a potentiality. In Blackfoot, $Dx_{[\text{SPACE}]}$ is the only head of the $P$ category ever operative in Blackfoot, and is the only head to license location-denoting DPs. Notably, neither $P$ nor $Asp_{[\text{SPACE}]}$ nor $C_{[\text{SPACE}]}$ is instantiated in the language. In fact, this view is consistent, we contend, with the fact that, in Blackfoot, spatial modifiers rarely occur external to the verbal complex (see (9)). As for the location-denoting DPs that lie outside the verbal complex, they are adjoined within the projection of $vP/VP$ (Louie 2009, Bliss 2013), and are licensed by virtue of being c-commanded by $it$- in the $Dx_{[\text{TENSE}]/IP}$ domain (in a sense, on a par with NPIs). The scope-taking analysis of Blackfoot $it$- has several desirable empirical consequences that we explore in Bliss, Déchaine, and Hirose (2013, 2015).

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6 Mutation may, but need not, be linked to language change and language acquisition. Also, unlike reanalysis or fusion, mutation does not require linear adjacency or proximity between relevant constituents. That said, however, it may be that mutation is enhanced or even triggered by the occurrence of a constituent undergoing mutation in the vicinity of the target syntactic position. For relevant discussion, see Rhodes (2006).
3.3 The non-feasibility of some obvious alternatives

It might be objected that a remnant movement analysis—where the associate DP strands P, and the remnant PP raises to the left edge of the verbal complex—would work as well as the mutation analysis. This is true only insofar as one is dealing with unmodified PPs. Once modified “PPs,” such as (5a) and (6a), are taken into consideration, however, the balance tips in favor of the mutation analysis. If there are PP constituents in Blackfoot, as a remnant movement analysis presupposes, the null hypothesis dictates that locative modifiers occur within the (maximal) PP projection and that they move along with the remnant PP, once the associate DP is extracted out of PP. In (6a), repeated from above, the locative modifier ssap-‘inside’ occurs along with it- within the V-complex. Remarkably, it is separated from it- by the imperfective morpheme -a. The non-contiguity of locative it- and modifier -ssap ‘inside’ goes against the prediction made by the remnant movement analysis.

(6) BLACKFOOT

a. Anna Leo itáissapiyo’kaa otsinakáá’simiksi.
   anna Leo it-a-ssap-yo’kaa-wa ot-inakaa’simiks-yi
   DEM L. LOC-IMPF-inside-sleep.AI-PROX 3.POSS-car-OBV
   ‘Leo slept inside of his car.’

By contrast, the mutation analysis, which does not posit a PP constituent in Blackfoot, is consistent with the non-contiguity of it- and ssap-. Thus, a remnant movement analysis cannot be maintained in its simplest form; it would have to apply locative modifier extraction as many times as the number of locative modifiers until the PP becomes evacuated except for it-.

In a similar vein, Blackfoot it- may possibly be analyzed as a clitic of the kind found in other languages with (pronominal) clitics, as its target seems to be an inflectional head. However, if it- is a clitic, then its associate DP is an obligatory double. A question then arises regarding the categorial mismatch between it- as the clitic (P(P)) and its double (DP). This invites analytical complexity, so an account of it- in terms of cliticization does not by itself
account for the distribution of Blackfoot locative it-.

Another alternative would be to assume that it- heads a PP base-generated VP-internally, and that the PP undergoes movement to adjoin in the IP region, with only the head being pronounced as it- in the upper copy and only the complement DP being pronounced in the lower copy, viz., in a complementary fashion (cf. Louie’s (2009) analysis of Blackfoot iiht- ‘means’; see Nunes 2004). This type of analysis leaves unanswered, for example, why the pronunciation pattern is not the other way around: i.e., the complement DP is pronounced in the upper copy and the P head is pronounced in the lower copy. In contrast, our mutation analysis automatically accounts for the distribution of Blackfoot it- and for the complete absence of a PP constituent in Blackfoot.

4 Consequences for Blackfoot

This section discusses two major consequences that the mutation analysis of it- has for Blackfoot. First, we discuss a P element dedicated to describe directional motion, i.e., itap-. We argue in section 4.1 that itap- lexicalizes Dx[PATH] and occurs in the IP domain as a result of mutation. Second we consider Ritter and Wiltschko’s (2009) claim that INFL in Blackfoot registers not the feature [TENSE], but the feature [PERSON]. We argue in section 4.2 that they can be analyzed as a case of mutation via substitution.

4.1 Itap- as Dx[PATH]

den Dikken (2010:101–4) argues that Dx[SPACE] comes in two varieties, one for stative or locative P elements, i.e., Dx[PLACE] and one for dynamic or directional P elements, i.e., Dx[PATH]. Is there any P element that is suitably considered a candidate for Dx[PATH] in Blackfoot? We take the verbal prefix itap- to be one such candidate. Frantz (1991:95) glosses itap- as ‘toward’, noting that “[it] occur[s] in verbs which describe motion, or at least imply change of location, and indicate[s] the direction of that motion or movement.” The following example
illustrates:

(22) **BLACKFOOT**

\[Nitsitapohkipista\] kiksista.

\[nit-itap-ohkipistaa\] k-ixsist-wa

1-toward-drive.team.AI 2-mother-PROX

‘I drove (a team of horses) to your mother.’

In this example, *itap-* occurs where *it-* would otherwise occur in the verbal complex; i.e., they are in complementary distribution. This is what one would predict if *itap-* is another instance of \(Dx[^{SPACE}]\), or more precisely \(Dx[^{PATH}]\) having undergone mutation into the extended projection of \(V\) in competition with *it-* as \(Dx[^{SPACE}]\).

### 4.2 Mutation via substitution

Identifying the deictic anchoring function that maps the event to the utterance as the universal component of the category INFL, Ritter and Wiltschko (2009, 2014) argue that languages vary according to whether anchoring is implemented via \([TENSE]\), \([LOCATION]\), or \([PERSON]\). According to these authors, Blackfoot is a language whose INFL is substantiated by \([PERSON]\); such INFL governs whether the event described involves an utterance participant or not. The choice among the three anchoring features, they argue, is parametric; INFL is endowed with the restricted set of features \([TENSE]\), \([LOCATION]\), and \([PERSON]\) as part of its UG property. In our terms, INFL in Blackfoot may be described as \(Dx[^{PERSON}]\) occurring in the

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7 We assume that Blackfoot *it-* is underspecified for the \([PLACE]\) versus \([PATH]\) dichotomy; it is \(Dx[^{SPACE}]\), not \(Dx[^{PLACE}]\). For related discussion, see Frantz (1991:95). A reviewer asks if a similar competition occurs in other languages; at present, we do not know. However, we do expect competition between \([SPACE]\) and \([PATH]/[PLACE]\) to be ubiquitous. This is because, according to markedness theory of (e.g., Williams 1997), the more specified or marked alternant takes precedence over the less specified/marked alternant. \(Dx[^{PATH}]\) is more specified than \(Dx[^{SPACE}]\), as \([PATH]\) and \([PLACE]\) are subcategories of \([SPACE]\).

8 If the function of deictic anchoring inherently characterizes INFL, regardless of its category — whether it is \(Dx[^{TENSE}]\), \(Dx[^{PERSON}]\), or \(Dx[^{SPACE}]\) — then the fact that clitics appear in the INFL domain in languages such as French and Italian falls into place, as they are anaphoric in nature.
extended projection of V, in place of $Dx^{[\text{TENSE}]}$. Therefore, correctly, the projection into which Blackfoot *it*- as $Dx^{[\text{SPACE}]}$ gets transposed in (23) is that of $Dx^{[\text{PERSON}]}$. On this view, $Dx^{[\text{PERSON}]}$ arises via mutation:

(23) MUTATION IN $Dx$: SUBSTITUTION

\begin{itemize}
  \item a.
  \item b.
  \item c.
\end{itemize}

Mutation via substitution is considered a stronger interpretation of (20) in that the extended projection of V is stripped of the mutation target $Dx^{[\text{TENSE}]}$; compare (23c) with (21c).

We wonder how widespread languages of the Blackfoot type are across the world, whose $Dx$ of the extended projection of V is $[\text{PERSON}]$-oriented. If, compared to the frequently attested $Dx^{[\text{TENSE}]}$, $Dx^{[\text{PERSON}]}$ is a marked option as $Dx$ of the extended projection of V, then there may be some virtue to our mutation approach to $Dx$ in Blackfoot. Resulting from mutation, $Dx^{[\text{PERSON}]}$ (as well as $Dx^{[\text{SPACE}]}$) is not expected to be as widely attested as $Dx^{[\text{TENSE}]}$, which is the default setting for $Dx$ of the extended projection of V in den Dikken’s (2010) theory of the three parallel extended projections of V, N, and P adopted here.

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9 See Ritter and Wiltschko (2009, 2014) for the absence of $Dx^{[\text{TENSE}]}$ in Blackfoot. For these authors, failure to obligatorily lexicalize $Dx^{[\text{TENSE}]}$ in a given language is one indication of the language’s dismissal of $[\text{TENSE}]$ for the feature of the $Dx$ in the V-spine.
Whether such markedness considerations kind bears on the issue must wait, at least partly, until more extensive investigation is conducted on the nature of Dx/INFL of the extended projection of V in other languages. On a speculative note, we draw attention to an observation made by Dahl and Velupillai (2013), who state that “[l]anguages may or may not distinguish [between present and past tenses] grammatically, and there is no clear majority for either alternative.” Suppose that 50% of languages are INFL\textsuperscript{TENSE} languages and the remaining 50% are not. Suppose further that non-INFL\textsuperscript{TENSE} languages are evenly divided into INFL\textsuperscript{PERSON} and INFL\textsuperscript{LOCATION} languages. Accordingly, it is to be concluded that INFL\textsuperscript{PERSON} and INFL\textsuperscript{LOCATION} are marked options, compared to INFL\textsuperscript{TENSE}. Of course, though this oversimplifies, it lays out the logic of the problem.

5 Consequences for Plains Cree

The mutation analysis generalizes to Plains Cree. This section examines two facts about ohci — one of the few surface postpositions in the language — that naturally invite such an extension. In section 5.1, we identify ohci as an incarnation of \textsuperscript{PATH} and argue that its occasional occurrence within the verbal complex is indicative of it having undergone mutation. In section 5.2, we point out that ohci can optionally serve the past-denoting function in negative contexts, again occurring within the verbal complex, and argue that this is an instance of mutation via “category shift.”

5.1 Plains Cree ohci as \textsuperscript{PATH}

Plains Cree has a small number of postpositions, one of which is ohci, the morpheme that encodes deixis and is indicative of the source end of path: ‘thence’ (Wolfart 1973:70). Accordingly, it is qualified to be a lexicalization of \textsuperscript{PATH}. The following example illustrates the postpositional use of ohci:
We consider the PP wáskahikanihk ohci ‘from the house’ in (24) to have resulted from the underlying prepositional configuration of (25a). The PP wáskahikanihk ‘at the house’ undergoes movement to SpecDx[PATH], as shown in (25b). SpecDx[PATH] filled with a moved element is reasonably likened to SpecDx[TENSE] (qua SpecIP) similarly filled (cf. den Dikken 2010:103).

Relevant is the fact that Plains Cree ohci sometimes occurs within the verbal complex, and when it does, the locative DP is obligatorily fronted (Cook 2008).

The prefixal use of Plains Cree ohci- in (26) represents Dx[PATH] having undergone mutation to be inserted into the Dx[TENSE] domain of the extended projection of V, as in (27).
Our claim that \textit{ohci} occurs in the Dx domain is consistent with the morpheme order observed in (26f). The “conjunct” prefix ê-, which immediately precedes \textit{ohci}- and marks the left edge of the verbal complex is, on independent grounds, a complementizer (i.e., \text{C}^{\text{FORCE}}) in the language (Blain 1997, Cook 2008, Déchaine and Wiltschko 2014).

The behavior of Plains Cree \textit{ohci} is reminiscent of German/Dutch path Ps that are postpositional and can be split from the rest of the PP. Consider the German examples in (28), which show that P can move to a position in the V-spine higher than the aspectual head hosting the participial prefix ge-, as well as the infinitival \textit{zu}:

\begin{enumerate}
  \item \textbf{GERMAN} \hspace{1cm} \textit{ohci} \hspace{1cm} \textit{Path}
  \begin{enumerate}
    \item [PP \hspace{0.5cm} In \hspace{0.5cm} das Haus \hspace{0.5cm} \textbf{rein} \hspace{0.5cm} ] \hspace{0.5cm} ist \hspace{0.5cm} sie \hspace{0.5cm} gelaufen. \hspace{0.5cm} \rightarrow \hspace{0.5cm} \begin{align*}
      \text{in} & \text{ the house} \hspace{0.5cm} \text{R.in} \hspace{0.5cm} \text{is} \hspace{0.5cm} \text{she} \hspace{0.5cm} \text{run} \\
      \text{‘She ran into the house.’}
    \end{align*}
    \item [PP \hspace{0.5cm} In \hspace{0.5cm} das Haus ] \hspace{0.5cm} ist \hspace{0.5cm} sie \hspace{0.5cm} \textbf{rein}-gelaufen. \hspace{0.5cm} \rightarrow \hspace{0.5cm} \begin{align*}
      \text{in} & \text{ the house} \hspace{0.5cm} \text{is} \hspace{0.5cm} \text{she} \hspace{0.5cm} \text{R.in-run} \\
      \text{‘She ran into the house.’}
    \end{align*}
    \item [PP \hspace{0.5cm} In \hspace{0.5cm} das Haus ] \hspace{0.5cm} versucht \hspace{0.5cm} sie \hspace{0.5cm} \textbf{rein} \hspace{0.5cm} zu \hspace{0.5cm} laufen. \hspace{0.5cm} \rightarrow \hspace{0.5cm} \begin{align*}
      \text{in} & \text{ the house} \hspace{0.5cm} \text{tried} \hspace{0.5cm} \text{she} \hspace{0.5cm} \text{R.in} \hspace{0.5cm} \text{to} \hspace{0.5cm} \text{run} \\
      \text{‘She tried to run into the house.’}
    \end{align*}
  \end{enumerate}
\end{enumerate}

But moving Plains Cree \textit{ohci} from within the PP into the IP domain is not feasible, as PPs in Plains Cree adjoined to (as low as) CP; any such movement would require a lowering operation, which is commonly assumed to be illegitimate. Via movement or not, the fact that both \textit{rein} in German and \textit{ohci} (or \textit{ôh}-) in Plains Cree can occur in the IP domain suggests that
it is the deictic anchoring nature of INFL/Dx\textsuperscript{TENSE} (Ritter and Wiltschko 2009, 2014) that attracts P elements (although rein is considered phrasal, Noonan 2010; see also den Dikken 2003).

Another reason to prefer the mutation anlaysis for Plains Cree is that it correctly predicts that preverbal ohci (in the form of ôh-) co-occur with postpositional ohci simultaneously; this is attested with rationale that/this is why clauses (Cook 2008). In terms of the mutation thesis, the simultaneous occurrence of ôh and ohci can be described as both the head and the tail of the “mutation chain” being phonologically realized. Movement of ohci from the outside to the inside of the V-complex is not a feasible option for reasons mentioned above.

(29) PLAINS CREE
a. ;êwakw anima k-ôh-ispayik ohci.
   êwakw anima kà-ôh-ispayi-k ohci.
   that DEM.INAN REL-thence-happen.VII-INAN thence
   ‘; that is why this happens.’
   (Ahenakew and Wolfart 1998: 88–9)

b. Êwakw anim ohci k-ôh-itwêyân,
   êwakw anima ohci kà-ôh-itwê-yân
   that DEM.INAN thence REL-thence-say.AI-1
   ‘That is why I say,’
   (Ahenakew and Wolfart 1998: 90–1)

5.2 Mutation via Category Shift

The verbal prefix kî- in Plains Cree serves the function of temporal anchoring by “marking a temporal non-coincidence relation between the reference time and the evaluation time” (Cook 2008:320). When the reference time is a point in the past and the evaluation time is the utterance time, for example, it ends up denoting a simple past, as exemplified below:

(30) PLAINS CREE
Ni-kî-nitawêyihtên ôma maskihkîs. (Hirose 2003:46)
nî-kî-nitawêyiht-ê-n ôma maskihkîs
1-PREV-want.TI-LCL this.IN candy
‘I wanted this candy.’

Thus, there is every reason to take $kî$- as an incarnation of $\text{Dx}^{\text{TENSE}}$ in the language.

There is one peculiar thing about $\text{Dx}^{\text{TENSE}}$ in Plains Cree, though: when under the scope of negation, $kî$- can (and for some speakers must) be substituted by $\text{ohci}$- in serving the designated anchoring function:

\begin{enumerate}
\item[31] \textsc{plains cree}\\
a. $\text{Mâwiyak } kî$-nitawêyihtam ôma maskhkîs$. (Hirose 2003:46, fn. 15)\\
   namawiyak $kî$-nitawêyihtam-w ôma maskhkîs\\
   nobody PREV-want.TI-3 this.IN candy\\
   ‘Nobody wanted this candy.’

\item[b] $\text{Mâwiyak } \text{ohci}$-nitawêyihtam ôma maskhkîs$. (Hirose 2003:46)\\
   namawiyak $\text{ohci}$-nitawêyihtam-w ôma maskhkîs\\
   nobody thence-want.TI-3 this.IN candy\\
   ‘Nobody wanted this candy.’
\end{enumerate}

The alternation between $kî$- and $\text{ohci}$- is only found in negative contexts; witness the occurrence of $mâwiyak$ in (31). Do we expect this phenomenon? We are unable to answer why negation makes the use of $\text{ohci}$ as $\text{Dx}^{\text{TENSE}}$ possible. Yet we are able to (partially) answer why it is $\text{ohci}$, among other morphemes, that may be used as $\text{Dx}^{\text{TENSE}}$. The answer lies in our claim that $\text{ohci}$ elsewhere lexicalizes $\text{Dx}^{\text{PATH}}$, a functional head of the P category in the mutation-prone Dx family. More specifically, we propose that the use of $\text{ohci}$- as $\text{Dx}^{\text{TENSE}}$ in (32 b) and similar examples represents another mode of mutation, namely, mutation via category shift:

\begin{enumerate}
\item[32] \textsc{mutation in dx: category shift}\\
a. $\text{ohci} = \text{Dx}^{\text{PATH}}$
\end{enumerate}
In undergoing mutation, *ohci* as $\text{Dx}^{\text{PATH}}$ targets $\text{Dx}^{\text{TENSE}}$, losing its original $\text{Dx}^{\text{PATH}}$ status to turn into $\text{Dx}^{\text{TENSE}}$. Direction (or $\text{PATH}$) implies non-central coincidence (Hale (1984), and the semantics of past may be encoded spatially as an instance of non-central coincidence between the utterance/speech time and the assertion/reference time (Demirdache and Uribe-Etxebarria 2000). The mutation of *ohci* from $\text{Dx}^{\text{PATH}}$ to $\text{Dx}^{\text{TENSE}}$ is thus reasonable, if not predictable, and it is no accident that *ohci* is $\text{Dx}^{\text{PATH}}$.

What distinguishes mutation via category shift (as with Plains Cree *ohci-*) from mutation via insertion (as with Blackfoot *it-*) is that while Plains Cree *ohci* functions as $\text{Dx}^{\text{PATH}}$ (as a P) or as $\text{Dx}^{\text{TENSE}}$, Blackfoot *it-* only functions as $\text{Dx}^{\text{SPACE}}$ (as a verbal prefix).

Interestingly, Blackfoot *it-* can also get a temporal interpretation, as in the following example:

(33)  \begin{align*}
\text{BLACKFOOT} \\
\text{Anná} & \quad \text{Anna} & \text{itsistóhkpi} & \quad \text{matónni.} \\
\text{ann-wa} & \quad \text{Anna} & \text{it-istóhkpi} & \quad \text{matonni} \\
\text{DEM-PROX A.} & \quad \text{LOC-fall.down.AI} & \quad \text{yesterday} \\
\text{`Anna fell down yesterday.'}
\end{align*}

Unlike Plains Cree *ohci-*, Blackfoot *it-* does not function as a tense marker, but rather as a P element that introduces a temporal modifier (such as *matónni* ‘yesterday’). (See Bliss (2012a, b) for details and examples.) Whether temporally-oriented *it-* can be analyzed as an instance of $\text{Dx}$ remains to be seen.
6 Conclusion

We began this paper by asking why Blackfoot and Plains Cree, two geographically adjacent Algonquian languages, differ in how their spatial Ps are realized in the clause: the Blackfoot P element *it*- is a verbal prefix, while the Plains Cree P element *-ihk* is a nominal suffix. We argued that the factor ultimately responsible for the varied exponence of the P elements involved is the categorial difference between them: *it*- is $Dx^{[SPACE]}$ and *-ihk* is $P$ of the extended projection of $P$ in den Dikken’s (2010) sense. On the one hand, spatial DPs in Plains Cree undergo a local movement to SpecPP, giving rise to the configuration in which *-ihk* is suffixed to the associate DP. On the other hand, the process of mutation forces Blackfoot *it*- to be inserted into the $Dx$ domain of the extended projection of $V$, creating a configuration in which *it*- is discontinuous from its associate DP. In other words, the different incarnations of spatial expressions in these two languages can be traced back to a difference in which head of the $P$-spine the $P$ element lexicalizes.

The process of mutation, as applied to $Dx$, comes in three varieties. First, mutation via insertion is involved not only in the derivation of Blackfoot *it*- (lexicalizing $Dx^{[SPACE]}$), but in the derivation of Blackfoot *itap-* and Plains Cree *ohci-* (both lexicalizing $Dx^{[PATH]}$) in the $Dx$ domain of the extended projection of $V$. Second, mutation via substitution may account for the tenselessness of Blackfoot as a result of $Dx^{[PERSON]}$ having taken the place of $Dx^{[TENSE]}$ in heading the $DxP$ of the extended projection of $V$ (cf. Ritter and Wiltshko 2009, 2014). Third, mutation via category shift describes the alteration of *ohci-* from $Dx^{[PATH]}$ to $Dx^{[TENSE]}$ in Plains Cree.

The mutation hypothesis advanced here assumes den Dikken’s (2010) theory of the three parallel extended projections of $V$, $N$, and $P$ and allows for transcategorial change to the initial settings of the functional specifications of each extended projection. Accordingly, it may well be viewed as a theory of markedness; all of the phenomena we dealt with in terms of mutation in the preceding pages are arguably marked ones.
Our mutation hypothesis provides a restrictive theory of transcategorial shifts, as it only allows for mutation between the three members of one and the same functional category. For example, changes are predicted to take place across each layer of the spine. To see this, consider (34). We have argued that \( \text{Dx}^{\text{TENSE}} \) mutates to \( \text{Dx}^{\text{PERSON}} \) in Blackfoot, and that \( \text{Dx}^{\text{SPACE}} \) mutates to \( \text{Dx}^{\text{TENSE/PERSON}} \) in Blackfoot and Plains Cree. Other possibilities include mutation from \( \text{C}^{\text{FORCE}} \) to \( \text{C}^{\text{DEF}} \) to \( \text{C}^{\text{SPACE}} \), or from \( \text{Asp}^{\text{EVENT}} \) to \( \text{Asp}^{\text{NUM}} \) to \( \text{Asp}^{\text{SPACE}} \). If only counterpart layers can mutate into each other, then no change is predicted to be possible between the C layer and the Dx layer, or between the Dx and the Asp layer.

\[
\begin{align*}
(34) \quad & \text{a. } [\text{CP } \text{C}^{\text{FORCE}}] \quad [\text{DxP } \text{Dx}^{\text{TENSE}}] \quad [\text{AspP } \text{Asp}^{\text{EVENT}}] \quad [\text{VP } \text{V} \ldots ]]]) \\
& \text{b. } [\text{CP } \text{C}^{\text{DEF}}] \quad [\text{DxP } \text{Dx}^{\text{PERSON}}] \quad [\text{AspP } \text{Asp}^{\text{NUM}}] \quad [\text{NP } \text{N} \ldots ]]]) \\
& \text{c. } [\text{CP } \text{C}^{\text{SPACE}}] \quad [\text{DxP } \text{Dx}^{\text{SPACE}}] \quad [\text{AspP } \text{Asp}^{\text{SPACE}}] \quad [\text{PP } \text{P} \ldots ]]])
\end{align*}
\]

In the mutation analysis proposed here, a language with no PP constituent is a marked but possible option permitted by UG. This option manifests if the P element in a given language lexicalizes a functional head of the extended projection of P that is susceptible to mutation, as with \( \text{Dx}^{\text{SPACE}} \) in Blackfoot.\(^{10}\)

All the mutation phenomena examined in this paper are unidirectional: \( \text{Dx}^{\text{SPACE}/\text{PATH}} \) is the Dx head that undergoes mutation, not the one that other Dx heads mutate towards. At present, we are unsure of whether this is an accident or a fact that points to a deeper generalization. If it is not accidental, it could be taken as confirming the view that P is an emergent (categorically underspecified) default category, along the lines of Emonds (1985) and Déchaine (1993, 2005).

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\(^{10}\) The occurrence of a perfective-denoting morpheme in the N-spine of many languages of the Americas (Goddard 1911, Wolfart 1973, Burton 1997, Wojdak 2008, Haude 2010) suggests that mutation of \( \text{Asp}^{\text{EVENT}} \) to \( \text{Asp}^{\text{NUMBER}} \) is possible in the N-spine. See Nordlinger and Sadler (2004) for discussion and analysis.
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