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Edited by:
Beth Rogers and Anita Szakay

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Beth Rogers and Anita Szakay

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TABLE OF CONTENTS

Preface ……v

HEATHER BLISS, ELIZABETH RITTER, AND MARTINA WILTSCHKO ……..1
A comparison of theme marking in Blackfoot and Nishnaabemwin

CARRIE GILLON ……..12
The mass/count distinction in Innu-aimun: implications for the meaning of plurality

WILL OXFORD ……30
Nominal predication and verbal morphology in Innu-aimun

BETHANY LOCHBIHLER ……...47
Transitivity and animacy mismatches in the Ojibwe finals system: the Cyclic licensing of Person features

SOLVEIGA ARMOSKAITE ……60
On intrinsic transitivity of Blackfoot √verbs

BRONWYN M. BJORKMAN ……..70
Morphology and stress in Nez Perce verbs

RICHARD COMPTON AND CHRISTINE PITTMAN ……...85
Pi as a syntactic pro-form in Inuktitut noun-incorporation and beyond

CARRIE DYCK, MARIE-ODILE JUNKER, AND KELLY LOGAN ……98
Phonetic and phonological evidence for a vowel merger in Southern East Cree

ANALÍA GUTIÉRREZ ……..115
Metathesis in Nivaclé

MICHAEL DAVID HAMILTON, MARIE-ODILE JUNKER, AND MARGUERITE MACKENZIE ……...126
Is there "pragmatic skewing" in East Cree?

ALICE LEMIEUX ……149
Small but significant – body part incorporation in Washo

SUZI LIMA ……157
About the count-mass distinction in Yudja: a description

MEAGAN LOUIE ……165
Variations on vowel devoicing in Northern Paiute

PREFACE

Volume 29 of the University of British Columbia Working Papers in Linguistics (UBCWPL) series presents the Proceedings of the Fifteenth Workshop on Structure and Constituency in Languages of the Americas, which was held at the University of Ottawa in Ottawa, Ontario, Canada, February 4-7, 2010. The first day of this year's conference involved presentations from invited speakers for the Algonquian Syntax Workshop.

The first three papers in the volume (Bliss *et al*, Gillon, Oxford) come from that workshop. The next paper (Lochbihler) is from an invited speaker for the main conference and all following papers are from the main conference (listed in alphabetical order). We would like to thank all the authors for their submissions.

UBCWPL is a regular publisher of the Proceedings of ICSNL; please contact us if you are interested in back issues.

Beth Rogers
Anita Szakay

A comparison of theme marking in Blackfoot and Nishnaabemwin*

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This paper has three goals. The empirical goal is to compare and contrast the morphology and syntax of the direct/inverse systems of two Algonquian languages, Blackfoot and Nishnaabemwin, with an aim to demonstrating that direct/inverse is not a natural class. The analytical goal is to account for the variation observed in the direct/inverse paradigms by proposing that direct/inverse markers are distributed across different syntactic positions. The theoretical goal is to situate our analysis within the context of the parametric substantiation hypothesis, which states that UG supplies a fixed set of functional categories, organized along a universal clausal spine. We argue that direct/inverse marking in Blackfoot and Nishnaabemwin occupies the functional categories of Inner and Outer Aspect, and show how it is functionally equivalent to Viewpoint and Situation Aspect in a Tense-based language like English.

1 Introduction

This paper has three goals: an empirical goal, an analytical goal, and a theoretical goal. Our empirical goal is to compare and contrast the morphology and syntax of the direct/inverse systems in two Algonquian languages, Blackfoot and Nishaabemwin. Our analytical goal is to argue that direct and inverse markers do not form a natural class, and are distributed across different syntactic positions. Finally, our theoretical goal is to situate our analysis in the context of the parametric substantiation hypothesis (Ritter and Wiltschko 2009), and to argue that core instances of direct/inverse marking in both languages are the functional equivalent to Aspect in Tense-based languages such as English.

This paper is organized as follows: In §2, we outline our theoretical assumptions about universal categories and the clausal spine. In §3, we give a comparison of the morphology of the direct/inverse systems of Blackfoot and Nishnaabemwin. Our analysis is in §4, and §5 concludes the paper.

2 Background

Our starting assumption in this paper is that Universal Grammar (UG) supplies a fixed set of functional categories that are ordered along a fixed clausal spine, as in (1).

(1) $[_{CP}$ COMP $[_{IP}$ INFL $[_{AspP}$ Asp_{Vw} $[_{vP}$ *v* $[_{AspP}$ Asp_{Sit} $[_{VP}$ V]]]]]]

We adopt the parametric substantiation hypothesis (Ritter and Wiltschko 2009, henceforth R&W), which states that languages vary in the content they associate with functional categories. For example, R&W argue that whereas in English, the category of INFL is occupied by Tense, this is not necessarily the case for all languages. Halkomelem (Central Salish) and Blackfoot constitute two alternatives, having Location- and Person-based INFL, respectively. The consequence of such a model is that function is independent of content, and this allows for a novel formal typology of categories. In this paper, we adopt this view in our analysis of the Algonquian direct/inverse system, and specifically, we claim that the direct/inverse markers of Blackfoot and Nishnaabemwin instantiate the functional categories of Inner and

* Blackfoot is a Plains Algonquian language spoken in Southern Alberta, and Nishnaabemwin is a Central Algonquian language spoken in Southern Ontario. Unless otherwise cited, Blackfoot data are from the authors' fieldwork with native speakers of the Siksiká and Kainaa dialects, and Nishnaabemwin data are from Valentine (2001). Sincere thanks to Rachel Ermineskin and Beatrice Bullshields for sharing their language with us, and to the audience at the pre-WSLCA 15 Algonquian Syntax Workshop for helpful feedback. All errors are our own.

Outer Aspect, and are functionally equivalent to Viewpoint and Situation Aspect in Tense-based languages such as English.

(2) English: $[_{IP}\ INFL_{\mathbf{Tns}}\ [_{AspP}\ Asp_{Vw}\ [_{vP}\ v\ [_{AspP}\ Asp_{Sit}\ [_{VP}\ V]]]]]$
Bf/Nsh: $[_{IP}\ INFL_{\mathbf{Pers}}\ [_{AspP}\ Asp_{Dir/Inv}\ [_{vP}\ v\ [_{AspP}\ Asp_{Dir/Inv}\ [_{VP}\ V]]]]]$

3 Case studies

In this section, we compare the morphology of the direct/inverse systems in Blackfoot and Nishnaabemwin. Not only do the two languages differ in their marking of direct/inverse, but language-internal variation is observed across orders, or clause types, indicating that direct/inverse is not a natural class.

In the core instances, direct/inverse refers to the marking of interactions between local (1st or 2nd) and non-local (3rd) persons in a transitive verb paradigm. Direct marking is used when a local person is the logical subject or actor and a non-local person is the logical object or goal. Inverse marking is used when the roles are reversed, that is when a non-local person is the actor, and a local person is the goal.

(3) Core instances: {1,2}/3 interactions

Goal → Actor ↓	1,2	3
1,2		direct
3	inverse	

This description is consistent with Klaimann (1992: 227), who defines inverseness as "…a variety of structural organization in which a transitive, non-reflexive predication is specially marked in case a first or second person referent corresponds to a non-subject logical role."

A source of variation in direct/inverse systems is found in extensions to the core pattern observed in (4). Direct/inverse may extend into exclusively local interactions, between 1st and 2nd persons, or exclusively non-local interactions between multiple 3rd persons.[1]

(4) Extensions of the core pattern

Goal → Actor ↓	1	2	3	3'
1		direct	direct	
2	inverse			
3	inverse			direct
3'			inverse	

How these extensions are marked differs not only across languages, but also within a given language, across orders, or across clause types. In what follows, we look first at direct/inverse in the independent order, which is used in matrix clauses, and then in the conjunct order, which is used in subordinate clauses.

3.1 Comparing independent orders

In the independent order, Blackfoot and Nishnaabemwin use cognate morphemes to mark the core instances of the direct and the inverse, as shown in (5) and (6).

[1] Algonquian languages distinguish between multiple 3rd persons morphologically, with the more prominent 3rd person being marked "proximate," and less prominent 3rd persons being marked "obviative." We use the shorthand of 3 and 3' to refer to proximate and obviative 3rd persons, respectively.

(5) Blackfoot

a. *nitsinóáwa*
nit-ino-**aa**-wa
1-see.TA-**DIR**-3S
'I see her/him.'

b. *nitsinóóka*
nit-ino-**ok**-wa
1-see.TA-**INV**-3S
'S/he sees me.'

(6) Nishaabemwin

a. *nwaabmaa*
n-waabm-**aa**
1-see-**DIR**
'I see her/him.'

b. *nwaabmig*
n-waabm-**igw**
1-see-**INV**
'S/he sees me.'

Looking now to the local interactions, we observe that neither Blackfoot nor Nishnaabemwin employs the core morphology for interactions between a 1st person actor and a 2nd person goal:

(7) a. Blackfoot
kitsinóó
kit-ino-**o**
2-see.TA-**1:2**
'I see you.'

b. Nishnaabemwin
gwaabmin
g-waabm-**in**
2-see,TA-**1:2**
'I see you.'

However, Blackfoot seems to use a complex form, consisting of the core inverse *–ok* plus a suffix *–i*, in instances with a 2nd person actor and a 1st person goal.

(8) Blackfoot
kitsinóóki
kit-ino-**ok-i**
2-see.TA-**INV-2:1**
'You see me.'

Nishnaabemwin marks this same interaction with a simplex form, *-i*, identical to the second part of the complex form used for Blackfoot 2:1 interactions.

(9) Nishnaabemwin
*gwaabm_*
g-waabm-**i**
2-see-**2:1**
'You see me.'

Thus, core marking is partly extended to local interactions in Blackfoot, but not Nishnaabemwin. The opposite is true of the non-local extensions where Nishaabemwin employs the core direct marker for 3:3' interactions, but Blackfoot employs a unique form, *-yii*.

(10) a. Blackfoot
íínooyiiwa
ii-ino-**yii**-wa
IC-see.TA-**3:3'**-3S
'S/he$_{PROX}$ sees him/her$_{OBV}$.'

b. Nishnaabemwin
wwaabmaan
w-waabm-**aa**-n
3-see-**DIR**-3S
'S/he$_{PROX}$ sees him/her$_{OBV}$.'

Note that, in addition to the difference in direct theme marking, Nishnaabemwin, but not Blackfoot, has a 3rd person prefix, as shown in (10). This differs from the inverse, where both languages mark 3rd person with a prefix. Both languages also use the core inverse marker, as shown in (11).

(11) a. Blackfoot
otsinóóka
ot-ino-**ok**-wa
3-see.TA-**INV**-3S
'S/he$_{OBV}$ sees him/her$_{PROX}$.'

b. Nishnaabemwin
wwaabmigoon
w-waabm-**igw**-aan
3-see-**INV**-3OBV
'S/he$_{OBV}$ sees him/her$_{PROX}$.'

The final difference to be noted is that, whereas Blackfoot does not permit inanimate actors, Nishnaabemwin does. Here, too, the core inverse marker is used, as shown in (12):

(12) a. Blackfoot
otsinóóka
ot-ino-ok-wa
3-see.TA-INV-3S
*'It sees him/her.'
'S/he$_{OBV}$ sees him/her$_{PROX}$.'

b. Nishnaabemwin
wwaabmigon
w-waabm-**igw**-an
3-see-**INV**-3OBV
'It sees him/her.'
(cf. *wwaabmigoon*
'S/he$_{OBV}$ sees him/her$_{PROX}$')

The complete transitive animate paradigms for independent order verbs in Blackfoot and Nishnaabemwin are given in (13) and (14) below, where yellow indicates that the morphological marking differs from the core instances.

(13) Blackfoot TA independent order paradigm

Goal → Actor ↓	1	2	3prox	3obv
1		**o**	aa	aa
2	ok **i**		aa	aa
3prox	ok	ok		**yii**
3obv	ok	ok	ok	
3inan				

(14) Nishaabemwin TA independent order paradigm

Goal → Actor ↓	1	2	3prox	3obv
1		**iN**	aa	aa
2	**i**		aa	aa
3prox	igw	igw		aa
3obv	igw	igw	igw	
3inan	igw	igw	igw	igw

Comparing these two paradigms, we see that the languages pattern similarly in the core pattern, but differ with respect to the extensions to the core pattern. In particular, the core marking is extended to 2:1 and 3':3 interactions in Blackfoot, but to all non-local interactions in Nishnaabemwin. Furthermore, whereas Nishnaabemwin marks 3rd person prefixally in all non-local interactions, Blackfoot does so only in the non-local inverse. Nishnaabemwin also permits inanimate actors, whereas Blackfoot does not. In the following section, we compare the TA paradigms in the conjunct order, which differs in significant ways from the independent order.

3.2 Comparing conjunct orders

Whereas independent order clauses are used in matrix contexts, conjunct order clauses are used in subordinate contexts in both Blackfoot and Nishaabemwin. Both languages show differences between the independent and conjunct orders in the exponent of direct/inverse.

First considering interactions between local and non-local participants, Blackfoot uses the same core direct marker found in the independent order. Nishaabemwin, on the other hand, has a null morpheme for the direct theme in the conjunct order.

(15) a. Blackfoot
...nitsinowaahsi
nit-ino-**aa**-his
1-see.TA-**DIR**-CONJ
'(when) I see her'

b. Nishnaabemwin
…waabmag
waabm-∅-ag
see-**DIR**-3S
'(if) I see her'

Note also that the person prefix is retained in the conjunct order in Blackfoot, but not Nishnaabemwin. Further, Blackfoot has a dedicated conjunct order morpheme, but Nishaabemwin does not. These two differences are found throughout the conjunct paradigms.

Neither language uses the core morphology to mark the inverse in the conjunct order. In Blackfoot, the same suffix that marks 3:3' interactions in the independent order marks the core inverse in the conjunct (i.e. 3:2/1), and in Nishnaabemwin, the two suffixes that mark local interactions are used for the core inverse, with the form varying depending on whether the goal is 1st or 2nd person.

(16) Blackfoot
…nitsinoyssi
nit-ino-**yii**-hsi
1-see.TA-**3:1**-CONJ
'(when) s/he sees me'

(17) Nishnaabemwin

a. *...waabmid*
waabm-**i**-d
see-**3:1**-3S
'(if) s/he sees me'

b. *...waabmik*
waabm-**iN**-g
see-**3:2**-3S
'(if) s/he sees you'

Turning to the local extensions, we see that, in both languages, they are marked with the same morphology as in the independent order.

(18) Blackfoot

a. *...kitsinoohsi*
kit-ino-**o**-hsi
2-see.TA-**1:2**-CONJ
'(when) I see you'

b. *...kitsinookssi*
kit-ino-**ok-i**-hsi
2-see.TA-**INV-2:1**-CONJ
'(when) you see me'

(19) Nishnaabemwin

a. … *waabminaan*
waabm-**iN**-aan
see-**1:2**-1
'(if) I see you'

b. … *waabmiyan*
waabm-**i**-yan
see-**2:1**-2
'(if) you see me'

In the non-local extensions, the core direct marker is used to mark non-local direct in both Blackfoot and Nishnaabemwin. However, there are differences in the inverse: the non-local inverse is marked with the core inverse marker in Nishnaabemwin, whereas in Blackfoot it is marked with *–yii*, the same suffix used to mark non-local direct in the independent order.

(20) Blackfoot

a. *...otsinowaahsi*
ot-ino-**aa**-hsi
2-see.TA-**1:2**-CONJ
'(when) she$_{PROX}$ sees him$_{OBV}$'

b. *… otsinooyssi*
kit-ino-**yii**-hsi
2-see.TA-**3':3**-CONJ
'(when) he$_{PROX}$ sees her$_{OBV}$'

(21) Nishnaabemwin

a. *… waabmaad*
waabm-**aa**-d
see-**DIR**-3
'(if) she$_{PROX}$ sees him$_{OBV}$'

b. *… waabmigod*
waabm-**igw**-d
see-**INV-3**
'(if) he$_{PROX}$ sees her$_{OBV}$'

The paradigms for TA conjunct order verbs are given in (22) and (23).

(22) Blackfoot TA conjunct order paradigm

Goal → Actor ↓	1	2	3prox	3obv
1		o	aa	aa
2	ok -i		aa	aa
3prox	yii	yii		aa
3obv	yii	yii	yii	

(23) Nishaabemwin TA conjunct order paradigm

Goal → Actor ↓	1	2	3prox	3obv
1		iN	--	--
2	i		--	--
3prox	i	iN		aa
3obv	i	iN	igw	

3.3 More variation

In the preceding subsections, we observed that Algonquian direct/inverse marking varies both across languages and across clause type (i.e. order). In addition to variation in direct/inverse marking, there is variation in the distribution of person prefixes, as summarized in (24).

(24) Distribution of person prefixes in Blackfoot and Nishnaabemwin

	Blackfoot		Nishnaabemwin	
	independent	conjunct	independent	conjunct
1:2	kit-	kit-	g-	--
2:1				
2:3	kit-	kit-	g-	--
3:2				
1:3	nit-	nit-	n-	--
3:1				
3:3'	--	ot-	w-	--
3':3	ot-			

Further, there is variation in the morphological marking of order, or clause type; Blackfoot marks both conjunct and independent orders overtly, whereas Nishaabemwin does not. First regarding the conjunct, the examples in the preceding section showed the Blackfoot conjunct being marked with the complex morpheme *–hsi* (*-hs* + *-yi*, Frantz 1991, p.110), with no counterpart in Nishnaabemwin. Independent order

is evident in Blackfoot's TI paradigm and in its TA paradigm with plural arguments, but not in its TA paradigm with singular arguments, as shown in (25).

(25) a. Bf sg. independent – TA
kitsinooki
kit-ino-ok-i-∅
2-see.TA-INV-2:1-**IND**
'You see me.'

b. Bf sg. independent - TI
kitsinihp
kit-ini-**hp**
2-see.TI-**IND**
'You see it.'

c. Bf pl independent – TA
kitsinookihpinnaan
kit-ino-ok-i-**hp**-innaan
2-see.TA-INV-2:1-**IND**-1PL
'You see us (excl).'

d. Bf pl conjunct - TA
kitsinookssinnaani
kit-ino-ok-i-**hs**-innaan-**yi**
2-see.TA-INV-2:1-**CONJ**-1PL-**CONJ**
'…(when) you see us'

To summarize, the direct/inverse systems of Blackfoot and Nishnaabemwin do not form a natural class. We have shown that the formal properties of direct/inverse differ both across languages and within a given language. This variation tells us that the morphological template is misleading, because it leads to an illusion of uniform function. Direct/inverse is standardly defined as signalling the mapping from a hierarchy of semantic roles (e.g. AGENT) to a hierarchy of participant roles (PERSON). However, if we accept that these hierarchies are not grammatical primitives, then this function cannot be a primitive either. In the next section, we develop an account of the variation we have observed here.

4 The sources of variation in the Algonquian direct/inverse

The starting point for our analysis is the claim that direct/inverse markers are not a natural class, and that they are distributed across different syntactic positions. This itself is not a new idea; Brittain (1999) claims that direct marking in Western Naskapi is associated with AgrS and inverse with AgrO, and Déchaine and Reinholtz (1997) argue that in Plains Cree, the direct theme sign associates with the VP and the inverse theme sign associates with the IP.

Although similar in spirit, our analysis diverges from those of Brittain and Déchaine and Reinholtz by focusing on the division between the core pattern of direct/inverse (interactions between local and non-local participants) and the extensions to this pattern (exclusively local or non-local participants, or in the case of Nishnaabemwin, interactions involving inanimate actors). Specifically, we claim that the core pattern involves Point-of-View (POV), which we analyse as an aspectual head located above *v*P and that the extensions to the core pattern are agreement morphemes realized elsewhere.

In section 3 we observed uniformity in the core pattern and variability in the extensions. In subsection 4.1, we develop an analysis of the theme marking as the expression of POV for core instances, i.e. for local-non-local interactions. In subsection 4.2, we develop analyses for instances where theme marking is used to signal other types of interactions. We propose that these extensions realize one of the functional heads below POV – either *v* or a *v*P-internal Aspect.

(26) a. $[_{IP}$ Spec INFL $[_{AspP}$ Spec Asp_{VW} $[_{vP}$ Actor *v* $[_{AspP}$ Asp_{sit} $[_{VP}$ V Goal]]]]]

b. $[_{IP}$ Spec INFL $[_{AspP}$ Spec Asp_{POV} $[_{vP}$ Actor *v* $[_{AspP}$ Asp_2 $[_{VP}$ V Goal]]]]]
⇑ ⇑ ⇑
Core Dir/Inv Extended Dir/Inv

For reasons of space, we cannot provide an analysis of all non-core instances here, as the patterns vary depending on person, order and language.

4.1 Core Pattern: theme marker is POV

The core pattern of theme marking occurs in the Independent Order in both Blackfoot and Nishnaabemwin: A direct theme (*–aa* in both Blackfoot and Nishnaabemwin) signals an interaction between a local (1st or 2nd person) actor and a non-local (3rd animate) goal; an inverse theme (Blackfoot *–ok*, Nishnaabemwin *–igw*) signals an interaction between a non-local actor and a local theme. De Lancey (1981: 653) suggests that this pattern constitutes a type of viewpoint aspect that alternates with the more familiar temporal-based system:

> The two endpoints of an event vector are simultaneously points in space, points in time, and entities in the universe of discourse. The EH-split [empathy hierarchy; HB,BR,MW] pattern assigns viewpoint on the basis of the identities of the occupants of the two endpoints of the event vector; the typical pattern is one in which viewpoint placement is deictically constrained, so that it must be placed at the endpoint occupied by a SAP [speech act participant; HB,BR, MW] if possible. The aspectual split pattern assigns viewpoint with respect to the temporal aspect of the event vector, with terminal viewpoint corresponding to the attainment of the terminal point by the actors in the event.

We propose to formalize this insight as follows: Core direct/inverse marking is realized in the functional head, Point-Of-View Aspect (POV), which is located immediately above *v*. This is the same category that realizes temporal viewpoint aspect. As POV, this category indicates whether the actor role coincides with a discourse role, i.e. whether the same entity bears both roles. Direct marking indicates that the actor coincides with a local discourse role while inverse marking indicates that it does not.

4.2 Extended patterns: theme marker is agreement

From a morphological perspective, extended patterns of theme marking are similar to core patterns. They use the same forms, and compete with core theme marking for a single affix position within the verb. Nevertheless, we propose that they have different functions, and consequently realize categories other than POV. More specifically, we analyse extended patterns as instances of agreement expressed as functional categories below POV. We focus here on several cases that clearly support this view.

4.2.1 Extension #1: theme markers as Inner Aspect or *v* in Nishnaabemwin Conjunct Order

We consider first the Nishnaabemwin TA conjunct order paradigm. In this paradigm, a 1st person goal requires the theme marker *–i*, and a 2nd person goal requires the theme marker *–iN).*[2] Thus, these two morphemes are clearly instances of object agreement. We propose that *–i* and *-iN* are realizations of an 'inner' aspectual head below *v*, which we label Asp_2 (cf. Travis 1991). In tense-based languages, Asp_2 signals telicity, i.e. whether the event has an inherent endpoint, expressed as a grammatical object. In a person-based language Asp_2 indicates whether the goal bears a local (1st or 2nd person) discourse role. In the Nishnaabemwin conjunct order Asp_2 checks features of a 1st or 2nd person goal; otherwise it is not activated.

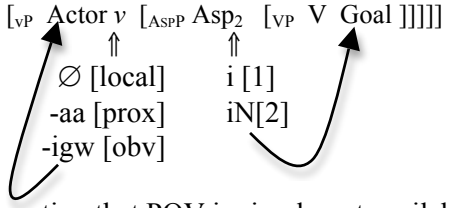
What about 3rd person goals? In the Nishnaabemwin conjunct order, if the goal of a TA verb is 3rd person, choice of theme marker depends on the actor: If the actor is local, then the theme marker is null; if the actor is 3rd proximate, then the theme marker is *–a* and if the actor is 3rd obviative, the theme marker is*–igw*. This is clearly not a case of object agreement, and hence not Asp_2. The fact that the core instances involving a local actor and non-local goal have no overt theme marker suggests that it is also not POV. We propose that these instances are expressions of subject agreement in *v*, the light verb that selects the external argument of the verb.

[2] There is one exception to this generalization: Theme marking is always *–igw* if the actor is inanimate. See 4.2.3 for discussion and analysis.

In short, theme marking in the Nishnaabemwin conjunct order realizes either Asp_2 or *v*, depending on the person specification of the object (goal). We attribute this to a spell-out restriction that prohibits the co-occurrence of goal and actor agreement. This restriction is implemented as follows: If theme marking can express 1st or 2nd person goal agreement, then it must do so, otherwise it signals actor agreement, as shown in (27):

(27) Nishnaabemwin Conjunct Order

$[_{IP}$ Spec INFL $[_{AspP}$ Spec Asp_{POV} $[_{vP}$ Actor *v* $[_{AspP}$ Asp_2 $[_{VP}$ V Goal]]]]]



Implicit in this analysis is the assumption that POV is simply not available in a clause with a conjunct order verb. We attribute this to the fact that conjunct order verbs are only used in embedded clauses. Recall that the function of POV is to relate event roles to discourse roles, and as such it is activated in root clauses, where reference of the event is calculated relative to the utterance (discourse), but not in embedded clauses, where the reference of the event is dependent on a higher clause.

4.2.2 Extension #2: theme markers as Inner Aspect or *v* in Nishnaabemwin Independent Order

Next we turn to the Nishnaabemwin independent order paradigm with strictly local interactions. As in the conjunct order, the choice of theme marking depends on the person specification of the goal, and in fact the same forms are used in both paradigms, i.e. theme marking for a 1st person goal is consistently *–i* and for a 2nd person goal, *-iN*. Extending the analysis developed in the last subsection, these are the same object agreement markers, realized in Asp_2 rather than POV.

Similarly, the Nishnaabemwin TA independent order paradigm, theme marking for strictly non-local interactions takes the same form as in the conjunct order, i.e. if the actor is 3rd proximate, then the theme marker is *–a*, and if the actor is 3rd obviative, the theme marker is*–igw*. Again, we extend the analysis of the last subsection, proposing that these are the same subject agreement markers, and that they are realized in *v*, rather than POV.

Comparing the two paradigms we observe that only local: non-local interactions in the independent order exhibit the core pattern of theme marking, and, thus, that only these interactions are realized by theme marking in POV. All other instances of theme marking in Nishnaabemwin are realizations of agreement in *v* or Asp_2. Spell-out restrictions block multiple theme marking on a single verb, and choice among the three options (POV, *v* and Asp_2) depends on both order and person specification of the actor and goal.

4.2.3 Extension #3: Inanimate Actor agreement in Nishnaabemwin (but not Blackfoot)

One of the striking differences between Blackfoot and Nishnaabemwin is that only the latter permits inanimate actors. We assume that POV is present whenever there are two potential point-of-view holders, i.e. two animate participants to be ordered. In order to account for this contrast, we now propose that the distribution of POV is different in the two languages: In Blackfoot, POV is always projected in the context of TA verbs, and as a consequence, TA verbs require both animate goals and animate actors.

In Nishnaabemwin, on the other hand, POV is optional in the context of TA verbs, and is in fact not projected if the actor is inanimate. As noted in section 3, in both the independent and conjunct orders, theme marking is *–igw* whenever there is an inanimate actor and an animate goal. This cannot be POV because the referent of an inanimate DP can never be a point-of-view holder. Similarly, it is clearly not Asp_2 because the form does not vary with person specification of the goal. The only logical conclusion to be drawn is that *–igw* must be the realization of inanimate subject agreement in *v*. This constitutes an exception to the generalization that the form of theme marking in the Nishnaabemwin conjunct order is always *-i* if the goal is 1st person and *–iN* if it is 2nd person.

We propose to account for this exception as follows: Suppose that both aspectual categories, POV and Asp_2 are optional in Nishnaabemwin, and that they are only included in the structure when there are two potential point-of-view holders. Since inanimate actors are not potential point-of-view holders, neither will be available in this context. This leaves only *v*, which realizes actor agreement, and if the actor is inanimate, then the form of this agreement is *–igw*.

4.2.4 Extension #4: theme markers as Inner Aspect in Blackfoot

Evidence in support of the hypothesis that POV is obligatorily projected in Blackfoot may be gathered from the investigation of strictly local interactions. As we saw in section 3, the extended patterns of theme marking in Blackfoot consistently differ from those of Nishnaabemwin. With respect to interactions between 1st and 2nd person participants, there is no difference between the independent and conjunct orders: Events involving a 1st person actor and a 2nd person goal require the theme marker *-o* in both paradigms; events involving a 2nd person actor and a 1st person goal require *–oki*. Extending our analysis of Nishnaabemwin local interactions, we analyse these theme markers as realizations of Asp_2, the aspectual category which indicates whether the goal bears a local (1st or 2nd person) discourse role. In Blackfoot, as in Nishnaabemwin, Asp_2 checks features of a 1st or 2nd person goal; otherwise it is not activated.

We note that the theme marker *–oki* appears to consist of the inverse marker *-ok* and a cognate of the Nishnaabemwin 1st person goal theme marker *–i*. However, the evidence suggests that in fact this is best analysed as a single morpheme which simply marks 1st person goal agreement, rather than a bimorphemic element consisting of both POV and Asp_2. While it is tempting to treat *-oki* as having these two constituents, this would comprise the only exception to what is otherwise a strict ban on the co-occurrence of POV and Asp_2, and then the question is why this should be. More significantly, this would constitute the only exception to the generalization that inverse marking in POV is impossible in the context of a local actor. Given our assumption that local actors are inherent point-of-view holders, such an exception is highly problematic, leading us to reject this possibility.

4.2.5 Extension #5: theme markers as *v* in Blackfoot

As in Nishnaabemwin, Blackfoot uses *v* to express agreement with non-local (3rd person) actors. In the conjunct order, *v* is realized as *yii* in two contexts: (i) when the actor is 3rd person and the goal is 1st or 2nd, and (ii) when the actor is 3rd obviative and the goal 3rd proximate. The fact that goal agreement is not expressed in these contexts indicates that there are spell-out restrictions, as in Nishnaabemwin. However, the content of this restriction is different in Blackfoot: If theme marking can express 3rd person actor agreement, then it must do so; otherwise it signals goal agreement.

There is an exception to this generalization: The theme marker *–aa*, which is also found in the core paradigm with a local actor and a 3rd person goal, is used in the conjunct order when the actor is 3rd person proximate and the goal 3rd person obviative. Can this also be analysed as a case of subject agreement? We leave this question for future research.

4.3 Summary

In short, our analysis of theme marking as either viewpoint aspect or related agreement marking provides insight into both the uniformity and variability observed within and across the two Algonquian languages in this case study. We observed uniformity in the 'core patterns' of theme marking involving a local actor and a non-local goal . On our analysis, all are realizations of POV (viewpoint aspect). We also observed variability in the 'extended patterns' of theme marking both between Nishnaabemwin and Blackfoot and within each language. The extended patterns are not POV, but alternate between subject agreement in *v* and object agreement in inner aspect. The variation in the extended patterns is due to choice between these two options, which we attribute to different spell-out restrictions, and to optionality or obligatoriness of the category POV.

5 Conclusion

In conclusion, this paper develops an analysis of the Algonquian direct/inverse that situates it within the context of a universal clausal spine, with direct and inverse morphology being distributed across different syntactic positions. The evidence suggests that core instances of direct-inverse marking are participant-based viewpoint aspect (POV), while extensions are agreement and are realized in lower functional heads – either *v* or inner aspect. Thus, the morphological template is misleading, because it leads to an illusion of uniform function among the different direct/inverse markers, all of which occupy the same position in the inflected verb.

The categorization of core direct/inverse marking as viewpoint aspect also provides additional support for the parametric substantiation hypothesis (Ritter and Wiltschko 2009), in that the content of viewpoint aspect is participant-based in Blackfoot and Nishnaabemwin, rather than temporally-based, as in English. The methodological implication of this approach is that if a language appears to lack a certain category, then we cannot assume that it lacks the functional head typically associated with it. Rather, we can seek a category with the same function but different substantive content.

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The mass/count distinction in Innu-aimun: implications for the meaning of plurality[1]

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In this paper, I address two questions: i) whether Innu-aimun makes a distinction between mass and count nouns, and ii) whether the plural in Innu-aimun has the same denotation as plural in better-known languages like English. These questions are inter-dependent: that is, the answer to the first has implications for the second. I argue that, contrary to appearances, Innu-aimun does, in fact, have a mass/count distinction. I further argue that there are two plurals in Innu-aimun: one that has the same semantics as the plural in English and one that has a very different semantics, something more akin to "lots of x".

1 Introduction

In this paper, I argue that despite all outward appearances, Innu-aimun[2] has a mass/count distinction. This distinction is only apparent when numerals and certain quantifiers are used with mass nouns. I further argue that the plural in Innu-aimun must be associated with a different semantics than that of the plural in English.

1.1 The problem

Algonquian languages (including Innu-aimun) do not appear to distinguish between count and mass nouns. Many ontologically mass nouns can be pluralized in Innu-aimun (1), Ojibwe (2) (Rhodes 1990, Mathieu 2007, 2009) and Blackfoot (3) (Wiltschko 2009a, b).

(1) Innu-aimun

a.	b.	c.	d.
mik^{u}	miku-a	pimî	pimî-a[3]
blood	*blood-inan.pl*	*oil*	*oil-inan.pl*[4]
'blood'	'lots of blood'	'oil'	i) 'amounts of oil'
			ii) 'lots of oil'

(2) Ojibwe

a.	b.	c.	d.	
waabigan	waabigan-ag	bkwezhgan	bkwezhgan-an	
clay	*clay-an.pl*	*bread*	*bread-inan.pl*	
'clay'	'clays'	'bread'	'breads'	(Mathieu 2007)

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[2] Innu-aimun is also known as Montagnais, and is part of the dialect continuum of Cree (MacKenzie 1980).

[3] All data is from original fieldwork, unless otherwise noted.

[4] I use the following abbreviations: 1 = first person, 2 = second person, 3 = third person, 3' = obviate third person, AI = animate intransitive, an = animate, II = inanimate intransitive, inan = inanimate, past = past tense, pl = plural, sg = singular, TA = transitive animate, and TI = transitive inanimate.

(3) Blackfoot

a.	b.	c.	d.	
aaapan	aaapa-istsi	isstsskáán	isstsskä-istsi	
blood	*blood-pl*	*dust*	*dust-pl*	
'blood'	'bloods'	'dust'	'dust' (pl)	(Frantz & Russell 1989)

Algonquian languages in general do not appear to distinguish between count and mass nouns. In fact, on the basis of data like that in (1)-(3), Rhodes (1990) and Wiltschko (2009a, b) both argue that Algonquian languages do not make any grammatical distinction between mass and count nouns.

> "In Ojibwa there is no grammatical distinction like the mass/count distinction of Indo-European. Thus *mkwam* can equally mean 'ice' or 'piece of ice'. *Nbiish* can mean 'water' or 'an amount of water'." (Rhodes 1990: 153)

The question is whether this is in fact true, at least in Innu-aimun.

1.2 The data

Certainly, on the surface, it appears that Innu-aimun lacks a grammatical distinction between count and mass. There is no known mass noun in Innu-aimun which cannot be pluralized.[5] (See §4 for more data.)

(4) inanimate mass nouns

a.	b.
nekâu/nekâu-*a*	neneu/neneu-a
sand/sand-inan.pl	*breath/breath-inan.pl*

(5) animate mass nouns

a.	b.
kûn/kûn-at	mishkumî/mishkumî-at
snow/snow-an.pl	*ice/ice-an.pl*

Mathieu (2007, 2009) argues that Ojibwe makes a grammatical distinction between count and mass nouns on the basis of the fact that some mass nouns resist pluralization. However, no mass nouns in Innu-aimun resist pluralization. We will need to look at different phenomenon to see that the distinction is maintained in Innu-aimun.

1.3 The outline of the paper

In §2, I provide background on the morpho-syntax of Innu-aimun. In §3, I describe the mass/count distinction, and discuss some of the diagnostics for testing for the distinction. In §4, I apply the diagnostics to Innu-aimun and show that Innu-aimun does indeed have a mass/count distinction. In §5, I show what implications this has for the semantics of plural in Innu-aimun. In §6, I discuss an alternative view. §7 concludes the paper.

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[5] Even proper names can be pluralized.

(i)	(ii)
Mânî	Mânî-at
Mary	*Mary-an.pl*
'Mary'	'Marys'

There are, however, a few abstract nouns which cannot be pluralized.

(iii)	(iv)	(v)	(vi)
kuakateun	??kuakateun-a	tshishîkushun	*tshishîkushun-a
hunger	*hunger-inan.pl*	*sleepiness*	*sleepiness-inan.pl*
'hunger'		'sleepiness'	

2 Background on Innu-aimun

Innu-aimun is a dialect of Montagnais spoken in Labrador and Quebec, Canada. The speakers I worked with lived in St Johns, NL or in Sheshatshiu, NL. Innu-aimun-Montagnais is spoken by approximately 11,000 people, and by fewer than 1,600 in Labrador (Statistics Canada 2006); children are still acquiring the language.

2.1 Polysynthesis and word order

Innu-aimun is a polysynthetic language. Both subject and object are marked on the verb. In (6), the first person singular subject is marked on the verb via the prefix *ni-* and the suffix *-u*.[6] The prefix *ni-* indicates that the subject is first person, and the suffix *-u* indicates that the object is third person (proximate or obviative).[7]

(6) Mashk^{u} ni-pâssu-â-u anûtshîsh.
bear 1-shootTA-dir-3 today
'I shot a bear today.'

Word order is fairly free.[8]

(7) a. Atîk^{u} pimût-eu. (SV)
caribou walkAI-3sg
'A caribou was walking.'

b. Pimût-eu atîk^{u}. (VS)
walkAI-3sg caribou
'A caribou was walking.'

(8) a. Namesh-a mu-euat mashku-at. (OVS)
fish-3' eatTA-3pl>3' bear-an.pl
'Bears were eating fish.'

b. Namesh-a mashku-at mu-euat. (OSV)
fish-3' bear-an.pl eatTA-3pl>3'
'Bears were eating fish.'

c. Mu-euat mashku-at namesh-a. (VSO)
eatTA-3pl>3' bear-an.pl fish-3'
'Bears were eating fish.'

d. Mu-euat namesh-a mashku-at. (VOS)
eatTA-3pl>3' fish-3' bear-an.pl
'Bears were eating fish.'

e. Mashku-at mu-euat namesh-a. (SVO)
bear-an.pl eatTA-3pl>3' fish-3'
'Bears were eating fish.'

[6] The suffix *-â-* is the direct theme sign, signaling that highest person on the person hierarchy is the subject, and the lowest person is the object (Goddard 1966). The person hierarchy is as follows: 2 > 1 > 3 > 3'. In this case, first person outranks third, so the subject is first person.
[7] The lack of a plural marker entails that both the subject and object are singular.
[8] It is likely that there are restrictions on word order, arising from focus or discourse considerations. For example, (7)b focuses on the walking, rather than on the caribou. A study of word order is beyond the scope of this paper.

f. Mashku-at namesh-a mu-euat. (SOV)
bear-an.pl fish-3' *eatTA-3pl>3'*
'Bears were eating fish.'

2.2 Animacy

All nouns in Innu-aimun (and in Algonquian in general) are classified as either inanimate or animate. The plural animate suffix is *-at* and the plural inanimate suffix is *-a*.

(9) a. mashk[u] b. masku-at c. shîpu d. shîpu-a
bear *bear-an.pl* *river* *river-inan.pl*
'bear' 'bears' 'river' 'rivers'

e. mînûsh f. mînûsh-at g. utâpân h. utâpân-a
cat *cat-an.pl* *car* *car-inan.pl*
'cat' 'cats' 'car' 'cars'

There are four verb types in Algonquian in general and Innu-aimun in particular.

	inanimate	animate
transitive	TI	TA
intransitive	II	AI

Table 1. The four types of verbs in Algonquian

All verbs agree with one of their arguments with respect to animacy. Intransitive verbs agree with the animacy of their subject. Transitive verbs agree with the animacy of their objects – at least when the object is animate. An example of each type of verb is given in (10).

(10) a. Uîk-an nashûp.
deliciousII-3 *soup*
'The soup is delicious.'

b. Uîtshit-u namesh.
deliciousAI-3 *fish*
'The fish is delicious.'

c. Mashku-at namesh-a mu-euat.
bear-an.pl fish-3' *eatTA-3pl>3'*
'Bears were eating fish.'

d. Suzie mîtshî-pan nashûp-inu.
Suzie eatTI-3>3'.past *soup-sg.inan.obv*
'Suzie ate the soup.'

Things get more complicated when the object is inanimate. In this case, the verb may agree with the object (resulting in a morphologically TI verb, as in (10)d), or with the subject (resulting in a morphologically AI verb; also called a pseudo-transitive, as in (11)).

(11) Niueueshîtân utâpâna.
ni-ueuesh-ît-â-n utâpân-a
1-repair-caus-AI-1 car-pl.inan
'I am repairing the cars.' (Brittain 1993: 24) [9]

2.3 Obviation

Innu-aimun, like other Algonquian languages makes a distinction between the "important" third person (proximate) vs. all other third persons (obviative) (Bloomfield 1958, Wolfart 1973). There are two obviative markers: animate (singular and plural) *-a* and inanimate *-inu* (Brittain 1993).

(12) a. Mashku-at namesh-a mu-euat.
bear-an.pl fish-3' eatTA-3pl>3'
'Bears were eating fish (sg or pl).'

b. Suzie mîtshî-pan nashûp-inu.
Suzie eatTI-3>3'past soup-inan.obv
'Suzie ate the soup.'

Inanimate obviatives can also be pluralized.

(13) Mâni mishkam^{u} assîkunua. (Brittain 1993: 32)
Mâni mishk-am^{u} assîku-inu-a
Mary findTI-3>3' pot-inan.obv-pl
'Mary finds some pots.'

3 The mass/count distinction

As is well known, mass nouns behave semantically and syntactically different from count nouns in languages like English (Chierchia 1998). There are a number of grammatical processes that distinguish between the two types of nouns: plurality, the need to occur with a measure phrase (or classifier), the (in)ability to occur with numerals without a measure phrase, and the (in)ability to occur with certain determiners or quantifiers.

Count nouns can be pluralized; mass nouns cannot (without coercion).

(14) a. count: car/cars, chair/chairs, elephant/elephants, desk/desks
b. mass: blood/*bloods, oil/*oils, furniture/*furnitures, rice/*rices

Only count nouns can co-occur with numerals without a measure phrase.

(15) a. count: one car, one chair, one elephant, one desk
two cars, two chairs, two elephants, two desks

b. mass: *one blood, *one oil, *one furniture, *one rice
*two bloods, *two oils, *two furnitures, *two rice

one pint of blood, one bottle of oil, one piece of furniture, one cup of rice

[9] I have modified Brittain's glosses and orthography in (11) and all subsequent examples to be consistent with the glosses and orthography used throughout this paper.

Some determiners and quantifiers only occur with count nouns (16)a, while others only occur with mass nouns (16)b.

(16) a. count: a car, many cars
mass: *a blood, *many blood(s)

b. count: *little car, *much car
mass: little blood, much blood

Only some of the diagnostics for the mass/count distinction are relevant to Innu-aimun: (i) count nouns can be pluralized; mass nouns cannot (without coercion), (ii) numerals can only co-occur with count nouns, and (iii) some determiners and quantifiers only occur with count/only occur with mass nouns. As we will see, while plurality does not distinguish between count and mass nouns, numerals and other quantifiers do.

4 The mass/count distinction in Innu-aimun

The mass/count distinction is not obvious in Innu-aimun. In this section, I show that while all nouns can be pluralized, the mass/count distinction does present itself in certain contexts.

4.1 Plurality

Most count nouns[10] (17) and all mass nouns ((18) and(19)) can be pluralized.

(17) count nouns

a. atîk^{u}/atîku-at
caribou-caribou-an.pl

b. namesh/namesh-at
fish-fish.an.pl

c. nâpeu/nâpeu-at
man/man-an.pl

d. âshûkan/âshûkan-a
bridge/bridge-inan.pl

e. pâushtik^{u}/pâushtiku-a
waterfall/waterfall-inan.pl

f. metuâkan/metuâkan-a
toy/toy-inan.pl

(18) inanimate mass nouns

a. nekâu/nekâu-a
sand/sand-inan.pl

b. neneu/neneu-a
breath/breath-inan.pl

c. mashkushu/mashkushu-a
grass/grass-inan.pl

d. mîtshim/mîtshim-a
food/food-inan.pl

e. nîpîsh/nîpîsh-a
tea/tea-inan.pl

f. mît/mît-a
firewood/firewood-inan.pl

[10] Speakers resist pluralizing words like *tshisâminitû* ‘god’ and *mitshiminitû* ‘devil’, as well as abstract nouns, as discussed in footnote 3.

g. shîtâkunâpui/shîtâkunâpui-a
beer/beer-inan.pl

h. uiâsh/uiâsh-a[11]
meat/meat-inan.pl

i. ishkuteu/ishkuteu-a
fire/fire-inan.pl

j. pâkueshikan/pâkueshikan-a
bread/bread-inan.pl

k. nipî/nipî-a
water/water-inan.pl

l. shûminâpui/shûminâpui-a
wine/wine.inan.pl

m. matshunish/matshunish-a
clothing/clothing-inan.pl

n. uepinâshun/uepinâshun-*a*
garbage/garbage-inan.pl

o. shîutâkan/shîutâkan-a
salt/salt-inan.pl

p. nashûp/nashûp-a
soup/soup-inan.pl

q. kâshîuâsht/kâshîuâsht-a
sugar/sugar-inan.pl

r. âmû-kâshîuâsht/âmû-kâshîuâsht-a
honey/honey-inan.pl

s. kâuîshâuâuat ashinî
yellow rock
'gold'

t. kâuîshâuâuat ashinî-a
yellow rock-inan.pl
'nuggets of gold'

u. assî/assî-a
earth~land~moss~ground/earth~land~moss~ground-inan.pl

v. uâpitsheushkamik^{u}/uâpitsheushkamiku-a
moss/moss-inan.pl

(19) animate mass nouns

a. kûn/kûn-at
snow/snow-an.pl

b. mishkumî/mishkumî-at
ice/ice.an.pl

c. ashissu/ashissu-at
clay/clay-an.pl

d. kashkuan/kashkuan-at
cloud/cloud-an.pl

e. tûtûshinâpui/tûtûshinâpui-at
milk/milk-an.pl

Innu-aimun nouns can almost always be pluralized (and seemingly all mass nouns). We might be tempted to say that all nouns are count in Innu-aimun (as Davis and Matthewson 1999 argue for St'át'imcets). However, this cannot be true, as I show in §4.2.

4.2 Numerals

Recall that numerals are only licit with count nouns (without a measure phrase) in languages like English. As expected, Innu-aimun count nouns can occur with numerals.

[11] Modified versions of this word may also be pluralized.

(i) atîku-uiâsh
caribou-meat
'caribou meat'

(ii) atîku-uiâsh-a
caribou-meat-inan.pl
'lots of caribou meat'

(20) a. mashk^{u} b. mashku-at c. nisht^{u} mashku-at
bear *bear-an.pl* *three* *bear-an.pl*
'bear' 'bears' 'three bears'

d. namesh e. namesh-a f. nisht^{u} namesh-a
fish *fish-inan.pl* *three* *fish-inan.pl*
'fish' 'fish' (pl) 'three fish'

However, unlike English, many Innu-aimun mass nouns can occur with numerals (without a measure phrase).

(21) numeral + inanimate mass nouns

a. nîpîsh b. nîpîsh-a c. nisht^{u} nîpîsh-a
tea *tea-inan.pl* *three* *tea-inan.pl*
'tea bag' 'tea, cups of tea' 'three cups of tea'

d. shûminâpui e. shûminâpui-a f. nisht^{u} shûminâpui-a
wine *wine-inan.pl* *three* *wine-inan.pl*
'wine' 'glasses of wine' 'three glasses of wine'
'bottles of wine' 'three bottles of wine'
'lots of wine'

g. uepinâshun h. uepinâshun-a i. nisht^{u} uepinâshun-a
garbage *garbage-inan.pl* *three* *garbage-inan.pl*
'garbage' 'lots of garbage' 'three piles of garbage'
*'three garbage bags'

j. shîutâkan k. shîutâkan-a l. nisht^{u} shîutâkan-a
salt *salt-inan.pl* *three* *salt-inan.pl*
'salt' 'salts' 'three salts'
'piles/shakers of salt' 'three piles/shakers of salt'

m. nekâu n. nekâu-a o. nisht^{u} nekâu-a
sand *sand-inan.pl* *three* *sand-inan.pl*
'sand' 'piles of sand' 'three piles of sand'

p. kâshîuâsht q. kâshîuâsht-a r. nisht^{u} kâshîuâsht-a
sugar *sugar-inan.pl* *three* *sugar-inan.pl*
'sugar' 'piles/bottles/spoons of sugar' 'three piles/bottles/spoons of sugar'
'lots of sugar'

(22) numeral + animate mass nouns

a. kashkuan b. kashkuan-at c. nisht^{u} kashkuan-at
cloud *cloud-an.pl* *three* *cloud-an.pl*
'cloud' 'clouds' i) 'three clouds'
ii) 'three different places of cloud'

d. ashissu e. ashissu-at f. nisht^{u} ashissu-at
clay *clay-an.pl* *three* *clay-an.pl*
'clay' 'clays' 'three amounts of clay'

g. mishkumî
ice
'ice'

h. mishkumî-at
ice-an.pl
'cubes of ice'
'lots of ice'

i. nisht^{u} mishkumî-at
three *ice-an.pl*
'three cubes of ice'

There are, however, a limited number of mass nouns that cannot occur with a numeral.

(23) a. mîtshim
food
'food'

b. mîtshim-a
food-inan.pl
'lots of food'
*'portions of food'

c. * nisht^{u} mîtshim-a
three *food-inan.pl*

d. kûn
snow
'snow'

e. kûn-at
snow-an.pl
'lots of snow'

f. *nisht^{u} kûn-at
three *snow-an.pl*

g. ishkuteu
fire
'fire'

h. ishkuteu-a
fire-inan.pl
'lots of fire'

i. *nisht^{u} ishkuteu-a[12]
three *fire-inan.pl*

j. uâpitsheushkamik^{u}
moss
'moss'

k. uâpitsheushkamiku-a
moss-inan.pl
'mosses, lots of moss'

l. *nisht^{u} uâpitsheushkamiku-a
three *moss-inan.pl*

Note that at least in a few cases, there is no ontological reason for this restriction to arise. *Mîtshima* 'food' is easily divided into amounts (plates of food), as is *ishkuteu* 'fire'.

4.3 No quantifier distinguishes between count and mass nouns

Unlike English, quantifiers in Innu-aimun do not distinguish between count and mass nouns. Count and mass nouns can all occur with *kassinû* 'all/every'.

(24) count noun + *kassinû*

a. kassinû atîku(-at)
all caribou(-an.pl)
'every caribou'

b. kassinû utenâu(-a)
all town-inan.pl
'every town'

c. kassinû namesh(-at)
all fish-pl.an
'every fish'

d. kassinû metuâkan(-a)
all toy-inan.pl
'every toy'

(25) mass noun + *kassinû*

a. kassinû tûtûshinâpui
all milk
'all the milk'

b. kassinû mîtshim
all food
'all the food'

[12] From an English perspective, the ungrammaticality of "three fires" seems odd. However, the only way to get this meaning is to use the verb *nishtuat* "they are three".

(i) Nishtu-at ishkuteu-a
be.three-3pl fire-inan.pl
'There are three fires.'

Why this should be is mysterious to me.

c. kassinû mishkumî
all *ice*
'all the ice'

d. kassinû pimî
all *oil*
'all the oil'

Count and mass nouns can all occur with *nûtim* 'all the, the entire'.

(26) count noun + *nûtim*

a. nûtim atîku(-at)[13]
all *caribou(-an.pl)*
'every caribou'

b. nûtim utenâu(-a)
all *town(-inan.pl)*
'every town'

c. nûtim namesh(-at)
all *fish(-pl.an)*
'every fish'

d. nûtim metuâkan(-a)
all *toy(-inan.pl)*
'every toy'

(27) mass noun + *nûtim*

a. nûtim tûtûshinâpui
all *milk*
'all the milk'

b. nûtim mîtshim
all *food*
'all the food'

c. nûtim mishkumî
all *ice*
'all the ice'

d. nûtim pimî
all *oil*
'all the oil'

Count and mass nouns can all occur with *passe* 'some'.

(28) count noun + *passe*

a. passe atîku(-at)
all *caribou(-an.pl)*
'every caribou'

b. passe utenâu(-a)
all *town(-inan.pl)*
'every town'

c. passe namesh(-at)
all fish(-an.pl)
'every fish'

d. passe metuâkan(-a)
all *toy(-inan.pl)*
'every toy'

(29) mass noun + *passe*

a. passe tûtûshinâpui
all *milk*
'all the milk'

b. passe mîtshim
all *food*
'all the food'

c. passe mishkumî
all *ice*
'all the ice'

d. passe pimî
all *oil*
'all the oil'

Count and mass nouns can all occur with *mîtshet* 'many/much'.

(30) count noun + *mîtshet*

a. mîtshet atîk^{u}
lots/many *caribou*
'many caribou'

b. mîtshet utenâu
lots/many *town*
'many towns'

[13] With count nouns, the plural marker is available (and perhaps preferred), but not obligatory.

c. mîtshet namesh
lots/many fish
'many fish'

d. mîtshet metuâkan
lots/many toy
'many toys'

(31) mass noun + *mîtshet*

a. mîtshet tûtûshinâpui
lots/many milk
'lots of milk'

b. mîtshet mîtshim
lots/many food
'lots of food'

c. mîtshet mishkumî
lots/many ice
'lots of ice'

d. mîtshet pimî
lots/many oil
'lots of oil'

e. mîtshet uiâsh
lots/many meat
'lots of meat'

No quantifier distinguishes between mass or count nouns. However, there is one difference between count nouns and at least some mass nouns: the availability of plurality when they occur with a quantifier.

4.4 Plural + quantification

As we saw above, all nouns can occur with quantifiers, regardless of mass/count status. However, only count nouns and some mass nouns can be pluralized when occurring with *mîtshet* 'many/much'.

(32) plural count nouns + *mîtshet*

a. mîtshet atîku-at
lots/many caribou-an.pl
'many caribou'

b. mîtshet namesh-at
lots/many fish-an.pl
'many fish'

c. mîtshet utenâu-a
lots/many town-inan.pl
'many towns'

d. mîtshet metuâkan-a
lots/many toy-inan.pl
'many toys'

(33) plural mass nouns + *mîtshet*

a. mîtshet uiâsh-a
lots/many meat-inan.pl
'lots of portions of meat'

b. mîtshet mishkumî-at
lots/many ice-an.pl
'lots of ice cubes'

c.*mîtshet pimî-a
lots/many oil-inan.pl
(intended: lots of bottles of oil)

d. *mîtshet tûtûshinâpui-at
lots/many milk-an.pl
(intended: lots of glasses of milk)

e.*mîtshet mîtshim-a
lots/many food-inan.pl
(intended: lots of foods)

Note that the mass nouns that cannot take a numeral do not coincide with the nouns that cannot be pluralized when co-occurring with the quantifier 'much/many'. This suggests that the quantifier *mîtshet* 'many' and numerals are looking for different things. As I argue in §5.2, Innu-aimun numerals require the nouns they take to have atomic structure. The quantifier *mîtshet* must have a different requirement. It may be that as *mîtshet* does not require atoms at all, it prefers to take the non-coerced version of the noun. For

example, (33)e would be redundant, as *mîtshima* already means 'lots of food', and cannot be portioned out (into plates of food). For (33)c-d, I assume that a similar process occurs: one meaning (perhaps the most readily available meaning) of *pimîa* is 'lots of oil', which would make (33)c redundant. In (33)a-b, I assume that the portioned out readings are more readily available.

4.5 Summary

The plural allomorphs in Innu-aimun do not distinguish between count and mass nouns. Numerals, however, do. Quantifiers also do not distinguish between count and mass nouns; however, only count and some mass nouns can be pluralized when they take the quantifier 'many/much'.

I argue that the count/mass distinction is grammaticized; however, the distinction has nothing to do with the ability to take a plural marker. Since the group of mass nouns that cannot be co-occur with a numeral is not co-extensive with the group of mass nouns that cannot be pluralized with the quantifier 'much/many', I argue that the distinction is real, but that the quantifier prefers the non-coerced version of the mass nouns, whereas numerals require the mass nouns to be coerced into count nouns.

5 The semantics of *-a/-at*

So far, I have shown that while the plural may occur with both count and mass nouns, a subset of mass nouns cannot co-occur with a numeral, and a different subset cannot be pluralized when they co-occur with the quantifier *mîtshet* 'much/many'. I have also argued that there is a mass/count distinction in Innu-aimun. If this analysis is correct, then it has consequences for the interpretation of the plural in Innu-aimun.

5.1 The plural and numerals in English

Link (2002 [1983]) models count and mass denotations with two separate but homomorphic domains, an atomic domain *E* and a nonatomic domain *D*. Each domain has its own sum operation (⊕) and (proper) part relation (⊏), and thus is a set closed under sum formation, or a complete semi-lattice. Singular count nouns in English denote sets of atoms, and plural count nouns denote the proper sum of the atoms that make up the predicate NP.[14]

(34) a. ⟦apple⟧ = λx[apple(x)] = {a, b, c, …}
b. ⟦apples⟧ = λx[*apple(x)] = {a⊕b, a⊕c, b⊕c, a⊕b⊕c, …}
c. ⟦-s⟧ = λP[*P]

Following Wilhelm (2008), I assume that counting requires access to atoms (cf. Chierchia 1998). Therefore, numerals cannot simply denote a number. Numerals also contain an atom-accessing function (see also Krifka 1995, Kang 1994): *OU* (35). *OU* gives the number of atoms in a plurality.

(35) a. ⟦three⟧ = λPλx[P(x) & OU(x) = 3]
b. ⟦three apples⟧ = λx[*apple(x) & OU(x) = 3]

[14] I ignore the fact that plurals in English do not always exclude atoms, as in (i).
(i) Do you have children?
The answer is still yes, even if the addressee only has one child.

Mass nouns do not denote sets of atoms; instead they are associated with nonatomic denotations. They denote sets of (sums of) quantities, i.e., nonatomic sublattices of *D*. In order for a mass noun to be pluralized in English, it must be coerced into a count noun (Chierchia 1998).

(36) a. $[\![\text{blood}]\!] = \lambda x[^{m}\text{blood}(x)]$
b. $[\![\text{bloods}]\!] = \lambda x[^{*}\text{blood}(x)] = \{a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c, \ldots\}$

Once a mass noun has been coerced into a count noun, it can be counted.

(37) $[\![\text{three bloods}]\!] = \lambda x[^{*}\text{blood}(x) \,\&\, \text{OU}(x) = 3]$

5.2 The plural and numerals in Innu-aimun

With the above analysis in mind, we can now return to the Innu-aimun data. Recall that any mass noun can be pluralized. This could mean that all nouns are underlyingly count (or are all coerceable); however, as I showed above, not all mass nouns can occur with a numeral.

I claim that there are two denotations for plural in Innu-aimun. The first meaning is the same as the English plural.

(38) animate count noun
a. $[\![\text{atîk}^{u}]\!] = \lambda x[\text{caribou}(x)] = \{a, b, c, \ldots\}$
b. $[\![\text{atîkuat}]\!] = \lambda x[^{*}\text{caribou}(x)] = \{a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c, \ldots\}$
c. $[\![\text{-at}]\!] = \lambda P[^{*}P]$

(39) inanimate count noun
a. $[\![\text{metuâkan}]\!] = \lambda x[\text{toy}(x)] = \{a, b, c, \ldots\}$
b. $[\![\text{metuâkana}]\!] = \lambda x[^{*}\text{toy}(x)] = \{a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c, \ldots\}$
c. $[\![\text{-a}]\!] = \lambda P[^{*}P]$

The second denotation is akin to the meaning of "lots of x" (cf. Wiltschko 2007; to appear).[15] I treat this denotation of *-at*/*-a* like 'much' (cf. Solt 2009).

(40) animate mass noun
a. $[\![\text{tûtûshinâpui}]\!] = \lambda x[^{m}\text{bread}(x)]$
b. $[\![\text{tûtûshinâpuiat}]\!] = \lambda x[^{m}\text{bread}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$
c. $[\![\text{-at}]\!] = \lambda P\, \lambda x[^{m}P(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$

(41) inanimate mass noun
a. $[\![\text{pimî}]\!] = \lambda x[^{m}\text{oil}(x)]$
b. $[\![\text{pimîa}]\!] = \lambda x[^{m}\text{oil}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$
c. $[\![\text{-a}]\!] = \lambda P\, \lambda x[^{m}P(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$

This plural, rather than creating sums of atoms, creates sets of (sums of) quantities that are larger than some standard of comparison. μ_{DIM} is a measure function whereby a portion of matter is associated with a degree on some dimension (e.g. weight, volume, etc.). d_{Std} is a standard of comparison that is context-dependent.

[15] Wiltschko argues that the plural in Halkomelem has a meaning like "lots" instead of the atomic meaning of plurality in languages like English because it occupies a modifier position, rather than the head of NumP. However, the plural in Innu-aimun cannot be a modifier. See Mathieu (2009) for arguments that the plural is not a modifier in Ojibwe; the same arguments apply to Innu-aimun.

If this story is correct, we expect at least some mass nouns to be able to take either plural. When the mass noun takes the English-type plural, it will be coerced into a count noun. When it takes the much-type plural, it will remain mass.

This prediction is borne out. Some mass nouns can take either interpretation of the plural morpheme *-at*/*-a*.

(42) a. ⟦nekâu⟧ = $\lambda x[^{m}\text{sand}(x)]$
b. ⟦nekâua⟧ = $\lambda x[^{m}\text{sand}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$ (a lot of sand)
c. ⟦nekâua⟧ = $\lambda x[^{\circledast}\text{sand}(x)]$ (piles of sand)

d. ⟦kâshîuâsht⟧ = $\lambda x[^{m}\text{sugar}(x)]$
e. ⟦kâshîuâshta⟧ = $\lambda x[^{m}\text{sugar}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$ (a lot of sugar)
f. ⟦kâshîuâshta⟧ = $\lambda x[^{\circledast}\text{sugar}(x)]$ (bottles/spoons/packets of sugar)

g. ⟦shûminâpui⟧ = $\lambda x[^{m}\text{wine}(x)]$
h. ⟦shûminâpuia⟧ = $\lambda x[^{m}\text{wine}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$ (a lot of wine)
i. ⟦shûminâpuia⟧ = $\lambda x[^{\circledast}\text{wine}(x)]$ (bottles/glasses/ of wine)

The mass nouns that can take the English-type plural (where they are coerced into a count noun) should also be able to occur with a numeral, assuming that numerals have an atom-accessing function. This is also borne out.

(43) a. ⟦nisht^{u}⟧ = $\lambda P \lambda x[P(x) \,\&\, OU(x) = 3]$
b. ⟦nisht^{u} nekâua⟧ = $\lambda x[^{\circledast}\text{sand}(x) \,\&\, OU(x) = 3]$ (three piles of sand)
c. ⟦nisht^{u} kâshîuâshta⟧ = $\lambda x[^{\circledast}\text{sugar}(x) \,\&\, OU(x) = 3]$ (three bottles/spoons/packets of sugar)
d. ⟦nisht^{u} shûminâpuia⟧ = $\lambda x[^{\circledast}\text{wine}(x) \,\&\, OU(x) = 3]$ (three bottles/glasses of wine)

As shown in §4.2, not all mass nouns can occur with a numeral. This is explained if they can only occur with the much-type plural.

(44) a. ⟦mîtshim⟧ = $\lambda x[^{m}\text{food}(x)]$
b. ⟦mîtshima⟧ = $\lambda x[^{m}\text{food}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$
c.*⟦mîtshima⟧ = $\lambda x[^{\circledast}\text{food}(x)]$
d.*⟦nisht^{u} mîtshima⟧ = $\lambda P \lambda x[P(x) \,\&\, OU(x) = 3]$ ($\lambda x[^{m}\text{food}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$)

Numerals can only take elements with atoms – singular count nouns, plural count nouns, and plural mass nouns that take the dividing plural.

5.3 Evidence for the two readings of the plural marker in Innu-aimun

While it may appear burdensome to have two meanings for the same morpheme, there is evidence for two different meanings. First, speakers don't always agree on which mass nouns get the "measured out" reading. For example, *nekaua* is always interpreted as 'lots of sand', but only some speakers accept or produce the atomic reading 'piles of sand'. Only those speakers that allow the atomic reading allow the use of the numeral.

(45) a. nekâu-a
sand-inan.pl
i) 'lots of sand'
ii)%'piles of sand'

b.%nisht^{u} nekâu-a
three *sand-inan.pl*
'three piles of sand'

Second, mass-like readings ("lots of x") can be created from count nouns. This is only expected if the plural has two different denotations.[16]

(46) a. pâkueshikannânîsh
rice
'grain of rice'

b. pâkueshikannânîsh-at
rice-an.pl
'rice, grains of rice'

c. kâtshîtshîkumâkan
kâtshîtshîkumâkan
corn
'kernal or cob of corn'

d. kâtshîtshîkumâkaniht
kâtshîtshîkumâkan-at
corn-an.pl
'corn, kernals/cobs of corn'

(47) a. ⟦pâkueshikannânîsh⟧ = $\lambda x[\text{rice}(x)]$ (a grain of rice)
b. ⟦pâkueshikannânîshat⟧ = $\lambda x[{}^{m}\text{rice}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$ (a lot of rice)
c. ⟦pâkueshikannânîshat⟧ = $\lambda x[{}^{\circledast}\text{rice}(x)]$ (grains of rice)

(48) a. ⟦kâtshîtshîkumâkan⟧ = $\lambda x[\text{corn}(x)]$ (a kernal/cob of corn)
b. ⟦kâtshîtshîkumâkaniht⟧ = $\lambda x[{}^{m}\text{corn}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$ (a lot of corn)
c. ⟦kâtshîtshîkumâkaniht⟧ = $\lambda x[{}^{\circledast}\text{corn}(x)]$ (kernals/cobs of corn)

Third, at least one noun appears to be underlyingly either count or mass.[17] The count reading is associated with the atomic plural reading when pluralized; the mass reading is associated with the measured out plural (cloudy portions), as well as the "lots of x" reading.

(49) a. kashkuan
cloud
'cloud'

b. kashkuan-at
cloud-an.pl
'clouds, lots of clouds'

c. nisht^{u} kashkuan-at
three *cloud-an.pl*
i) 'three clouds' (count)
ii) 'clouds in three places' (mass)

(50) a. ⟦kashkuan⟧ = $\lambda x[\text{cloud}(x)]$ (count cloud)
b. ⟦kashkuanat⟧ = $\lambda x[{}^{\circledast}\text{cloud}(x)]$ (clouds)
c. ⟦nisht^{u} kashkuanat⟧ = $\lambda x[{}^{\circledast}\text{cloud}(x) \,\&\, OU(x) = 3]$ (three clouds)

d. ⟦kashkuan⟧ = $\lambda x[{}^{m}\text{cloud}(x)]$ (mass cloud)
e. ⟦kashkuanat⟧ = $\lambda x[{}^{m}\text{cloud}(x) \,\&\, \mu_{DIM}(x) > d_{Std}]$ (a lot of cloud)
f. ⟦kashkuanat⟧ = $\lambda x[{}^{\circledast}M(\text{cloud}(x))]$[18] (cloudy bits)
g. ⟦nisht^{u} kashkuanat⟧ = $\lambda x[{}^{\circledast}M(\text{cloud}(x)) \,\&\, OU(x) = 3]$ (three cloudy bits)

[16] Another potential example of this is given in (i) and (ii).

(i) tetapuâkan
chair
'chair'

(ii) tetapuâkan-a
chair-inan.pl
a. 'chairs'
b. 'furniture'

It is not clear to me how "lots of chairs" results in the interpretation "furniture", however.

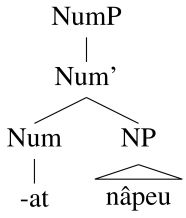
[17] It may be the case that one reading is the underlying reading and that the other reading is derived; however, I am unsure as to which is the underlying reading in this case.

[18] M(P) is to be read "as 'P is a *material predicate*' (i.e. it is true of portions of matter only)" (Link 2002: 136). Thus *kashkuanat* in this case is the plural of portions of matter.

6 Alternative analyses

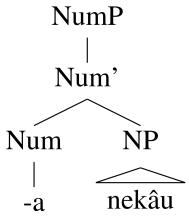
There are at least two alternative analyses of the data I have presented. The first alternative is that there is no *grammaticized* difference between count and mass nouns in Innu-aimun. That is, ontologically, nouns may be mass or count, but the grammar of Innu-aimun ignores this difference (see Wiltschko 2009 for such arguments for Blackfoot). The problem with this analysis is that the grammar *does* care about whether the noun is count or mass. Numerals can only co-occur with nouns that have atomic structure. They are thus sensitive to something akin to a count/mass distinction. This may be a semantic distinction, rather than a truly syntactic one; however, even the meanings of the plural marker distinguish between mass and count. The "lots of x" reading is almost exclusively found with the mass nouns, whereas the atomic plural is found with count nouns, and coerces some of the mass nouns into count nouns. Assuming that the dividing plural is the head of NumP (as in Borer 2004 and Wiltschko 2009), and the "lots of x" plural occupies a different position, then, grammatically, mass and count nouns are treated differently in Innu-aimun.

(51) a. plural count noun



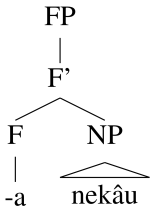
'men'

b. atomic plural mass noun



'piles of sand'

c. "lots of x" plural mass noun



'lots of sand'

Further, the quantifier *mîtshet* 'many/much' is also sensitive to the mass/count distinction. Although it does not require atomic structure, it does appear to prefer non-coerced mass nouns (i.e. non-plural mass nouns).

The second alternative analysis is that there is only one plural morpheme *–at/-a*, with the meaning "lots of x". This would mean that the mass nouns that can be coerced into having atomic structure would be coerced by some other part of the grammar (not the plural). One potential location for the coercion would be in the numerals. The numerals would then introduce atomic structure to all nouns. However, this cannot be, as then all mass nouns should be able to co-occur with numerals, contrary to fact. It is unclear what else would be doing the work of coercing the mass nouns to count nouns.

Further, this analysis could not account for examples like (46) or (49), repeated below.

(46) a. pâkueshikannânîsh
rice
'grain of rice'

b. pâkueshikannânîsh-at
rice-an.pl
'rice, grains of rice'

c. kâtshîtshîkumâkan
corn
'cob of corn'

d. kâtshîtshîkumâkan-iht
corn-an.pl
'corn, cobs of corn'

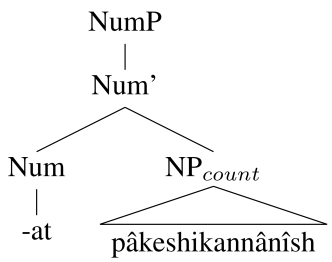
(49) a. kashkuan
cloud
'cloud'

b. kashkuan-at
cloud-an.pl
'clouds, lots of clouds'

c. nisht^{u} kashkuan-at
three *cloud-an.pl*
i) 'three clouds' (count)
ii) 'clouds in three places' (mass)

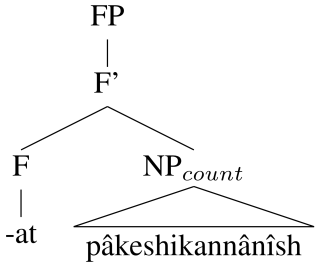
The availability for both the "lots of x" and the atomic plural readings for the plural examples in (46) and (49) is unexplained without two different denotations for the plural marker.

(52) a. count → count



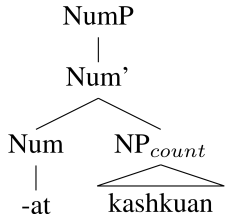
'many grains of rice'

b. count → masslike



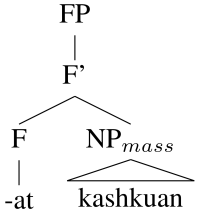
'rice' (=lots of rice)

c. count → count



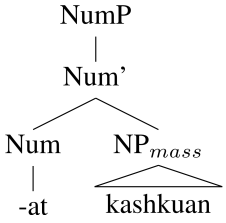
'clouds' (count)

d. mass → mass



'a lot of cloud' (mass)

e. mass → count



'cloudy areas'

7 Conclusion

Innu-aimun appears on the surface not to have a count/mass distinction, as with other Algonquian languages. However, Innu-aimun (and probably other Algonquian languages) does have a count/mass distinction. This has implications for the denotation of plurality in Innu-aimun. I argue that there are two plurals: the regular English-type plural, and a "lots of x" plural. Most count nouns take the atomic plural, resulting in the normal plural interpretation; some count nouns can also take the "lots of x" plural, resulting in a mass-like interpretation. Some mass nouns can only take the "lots of x" plural; others can also take the English-type plural, which divides the mass into measurable pieces (bottles of oil, piles of garbage, etc.).

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Nominal predication and verb morphology in Innu-aimun[*]

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Pronouns in the Algonquian language Innu-aimun have a surprising property: they can carry tense and modality suffixes normally found on verbs. This paper describes and analyzes this interesting phenomenon. After showing that pronouns can carry verb morphology only when they serve as predicates, I formulate an analysis that builds upon Déchaine's (1997) treatment of nominal predication in Plains Cree. In particular, I propose that Innu-aimun allows the T head in a nominal clause to contain an overt tense/modality affix, just as in a verbal clause. The ability of this affix to appear on certain restricted nominal elements follows from established constraints on syntactic movement. The implications of this phenomenon for the syntax of Algonquian *wh*-questions are discussed, and the Innu-aimun patterns are compared with data from East Cree.

1 Introduction

This paper discusses an interesting property of Innu-aimun, a member of the Cree-Montagnais-Naskapi dialect continuum with approximately 10,000 speakers in Quebec and Labrador (Thorburn 2005). In Innu-aimun, pronouns in certain syntactic contexts have the surprising ability to inflect for tense and modality just as verbs do. Although this intriguing phenomenon is known to linguists who work on the language (Marguerite MacKenzie, p. c.), it has not, to my knowledge, been documented in the literature. In this paper, then, my primary goal is to formulate an initial description and analysis of the Innu-aimun "tensed pronoun construction," as well as considering some of its broader implications.

Perhaps the most fundamental property of this construction is that it is possible only when the pronoun functions as a predicate. For context, therefore, the paper begins by examining "typical" cases of nominal predication in Innu-aimun—that is, cases in which verb morphology does *not* appear (§2). After developing an analysis for such cases based on the work of Déchaine (1997) and Blain (1997), I then describe the surprising tense-bearing examples and extend the analysis to account for them (§3). This is followed by a discussion of two related constructions in which the predicate nominal is unable to inflect for tense: DP predicates and locative predicates (§4). With the description and analysis now complete, I subsequently turn to consider the implications of the Innu-aimun facts for an ongoing discussion regarding the nature of Algonquian *wh*-questions, addressed most recently by Johns (2008) (§5). The final section of the paper takes a comparative perspective, drawing insight from similar patterns in East Cree, a neighbouring dialect (§6).

2 Typical (tenseless) nominal predication structures in Innu-aimun

This section provides a description and analysis of the simplest type of Innu-aimun nominal predication structures: those in which tense does not appear. The description is divided into three sections based on the type of nominal functioning as the predicate: (1) a DP containing a noun, (2) a pronoun, and (3) a copula-like element that I will refer to as a "presentative."

[*] This paper is based partly on work completed while I was an MA student at Memorial University of Newfoundland, supervised by Phil Branigan and Marguerite MacKenzie. Aside from WSCLA 15, versions of this work have been presented at the LGCU Welcome Workshop, Toronto; the 41st Algonquian Conference, Montreal; and the Advanced Syntax seminar at U of T. I am particularly grateful for helpful feedback from Diane Massam, Alana Johns, Phil Branigan, and Lynn Drapeau. Special thanks go to José Mailhot for sharing her excellent example sentences.

2.1 Nominal predicates involving a DP

When the predicate is a DP such as a possessed noun or a proper name, the general pattern is as shown in (1): the predicate nominal occurs in sentence-initial position, followed by a demonstrative which appears to function as the subject.

(1) a. ***Shûshep*** *ume.*
Joseph this
'This is Joseph.' (WO)[1]

b. ***Nishîm*** *ne.*
1.younger.sibling that
'That's my younger sister/brother.' (WO)

Since demonstratives frequently occur in nominal predication structures, the basic Innu-aimun demonstratives are given in (2) for reference. Demonstratives inflect for number, gender, and obviation.

(2) ***ume*** 'this', ***an*** 'it/that', ***ne*** 'that', ***nânâ*** 'that (absent)'

Reversing the noun-demonstrative order shown in (1) results in an argument-type nominal, not a clause:

(3) a. *ume Shûshep* 'this Joseph'

b. *ne nishîm* 'that younger sibling of mine'

2.2 Nominal predicates involving a pronoun

Personal and interrogative pronouns both participate in the same predication pattern as DPs, as shown in (4) and (5), respectively: the predicative element occurs sentence-initially, followed by the subject. Although the subject is typically a demonstrative, a personal pronoun can occur as the subject of an interrogative pronominal predicate, as in (5a).

(4) a. ***Tshîn*** *an.*
you that
'It's you.' / 'It's yours.' (WO)

b. ***Nîn*** *an.*
me that
'It's me.' / 'It's mine.' (WO)

(5) a. ***Auen*** *tshîn?*
who you
'Who are you?' (WO)

b. ***Tshekuân*** *ne?*
what that
'What is that?' (WO)

Any nominal predication structure can be "augmented" to form a cleft by the addition of a relative clause, as shown in (6) for an example involving a pronominal predicate. Two facts make it clear that the additional material in such cases is a relative clause. First, as in subordinate clauses in general, the lexical verb is inflected using affixes from the paradigm known as the CONJUNCT ORDER (glossed as CONJ), rather than the INDEPENDENT ORDER affixes that occur in simple main clauses. Second, the initial vowel of the verb complex typically undergoes an ablaut process known as INITIAL CHANGE (glossed as IC), which also typically occurs in relative clauses (Clarke 1982: 139).

(6) *Tshîn an* [***kâ*** ***tûtaman***].
you that [IC.PERF do.CONJ.2S]
'You're the one who did it.' (WO)

[1] Examples marked with "WO" are from my fieldwork, while those marked with "LITP" are from the Labrador Innu Text Project (Mailhot and collaborators 1999). Morphemic glosses use the following abbreviations: 1,2,3 = 1st, 2nd, 3rd person; 3′ = obviative; CONJ = conjunct; DUB = dubitative; EVID = evidential; IC = initial change; LOC = locative; PERF = perfective; P/PL = plural; PRET = preterit; Q = question particle; REL = relative clause marker; S = singular.

2.3 Nominal predicates involving a presentative

In addition to DPs and pronouns, nominal predication structures may involve one other class of items: the PRESENTATIVES *eukuan* 'this is' and *namaieu* 'it's not.' Unlike DPs and pronouns, which also regularly function as argument-type nominals, *eukuan* and *namaieu* only ever occur in nominal predication structures. Likely for this reason, Clarke and MacKenzie (2007) refer to them as "verb-like pronouns." Simple examples involving presentatives follow the familiar sentence-initial predication pattern:

(7) a. ***Eukuan*** *an.*
that.is that
'That's it.' (WO)

b. ***Namaieu*** *an.*
it's.not that
'It's not him.' (LITP 2-4)

The similarity of *eukuan* to French *voici/voilà*, commonly known as "presentatives," is the source of the term.[2] Presentatives differ from predicative DPs and pronouns in that they may occur with what appears to be a DP complement, as in (8) and (9). In such cases, the predicate is syntactically discontinuous: the presentative is sentence-initial and the complement DP follows the demonstrative subject.

(8) a. *Eukuan an* ***Shûshep****.*
that.is that Joseph
'That's Joseph.' (WO)

b. *Eukuana nenua* ***nimassina****.*
that.is.PL those 1.shoe.PL
'Those are my shoes.' (WO)

(9) a. *Namaieu an* ***Shânût****.*
it's.not that Charlotte.
'It's not Charlotte.' (WO)

b. *Namaieu ne* ***nikâu****.*
it's.not that 1.mother
'That's not my mother.' (WO)

As shown for predicative pronouns above, a cleft can be created by adjoining a relative clause:[3]

(10) a. *Namaieu an Shûshep* [***tûtamûpan***].
it's.not that Joseph [do.PRET.3S]
'It's not Joseph that did it.' (WO)

b. *Namaieu nîn* [***nipîkunetî ne miûsh ka-pîkupanua***].
it's.not me [1.break.PRET that box REL-be.broken]
'It's not me that broke the box that's broken.' (Mailhot 2006)

2.4 Summary of typical nominal predication structures

We have seen that all examples of nominal predication in Innu-aimun involve the same basic pattern. In sentence-initial position, there is a predicative element, which may be a DP, a pronoun, or a presentative. This is followed by the subject, which is usually a demonstrative. When the predicative element is a presentative, it may be accompanied by a sentence-final complement DP. In all cases, a relative clause may be added in order to create a cleft.

---

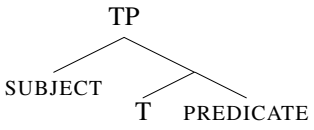
[2] Thanks to Lynn Drapeau and Anne-Marie Baraby for pointing this out to me. In previous work (Oxford 2007, 2008) I had used the awkward (and rather loaded) label "clefting words."

[3] In the two examples in (10), note that the verb does not carry the conjunct inflection that we would expect to find in a subordinate clause, as in example (6) above. However, there is a principled reason for the absence of conjunct inflection in (10): Innu-aimun lacks an indicative preterit paradigm in the conjunct order, so *independent* indicative preterit forms are substituted for the missing *conjunct* indicative preterit forms. This substitution also occurs in *wh*-questions, which otherwise require conjunct forms (Clarke 1982: 127). The absence of conjunct morphology therefore does not weaken the claim that such examples involve biclausal cleft structures.

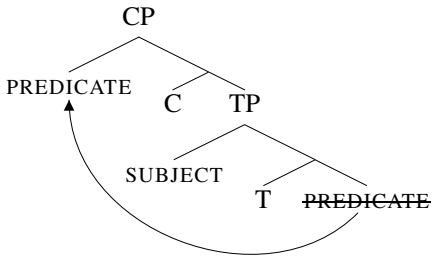
2.5 Analysis of typical nominal predication structures

Innu-aimun nominal predication structures appear quite similar to those reported for Plains Cree by Déchaine (1997), and can easily be accounted for by her analysis. Déchaine proposes that a nominal predication structure has the underlying configuration in (11a), with the surface word order derived by the predicate fronting operation shown in (11b).

(11) a. Underlying non-verbal predication structure (with "T" for Déchaine's "I"):

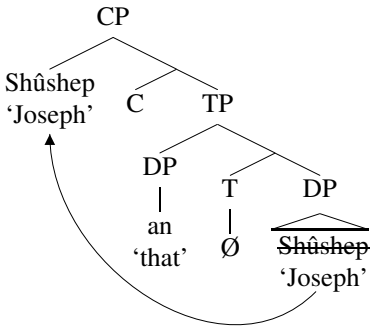


b. Predicate fronting derives obligatorily predicate-initial word order:

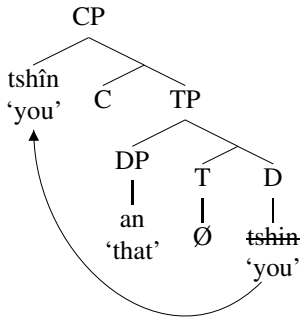


The application of this analysis to the Innu-aimun examples is shown in (12).

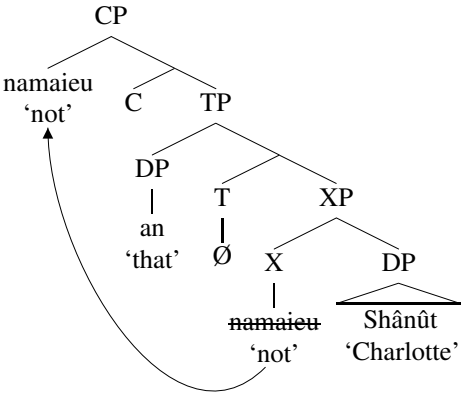
(12) a. Predicate is a noun:
Shûshep an. 'It's Joseph.'



b. Predicate is a pronoun:
Tshîn an. 'It's you.'



c. Predicate contains a presentative: *Namaieu an Shânût* 'It's not Charlotte.'



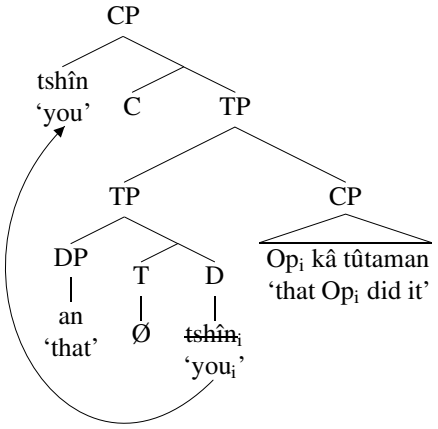
In (12c), I have assumed that the presentative takes the predicate nominal as its complement and subsequently undergoes predicate fronting.[4] I have represented the category of the presentative simply as

[4] Note that the movement operation shown in (12c) is problematic, as the presentative—a head—undergoes phrasal movement. The revised analysis proposed in the following section removes this problem.

"X," and will leave aside the question of whether it is best characterized as a copula or as some sort of functional nominal. Although this may seem like a strange sort of ambiguity, note that the same question arises in regard to the Hebrew present-tense copula (e.g. Falk 2004).

The cleft constructions formed upon nominal predication structures can be analyzed as involving the adjunction of a clause to the nominal predication TP, as shown in (13), based on Blain's (1997) analysis of Plains Cree *wh*-questions.

(13) *Tshîn an* [*kâ tûtaman*]. 'It's you that did it.'



3 Nominal predication with verb morphology

With the canonical nominal predication construction described and analyzed, I now turn to the rather surprising appearance of verb morphology in such constructions. I will revisit the classes of nominal predication discussed above, this time presenting examples involving verb morphology. I begin with presentatives, since such examples are the most numerous, before turning to pronouns and DPs. For reference, a simplified overview of Innu-aimun tense/modality inflection is provided in (14), based on Clarke 1982 and Clarke and MacKenzie 2007. (Indicative modality and present tense are the default, unmarked values, and will not be noted in glosses.)

(14)

MODALITY	TENSE	
	PRESENT/NEUTRAL	PAST/PRETERIT
INDICATIVE	*nipâ**u*** 's/he is asleep'	*nipâ**pan*** 's/he was asleep'
DUBITATIVE	*nipâ**tshe*** 's/he is probably asleep'	*nipâ**kupan*** 's/he must have been asleep'
EVIDENTIAL	*nipâ**tak*** 's/he seems to be asleep'	*nipâ**shapan*** 's/he turned out to be asleep'

3.1 Verb morphology on presentatives

The examples involving *eukuan* and *namaieu* in (15) and (16) are parallel to those shown earlier, with one difference: the presentative carries a verb suffix. As the glosses indicate, the suffixes contribute the expected notions of tense and modality to the clause.

(15) a. *Eukuan**itshe** ne Shûshep.*
that.is.DUB that Joseph
'That's probably Joseph.' (WO)

b. *Eukuan**nîshapanî** nenua Pûn ukussa.*
that.is.PRET.EVID.3′ that.3′ Paul 3.son.3′
'That was obviously Paul's son.' (WO)

(16) a. *Namaieu**nîtshenî** nenua ukâuîa.*
it's.not.DUB.3′ that.3′ 3.mother.3′
'That's probably not his/her mother.' (WO)

b. *Namaie**tak** nishîm [nâhî ka-pimûtetaka].*
it's.not.EVID 1.younger.sibling [over.there REL-walk.EVID]
'It seems not to be my younger brother walking over there.' (Mailhot 2006)

c. *Namaieu**nîkupan** nenû [nenatuenitâk].*
it's.not.PRET.DUB.3′S that.3′S [IC.ask.for.CONJ.3S]
'It probably wasn't that one that s/he asked for.' (WO)

In (17), each of the above presentatives is compared with a corresponding verb form (based on Clarke 1982 and Clarke and MacKenzie 2007). As can be seen, the suffixes are identical.

(17)

PRESENTATIVE	INFLECTION	CORRESPONDING VERB
*eukuan**itshe***	AI 3S PRES DUB	*nipâ**tshe*** 'perhaps s/he is asleep'
*eukuan**nîshapanî***	AI 3′ PRET EVID	*nipâ**nîshapanî*** 'it turns out that s/he (3′) was asleep'
*namaieu**nîtshenî***	AI 3′ PRES DUB	*nipâ**nîtshenî*** 'perhaps s/he (3′) is asleep'
*namaie**tak***	AI 3 PRES EVID	*nipâ**tak*** 's/he seems to be asleep'
*namaieu**nîkupan***	II 3′ PRET DUB	*uâpâ**nîkupan*** 'perhaps it (3′) was white'

Based on the above, the most obvious conclusion may seem to be that presentatives are, in fact, verbs. However, I argue that this is not the case. Aside from their ability to inflect for tense and modality, presentatives differ significantly from verbs: they have no conjunct forms, they do not take preverbs, and they are subject to rigid word order, occurring only sentence-initially. It seems, then, that presentatives are not verbs, but, rather, are some other category that shares only certain properties with verbs.

3.2 Verb morphology on pronouns

The preceding point—that tense morphology alone does not entail that a category is a verb—gains strength when we consider that pronouns, too, may carry verb suffixes, as in (18), where the personal pronouns *nîn* 'me' and *uîn* 'him/her' carry the present dubitative *-(i)tshe* suffix.

(18) a. *Nîn**itshe** [kâ utinakâu tshitashtishat].*
me.DUB [IC.PERF take.CONJ.1>3 2.mitten.PL]
'It must be me that took your mittens.' (Mailhot 2006)

b. *Uîn**itshe*** [*nenua auâssa kâ utâmuât*] *ne nâpess.*
him/her.DUB [that.3′ child.3′ IC.PERF hit.CONJ.3S>3′] that boy
'It must be him, the boy, that hit the child.' (Mailhot 2006)

Verbal tense/modality suffixes can appear on interrogative pronouns as well:

(19) a. *Tshekuen**itshe** nânâ* [*kâ uâpamâk^{u} utâkushît*]*?*
who.DUB that.absent [IC.PERF see.CONJ.21P>3]
'Who can it be that we saw yesterday?' (Mailhot 2006)

b. *Tshekuân**nîtshe*** [*uet ekâ uî tshîtûtet*]*?*
what.DUB.3′S [IC.from not want leave.CONJ.3S]
'Why could it be that she doesn't want to go?' (LITP 2-2)

Note that this is not a case of "nominal tense" in the sense of Nordlinger and Sadler (2004), "nominal temporal marking" in the sense of Tonhauser (2007), or "tense on D" in the sense of Wiltschko (2003), because the tense/modality suffixes can appear only on *predicative* nominals. The link to predication suggests that the Innu-aimun examples involve regular clausal tense, which is apparently able to manifest itself on nominals under certain syntactic circumstances.

3.3 Verb morphology on nouns

Unlike presentatives and pronouns, predicative nouns cannot bear verb inflection.[5] We never find a noun inflecting for tense/modality and acting as a clause, as in the following ungrammatical dubitative-inflected nominal predicates:[6]

(20) a. **nikâu**tshe*... 'It might be my mother that...'
b. **Shûshep**itshe** *nânâ.* 'That might be Joseph.'

3.4 Analysis of tensed nominal predicates

The central question raised by the Innu-aimun data is how it is possible for a verb morpheme to occur in a nominal predication structure. Interestingly, this possibility is in fact predicted by the structure proposed by Déchaine (1997) for nominal predication in Plains Cree. Recall from above that Déchaine analyzed such structures as involving a null T.[7] The only difference in Innu-aimun, then, seems to be that this T position is allowed to host overt material—exactly as it does in a normal finite clause. The "underlying" structures in (21), which ignore the effects of movement, illustrate how this proposal applies to two representative examples, one involving a predicative pronoun and one involving a presentative.

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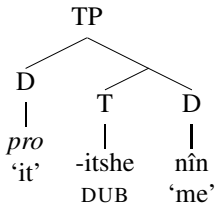
[5] For clarification, note that it *is* possible for the past-tense suffix *-(i)pan* to appear on a noun, as discussed by Clarke (1982: 35). However, in this case, *-(i)pan* acts as a derivational suffix, deriving a noun meaning 'the late X' (e.g. *nikâu* 'my mother' + *(i)pan* = *nikâupan* 'my late mother'). That this is derivation, not inflection, is indicated by the fact that the *-(i)pan* suffix can be followed by the nominal obviative marker *-a*, as in *ukâupana* 'his/her late mother.' Furthermore, the resulting noun in *-(i)pan* still behaves like a normal noun (i.e. it can be a subject or an object); it does not obligatorily form a non-verbal predication structure.

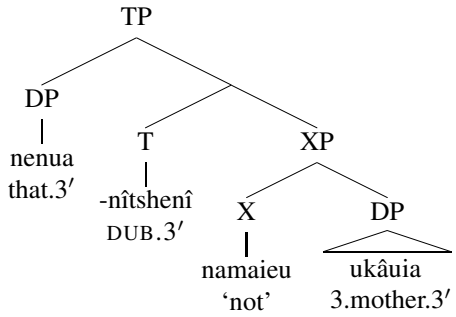
[6] Lynn Drapeau (p. c.) reports that she has, in fact, very occasionally encountered such dubitative-inflected nouns, but that they occur as single-word utterances rather than forming a clause such as **Shushepitshe an*. She indicates that this process is not productive, since she found each such rare occurrence to be surprising and memorable—a clear difference from the productive, clausally-integrated use of verb inflection on pronouns and presentatives.

[7] As mentioned above, Dechaine's structures actually involve I rather than T, but this is only a notational difference. In any case, my "T" should actually be understood as shorthand for a sequence of functional heads such as Tns (Tense) and Mod (Modality), as in Cinque 1999.

(21) a. *Nin**itshe*** [. . .]
'It must be me [that. . .]'



b. *Namaieu**nîtshenî** nenua ukâuîa.*
'That's probably not his/her mother.'



In essence, then, it seems that Innu-aimun has taken what was originally an abstract predication structure and made it more concrete by the addition of verb morphology.

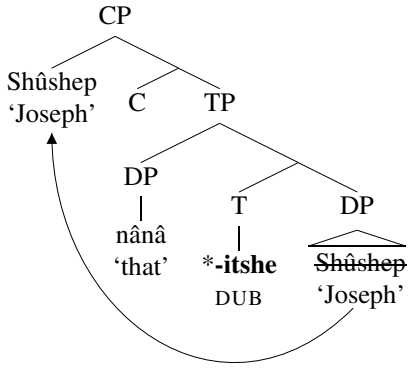
Given the structures in (21), how does the pronoun/presentative (which will subsequently be fronted) end up carrying the tense morpheme? If fronting is XP-movement, as in Déchaine's analysis, the pronoun will move directly to Spec-CP, bypassing the affix in T. Instead, it seems that predicative pronouns and presentatives—which are, arguably, both heads—undergo HEAD-MOVEMENT via T, where they pick up the tense suffix, as schematized in (22).

(22) a. [$_C$ **nînitshe**] *pro* [$_T$ ~~**nîn** + -itshe~~] [$_D$ ~~nîn~~]

b. [$_C$ **namaieunîtshenî**] nenua [$_T$ ~~**namaieu** + nîtshenî~~] [$_{XP}$ [$_X$ ~~namaieu~~] ukâuîa]

Recall that DPs, unlike pronouns and presentatives, cannot inflect for tense. This fact is predicted by the head-movement analysis. Since DPs are phrases rather than heads, there is no way for a DP to undergo head-movement to T—it can only raise to Spec-CP by XP-movement, skipping T.[8] The tense suffix is therefore inaccessible to a DP predicate, as indicated by the structure in (23).

(23) **Shûshep**__**itshe**__ *nânâ.* 'That might be Joseph.' (invented example)



To conclude, it appears that Innu-aimun nominal predication structures differ from those of Plains Cree in two ways: (1) an overt T is permitted, and (2) head-movement via T may occur. This analysis captures the fact that DPs, unlike pronouns, cannot be tensed.

[8] It would appear, then, that C in a nominal predication structure has some type of left-edge requirement that can be satisfied either by head-movement to C (as for pronouns and presentatives) or by XP-movement to Spec-CP (as for DPs). Some authors have proposed that the EPP can be satisfied either by XP-movement or X^0-movement (e.g. Alexiadou and Anagnostopoulou 1998). This may be the case here.

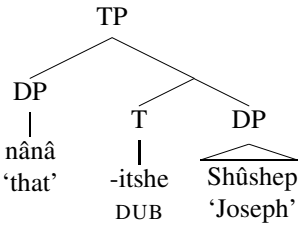
4 Additional nominal predication patterns

Now that the core properties of Innu-aimun nominal predication structures have been described and analyzed, I turn to two slightly more complicated patterns, involving DP predicates (§4.1) and locative predicates (§4.2).

4.1 DP predicates

We have seen that examples such as (23) above, in which the DP carries verb inflection, are ungrammatical. However, the structure in (23) has what appears to be a conceivable meaning. Is it possible for such structures to be grammatically realized? Consider the TP from (23), repeated in (24).

(24) 'That might be Joseph'



As we have seen, the DP *Shûshep* cannot undergo head-movement to support the affix in T. However, there is still a way to save this structure: it is possible to insert what appears to be a dummy morpheme *e-* to support the suffix in T, creating the form *etshe*, as in (25).

(25) ***Etshe*** *nânâ Shûshep.*
e.DUB that Joseph
'That might be Joseph.' (WO)

As evidence that *e-* is indeed a meaningless dummy morpheme, consider that it cannot occur in a morphologically unmarked form:

(26) a. ***Etshe*** *nânâ Shûshep.* 'That might be Joseph.'
b. ****E*** *nânâ Shûshep.* 'That's Joseph.' (must say *Shûshep nânâ.*)

Also note that *e-* can be prefixed to a conjunct verb in lieu of initial change; in this context, it has been called a "dummy prefix" by Clarke (1982). Wolfart (1973: 46) describes the parallel Plains Cree *e-* as "nothing but a 'vehicle' for initial change." It seems, then, that *e-* may be a general dummy prefix that serves to "fill out" incomplete verb complexes.

Interestingly, when *e*-insertion occurs, two word orders are possible: either the *e*+T complex *or* the predicate DP can be fronted, as shown in (27).

(27) 'That's probably Joseph.' (WO)

a. ***Etshe*** *nânâ Shûshep.* (T-to-C head-movement)
e.DUB that Joseph

b. ***Shûshep*** *nânâ etshe.* (movement of DP to Spec-CP)
Joseph that e.DUB

The word-order variation in (27) is striking, because in all other examples, it is always the tensed presentative or pronoun that is obligatorily fronted. For example, the sentences in (28) are identical to those in (27) except that they contain the presentative *eukuan* 'that is' rather than the dummy *e-*. In this case, as shown in (28b), we do *not* have the option of fronting the DP; only the tensed presentative can be fronted.

(28) 'That's probably Joseph.' (WO)

a. ***Eukuanitshe*** *nânâ Shûshep.* (T-to-C head-movement)
that.is.DUB that Joseph

b. *****Shûshep*** *nânâ eukuanitshe.* (movement of DP to Spec-CP)
Joseph that that.is.DUB

It seems clear, then, that the presence of the dummy prefix has the side-effect of "loosening up" the word order. It is less clear *why* this should be the case; for the time being, I leave this as an unsolved problem.[9] In general, the phenomenon of *e*-support appears to be an interesting parallel to *do*-support in English. This parallel may be another manifestation of Déchaine's (1997) observation that nominal predication clauses in Cree actually have *configurational* syntax, in contrast to the otherwise non-configurational nature of Algonquian word order.

4.2 Locative predicates

Innu-aimun presentatives and *wh*-words are parallelled by a series of locative equivalents carrying the derivational locative morpheme *-ite/-ita* (Oxford 2008: 75):

(29)

NON-LOCATIVE		LOCATIVE	
eukuan	'that is'	*ekute / ekuta*	'that's where'
namaieu	'it's not'	*namaieute / namaieuta*	'that's not where'
tshekuân	'what (is)'	*tânite / tânita*	'where (is)'

Locative presentatives occur in syntactic structures that are broadly similar to those we have seen for predicative pronouns and presentatives. As shown in (30), the following lexical verb must be in the conjunct order, suggesting that the overall structure is a cleft; also, just as we have seen above for their non-locative equivalents, locative presentatives are often followed by a demonstrative "subject" (bolded).

(30) a. *Ekuta* ***anita*** [*nânitam epît* *Pûn*].
that.is.LOC that.LOC [always IC.sit.CONJ.3 Paul]
'That's where Paul always sits.' (WO)

b. *Namaieute* ***anite*** [*uiâtshîht*].
it.is.not.LOC that.LOC [IC.live.CONJ.3P]
'That's not where they live.' (WO)

c. *Tânite* ***anite*** [*Tânien niânataut* *mân*]*?*
what.LOC that.LOC [Daniel IC.REDUP.hunt.CONJ.3S often]
'Where is it that Daniel often hunts?' (WO)

Similar examples in Plains Cree are discussed by Déchaine (1997: 120–121).

[9] One possibility is that the dummy *e-* may be inserted either in the syntax (in which case it will subsequently undergo head-movement) or at PF (in which case the left-edge requirement of C will be satisfied in the syntax by the only other alternative: raising of the DP).

Locative presentatives differ from their non-locative equivalents in one important way, however: they cannot carry verb inflection. This is not particularly surprising, since locatives also do not carry nominal inflection such as number and obviation. As obliques, they apparently lack access to the clausal tense-case-agreement inflectional system (cf. Pesetsky and Torrego 2001, 2004, 2007). Since the syntax of locative and non-locative presentatives seems identical in all other respects, it would be interesting to investigate the structural ramifications of this difference.

5 Implications for Algonquian *wh*-questions

I now turn from description and analysis to a somewhat different topic: the implications of Innu-aimun tensed pronouns for the syntax of Algonquian *wh*-questions. I first outline two competing analyses of *wh*-questions and then discuss the relevance of the Innu-aimun data to this issue.

5.1 Two analyses of Algonquian *wh*-questions

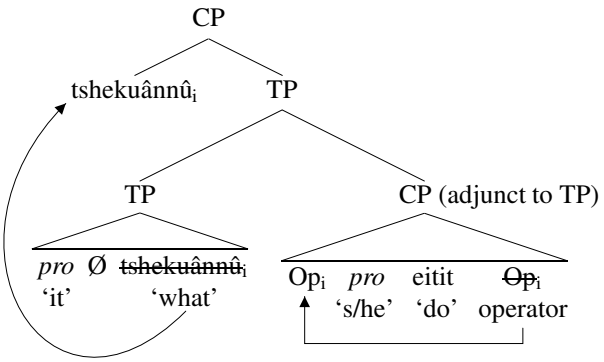
Analyses of Algonquian *wh*-questions fall into two basic groups: *biclausal* and *monoclausal*. Under a typical biclausal analysis, the *wh*-word is seen as a predicate that may be followed by a dependent clause containing a lexical verb. In essence, then, *wh*-questions are clefts. This is the traditional view (Bloomfield 1946: 116; Wolfart 1973: 34), and it has been echoed in several generative analyses (Johns 1982; Reinholtz and Russell 1995; Blain 1997). This analysis has the benefit of neatly accounting for the appearance of conjunct morphology in *wh*-questions—since the lexical verb is in a dependent clause, the conjunct is expected.

The monoclausal analysis, in contrast, regards a wh-question as a single clause; *wh*-words are regular nominals that undergo *wh*-movement, as in English. This analysis has been proposed in recent work in the Minimalist paradigm (Brittain 1999, 2001; Bruening 2001, 2004). In such an analysis, conjunct morphology arises from other factors, such as the presence of a C head in the structure.

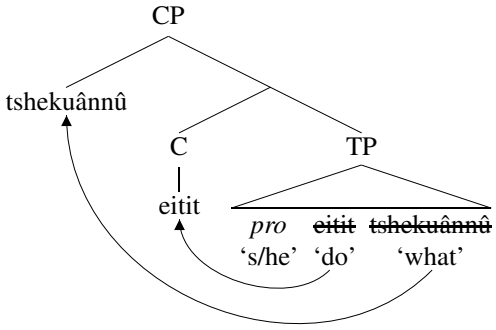
The structures in (32) and (33) illustrate, in simplified form, the application of each analysis to the Innu-aimun wh-question in (31).

(31) *Tshekuânnû eitit?*
what.3′ IC.do.CONJ.3S
'What is s/he doing?'

(32) BICLAUSAL ANALYSIS, literally 'What is it [$_{CP}$ that s/he is doing]?'
(based on Blain's (1997) analysis of Plains Cree, with I changed to T)



(33) MONOCLAUSAL ANALYSIS, literally 'What is s/he doing?'
(based loosely on Brittain's (2001) analysis of Western Naskapi)



5.2 Implications of the Innu-aimun facts

After examining the theoretical debate summarized above, Johns (2008) concludes that the question is still open, and that further research is needed. The appearance of tense on Innu-aimun pronouns, I contend, constitutes one such further piece of evidence—in fact, a rather significant one. Consider the predictions that the two analyses would make regarding the appearance of tense morphology. The biclausal analysis regards the *wh*-word as occupying a nominal predication structure, so, like other predicative pronouns in Innu-aimun, it should be able to carry verb inflection. The monoclausal analysis, on the other hand, regards the *wh*-word as a regular nominal, so verb inflection should not be possible. As we have already seen, it is the biclausal analysis that makes the correct prediction: Innu-aimun *wh*-words can indeed carry verb suffixes, as shown in (34).

(34) a. *Tshekuen**itshe** nânâ* [*kâ uâpamâk^{u} utâkushît*]*?*
who.DUB that.absent [IC.PERF see.CONJ.21P>3 yesterday]
'Who can it be that we saw yesterday?' (Mailhot 2006)

b. *Tshekuân**nîtshe*** [*uet ekâ uî tshîtûtet*]*?*
what.DUB.3′S [IC.from not want leave.CONJ.3S]
'Why could it be that she doesn't want to go?' (LITP 2-2)

The Innu-aimun data therefore seems to favour an analysis along the lines of Blain 1997 (shown in (32) above), though with head-movement of the *wh*-word to account for the innovative tense/modality inflection. In general, the occurrence of verb inflection seems to be a new and compelling piece of evidence that Innu-aimun *wh*-words are predicates, which, in turn, is strong evidence that Innu-aimun *wh*-questions are biclausal.[10]

5.3 Challenges for both analyses

Although I feel that the Innu-aimun data, at face value, seems to strengthen the case for a biclausal analysis of *wh*-questions, my main goal here is simply to present the data, not to argue for one analysis over

[10] As Phil Branigan (p. c.) points out, however, it is not *conclusive* evidence for the biclausal approach. We could, for example, propose that only those *wh*-questions that involve verb morphology are formed from clefts—*wh*-questions without verb morphology could still be monoclausal, formed by standard *wh*-movement. If it can be shown that the clefting analysis cannot account for all Innu-aimun *wh*-questions, then a split analysis such as this would be necessary, but other things being equal, it does not seem preferable, since we would then require two separate explanations for the appearance of conjunct morphology in *wh*-questions (it follows naturally in a cleft, but requires other motivation in a monoclausal structure).

the other. Indeed, both analyses face empirical challenges. Any attempt to propose a monoclausal analysis of Innu-aimun *wh*-questions should address two empirical issues: (1) the appearance of verb morphology on the *wh*-word, and (2) the "extra" demonstrative that often appears in nominal predication clauses. *Wh*-questions containing such demonstratives are shown in (35).

(35) a. *Tshekuen* ***an*** [*shâsh tshî shâtshuâpatamûshapan umenua unaikana*]*?*
who that [already PERF go.to.see.PRET.EVID.3S these traps]
'Who is it that already checked these traps?' (WO)

b. *Tshekuânnû* ***nenû*** [*Shûshep mînepan Mânîua*]*?*
what.3′S that.3′S [Joseph give.PRET.3>3′ Mary.3′]
'What is it that Joseph gave Mary?' (WO)

Under the biclausal analysis, this demonstrative is straightforwardly accommodated as the subject of the nominal predicate. Under a strictly monoclausal analysis, it is not clear what the structural position of this demonstrative could be.

Conversely, a biclausal analysis—if applied to other related dialects—must address the fact that in Western Naskapi, multiple-*wh*-questions are grammatical (Brittain 1999, 2001). It is not obvious how a cleft analysis could deal with two *wh*-phrases, since a cleft normally has only a single focus.[11] Further challenges for the biclausal view are given in the appendix to Bruening 2004.

One important point, however, is that from a cross-linguistic perspective, there is nothing strange about positing that *wh*-questions are clefts. The proposal has been made for a diverse range of languages, including various Austronesian languages such as Palauan (Georgopoulos 1991), Tagalog (Richards 1998; Aldridge 2002), Niuean (Massam 2003), and Malagasy (Potsdam 2006); the Niger-Congo language Yorùbá (Manfredi 1995 and Déchaine 2002, cited in Cook 2005); Egyptian Arabic (Cheng 1997); the Dravidian language Malayalam (Jayaseelan 2008); the Tibeto-Burman language Meitei-lon (Bhattacharya and Devi 2004); Yucatec Maya (AnderBois 2009); and Coast Salish and Northern Interior Salish (Kroeber 1991, 1999, Davis et al. 1993, and Jelinek 1998, all cited in Baptiste 2001).

As a footnote to this discussion, it is interesting to consider that there have been some recent proposals that clefts are actually monoclausal (Meinunger 1998; Grohmann 2007; Reeve 2008). This idea is no doubt somewhat radical, but if it turned out to be correct, it could provide a means of reconciling the biclausal and monoclausal approaches to Algonquian *wh*-questions.

6 Comparison with East Cree

In this section, I compare the Innu-aimun patterns with those of East Cree, a neighbouring dialect in the Cree-Montagnais-Naskapi continuum. The East Cree facts shed light on two issues: the availability of verb morphology in nominal clauses (§6.1) and the historical development of presentatives (§6.2).

6.1 Availability of verb morphology in nominal clauses

In East Cree, there is a limited parallel to the ability of Innu-aimun pronouns to carry verb inflection. Southern East Cree *wh*-words can carry dubitative inflectional suffixes (Junker and MacKenzie 2004), but Junker and MacKenzie list only present/neutral-tense dubitatives—no past/preterit forms. It appears, then, that East Cree *wh*-words can inflect for modality, but not for tense.

Interestingly, José Mailhot (p. c.) reports that Innu-aimun elders reject preterit inflection on pronouns as well, although younger speakers readily supply such forms. Taken together, these facts suggest

[11] It would be interesting to find an Innu-aimun example in which both multiple-*wh*-movement and tense/modality inflection co-occur. If such examples are possible, they would be an interesting challenge for both approaches.

that Innu-aimun pronouns did not gain access to the entire set of verb suffixes all at once. Rather, it seems that the phenomenon began with modality alone (as is still the case in Southern East Cree), and has more recently expanded to include tense. This trajectory is perhaps not surprising if, as in Cinque 1999, epistemic and evidential modal heads are structurally higher than tense, and thus more distant from the verb—plausibly making them less strongly "verb-like" than tense, and consequently more amenable to combining with a non-verbal category.

6.2 Historical development of presentatives

Regarding the historical development of the presentative *eukuan* 'this/that is', Southern East Cree displays what appears to be an earlier state of affairs. The SEC equivalent of *eukuan* can appear in either fused or non-fused forms (Junker and MacKenzie 2003: 212–213), as shown in (36). (*Eukw* is a particle that seems to have focusing properties, while *an* is a demonstrative, as in Innu-aimun.)

(36) a. *Eukw an*. 'That's the one.'
b. *Eukun*. 'That's the one.'

We might therefore speculate (as in Oxford 2008: 80) that Innu-aimun *eukuan* arose from the fusion of the discourse particle *euk*^{u} and the following demonstrative *an*. At some point, the original position of *an* must have been reanalyzed as being truly vacated, opening the door for a second *an* to appear, as in modern Innu-aimun *eukuan an* 'that's the one.'

Interestingly, in present-day Innu-aimun (at least in Sheshatshiu, Labrador), there are signs that another cycle of the same kind of fusion is occurring. Speakers often write sequences involving a presentative plus a demonstrative as a single word, as in (37). (In fact, I have been corrected for using a space in such examples.)

(37) a. *eukuan an* 'that's the one' → *eukuanan*
b. *tshekuânnû (ne)nû* 'what is that?' → *tshekuânnûnû*
c. *ekute anite* 'that's where…' → *ekutenite* or even *ekutete*

More evidence that fusion might be occurring comes from the fact that some speakers place the second-position question particle *â* after *eukuan an*, as in (38a), which indicates that *eukuan an* is being treated as a single word. However, this is not always the case, as shown in (38b), where *â* intervenes between *eukuan* and *an*. This variability suggests that we may be seeing a change in progress.

(38) a. *Eukuan an* ***â*** *Shûshep uiâuînat?*
that.is that Q Joseph IC.talk.about.CONJ.2S>3
'Is that the Joseph you're talking about?' (WO)

b. *Eukuan* ***â*** *an tshutâu?*
that.is Q that 2.father
'Is that your father?' (WO)

Based on the apparently strong tendency for demonstratives to fuse with the preceding presentative, it seems that something in the syntactic or prosodic nature of this "post-fronted-predicate" position particularly encourages cliticization and eventual reanalysis as a single word. Ideally, a fully worked-out analysis of Innu-aimun non-verbal predicate clauses should capture this fact.

On a more general level, it is interesting to note that the presentative *eukuan* 'this/that is,' the presentative *namaieu* 'it's not,' and the interrogative pronouns all arose from different sources. As we have seen, *eukuan* seems to be derived from the fusion of a particle and a demonstrative. *Namaieu*, on the other

hand, appears to have originally been a verb that became defective (Reinholtz 2005). Finally, interrogative pronouns clearly originated as nominals, and still function as regular nominals outside of sentence-initial position (in which case they are interpreted as indefinites). Despite these different origins, the three items have converged in present-day Innu-aimun to the point that their morphosyntax appears identical—all three occur sentence-initially, can carry tense and modality suffixes, can be followed by a demonstrative, and require a following lexical verb to be in the conjunct order. The fact that three once-distinct items have all converged toward this common set of properties suggests that "presentative" (i.e. "quasi-nominal predicate") has become a true grammatical category in Innu-aimun.

7 Conclusion

This paper has focused on an interesting property of Innu-aimun pronouns (and presentatives): in their predicative function, they can inflect for tense and modality just as verbs do. This phenomenon fits well with existing analyses of Algonquian nominal predication (Déchaine 1997; Blain 1997), requiring only the addition of an overt morpheme in the T position; the distribution of this morpheme follows from well-established constraints on syntactic movement. A related pattern of "dummy *e*-insertion," which occurs with DP predicates, provides an interesting parallel with *do*-insertion in English. Beyond their inherent interest, the Innu-aimun facts also have implications for the syntax of Algonquian *wh*-questions. Finally, I have shown that cross-dialectal comparison provides a deeper insight into the properties of such "presentative" constructions.

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Transitivity and animacy mismatches in the Ojibwe finals system: the Cyclic licensing of Person features[*]

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This paper proposes a unifying account of verb finals in Ojibwe (Central Algonquian) using Cyclic Agree (Béjar & Rezac 2009) to license Person (π) features. I first give an account of the long-standing puzzle of transitive inanimate verbs bearing animate intransitive theme-signs, even though these two types of verbs mismatch in both animacy and transitivity. Second, I argue for revisions to the mechanics of Béjar & Rezac's (2009) Cyclic Agree, and account for the Transitive Animate *Inverse System*, which is extended to theme-signs on ditransitive verbs.

1 Introduction

An interesting puzzle in the system of Ojibwe morphology involves certain verbs that appear to be transitive, yet systematically occur with *theme-sign* morphology associated with an intransitive paradigm. I propose that this puzzle is the result of a mismatch between the syntax and morphology, where the morpheme slot in question does not directly reflect the valency of a verb, but rather encodes the Person (π-)features of the arguments. I appeal to the theory of Cyclic Agree as set forth by Béjar & Rezac (2009), and posit that certain (inanimate) arguments bear no Person features, making them invisible for Person Agreement. I then argue for certain theoretical revisions to Béjar & Rezac's proposal and present an analysis of the infamous Ojibwe Inverse System where the theme-sign encodes the Person features of multiple arguments, and then extend my account to ditransitive forms.

This paper is organized as follows. The rest of section 1 introduces the data of transitive verbs bearing intransitive morphology and argues that this is not a case of underlying intransitivity for both types of verbs. Section 2 sketches Cyclic Agree as proposed by Béjar & Rezac (2009) and extends it to intransitive contexts to account for the transitivity puzzle. Section 3 goes into the details of Béjar & Rezac, arguing for certain revisions and featural organization to elegantly account for unambiguously transitive forms, which further extends to ditransitives. Section 4 concludes the paper.

1.1 Algonquian transitivity finals

Verbs in Algonquian languages bear suffixes called *finals* or *theme-signs* that are traditionally described as encoding transitivity and the animacy of arguments. There are four verbal paradigms: 1. Transitive Animate verbs (VTA) are transitive or ditransitive with animate arguments; 2. Transitive Inanimate verbs (VTI) are transitive, with an animate external argument but an inanimate internal argument; 3. Animate Intransitive verbs (VAI) are intransitive with an animate sole argument; 4. Inanimate Intransitive (VII) verbs are intransitive, or impersonal, with an inanimate sole argument.

Curiously, these divisions of both transitivity and animacy are not always reflected in the theme-sign morphology, as is the case for VTI forms, which bear VAI suffixes, bolded in (1):

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(1) Transitive Inanimate (VTI): Animate Intransitive (VAI):

a. waab-am-d-**am** 'sees it' a′. asosod-**am** 'coughs'

b. bii-d-**oo** 'bring it' b′. bimibat-**oo** 'run'

c. naa-d-**i** 'fetch it' c′. maw-**i** 'cry' (Piggott 1989:181-2)

The appearance of VAI finals on VTI constructions presents a puzzle since these two paradigms do not match with respect to transitivity or animacy, according to traditional divisions. They would be expected to occupy opposite paradigms, as in the table in (2).

(2)

	Transitive	Intransitive
Animate	VTA	VAI
Inanimate	VTI	VII

Bloomfield's (1957) view of this data is that VTIs are in fact syntactically intransitive, and that their inanimate internal arguments are oblique and do not count towards the valency of a verb. Contra Bloomfield, I want to argue that VTIs are actually syntactically transitive, that it is only the VAI morphology that indicates the apparent intransitivity of VTIs, and that the VAI morphology reflects the presence of only one animate argument.

1.2 Syntactic transitivity of Transitive Inanimate verbs (VTIs)

I claim that VTIs are underlyingly syntactically transitive, and that the inanimate objects in these constructions are not obliques as Bloomfield (1957) suggests. First, VTIs must be transitive because they obligatorily select for two syntactic arguments, shown in (3). The VTI form *waabamdam* can only mean 'He/she sees it,' and the object cannot be absent or unspecified. If the object is non-specific, or absent, the form changes from VTI, *dakondan* 'He/she bites it' in (4)a, to a kind of 'antipassive', in the terminology of Kyriakaki (2009), marked by the *–igee* suffix seen in (4)b, *dakonjigee* 'He/she bites (things)'.

(3) waab-am-d-am
see-TRANS-INAN-VAI
'He/she sees it(inan).' (Piggott 1989:180)
* 'He/she sees.' / 'He/she sees something(unspecified).'

(4) a. dakom-d-**am** /dakondan/
bite-INAN-**VAI**
'He/she bites it(inan).' (Valentine 2001:441)

b.[1] dakom-d-**igee** /dakonǰigee/
bite-INAN-**AP**
'He/she bites things(unspecified)' (Piggott 1989:201)

Second, beyond the theme-sign morphology shared with VAIs, VTIs share certain morphology with VTA verbs, which are unambiguously transitive. Consider the data in (5), where the VTI in (a) and the VTA in (b) both bear *–am*, marking their syntactic transitivity. This suffix is not shared with the intransitive (VAI and VII) paradigms.

(5) a. n-waab-**am**-d-am
1-see-**TRANS**-INAN-VAI
'I see it(inan).' (Piggott 1989:181-2)

b. n-waab-**am**-aa
1-see-**TRANS**-DIR
'I see him/her(anim).' (Valentine 2001:270)

[1] Compare with VTA form *dakon-igee* 'He/she bites people(unspecified)' (Piggott 1989:201) also with the 'antipassive' *–ige*.

Therefore VTIs are syntactically transitive since their objects are obligatory and not oblique (only possible with *–igee* in a kind of antipassive, see Kyriakaki 2009), and VTIs bear marking that clearly relates to transitivity.

1.3 Account outline

I claim that the presence of VAI finals on VTI forms is not due to syntactic intransitivity (contra Bloomfield 1957), but is rather a mismatch in the mapping from syntax to morphology. My account argues that all theme-sign suffixes in all verbal paradigms of Ojibwe are the spell-out of a little *v* head that can Agree with the π-features of the internal and external arguments (i.e. Cyclic Agree, introduced in section 2). While animate arguments bear interpretable π-features, inanimate arguments are completely unspecified for π-features (as has been proposed for 3rd person in other languages: Harley & Ritter 2002; Anagnostopoulou 2005; Adger & Harbour 2007, for example). Given that theme-signs encode Person agreement, and not strict transitivity, inanimates will pattern with syntactically absent arguments since neither bear π-features. VAI and VTI clauses have only one animate argument that is visible to π-agreement, and so the spell-out of the theme-sign will be identical for both constructions.

2 Cyclic Agree

2.1 Béjar & Rezac (2009)

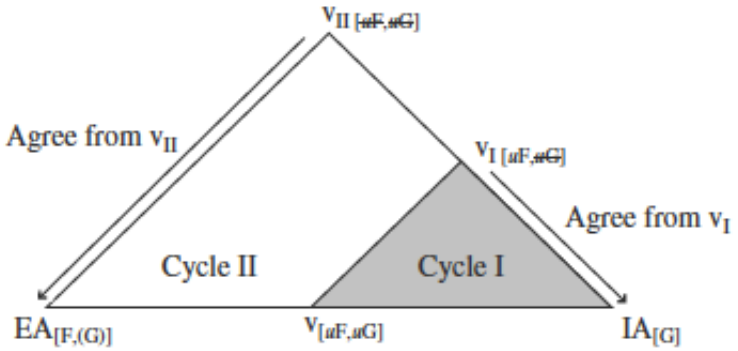
To account for the forms of theme-signs I adopt the concept of Cyclic Agree proposed by Béjar & Rezac (2009). They posit that multiple arguments can potentially Agree with a complex *core probe* that bears a set of uninterpretable π-features.[2,3] A sketch of their proposal is given in the derivation in (6). The VP containing the internal argument (IA) merges with little *v*, which bears a probe made up of a set of π-features (e.g. [1, 2, 3], Step 1). If the IA bears π-features that match the probe then those features are deleted on *v* (Step 2). Next (Step 3), the EA merges into the specifier of *v*P and can check π-features that are yet unmatched on *v*'s probe (that is, not checked by the IA goal), such that it is possible for two goals to Agree with the same probe.

(6) *Derivation of a transitive vP*(Béjar & Rezac 2009:48)
Step 0: VP constructed as {V, {V, IA}}; v becomes locus
Step 1: Merge(v, VP) ⇒ {v_I, {v, {V, {V, IA}}}}
Step 2: Agree(v_I, IA)
Step 3: Merge(vP, EA) ⇒ {v_{II}, {EA, {v_I, {v, {V, {V, IA}}}}}}
Step 4: Agree(v_{II}, EA), if there is still a probe on v_{II}

The diagram in (7) illustrates how *v* checks with multiple goals – which, again, is possible because *v* bears a probe with multiple uninterpretable π-features – to cyclically Agree with the IA and then the EA. Both the internal and external arguments are local to *v*, with one in its complement and one in its specifier.

[2] Béjar & Rezac (2009) apply their proposal to Ojibwe (termed *Nishnaabemwin* in that article) to account for the complex forms of theme-signs in the VTA paradigm (to be discussed in section 3).
[3] EA=external argument, IA=internal argument.

(7) Cyclic expansion of the search space (Béjar & Rezac 2009:49)



Taking the notion of Cyclic Agree from Béjar & Rezac (2009), I propose details of an extension of this theory to further account for intransitives in Ojibwe, and in fact to cover all verbal finals that appear in the theme-sign slot that corresponds to the spell-out of the *v* head.

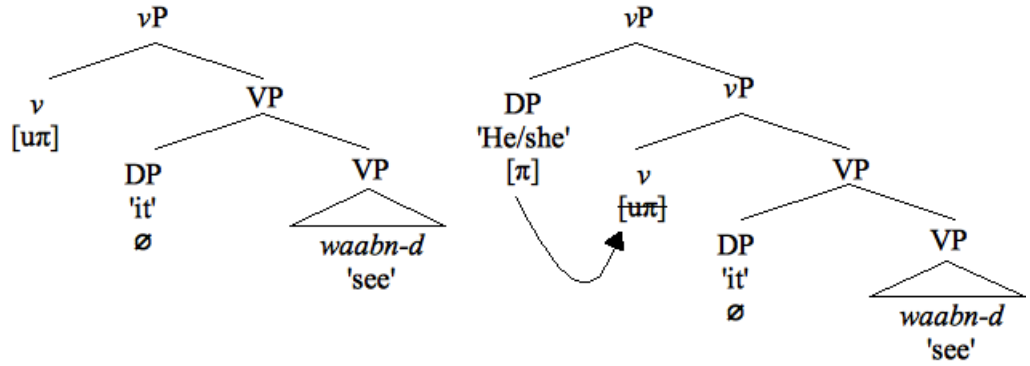
2.2 Animate Intransitive vs. Transitive Inanimate verbs

Returning to the problem of VTIs bearing VAI theme-signs, the arguments of both types of constructions interact with the π-probe on *v* in the same manner. All animate arguments in Ojibwe posses interpretable π-features which can match features on the π-probe on *v*, but I claim that inanimates are personless and have no π-features to Agree with such a probe. When *v* is merged in a VTI or VAI construction it searches its complement for an appropriate goal, but there are no π-features, either because it is an intransitive with no internal argument, or a transitive with an inanimate, personless argument. Matching only occurs when the animate external argument merges into spec *v*P, bearing interpretable person features. The sole animate arguments of VTI and VAI constructions therefore mark the *v* probe once and Vocabulary Insertion must spell-out with the same theme-sign suffix since both constructions show no distinction in how the *v* probe is marked.

Consider the derivations in (8) and (9). (8) involves the VTI *waaband* 'see': *v* merges with the inanimate internal argument 'it' in its complement, seen in Cycle 1 (a). No checking occurs since 'it,' as an inanimate, is featureless with respect to Person. Cycle 2 (b) shows the merging of the animate external argument, which does have an interpretable [π] feature that matches a feature on *v*. This derivation involves only one instance of matching on *v* (although *v* bears multiple [uF]s), corresponding to the theme-sign spell-out *–am* (for type I verbs). [4]

(8) VTI: w-waaband-**am**
'He/she sees it.' Vocab Insertion: *v*[~~uπ~~] → /-am/ / $VERB_I$

a. Cycle 1 (no feature matching/checking) b. Cycle 2: EA Goal

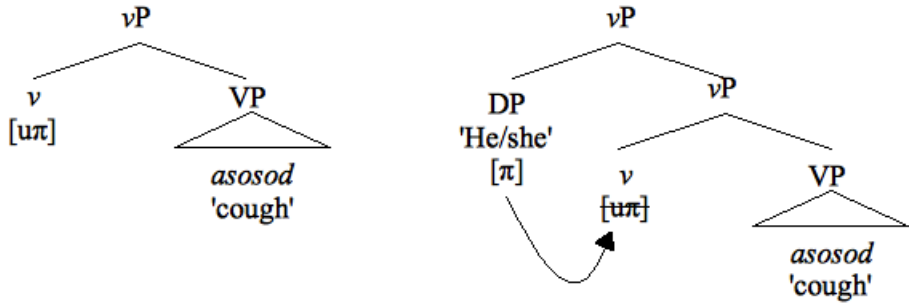


[4] The checking in VAI and VTI is different from transitives like VTAs, which have two goals checking two distinct features on the goal, shown in section 3 below. The [uπ] probe is actually a set of [uF]s (see (23)).

Now compare the VTI with the VAI derivation for *asosod* 'cough' given in (9). When *v* merges there is no argument in its complement (because the construction is intransitive) and no checking occurs in Cycle 1 (a), just like in (8)a for the VTI. In Cycle 2 (b) the animate external argument merges and Agrees with *v*, which was also the case in (8)b for the VTI. Only one instance of matching *v* occurs, and so this spells-out the theme-sign *–am* (for type I verbs) because the probe on *v* has been marked in an identical way to the VTI.

(9) VAI: asosod-**am**
'He/she coughs.' Vocab Insertion: *v*[~~uπ~~] → /-am/ / VERB_{I}

a. Cycle 1 (no feature matching/checking) b. Cycle 2: EA Goal



Since VAIs and VTIs both have only one animate (and therefore personful) argument they must bear the same set of theme-signs because the theme-sign is the spell-out of Person Agreement on *v*. Different VAI theme-signs occur on different classes of verbs – class I is shown above, but the same holds for other types of verbs. (10) illustrates another set of VTI and VAI derivations with verbs that take the *–oo* theme-sign rather than *–am*:

(10) a. VTI: w-bii-d-**oo**
'He/she brings it.'

EA	*v*	IA
[π] –	[~~uπ~~]	Ø

b. VAI: bimibat-**oo**
'He/she runs.'

EA	*v*
[π] –	[~~uπ~~]

Vocab Insertion: *v*[~~uπ~~] → /-oo/ / VERB_{II}

Therefore, syntactic transitivity can be realized as morphological intransitivity when an argument lacks π-features, since Ojibwe theme-signs are Person Agreement. VTI aligns with both VTA and VAI along two different dimensions – one in syntactic transitivity, and the other in the morphology:

(11)

Morph \ Syntax	Transitive	Intransitive
Transitive	VTA	
Intransitive	VTI	VAI

VTIs only appear to be intransitive when the theme-sign morphology is considered, but I am claiming that this morpheme does not directly reflect transitivity and instead directly indicates the π-features of the clausal arguments. Animate arguments bear interpretable π-features, but inanimate ones do not causing them to pattern alongside absent (or oblique) arguments with respect to Person Agreement.

3 Revisions to Béjar & Rezac (2009): the Algonquian Inverse System

Having introduced the extension of Cyclic Agree to morphologically intransitive constructions, I now discuss the details of my revised account, specifically with respect to the VTA theme-signs known as the Inverse System.

3.1 Transitive Animate theme-signs in the Inverse System

The VTA paradigm of theme-signs is much more complex than the other verbal paradigms and constitutes what is knows as the *Inverse System* (IS) in the Algonquian literature. Descriptively, different theme-sign morphemes are inserted dependent on the π-feature specifications of the internal and external arguments, and are further sensitive to the relative ranking of these features. The ranking is subject to the Participant Hierarchy in (12), where Speech Act Participants (SAPs, 1st and 2nd person) outrank third persons, and animates (SAPs, proximates and obviatives) outrank inanimates.

(12) Participant Hierarchy: 2 > 1 > 3 Proximate > 3 Obviative > Inanimate
(Valentine 2001:268)

VTA theme-signs are either *direct* (DIR) or *inverse* (INV). The theme-sign is direct when the external argument is higher ranked on the Participant Hierarchy than the internal argument. This the case in (13)a where the first person external argument is higher ranked than the third person animate internal argument 'him', resulting in the direct theme-sign *–aa*. The other possibility is that the VTA theme-sign is inverse, which occurs in the opposite environment of the direct, namely when the internal argument outranks the external argument on the hierarchy. The inverse is seen in (13)b, where the π-feature specifications of the arguments is reversed from the direct in (a), such that the first person internal argument outranks the syntactically higher third person argument, spelling-out *–ig* 'inverse'.

(13) a. n-waabm-aa
1-see-DIR
'I see him.'
b. n-waabm-ig
1-see-INV
'He sees me.' (Valentine 2001:270)

The direct/inverse distinction is not only seen between SAPs and third persons, but can also occur between types of third person arguments, shown in (14), where proximates outrank obviatives. When the proximate is the external argument over the obviative the theme-sign is direct (a), and when proximate is the internal argument the theme-sign is inverse (b).

(14) a. w-waabm-aa-n
3-see-DIR-OBV
'He(prox) sees him(obv).'
b. w-waabm-igo-on
3-see-INV-OBV
'He(obv) sees him(prox).' (Valentine 2001:272)

A further complication of the Inverse System is that there are two sets of direct/inverse suffixes: the Non-Local (NL) set (13)-(14), which appear when at least one argument is third person, and the Local (L) set (15), used only when both the IA and EA are SAPs (1st or 2nd person). (15)a is the local direct context with *–i*, since 2nd outranks 1st person on the Participant Hierarchy in Ojibwe (12), and (15)b is the local inverse where the features are swapped between the IA and EA, spelling out as *–in*.

(15) a. g-waabam-i
2-see-DIR(L)
'You see me.'
b. g-waabm-in
2-see-INV(L)
'I see you.' (Valentine 2001:270)

The complete set of VTA theme-signs are given in (16), and their contexts of usage are illustrated in the table in (17).

(16) Ojibwe VTA theme-signs:

	Direct	Inverse
Local (L)	*-i*	*-in(i)*
Non-local (NL)	*-aa*	*-igw* (also *-igo, -ig*)

(17) **Transitive Animate verbal paradigm** (Adapted from Valentine 2001:287)

IA / **EA**	2	1	3	3'
2	*reflexive*	g-STEM-i	g-STEM-aa	
1	g-STEM-in	*reflexive*	n-STEM-aa	
3	g-STEM-ig	n-STEM-ig	*reflexive*	w-STEM-aa-n
3'			w-STEM-igo-on	*reflexive*

The *v* head, which spells-out as the theme-sign, must encode the π-features of both arguments in order to correctly spell-out the local or non-local form (i.e. it must know when both arguments are SAPs or not), and to be able to record whether the internal or external argument is higher ranked on the Participant Hierarchy in (12). Béjar & Rezac (2009) give an account of the Inverse System via Cyclic Agree, outlined in the following subsection, and I revise their analysis in section 3.3 to solve certain theoretical difficulties with their account.

3.2 Béjar & Rezac (2009) on the Inverse System

I introduced the general scheme of Béjar & Rezac's (2009) Cyclic Agree in section 2, and their account is applied to the VTA theme-signs of the Inverse System. First, their core probe (18)b merged on *v* bears an arrangement of features (18)a that roughly reflects the Participant Hierarchy in (12).

(18) Algonquian Core Probe:

a. [π [participant [addressee]]]
or
[3 [1 [2]]]

b. [u3]
[u1]
[u2] (Béjar & Rezac 2009:49,50)

For Bejar & Rezac arguments are completely specified for their π-features, meaning an argument bears all features they outrank on the hierarchy, shown in (19). For example, a 1st person argument bears not only a [1] feature, but also a [3] feature since this feature is outranked, and therefore entailed, by [1].

(19)

3rd	1st	2nd	*Shorthand 2>1>3*
[3]	[3]	[3]	
	[1]	[1]	
		[2]	(Béjar & Rezac 2009:43)

In their account, Béjar & Rezac derive the direct as in (20). In Cycle I (on the right), *v* merges with the IA in its complement and matches the [u3] feature. Then in Cycle II (on the left) the EA merges bearing [1,3], where [1] can match [u1] on the core probe, but [3] cannot match since [u3] was already matched in the previous cycle (feature checking indicated by '—', features checked in a previous cycle indicated by parentheses ([uF])). Both the IA and EA can match unique features on the *core probe* that originally merges on *v*, which is denoted as the direct context (i.e. spells-out as *–aa* 'direct').

(20) Direct derivations (adapted from Béjar & Rezac 2009:63)

DIRECT(Non-Local) /-aa/ (cf. (13)a)

Cycle II			*Cycle I*		
v_{II} (Core)		EA	v_{I} (Core)		IA
([u3])		[3]	[u3]	–	[3]
[u1]	–	[1]	[u1]		
[u2]			[u2]		

The inverse differs from the direct in that the IA is more highly specified than the EA and fully Agrees with the core probe in Cycle I so that the EA cannot match any undeleted features. The inverse is derived in (21) where the 1st person IA checks [u1, u3] on the core probe. When the EA merges in Cycle 2 bearing only [3] it cannot match the already deleted [u3] and so this argument cannot Agree with the core probe. Béjar & Rezac (2009) claim that an *added probe* must be inserted into a higher label of *v* (the label v_{II} that is sister to the EA, see (7)) so that the EA's π-features can be licensed in Cycle II. It is the presence of this added probe that marks a construction and spells-out as inverse.

(21) Inverse derivations (adapted from Béjar & Rezac 2009:63)

INVERSE(Non-Local) /-igw/ (cf. (13)b)

Cycle II				*Cycle I*		
v_{II} (Core)	v_{II} (Added)		EA	v_{I} (Core)		IA
([u3])	**[u3]**	–	[3]	[u3]	–	[3]
([u1])				[u1]	–	[1]
[u2]				[u2]		

3.3 Revisions to Cyclic Agree

Now I want to argue that certain details of Béjar & Rezac's (2009) account are theoretically problematic, and propose revisions to the account. Béjar & Rezac require an *insertion* operation, distinct from Merge, that adds a probe to a higher label of *v* (i.e. the node that is sister to the EA in spec *v*P (7)). According to Chomsky (2000:133) a label is a lexical item, projected from the head/selector of a Merge operation, but the insertion of an added probe contributes material to this label that has not been inherited from either of its daughters in the derivation. The label, as a lexical item, is *not* independent from the originally merged *v* head, but is a copy of the head modulo the effects of Agree.

This application of insertion seems generally unmotivated, and theoretically problematic, except as a repair mechanism in 'inverse' contexts. Insertion is a very powerful mechanism without obvious restrictions and is expected to overgenerate beyond the discussion in Béjar & Rezac (2009). Taking the spirit of their account, where a complex probe can Agree with a goal in its complement and specifier, I propose several revisions to the details of the account to get around the need for insertion and to elegantly account for the data.

First, I posit that arguments are contrastively underspecified with respect to π-features, as in (22), unlike (19) where arguments are fully specified in the narrow syntax. Like with underspecified phonological features, the full specification of an argument can be filled in at the interface for interpretation. Second, the complex π-probe merged on *v* is a morpho-syntactic feature geometry, comparable to that found in Harley & Ritter (2002), with the root node [uπ] (23). The geometry encodes the entailment or ranking relationships between the π-features: [π] is the root node and therefore does not entail any other features, corresponding to third persons low ranking on the hierarchy in (12). The feature [2], for example, is high ranked and entails [π] and [1], which connect [2] to the root node of the geometry.

(22) Complex π-probe:
1st: [1]
2nd: [2]
3rd: [π]

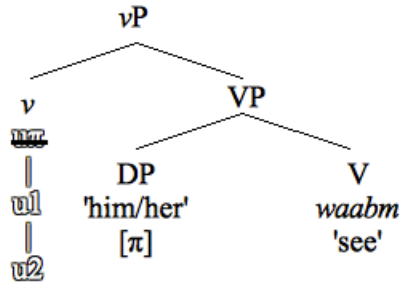
(23) . Complex π-probe (outlined features inactive at Merge):

For my account, uninterpretable features on the *v* probe are *inactive*, or unentailed, when merged into the structure. When a feature is matched on the probe when Agreeing with a goal argument it must connect to the root node and therefore *actives* the features it entails. For example, if a goal bears [1] it matches [u1] on *v* but it must activate [uπ] so that it is connected to the root. Activated, or entailed, features are not deleted because they are not matched by an interpretable feature, meaning they can be matched by another goal later in the derivation. The presence of contrastively underspecified features on arguments allows both the IA and EA to Agree with same probe in both the direct and inverse context, thus eliminating the need for an added probe.[5]

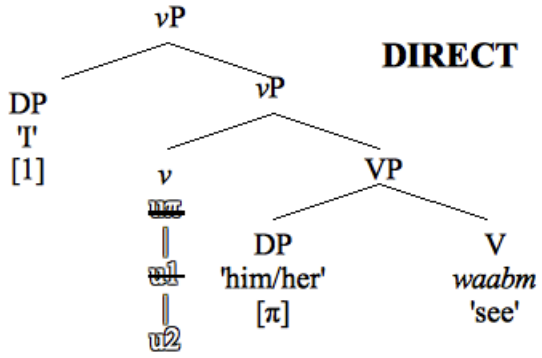
To show how the set-up of the features works, consider the derivations for the direct and inverse. The direct is derived when all features checked on *v* are inactive when matched, like in *nwaabmaa* 'I see him/her' in (24). In Cycle 1 (24)a the IA merges bearing [π] and checks [uπ] on *v*, which is the root node so no other features are entailed. Then Cycle 2 merges the EA bearing [1] which can check [u1] on *v* since it has not been matched in a previous cycle (inactive features outlined, active features are filled in).

(24) n-waabm-aa
1-see-**DIR**
'I see him/her.' (Valentine 2001:272)

a. Cycle 1: IA Goal



b. Cycle 2: EA Goal



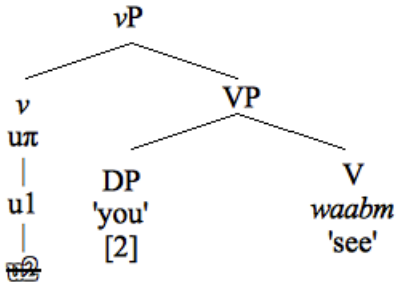
All features checked on *v* are inactive (or unentailed) when checked, which I label the direct context. However, the inverse involves the special checking of a feature that has already been entailed and activated in a previous cycle. This is the case for *gwaabmig* 'He/she sees you' in (25). In Cycle 1 the IA merges bearing [2], which deletes [u2] on *v* but must also connect to the root node and therefore activates [uπ] and [u1]. In Cycle 2 the EA bearing [π] merges in spec *v*P and can check [uπ] on *v* which has not

[5] This falls in line with the restriction on overlapping reference arguments in Ojibwe. For example, it is not possible to say 'We voted for me' because of the overlapping [1] feature in both the IA and EA. This restriction is accounted for since the IA and EA check their π-features against the same probe and the same feature can only be matched once.

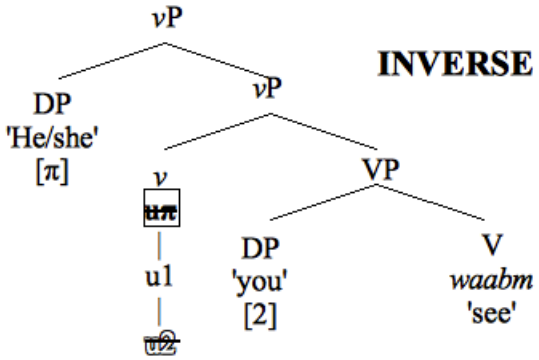
been matched, although [uπ] has been activated by the checking of [2] in Cycle 1. Like in the direct context, both arguments in (25) match unique features on the complex probe on *v*.

(25) g-waabm-ig
2-see-**INV**
'He/she sees you.' (Valentine 2001:272)

a. Cycle 1: IA Goal



b. Cycle 2: EA Goal



The defining factor of the inverse derivation is that a feature has been checked in cycle 2 while already entailed in cycle 1. In the case of (25), [uπ] is checked by the EA after the 2nd person IA has activated it. The direct derivation does not involve this kind of feature checking, where all features matched are inactive. I propose the spell-out rules in (26) for Non-Local VTA theme-signs, which refer to the presence of a feature checked while entailed.

(26) VTA theme-sign spell-out rules:
INV: *v* →/-igw/ / [~~uF~~]
DIR: *v* →/-aa/ / elsewhere

Appealing to argument feature underspecification and entailment (as in a feature geometry, a concept extended from phonological theory, notably by Harley & Ritter 2002) allows both the IA and EA to check against the same probe in the direct and the inverse. The distinction between the direct and inverse becomes Boolean, depending on the presence or absence of a checked and entailed feature.

3.4 Extension to ditransitives

I have argued that Cyclic Agree can account for the theme-signs found not only in the VTA (Inverse System) paradigm, but also for the VAI theme-signs, that appear in the transitive VTI paradigm as well. In fact, I want to claim that this analysis covers the spectrum of Ojibwe theme-signs including the suffixes found in ditransitive constructions, classified as VTA and showing the direct/inverse distinction.

Ditransitives in Ojibwe take the Double Object Construction (DOC) where both internal arguments are DPs (i.e. no prepositional phrases). In ditransitives, the theme-sign suffix reflects the relative ranking of the external argument and the indirect object (IO), or Goal. The direct object (DO), or Theme, is not encoded on the theme-sign. (27)a is non-local direct with the 1st person EA outranking the 3rd person IO 'Mary', and (27)b is non-local inverse since the EA is 3rd person and the IO is 1st person.

(27) a. ne-gii-miin-aa Mani mzinegen
1-pst-give-DIR(NL) Mary book
'I gave a book to Mary.' (Anonymous consultant, 19/04/07)

b. emkwaanes n-gii-miin-ig
spoon 1-pst-give-INV(NL)
'He gave a spoon to me.' (Philomene Chegahno, 20/04/07)

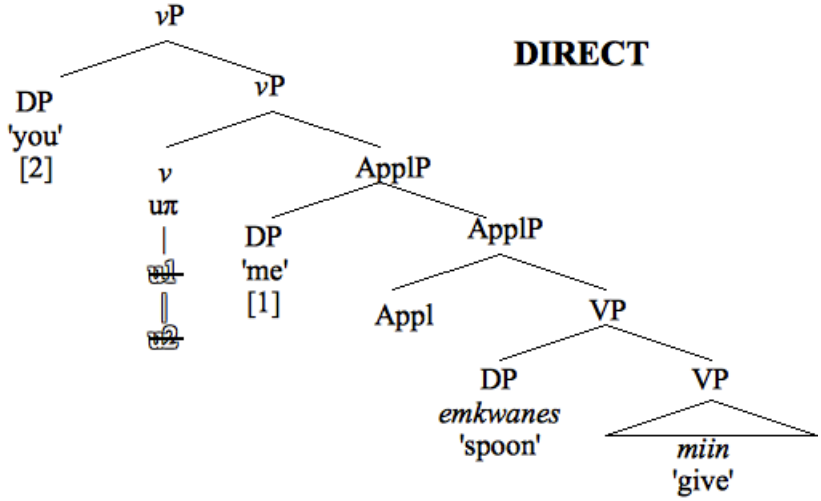
The data in (28) more clearly shows that the theme-sign is only concerned with the EA and IO in a ditransitive, and that the DO is not involved. (28)a contains a 2nd person EA and a 1st person IO, which spells-out the local direct theme-sign. The 3rd person DO *emkwaanes* 'spoon' is not encoded on the theme-sign, since that would trigger the non-local form, but the ditransitive theme-sign only considers the Person features of the external argument and the highest internal argument. Similarly for (28)b, the local inverse is spelled-out which encodes the relationship between the EA and IO only.

(28) a. gi-gii-miin-I emkwaanes
2-pst-give-DIR(L) spoon
'You gave a spoon to me.'
b. gi-gii-miin-in emkwaanes
2-pst-give-INV(L) spoon
'I gave a spoon to you.' (Philomene Chegahno, 20/04/07)

The IO, or Goal, argument is structurally higher than the DO, or Theme, in a double object construction. When *v* merges and searches its complement for an appropriate goal it will first find the IO, and will not Agree with the DO since the IO is an intervening goal between the DO and *v*. Therefore, in ditransitive constructions the Inverse System considers only the π-features and relative ranking of the external argument and the highest internal argument, which is the indirect object.[6]

(29) is the derivation of a ditransitive in Ojibwe, resulting in the spell-out of a direct local theme sign. When *v* merges there are two DP arguments in its complement, the 3rd person *emkwaanes* 'spoon' within the VP and a 1st person indirect object in a higher Applicative phrase. *v* Agrees with the 1st person IO, and is blocked from checking with the DO. *v* can still Agree with the EA when it merges in the specifier given there are matching, undeleted features remaining on the probe. Since the EA and IO are both speech act participants, the local theme-sign is used.

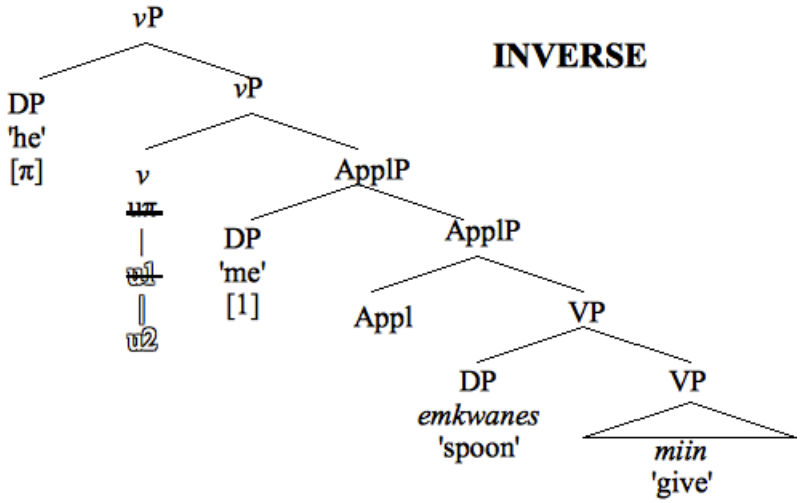
(29) gi-gii-miin-i emkwaanes
2-pst-give-**DIR(L)** spoon
'You gave a spoon to me.'



The non-local inverse derivation for a ditransitive is shown in (30). The 3rd person EA and 1st person IO Agree with *v*, and the DO *emkwaanes* 'spoon' is blocked from Agree with *v* since the DO intervenes between them. The form is inverse because [uπ] is activated by the checking of the 1st person IO, and [uπ] is then matched by the 3rd person EA, creating a a feature matched while active.

[6] I will not discuss the formation of the ditransitive stem here.

(30) emkwaanes n-gii-miin-ig
spoon 1-pst-give-**INV(NL)**
'He gave a spoon to me.'



Considering little *v* to be the head that spells-out as the theme-sign across Ojibwe verbal paradigms accounts for ditransitives, as well as transitive and intransitive forms. The position of *v* in the syntactic structure allows it to Agree with multiple arguments, since there are potential goals in its complement and specifier. Because ditransitives have two goals in the complement of *v*, the higher DP blocks Agreement with the lower DP, such that the DO does not affect the form of the ditransitive theme-sign.[7]

3.5 Section summary

In this section I have revised Béjar & Rezac's (2009) Cyclic Agree analysis to remove the need for an added probe that is arbitrarily inserted into a derivation to save a derivation that cannot otherwise license the Person features of both arguments in a transitive clause. For them, the added probe spells-out as the inverse theme sign, but for my analysis the inverse is derived when a feature is checked on the complex probe on *v* that has already been entailed by the checking of an argument in the previous cycle of Agreement. In this way, the inverse does not need to be considered a repair with an inserted probe, but is rather the more marked form of the VTA theme-signs. Also, I argue that theme-signs, both within the VTA paradigm and across the other verbal paradigms (VAI, VTI) always spell-out in the same morphological slot, corresponding to the little *v* head in the syntax, where Béjar & Rezac potentially have multiple theme-sign spell-out positions for the core and added probes. Further, my approach to the Ojibwe theme-sign morphology includes ditransitives, categorized under the VTA paradigm, where the theme-sign encodes the features of the external argument and the highest internal argument (i.e. the direct object).

4 Conclusion

I have proposed a solution to the mismatch between morphological and syntactic transitivity in VAI and VTI verbs in Ojibwe by appealing to an extension of Cyclic Agree. By treating inanimate arguments as personless, they pattern with absent arguments in the context of Person Agreement like with the theme-signs. The representation of features and their organization on a complex π-probe (on *v*) illuminates well-known Participant Hierarchy effects in Algonquian, namely the Ojibwe Inverse System,

[7] In other work I discuss the π-feature restriction found in such constructions, where the DO can only be 3rd person and is banned from being 1st or 2nd person (the Person-Case Constraint). I claim that this restriction arises because the DO cannot be properly Person Licensed by little *v*, and therefore must be relatively impoverished with respect to Person features.

as well as in a range of unrelated languages (e.g. Romance) where arguments are licensed, and therefore restricted, by their π-features.

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On intrinsic transitivity of Blackfoot √verbs[1]

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Blackfoot verbal stems are usually classified by transitivity and animacy of the object (Taylor 1969, Frantz 1971, 1995), while the interaction between roots and suffixes remains uncharted. This paper argues that Blackfoot verbal roots and transitivity suffixes form heterogeneous subclasses based on their intrinsic transitivity.

1 Traditional classification of Blackfoot verbal stems

Traditionally, verbal stems (root plus affixes) in Blackfoot are sub-classified on the basis of transitivity as well as the animacy of their argument. Intransitives verbs have one argument. Transitive stems require two arguments. In addition, all transitive stems are distinctly marked depending on whether their object is grammatically animate or inanimate. Similarly, intransitive verbs are traditionally sub-classified depending on the animacy of their subject. This stem- argument interaction is captured in the following classification:

(1) **Traditional classification of verbal stems in Algonquian**
(Preverb) [Root (Medial) Final] $_{TA}$
(Preverb) [Root (Medial) Final] $_{TI}$
(Preverb) [Root (Medial) Final] $_{AI}$
(Preverb) [Root (Medial) Final] $_{II}$

I will now go over the elements of the template. The preverb position hosts modal, temporal, aspectual and modifying prefixes. Suffixes that signal the transitivity (i.e., number of arguments) of the verb are analyzed as finals. Medials are modifying suffixes (mostly encoding manner). Preverbs and medials are not present in every verbal complex, while roots and finals are always required. Roots are simplex sound-meaning correspondences that finals and medials attach to when a stem is formed. As such, roots are essentially defined by their morpho-syntactic position. Animate transitive stems are TA, inanimate transitive -TI, animate intransitive - AI, and inanimate intransitive – II. Intransitive also includes pseudo intransitives (where an argument is optional). In (2), I illustrate how the template applies to a predicate:

(2) áakaaminnima[2]
yaak-ø-yaam-inn-i-wa
FUT-3SG-twisted-MED-TI-3>4
'She will twist it.' (F&R 1995:205)

Preverb	**Root**	**Medial**	**Final**
yaak	-yaam	-inn	-i

In the Algonquian tradition, the template serves as a tool for classification of individual morphemes as well as the phrases that these morphemes compose. It also captures the linear order of morphemes within the verbal complex. For example, Taylor's (1969) thesis lists Blackfoot verbal morphemes assuming the template as a sorting tool. Frantz (1971, 1995) also makes use of the template.

However, little research has been devoted to the question as to *what determines* the internal structure of the *verbal stem* (for a brief discussion on abstract and concrete finals, see Frantz's grammar 1991:99-110). Taylor's

[1] ***Nitsíniiyi'taki***, Beatrice Bullshields, our Blackfoot consultant**.** Many thanks to: Hotze Rullmann, Doug Pulleyblank, Thesis Anonymous & Blackfoot Reading group for questions & discussions. If you still find mistakes after all these people are through with me, it must be my fault. And Martina Wiltschko is just beyond thanks. The research was supported by Jacobs and Philips grants, as well as UBC AMS student initiative fund awarded to the author.

[2] Abbreviation key: AI-animate intransitive; AN- animate; DET-determiner; FUT- future; DIR-direct; IN-inanimate; II-inanimate intransitive; IMPF- imperfective; NOMZ- nominalizer; PL-plural; POSS-possesive; TA-transitive animate; TI-transitive inanimate; SG-singular.

(1969) thesis, for example, gives a list of at least 20 finals but it does not explore how the affixes relate to each other or to roots.[3] Specifically, it is not addressed (i) why and when particular verbal roots (henceforth √verbs) combine with particular finals, or (ii) why Blackfoot has more than one final of a particular type, e.g., why there are so many transitivity finals; (iii) and how these finals interact with each other. This study is a start in filling this gap.

2 Transitivity is intrinsic to √verbs

Given that animacy and transitivity are the prominent properties of the verbal stem, we might hypothesize that these properties may also play a role in classification of √verbs. In what follows, I argue that animacy does not bear on the classification of √verbs (section 2.1), but transitivity does (section 2.2).

2.1 √verbs are not inherently animate

The transitivity markers (or finals) on the verb agree with the object DPs in terms of animacy, √verbs are not intrinsically animate or inanimate. The same √verb can be used with different markers depending on the animacy of the object, which is visible in plural marking of the nouns. In 0, animate objects co-occur with ***–o*** (3a) but not with ***–i*** (3b), while inanimate objects co-occur with ***–i*** (3c) but not with ***-o*** (3d).

(3) a. Anná Sam inoyí ómiksi imitáíks.[4]
anna Sam in **-o** -i omi-iksi imitaa-iksi
DET Sam see-**TA**-3>4 DET-AN.PL dog- AN.PL
'Sam saw the dogs.'

b. *Anna Sam in**i**m omiksi imitaiks.
anna Sam in **-i** -m omi-iksi imitaa-iksi
DET Sam see-**TI**-3>4 DET-AN.PL dog- AN.PL
Intended: 'Sam saw the dogs.'

c. Anná Sam in**í**m ómistsi napayínísts.
anna Sam in **-i** - m omi-istsi napayín-istsi
DET Sam see-**TI**-3>4 DET-IN.PL bread- IN.PL
'Sam saw the breads.'

d. *Anna Sam in**o**yi omistsi napayínists.
anna Sam in **-o** -i omi-istsi napayín-istsi
DET Sam see-**TA**-3>4 DET-IN.PL bread- IN.PL
Intended: 'Sam saw the breads.'

The use of the same √verb with arguments of distinct animacy shows that only verbal stems but not √verbs can be classified in terms of the animacy of their arguments. As such, animacy does not reflect any inherent property of a √verb.

2.2. An inherent feature distinguishes √verbs

We are now left with transitivity as the most prominent characteristic of the stem. But what exactly determines the transitivity within a stem: preverbs, roots, medials or finals? I first rule out preverbs and medials.

Given that preverb position hosts modal, temporal, aspectual and modifying prefixes which are optional (Taylor 1969) and do not encode transitivity, I leave them out of the discussion.[5]

Medials are often optional, too. In 0, we see how a medial ***–ika*** 'foot' (bolded) is part of the predicate in (4a), yet it can be omitted without loss either in grammaticality or transitivity in (4b):

---

[3] Taylor (1969) gives a list of final suffixes without any comment on their distribution or allomorphy with respect to roots. The exact number of entries depends on the criteria of counting. For example, one could consider transitive animate and transitive inanimate suffixes allomorphs or one could treat every suffix as a separate morpheme.

[4] All data comes from my own fieldwork unless otherwise indicated.

[5] Unless one takes into account ***linkers*** (Frantz 1991, Frantz & Russell 1994) also labeled ***relative roots*** such as ***itap*** 'towards', which may introduce an argument, e.g., ***oo*** 'move' versus ***itapoo*** 'move toward something'. I assume that these indeed are a kind of root rather than a **preverb** (akin to prepositional prefixes in Slavic languages, which also introduce an argument), and leave the discussion to further research.

(4) a. áíssi**ika**awaatsimi
á-ssi-**ika**-atsi-m-yii
IMPF -wipe-**foot**-FIN-TA-DIR
'She is washing his feet.' (Dunham 2009:10)

b. áíssiwaatsimi
á-ssi-atsi-m-yii
IMPF -wipe- FIN-TA-DIR
'She is washing him.' (Dunham 2009:10)

In the cases where the medial is not optional, its contribution is that of manner, not transitivity. In the following examples, medial ***inn*** 'by hand' remains constant while the change in the final suffixes (bolded) results in the change of transitivity:

(5) ssinn 'break with the hand/cause to go bankrupt'
ss-yinn-**ø**
break-by.hand-TA

ssinn**i**
ss-yinn-**i**
break-by.hand-TI

ssinn**aki**
ss-yinn-**aki**
break-by.hand-PS.INT (F&R 1995:173)

Thus, the only obligatory elements for stem formation and their classification are √verb and finals. Which of the two elements decides transitivity? Let's hypothesize final suffixes determine the transitivity of a stem (cf Hirose 2000 on Cree). We see the same √verb co-occurring with different finals:

(6) **√verb class 1, suffix set A** **√verb class 1, suffix set B**

sisoy**i**	'cut'	ssinn**aki**	'break by hand'	
siso-**i**		ss-yinn-**aki**		
cut- **PS.INT**		break-by.hand- **PS.INT**		
sisow**atoo**		ssinn**i**		
siso-**atoo**		ss-yinn-**i**		
cut- **TI**		break-by.hand- **TI**		
sisow**at**		ssinn		
siso-**at**		ss-yinn-**ø**		
cut- **TA**		break-by.hand- **TA**		**(**F&R 1995:165,173)
ihkiit**aa**	'bake'	o't**aki**	'take'	
ihkiit-**aa**		o't-**aki**		
bake- **PS.INT**		take- **PS.INT**		
ihkiit**atoo**		o'ts**i**		
ihkiit-**atoo**		o't-i		
bake- **TI**		take- **TI**		
ihkiit**at**		o't**o**		
ihkiit-**at**		o't-**o**		
bake- **TA**		take- **TA**		**(**F&R 1995:17, 143)

So a √verb like ***siso*** 'cut' combines with finals like ***-i, -at, -atoo*** while a √verb like ***o't*** 'take' combines with ***-aki, -i,-o.*** These finals mark distinct transitivity values. Therefore, one could conclude that the use of a particular final

determines transitivity. However, this hypothesis does not hold. Although the same √verb can occur with different final suffixes, the finals fall into sets. The problem is that one cannot switch the sets of finals on these √verbs, illustrated below:

(7) a. *sisow**aki**[6] 'cut' *ssinn**i** 'break by hand'
siso-**aki** ss-yinn-**i**
cut- **PS.INT** break-by.hand- **PS.INT**

*sisoy**i** *ssinn**atoo**
siso-**i** ss-yinn-**atoo**
cut- **TI** break-by.hand- TA

*siso *ssinn**at**
siso-**ø** ss-yinn-**at**
cut- **TA** break-by.hand- TA

*ihkiit**aki** 'bake' *o't**aa** 'take'
ihkiit-**aki** o't-**aa**
bake- **PS.INT** take- **PS.INT**

b. *ihkiits**i** *o't**atoo**
ihkiit-**i** o't-**atoo**
bake- **TI** take- **TI**

*ihkiit**at** *o't**at**
ihkiit-**at** o't-**at**
bake- **TA** take- **TA**

Below, I show the attempt to switch the finals in fieldwork: the switch in finals yields ungrammatical predicates:

(8) a. nítssisoy**i**
nit-i-siso-**i**
1SG-?-cut-**PS.INT**
'I cut.' (F&R 1995:1965)

b. *nitsisow**aki**
nit-i-siso-**aki**
1SG-?-cut-**PS.INT**
Intended: 'I cut.'

c. nitó't**aki**
nit-ó't-**aki**
1SG-take- **PS.INT**
'I took something.' (F&R 1995:139)

d. *nitó't**aa**
nit-ó't-**aa**
1SG-take- **PS.INT**
Intended: 'I took something.'

A particular set of finals is associated with a particular set of √verbs. If finals determined the transitivity on their own, the ungrammaticality of these examples would be unexpected. Therefore I conclude that there must be some property which drives the interaction between √verbs and finals.

Note that the particular conceptual content of a √verb is not the determining factor. For example, the roots ***o'kaas*** 'grab' and ***o't*** 'take' could be considered as being ***verbs of obtaining*** (in the sense of Levin 1993:141). However, they combine with different sets of suffixes:

(9)

TA	TI	I	
o'kaas-**at**	o'kaas-**at**	o'kaas-**i**	(F&R 1995:118)
o't-**o**	o't-**i**	o't-**aki**	(F&R 1995:139)

If the selectional restrictions are not based on conceptual content we must conclude that we are dealing with an abstract feature. I propose that the relevant feature is *Transitivity*. In particular, I argue that *we can identify subcategories of √verbs based on their intrinsic transitivity*. Thus, √verbs and verbal stems are both subcategorized for transitivity. They differ however in that √verbs are not subcategorized for the animacy of the relevant argument.

Next, I show that √verbs fall into subcategories based on their intrinsic transitivity.

[6] The hypothetical switch in the quality of the epenthetic glides y~w is based on the actual examples in other verbs, e.g., oo**y**i~oo**w**at~oo**w**atoo.

3 The subclasses of transitivity suffixes and √verbs

The fact that one set of finals cannot be substituted for another set of finals (section 1) shows that √verbs and suffixes are not homogenous, i.e. are classified further. I propose that there are two types of suffixes and two classes of √verbs. √verbs fall into intrinsically transitive and intransitive. And suffixes fall into selecting for the transitivity intrinsic to √verbs versus deriving transitivity opposite to the one intrinsic to √verbs.

I first discuss the distinctions within suffixes. The √verbs are addressed in the following section.

3.1 Blackfoot transitivity suffixes are not homogeneous

Consider the actual suffixes in isolation, arranged below in the sets as they would appear on √**verbs**.

Table 1. Transitivity alternations: two sets of suffixes[7]

Set	Transitive animate	Transitive inanimate	(Pseudo)-intransitive
A	**-at**	**-atoo**	**-aa, i**
B	**-o**	**-i**	**-aki, -imaa**

So why can suffixes of type A not be interchanged with suffixes of type B if both sets of suffixes mark transitivity? The ungrammaticality of the substitution forces us to recognize that the suffixes themselves differ in some aspect. I argue that they differ in their relation to transitivity. I propose that the suffixes either match the transitivity inherent to √verbs, or they change the value of the transitivity intrinsic to √verbs. Thus, I posit two types of transitivity suffixes:

(10) i. ***Selecting Transitivity suffix*:** selects for the transitivity intrinsic to a √verb;

ii. ***Deriving Transitivity suffix:*** assigns transitivity opposite to the one intrinsic to a √verb

Each set contains ***deriving*** (outlined font) and ***selecting*** (regular font) suffixes.

Table 2. Transitivity alternations: selecting versus deriving suffixes

Set	Transitive animate	Transitive inanimate	Intransitive
A	-𝕒𝕥	-𝕒𝕥𝕠𝕠	**-aa, i**
B	**-o**	**-i**	-𝕒𝕜𝕚, 𝕚𝕞𝕒𝕒

Thus I claim that √verbs are intrinsically either transitive or intransitive, and in that case the transitivity suffix is *selecting*. The *deriving* suffix adds the value opposite to the √verb. Now the puzzling ungrammaticality of the data in 0-0 can be accounted for: due to the switch in the sets of finals, transitivity intrinsic to the √verbs is at odds with transitivity of the finals. For example, the inherently transitive √verb ***o't*** is paired up with a transitivity deriving suffix ***-at***. Since the √verb is inherently transitive it cannot be felicitous with a final that derives transitivity[8].

3.2 Blackfoot √verbs are not homogeneous

In the previous section, I have argued for the split in transitivity suffixes. If particular transitivity suffixes select for particular √verbs, then the split in suffixes must also indicate a split in √verbs: otherwise, what are these suffixes ***selecting*** and ***deriving***? I propose that some √verbs agree in transitivity with their transitivity suffixes: let us call these class1 √verbs. The √verbs in class 2 co-occur with the deriving suffixes, so these √verbs must differ from the transitivity of their suffixes.

In the previous section, I focused on the fact that the two sets of suffixes cannot freely substitute one another, therefore they form subtypes. Now I want to draw the attention to another aspect of the same phenomenon: the fact that the √verbs cannot be shuffled freely either. The fact that distinct finals select for distinct √verbs means

[7] This is not an exhaustive list of suffixes (cf Taylor 1969). I have selected these due to higher frequency. I leave analysis of other suffixes for further research.

[8] Data from secondary derivation confirms the split into *selecting* and *deriving* suffixes, too: only what I call ***deriving*** suffixes participate in secondary derivation (for more details, see Armoskaite in prep.)

that these √verbs are intrinsically specified for transitivity. We need to recognize at least two subtypes of √verbs: transitive and intransitive. I discuss each in turn.

Transitive √verbs. Intrinsically transitive √verbs combine with the selecting transitive suffixes ***–o,-i***, indicated by [transitive]:

(11) √**verb** $_{[transitive]}$ + {-o/-i}$_{[transitive]}$

In other words, the transitivity value of both the √verbs and the suffixes is [transitive]. The following data illustrates the use of such √verbs in a sentence:

(12) a. innísskoyiiwa
inn -i-ssk -o-yii-wa
down-?-chase-TA-3>4
'He chased her off' (F&R 1995:52)

b. á'psskima
á'p -ssk -i-mi-wa
about-chase-TI-3>4
'He sought after it' (F&R 1995:13)

Although the direct object may not be overtly expressed, it is always marked on the verb morphology. Suffixes ***–o/-i*** encode both transitivity and the animacy of the object. Suffixes ***- yi*** and ***-mi*** indicate that the third person subject is acting directly on the object, for animate transitive and inanimate transitive respectively.[9] Suffix ***–wa*** indicates that the object is another third person.[10]

If the object is acting on a subject, i.e., the action is not direct, an inverse morpheme ***–ok*** is used:

(13) nitá'pssko**ok**a
nit-á'p-ssk-o-**ok-w**a
1sg-around- TA -3:1
'She chased me.' (F&R 1995:13)

When the deriving suffixes *–aki,* or *-imaa* are combined with transitive √**verbs**, pseudo-intransitives are derived.[11] In this case, the inherent [transitive] value of the √**verb** is over-ridden by the in transitive value of the deriving suffix. The resulting stem allows only for an NP object. In terms of the Algonquian template, the pieces would fall as follows:

(14) √**verb** $_{[transitive]}$ **final**$_{[pseudo\ transitive]}$] $_{[intransitive]}$

In a sentence, the derived pseudo-intransitive is used as follows:

(15) a. innísska**ki** (imitáiks)
inn -i -ssk **-aki** imitaa-iksi
down-?- chase-P.INT dog -AN.PL
'He chased off (dogs).'

b. *innísska**ki** omiksi (imitáiks)
inn -i -ssk **-aki** omiksi imitaa-iksi
down-?- chase-P.INT DET dog -AN.PL
Intended: 'He chased off the dogs.'

The difference between transitive and pseudo intransitives is in the use of determiners on the object. While pseudo intransitives are ungrammatical with a determiner, transitives are ungrammatical without it 0.

[9] For inflectional paradigms, see Frantz 1991:44, 147-150.
[10] Frantz notes that ***w, y*** glides are deleted due to phonology. Our Blackfoot consultant often deletes entire***–wa***.
[11] Frantz (1971:50) states that ***–imaa*** adds a semantic component of valid personal motivation on the part of the actor of the action. I could not replicate Frantz's finding in my fieldwork and leave this issue for further research.

(16) a. áaksinnisskoyiiwa ánni otáni
yaak-inn -i-ssk -o-yii-wa ánni o-táni
FUT -down-?-chase-TA-DIR-3SG DET POSS-daughter
'She will chase her daughter off.' (F&R 1995:51)

b. *áaksinnisskoyiiwa otáni
yaak-inn -i-ssk -o -yii-wa o-táni
FUT -down-?-chase-TA-DIR-3SG POSS-daughter
Intended: 'She will chase her daughter off.'

Note that not all transitive √verbs have derived pseudo intransitive forms[12].

Intransitive √verbs**.** Intransitives fall into **genuine intransitive** √verbs and **pseudo-intransitive** √verbs. Both combine with the ***selecting*** suffixes ***-aa,-i***:

(17) √**verb** [intransitive] + {-aa/-i}[intransitive]
√**verb**[pseudo intransitive]

Genuine intransitives do not allow for an optional NP object, while pseudo-intransitives allow for an optional NP object. One cannot tell apart the two sub-categories morphologically, since both utilize the same final suffixes; the distinction is clear only in syntax due to the presence or lack of an NP object.

Pseudo-intransitives. Most of the intransitive √verbs are pseudo-intransitives. A quick glance at the dictionary reveals that what is listed as an intransitive stem is often a pseudo-intransitive because the entry itself contains a requirement for some unspecified object:

(18)	***á'pitsíihtaa***	vai worry (about s.t.)	(F&R 1995:12)
	ohpommaa	vai buy (s.t.)	(F&R 1995:114)
	ikiiki	vai win a prize	(F&R 1995:29)
	ipiksi	vai strike, hit (s.t. or s.o.)	(F&R 1995:60)

However, not all pseudo intransitive entries are clearly defined as having an optional NP object. For example, the following √verbs require an NP, yet their dictionary entries do not mention any implied object:

(19)	***ikamo'si***	vai steal	(F&R 1995:28)
	ooyi	vai eat	(F&R 1995:134)
	wa'psskaa	vai bet	(F&R 1995:200)

Only through the use of the predicates we can find out whether the √verbs are pseudo-intransitives or genuine intransitives.

(20) a. nítsoy**i** (ááattsistaa/aaattsistaaiks)
nit-oo **-i** aaattsistaa/ -iksi
1SG-eat-PS.INT rabbit / -AN.PL
'I ate (rabbit/rabbits).'

b. nítsoy**i** (napayín/ napayínists)
nit-oo **-i** napayin/ -istsi
1SG-eat- PS.INT bread -IN.PL
'I ate (bread/breads).'

c. nítohpomm**a** (imitaa/imitaiks)
nit –ohpomm **-aa** imitaa/-iksi
1SG –buy - PS.INT dog / -AN.PL
'I bought (dog/dogs).'

[12] I.e., some forms do not have the derived pseudo-intransitive in the dictionary, but these forms may be attested during elicitation. Although it would be desirable to obtain complete sets through elicitation and/or text materials, this is not the goal in this study.

d. nítohpomm**a** (itaisooyo'p/itaisooyo'pists)
nit –ohpomm **-aa** it-a-i-oo-o'p/ -istsi
1SG –buy - PS.INT there-IMP-eat -NOMZ -IN.PL
'I bought (table/tables).'

We can see that both ***ohpommaa*** and ***ooyi*** can have optional NP objects, even though only ***ohpommaa*** is explicitly identified as having this option in the dictionary. When the deriving suffixes ***–at,*** or ***-atoo*** are combined with these √verbs, transitives are derived. In this case, the inherent [pseudo transitive] value of the √verb is over-ridden by the [transitive] value of the deriving suffix. The resulting stem requires a DP object. In terms of the Algonquian template, the pieces would fall as follows:

(21) √**verb** [pseudo intransitive] **final**[transitive]] transitive

In a sentence, the derived transitives look like in 0:

(22) a. nítsow**at**a omi ááattsistaa
nit-oo **-at**- wa omi aaattsistaa
1SG-eat- TA-1>3 DET rabbit
'I ate the rabbit.'

b. nítsow**atoo**'p omi napayín
nit-oo **-atoo**-'p omi napayin
1SG-eat- TI-1>3 DET bread
'I ate that bread.'

c. nítohpomm**at**a omi ááattisstaa.
nit –ohpomm –**at-**wa omi aaattsistaa
1SG –buy - TA - 1>3 DET rabbit
'I bought that rabbit.'

d. nítohpomm**atoo**'p omi napayín.
nit –ohpomm –**atoo-**'p omi napayin
1SG –buy - TI - 1>3 DET bread
'I bought that bread.'

Genuine intransitives. Like pseudo-intransitives, genuine intransitive √verbs also combine with with the ***selecting*** suffixes ***-aa,-i***. However, in contrast to the pseudo-intransitive, the inherent intransitives do not allow for an optional object:

(23) a. nitsií'poy**i**
nit-í'po- **i** 1SG-speak- INT
1SG-speak- INT
'I spoke.'

b. *nitsí'poyi anna Sam
nit -í'po **-i** anna Sam
1SG-speak- INT DET Sam
Intended: 'I spoke to Sam.'

c. nitsó'k**aa**[13]
nit -yó'k **-aa**
1SG-sleep- INT
'I slept.'

d. *nitsó'k**aa** paapáó'kaan
nit -yó'k **-aa** papa-yó'k-aa -n
1SG-sleep- INT in.dream-sleep-INT-NOMZ
Intended: 'I slept a dream/a sleep.'

The behaviour of the √verbs shows that they are genuine intransitive. As in the case of pseudo-intransitives, transitives are derived with the help of ***–at,*** or ***–atoo***. The inherent [-transitive] value of the √verb is over-ridden by the [transitive] value of the *deriving* suffix. The resulting stem requires a DP object. In terms of the Algonquian template, the pieces fall as follows:

(24) √**verb** [intransitive] + **final**[transitive]] transitive
√**verb** [pseudo intransitive]

[13] Alternative attested surface form: *nitsíyo'ka*.

In a sentence, the derived transitives look like in 0:

(25) a. Nitsí'powatsi anna Sam
nit -í'po-**i** anna Sam
1SG-speak-TA-1>3 DET Sam
'I spoke to Sam.'

b. Anna Joe iitápipikkssi mistákiists
anna Joe i-itap-ipikkss-i mistaki-istsi
DET Joe ?-toward-flee-INT mountain-IN.PL
'Joe fled to the mountains.'

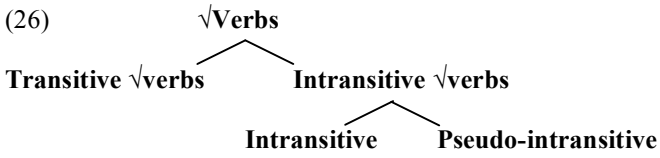
Not all intransitives form transitives. I could derive transitives only from √**verb *i'po*** 'speak, with ***at-***, one of the deriving suffixes discussed in this study, which requires an obligatory DP as an argument. The second derivation is with a relative root ***itap***-'toward' which I exclude from this study (see footnote 4). I leave the issue as to what are the restrictions on derivations of intransitives into transitives for further research.

4 Conclusions and open questions

Given that particular subsets of √**verbs** are selectable by particular transitivity suffixes, I proposed that [Transitivity] is the property that distinguishes between subclasses of both √verbs and transitivity suffixes. If transitivity suffixes determined transitivity, this would be unexpected (cf Hirose (2000) on Cree). This much leads to a conclusion that that neither √verbs nor transitivity suffixes are homogenous in Blackfoot. Thus both √verbs and suffixes fall into distinct classes.

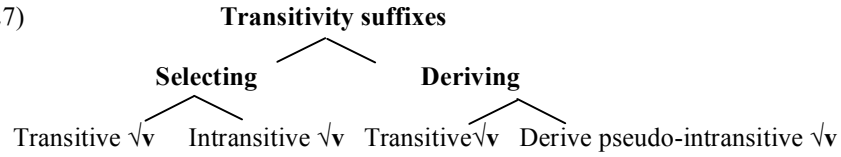
The √verbs fall into transitive and intransitive subcategories. The intransitive category further splits into genuine intransitive and pseudo-transitive subcategories:

(26)



The suffixes fall into ***selecting*** or ***deriving:***

(27)



The proposed classification of √verbs and transitivity suffixes complements the traditional classification of Algonquian verbal stems. The traditional classification is based on verbal predicates, i.e. it treats the √verb- suffix combination as a unit. My classification is driven by interaction between √verbs and suffixes. As a result, both √**verb** inherent properties and the distribution of suffixes are understood better.

Table 3. Stem versus √verb classification

	Traditional classification	**Proposed classification**
unit of analysis	[Root (Medial) Final] $_{TA}$ [Root (Medial) Final] $_{TI}$ [Root (Medial) Final] $_{AI}$ [Root (Medial) Final] $_{II}$	(i) √**verb** (ii) suffixes
classes of √verb	n.a.	inherently transitive inherently intransitive inherently pseudo-intransitive
classes of suffixes	n.a.	selecting transitivity deriving transitivity

Note, that Frantz also suggested that √verbs and transitivity suffixes need further analysis (1971:45; 1991:99, footnote 123). Frantz hypothesized that some √verbs may be inherently transitive, although the insight has not been developed further (1971:45). Frantz (1991:99, footnote 123) distinguished between 'abstract' and 'concrete' transitivity finals**.** According to Frantz, some of the suffixes analyzed here would belong to the same class, e.g. transitive ***–i*** and ***–at***, yet they are set apart under my analysis: one is ***selecting*** for particular transitivity the other is ***deriving*** transitivity.

In essence, the distribution of transitivity suffixes reveals the categorial identity of √verbs because transitivity suffixes select for [Transitivity] inherent to √verbs**.** The prediction is that these suffixes will not combine with either √nouns or √attributives, since they uniquely select for inherent transitivity. Further empirical questions are: what is the categorial identity of roots other than √verbs, i.e. what are the categorial properties that may be intrinsic to √nouns or √attributives, and how are these properties revealed? And how to reconcile the categorial identity of Blackfoot √verbs with the theory of category neutrality of roots (Marantz 1997, Borer 2005 among others)?

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Morphology and stress in Nez Perce verbs*

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This paper addresses the interaction between word-level stress and morphological constituency in Nez Perce, originally described by Crook (1999). Stress in Nez Perce, which is usually regularly *rightmost* in some domain, becomes unexpectedly *leftmost* in words that contain at least one accented prefix. Default rightmost stress is re-asserted, however, by the presence of any accented suffix. It is argued that these facts are best accounted for in terms of a positional faithfulness constraint privileging the realization of accents in certain *morphological* positions. The constraint proposed is PRESERVE EDGEMOST, which requires additional faithfulness to accents that are furthest away from the root towards the word edges. A novel property of this constraint is that it is sensitive not to hierarchical morphological structure, but only to linear morphological divisions. Later sections of the paper also address the relevance of Nez Perce for the typology of default-to-opposite stress systems.

1 Introduction

This paper addresses the interaction between word-level stress and morphological constituency in Nez Perce, a Sahaptian language spoken in parts of Washington, Oregon, and Idaho. The description of Nez Perce stress is drawn from Crook (1999), corroborated by data drawn from Aoki and Walker (1989) and Aoki (1994).

Stress in Nez Perce depends on the interaction between default alignment preferences and underlying accents (i.e. lexically determined stresses). The default pattern is for primary stress to be *rightmost* in some domain.

Nez Perce stress assignment is of particular interest to phonological theory because it shows interactions between morphology and phonology that are *non-cyclic*. Accented verbal prefixes trigger a *reversal* in the edge-alignment of stress in Nez Perce: they trigger left alignment of primary stress, overriding the default right alignment of the language. Default rightmost stress alignment is preserved, however, whenever a verb contains an accented suffix, *regardless of the relative scope between that suffix and any prefixes*.

The analysis of the Nez Perce facts proposed here is developed within the framework of Optimality Theory (OT) (Prince and Smolensky, 1993; McCarthy and Prince, 1994), using a set of stress-alignment constraints proposed in Gordon (2002). In this paper I argue that analyzing the reversal of stress alignment that is triggered by accented prefixes requires a constraint that is sensitive to morphological constituency, but in a relatively limited way: it is sensitive to *linear*, rather than hierarchical, morphological structure. The required constraint (PRESERVE EDGEMOST) prefers that accents (represented as stresses in the Input) be preserved on morphological constituents that are furthest from the root towards the word edge. The effect of this constraint will be to prefer to place primary stress at a word edge, so long as that does not involve placing primary stress on the root. This constraint is potentially in conflict with the constraint that aligns primary stress at the right edge of the word; in most cases these constraints can both be satisfied by a single candidate, but when their demands diverge, it will be PRESERVE EDGEMOST that is satisfied. This analysis is detailed in section (32). Section 5 dis-

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cusses how this analysis improves over the previous analysis proposed in the literature, that of Crook (1999), which accounted for the data via cyclic constraint-re-ranking together with a process of partial bracket erasure.

The correct analysis of the Nez Perce stress system bears directly on theoretical debates concerning the nature of the phonology-morphology interface. A number of recent theories propose that morpho-phonological interactions result (at least sometimes) from Output-Output relationships between related words (Benua, 1997; Burzio, 1998; Kenstowicz, 1996; McCarthy, 2005; Steriade, 1997). Cyclic effects are preserved in the case of derivational morphology by the principle of Base Priority (Benua, 1996, 1997), which constrains the directionality of transderivational correspondence.

The non-cyclic effects of Nez Perce point towards a residue of cases where morphology and phonology interact directly, independently of correspondence between derivationally related words. If the analysis presented in this paper is correct, it may be taken to illustrate the kinds of morphological information to which the phonological component has access.

The analysis of Nez Perce stress presented here also bears on debates concerning *default-to-opposite* stress systems and their analysis. First described for Eastern Cheremis by Kiparsky (1973) and for Selkup by Halle and Clements (1983); Idsardi (1992), default-to-opposite stress systems canonically involve reversal of stress alignment triggered by the presence of *heavy* syllables.

Recent analyses of default-to-opposite phenomena have disagreed on whether it results from the interaction of positional licensing with stress alignment (Zoll, 2002), or is an illusion resulting from obscuring phonetic factors Gordon (2000). Section 4 discusses how Nez Perce can be understood as a default-to-opposite stress system in which positional *faithfulness*, rather than positional *markedness*, interacts with stress alignment, providing indirect support for Zoll's analysis of default-to-opposite stress more generally.

2 Nez Perce stress

Before moving on to the stress facts themselves, it will be useful to review some of the basic phonotactics of Nez Perce. The segmental inventory of Nez Perce appears in (1):[1]

(1)

p, p'	t, t'		k, k'	q, q'	ʔ	
		c, c'				
	ɬ	s	x	χ	h	
m, m'	n, n'					
w			y			
	l, l'					

Nez Perce has a standard five-vowel inventory (*a, e, i, o, u*), with an underlying contrast in length that surfaces only under primary stress (with some irregular exceptions).[2]

Vowels in Nez Perce also participate in a process of *vowel harmony*: the surface form of a word can contain only vowels from either the 'dominant' or the 'recessive' set Aoki (1966, et seq.). The presence of an underlyingly 'dominant' vowel triggers harmony: underlyingly recessive vowels will surface only in the absence of any dominant vowel in the same word.

(2)

Dominant:		*Recessive:*	
i		i	u
	o	e	
a			

[1] This chart is adapted from the inventory presented in Aoki (1970, p. 10). It is adapted to reflect the system of transcription used in Crook (1999), which is used throughout this paper.

[2] Readers interested in details of the weight-stress interaction in Nez Perce are referred to §4.2.1 of Crook (1999).

Surface forms given in this paper reflect the operation of both vowel harmony and stress-weight interactions. Underlying forms show underlying length and quality contrasts, as provided in Aoki's (1994) *Nez Perce Dictionary* and in Crook (1999).

Section 2.1 describes rhythmic stress in Nez Perce, the fully predictable position of stress in words that contain no lexical accents, and provides an analysis in terms of constraints on the alignment of grid marks (based on the system of constraints developed in Gordon, 2002). Section 2.2 goes on to describe the patterns of stress seen in words containing at least one lexical accent (though without the complications introduced by accented prefixes), and extends the analysis of section 2.1 to account for these cases as well.

2.1 Rhythmic stress assignment

As mentioned in the introduction, in the absence of other determining factors primary stress in Nez Perce is aligned at the right edge of the word: stress is regularly penultimate (rather than absolutely final), and shifts rightwards under suffixation:[3]

(3)

a.	pískis	pìskís-ne	b.	hàníi-sa	hàni-sáaqa
	piskis	**piskis**-ne		**hanii**-see	**hanii**-seeqa
	door	door-OBJ		make-INC	make-REC
c.	wéeptes	wèptéesne	d.	càpátna	càpatíca
	weeptees	**weeptees**-ne		**capat**-ne	**capat**-cee
	eagle	eagle-OBJ		move.lengthwise-PFTV	move.lengthwise-INC

(Crook, 1999, pp. 294-5, 300)

All the examples in (3) involve bisyllabic roots, with stress shifting due to the addition of an affix (the difference between nominative and objective case in (3a,c)), the replacement of a monosyllabic suffix with a bisyllabic one (incompletive aspect versus the recent past tense in (3b)), or alternation between a suffix that requires epenthesis of a vowel after the root and one that does not (perfective versus incompletive aspect in (3d)).

Secondary stresses occur on initial syllables that do not bear primary stress, though Crook (1999) reports that this initial secondary stress is sometimes optional, particularly when it clashes with a peninitial stress.[4]

In the analysis pursued here I will adopt grid-based representation for stress, in which the relative prominence of a syllable corresponds to the relative height of columns of grid marks associated with it (Prince, 1983; Selkirk, 1984; Walker, 1996; Gordon, 2002). Representational well-formedness requires that any syllable associated with a grid mark on level n also be associated with a grid mark on level $n-1$. All syllables must be associated with a level 0 grid mark (x_0). Primary stress will be represented here by a level 2 grid mark (x_2), while secondary stress will be represented by a a level 1 grid mark (x_1). This is illustrated in (4) for the word *wèptéesne*:

(4) wèptéesne =

	x	
x	x	
x	x	x
wep	tees	ne

[3] The following abbreviations are used in this paper: 3 = 3rd person (subject or object), NOM = nominative case, OBJ = objective case, ERG = ergative case, INC = incompletive aspect, INST = instrumental, IRR = irrealis LOC = locative, PFTV = perfective aspect, PL = plural agreement,PLOB = plural object, REC = recent past tense, SF = stem formative

[4] Crook reports that rhythmic secondary stresses also occur to prevent two-syllable lapses, and that there is interaction between underlying vowel length and secondary stress assignment. These issues are beyond the scope of this paper.

Following Gordon (2002), I assume that the location of stress is determined by the action of a family of ALIGN constraints specific to particular grid levels. ALIGN constraints that determine the location of a grid mark on level n will generally refer to its alignment with respect to the edges of level $n-1$, though reference to other levels (particularly level zero) is in principle possible.

The relevant constraints for determining the position of stress in unaccented words in Nez Perce are NON-FINALITY, ALIGN(x_1, Edges), and ALIGN(x_2, R):

(5) NON-FINALITY
Assign one violation mark for every grid mark above level 0 assigned to the last syllable of a word.

(6) ALIGN(x_1, Edges)
"The edges of level 0 of grid marks in a prosodic word are aligned with level 1 grid marks." (Gordon, 2002, p.8)

(7) ALIGN(x_2, R)
Align all level 2 grid marks to the right edge of the level 1 grid. (one violation is assigned for each secondary stress between the primary stress and the right edge of word.)

I assume that spurious stresses are avoided due to the action of the following DEP constraint:

(8) DEP (x_n)
Assigns one violation for every grid mark of level n that is present in the output but does not correspond to a grid mark in the output.

These constraints must be ranked as follows:

(9) NON-FINALITY$\gg$ALIGN-EDGES $\gg$DEP (x_1)

(10) NON-FINALITY$\gg$ALIGN(x_2, R) $\gg$ALIGN(x_2, L)[5](Primary stress rightmost but non-final)

The ranking in (9) accounts for the fact that there are initial and penultimate stresses. ALIGN-EDGES penalizes each level zero grid mark that intervenes between a level one grid mark and the edge of the word. NON-FINALITY, however, requires that no level one grid mark align with the final syllable of the word. Together, these two constraints ensure that a level one grid mark will align with the first syllable of a word, and with the *penultimate* syllable of a word. The fact that ALIGN-EDGES outranks DEP (x_1) ensures that secondary stresses can be inserted at all, though this may result in unfaithfulness to the relative prominence relations in the input form.

The ranking in (10), meanwhile, accounts for the fact that primary stress is penultimate.The ALIGN(x_2, R) and ALIGN(x_2, L) constraints assign a penalty for each level one grid mark to the right (or left) of a level two grid mark. The effect of the ranking in (10) is therefore to prefer that there be no secondary stresses to the right of the primary stress in a word. Assuming that there can be only one level two grid mark in a word (potentially resulting from an undominated CULMINATIVITY constraint), it will occur in the rightmost column containing a level one grid mark.

The effect of these rankings in deriving initial secondary and penultimate primary stresses are shown in the tableau in (11).

(11) NON-FINALITY$\gg$ALIGN-EDGES, ALIGN(x_2 R) $\gg$ALIGN(x_2 L), DEP (x_1)

[5] In later discussion in this paper, ALIGN constraints that are outranked by their inverse counterpart will be omitted; the mention of an ALIGN-R constraint can be taken to imply that it outranks the corresponding ALIGN-L constraint, and vice versa.

	NON-FINALITY	ALIGN-EDGES	ALIGN(x_2 R)	ALIGN(x_2 L)	DEP (x_1)
a. ☞ **wèptées**-ne		*		*	**
b. **wéeptès**-ne		*	*!		**
c. **wèeptes**-né	*!*			*	**
d. **weeptés**-ne		**!		*	*

In this tableau, the candidate that best satisfies all ALIGN constraints, (11c), is nonetheless excluded because it violates the highly-ranked constraint NON-FINALITY(it violates this constraint twice, because a primary stress involves two grid-marks above level zero). The winning candidate, (11a), is the one that best satisfies ALIGN-EDGES and ALIGN(x_2 R) while still incurring no violations of NON-FINALITY: it has one violation of ALIGN-EDGES, due to there being no stress aligned at the right edge of the word, but this is true of all candidates that do not violate NON-FINALITY. The candidate in (11b) is excluded because it satisfies ALIGN(x_2,L) at the expense of the higher-ranked ALIGN(x_2,R), while (11d) is excluded because it has a second critical violation of ALIGN-EDGES, not required in order to satisfy NON-FINALITY.

This now sets the stage for an account of accentual (i.e. lexically determined) stress assignment in Nez Perce.

2.2 Accent-determined stress assignment

As mentioned in the introduction, some morphemes in Nez Perce possess lexically-specified accents. In words that have exactly one underlying accent, primary stress remains fixed on a single syllable even when suffixation moves that syllable further from the right word edge, as illustrated in (12):

(12)

a.	b.	c.	d.
híisèmtùks	’ìníit	hipú’	láwyàlacàqa
híisemtuks	**’iníit**	**hip**-ú’	**láwyala**-ceeqa
‘sun (nom)’	‘house (nom)’	eat-IRR	gaff-REC
		‘I will eat’	‘I fished with a gaff hook recently.’

(Crook, 1999, pp. 319, 321, 377)

To account for the interaction of accent with stress placement, it is useful to adopt a specific assumption about the representation of accents in the input. Given that accents can be viewed as lexically-specified positions of prominence, and we have a grid-based representation of prominence in the *output* (i.e. stress), the simplest hypothesis is that accents have the same representation. This paper therefore assumes that lexical accent is the underlying specification of a level two grid mark associated with a particular syllable.[6]

Once accent is formalized in this manner, the assignment of primary stress to an accent is simply a matter of ordinary MAX and DEP faithfulness constraints; no special accent- or stress-specific mechanisms are required. The particular constraint that will be relevant is a MAX (x_2) constraint, which will penalize the deletion of level two grid marks. MAX (x_2) must outrank the stress-related ALIGN constraints in order for it to allow arbitrary stress placement. This constraint must also outrank NON-FINALITY in order to allow primary stress to be assigned to word-final accents, as in (12b-c). The following tableau illustrates this point with respect to the accented noun *’ìníit* ‘house (NOM)’.

[6] There is no reason accent could not be represented as a level one grid mark instead. The choice between these two options is at this point arbitrary, though the assumption that accent is represented as a level two grid mark will be useful in accounting for the interaction of accent and secondary stress assignment, in words with more than one accented syllable.

(13) MAX (x_2) ≫NON-FINALITY

'iní́it	MAX $_{IO}$(x_2)	NON-FINALITY
a. ☞ 'ìní́it		*
b. 'í́niit	*!	

In words with more than one accent (which can occur when multiple accented morphemes appear together in a word) the multiple accents are in competition with one another to receive primary stress. In such cases of accent clash, primary stress surfaces on the rightmost non-final accented syllable. All other accents (including those that are final) receive secondary stress:

(14) a. sèpíinèwiyù'
sepíinewi-ú'
meaure-IRR
'I will measure'

b. pàynóosàqa
páay-núu-saaqa
arrive-toward-REC
'I recently arrived towards'

c. k'òmaynáapìiksa
k'óomay-náapii-k-see
sick-away-SF-INC
'I being sick am kept away'

(Crook, 1999, pp. 352, 456, 458)

CULMINATIVITY, an undominated constraint requiring that all words contain one and only one syllable with primary stress, requires that MAX (x_2) be violated at least once in any word with more than one underlying acent. Because of this, the previously-established ranking of NON-FINALITYover ALIGN(x_2,R) can reassert itself in such words, resulting in primary stress falling on the rightmost non-finalaccent.

The fact that that all accented syllables surface with at least secondary stress indicates the separate action of a MAX (x_1) constraint, which also dominates NON-FINALITY, but whose preservation of accents is not constrained by culminativity. This is illustrated in the tableaus in (15) and (16):

(15) MAX (x_1), MAX (x_2) ≫NON-FINALITY≫ALIGN(x_2, R)

páy-núu-saaqa	MAX (x_1)	MAX (x_2)	NON-FINALITY	ALIGN(x_2 R)
a. páynòsàqa		*		**!
b. pàynòsáaqa		**!		
c. pàynosáaqa	*!	**		
d. ☞ pàynóosàqa		*		*

(16) MAX (x_1), MAX (x_2) ≫NON-FINALITY≫ALIGN(x_2, R)

kí́wyek-sí́ix	MAX (x_1)	MAX (x_2)	NON-FINALITY	ALIGN(x_2 R)
a. ☞ kí́wyeksì́x		*		*
b. kí́wyèksix	*!	*		*
c. kì́wyeksí́x		*	*!	
d. kì́wyéksì́x		**!		*

Because there is a culminativity requirement on level two grid marks, but not on level one grid marks, all but one of the level two grid marks in the input must be absent in the output, and so all potentially optimal candidates (that is, all candidates that do not violate the CULMINATIVITY(x_2) constraint omitted from the tableau in (16)) violate MAX (x_2) equally. The activity of the NON-FINALITYand ALIGN(x_2) constraints is therefore able to influence the choice of *which* accent will be preserved as the primary word stress. Because multiple level one grid marks are allowed in the output, however, all ac-

cented syllables may retain a secondary stress, and the constraints governing the location of rhythmic secondary stress have no effect.

The action of CULMINATIVITY is illustrated in the following tableaus. MAX (x_2) is relevantly dominated only by this constraint, but CULMINATIVITY does *not* outrank MAX (x_1), and so all accents result in secondary stresses:

(17) MAX (x_1), CULMINATIVITY ≫MAX (x_2) ≫NON-FINALITY≫ALIGN(x_2, R) ≫ALIGN(x_2, L)

hip-ú'	MAX (x_1)	CULMIN.	MAX (x_2)	NON-FINALITY	ALIGN(x_2 R)	ALIGN(x_2 L)
a. ☞ hì́pú'				**		*
b. hí́pù'			*!	*	*	
c. hí́pu'	*!		*			

When there are multiple accents in a word, NON-FINALITY requires that primary stress be assigned to a non-final accent; primary stress still must surface on some accent, however, and the final accent receives secondary stress:

(18) MAX (x_1), CULMINATIVITY ≫MAX (x_2) ≫NON-FINALITY≫ALIGN(x_2, R) ≫ALIGN(x_2, L)

sepíinewi-ú'	MAX (x_1)	CULMIN.	MAX (x_2)	NON-FINALITY	ALIGN(x_2 R)	ALIGN(x_2 L)
a. ☞ sèpíinèwiyù'			*	*	**	*
b. sèpìinewíyu'	*!		**			**
c. sèpìinèwiyú'			*	**!		***
d. sèpíinèwiyú'		*!		**		*

It is crucial to the analysis above that ALIGNconstraints be evaluated *gradiently*. This contradicts McCarthy (2003), who claims that all OT constraints are evaluated *categorically*, and that gradient constraint evaluation is both theoretically and empirically undesireable. His specific proposal with regard to stress alignment is that categorical alignment (specifically framed in terms of the alignment of feet at word edges) is able to derive all of the attested stress patterns, and the addition of gradient alignment predicts unattested stress patterns.

The alternative mechanism for deriving penultimate stress adopted in McCarthy (2003) is to align a trochaic foot at the absolute right edge of a word. This specific proposal will not account for penultimate stress in Nez Perce: according to Crook (1999), there is always a penultimate secondary stress in the output, even when underlying accents have moved primary stress further to the left. Such metrically-determined penultimate stresses can be immediately followed by a *final* secondary stress, when the final syllable is underlyingly accented:

(19)

a.	b.	c.
kíwyèksìx	híitèmyèkù'	híitàmyàksìx
kíwyek-síix	hiitemyek-ú'	híitemyek-síix
feed-INC.PL	sweat-IRR	sweat-INC.PL
"we are feeding"	"I will sweat"	"we are sweating"

(Crook, 1999, pp. 446-7)

If the penultimate syllable bore stress due to rightmost alignment of a trochaic foot, two stresses at the right edge of a word should not be possible. Thus, the presence of a rhythmic penultimate secondary stress even in the presence of a final stress provides indirect evidence for the necessity of gradiently-evaluable ALIGN constraints.

3 Alignment reversal with accented prefixes

We are now in a position to turn to the main empirical focus of this paper, the unexpected alignment reversal triggered by accented prefixes in certain morpho-phonological configurations.

The previous section established that primary stress in Nez Perce is generally aligned to the *right* rather than to the left. The examples in (20) and (20) show that stress is unexpectedly attracted iteratively leftwards onto accented verbal prefixes.[7]

(20) a. cúukwe-ce
cúukwe-cee
know-INC
"I know."

b. siléew-cùukwe-ce
siléew-**cúukwe**-cee
by.seeing-know-INC
"I know by seeing."

c. sepée-silèew-cùukwe-ce
sepée-siléew-**cúukwe**-cee
CAUS-by.seeing-know-INC
"I make you (sg.) know by seeing."

d. née-sepèe-silèew-cùukwe-ce
nées-sepée-siléew-**cúukwe**-cee
PLOB-CAUS-by.seeing-know-INC
"I make you (pl.) know by seeing."

(Crook, 1999, p. 462)

What is particularly interesting about this pattern is that it is *not* the case that accented prefixes are *universally* preferred locations for stress: an accented *suffix* will always attract stress back to the right edge of the word.

(21) a. hì-nées-wèyik-se
hii-nées-**wéeyik**-see
3-PLOB-cross-INC
'He is crossing them.'

b. hì-nès-wèyik-[úu]-se
hii-nées-**wéeyik**-[úu]-see
3-PLOB-cross-toward-INC
'He is crossing toward them.'

(Crook, 1999, pp. 463, 480)

The reassertion of rightmost stress by accented suffixes is not simply a cyclic effect — that is, it is not the case that stress is assigned cyclically to the most recently affixed accented morpheme, and suffixes create the illusion of outermost stress simply because they are cyclically outside prefixes. Accented suffixes over-ride the leftward assignment of stress onto an accented prefix even when they are *inside* the morphological scope of such prefixes.

To see this, begin with (22), which shows shows that accented prefixes attract stress leftward from the accented root *páay* 'arrive':

(22) a. hì-sapáa-pày-ca
hii-sepée-**páay**-cee
3-CAUS -arrive-INC
'He makes arrive (someone).'

b. hì-náa-sapàa-pày-ca
hii-nées-sepée-**páay**-cee
3-PLOB-CAUS-arrive-INC
'He makes them arrive.'

In (23), the derivational suffix *-núu* 'towards' transitivizes the intransitive root *páay* 'arrive' (Crook, 1999, p. 481), adding an object argument. In (23a), the plural object agreement marker *nées-* agrees with the object introduced by *-núu*, suggesting that the prefix is *outside* the root-suffix constituent (following, for example, the work of Pylkkänen 2008). Similarly, in (23b), the suffix *núu* is semantically within the scope of the causative prefix *sepée-*.

Despite its scope with respect to the prefix, the accented suffix reasserts rightmost stress in both cases, showing that it is *not* the stress properties of the 'highest' accented affix that determine stress assignment in the word, as would be the case were this a cyclic phenomenon:

[7] This is observed in verbs but not in nouns, something that could be attributed to the absence of accented nominal prefixes in the language (Amy-Rose Deal, p.c.).

(23) a. hì-nàs-pày-nóo-ca
hii-[nées-[**páay**-núu]]-cee
3-[PLOB-[arrive-toward]]-INC
'He arrives toward (them).'

b. hì-nà-sapà-pày-nóo-ca
hii-nées-sepée-**páay**-núu-cee
3-PLOB-CAUS-arrive-toward-INC
'He makes them arrive toward him'

For purposes of comparison, we can consider stress assignment in Chamorro, as described by Chung (1983). Chamorro stress assignment displays truly cyclic interaction between the stress properties of prefixes and suffixes; the comparison between this pattern and the one we have seen in Nez Perce can help to illustrate the non-cyclic nature of the latter.

By default, primary stress in Chamorro is penultimate. The language also has lexically determined stress, however: roots can be specified to require stress to fall within a three syllable final window.

Further lexically determined stress in Chamorro involves a class of stress-attracting prefixes: these prefixes attract stress onto themselves away from its default position on the penultimate syllable of the word.

(24) Chamorro stress-attracting prefixes

a.	púgas	mípugas	'uncooked rice' / 'abounding in uncooked rice.'
b.	mantíka	mímantika	'fat' / 'abounding in fat'
c	paníti	ápaniti	'to strike' / 'to strike one another'
d.	agradési	sénagradesi	'to give thanks' / 'to give many thanks'

(Chung, 1983, p. 40)

The stress attraction by prefixes, however, is *cyclic* in nature: a prefix attracts stress onto itself only when it is morphologically outermost. Suffixes re-assert regular penultimate stress. A prefix *outside* the scope of a suffix will therefore attract stress as in (a) and (d) below, while a prefix *within* the scope of a suffix does not, as in (b) and (c).

(25) Bracketing-sensitive stress

a.	[á[[kwentus]i]]	'to speak to one another' (cf. *kwéntus* 'to speak', *kwentús* + *i* 'to speak to')
b.	[[mi[mantiká]]]ña]	'more abounding in fat' (cf. *mantíka* 'fat', *mí+mantika* 'abounding in fat')
c.	[[ma[faʔtinás]]ña]	'its being made' (cf. *faʔtínas* 'to make', *ma +faʔtínas* 'being made')
d.	[man[ä[[tügiʔ]i]]]	'to write to one another (pl.)' (cf. *tugiʔ* 'to write', *tugiʔ+ i* 'to write to', *ʹä + tugiʔ+ i* 'to write to one another')

(Chung, 1983, p. 41)

The contrast with Nez Perce stress assignment is clear: while in Nez Perce leftwards attraction of stress onto prefixes is overcome by *any* accented suffix, regardless of their relative morphological scopes, in Chamorro accented prefixes present a real *cyclic* effect, where the outermost affix always regularly asserts its influence on word-level stress.

In the absence of a cyclic explanation for the interaction between morphological constituency and stress assignment in Nez Perce, we must search for another account. The observation I will capitalize on in what follows is that accented prefixes *only* attract stress iteratively leftwards when the only alternative would be to place primary stress on a syllable belonging to the root: whenever the rightmost accented syllable in a word does *not* belong to the root (as in cases where there is an accented suffix), the default rightmost pattern reasserts itself (as in (21) and (25)).

More specifically, the proposal I will implement here is that the alignment reversal triggered by accented prefixes in Nez Perce results from conflicting requirements on the alignment of stress: the pressure for rightmost alignment (resulting from the action of ALIGN(x_2, R)) competes with a constraint privileging the preservation of accent on morphological constituents *furthest toward each word edge*.

This preservation of accents at word edges is accomplished via the constraint in (26):

(26) PRESERVE EDGEMOST (x_2) [PRES-EDGES]
Assign a violation if a level-2 gridmark that is outermost from the root on one edge in the input is not present in the output.

PRESERVE EDGEMOST is a differential faithfulness constraint: it does not require that primary stress be edgemost in the output, but instead preserves (non-root) accents that are located furthest towards the word edges. In this respect it is sensitive only to *linear* morphological structure, in that it can detect boundaries between morphemes but not their hierarchical or bracketed relationships to one another.

It is necessary that this constraint be framed in terms of *faithfulness* because, as we have already seen, it is only accents (stresses represented in the input) that show signs of its effect. All potential stress positions are indistinguishable in the output — looking only at candidate outputs, a stress resulting from an underlying accent is indistinguishable from a stress placed for purely metrical reasons. Yet it is only *accents* that trigger alignment reversal in Nez Perce: the responsible constraint must therefore be sensitive to input representations, and must therefore be a faithfulness constraint.

For illustration of the contexts in which this constraint will be violated, consider the hypothetical underlying structure in (27). This structure contains a root and three affixes (α, β, and γ), all of which are accented. The relative hierarchical positions of the affixes are indicated by the given bracketing; the suffix γ is the affix structurally closest to the root (the 'lowest' affix):

(27) [$\acute{\alpha}$ - [$\acute{\beta}$ - [[ROOT] - $\acute{\gamma}$]]]

PRESERVE EDGEMOST (x_2) would be violated by the deletion of a level two grid-mark from α *or* from γ, because those accents are furthest from the root on the left and right edges, respectively. It would *not* be violated by deletion of a level two grid-mark on β, because β is not furthest toward the word edge on either side of the root.

Furthermore, were there no suffix in the structure in (27)– were γ absent from the structure – PRESERVE EDGEMOST(x_2) would require that primary stress fall on α. It would not be satisfied by preserving an accent on the root, even if that accent were at the right edge of the wrod, because the root morpheme will never count as edgemost for the morphological purposes of this constraint.

PRESERVE EDGEMOST(x_2) must be outranked by CULMINATIVITY, as only *one* edgemost accent is ever preserved. It must also outrank the ALIGN(x_2, R) constraint in order to force leftward stress assignment:

With these rankings, the inclusion of this constraint enables us to account for the fact that, in words where all accents are either on the root on on prefixes, stress falls on the leftmost accent. This is shown in the tableau in (28), where the root morpheme is bolded in the input:

(28) PRESERVE EDGEMOST (x_2) , MAX (x_2) ≫ALIGN(x_2, R) ≫ALIGN(x_2, L)

	nées-sepée-sléew-**cúukwe**-cee	PRES-EDGES	MAX (x_2)	ALIGN(x_2 R)	ALIGN(x_2 L)
a. ☞	née-sepè-slèw-cùkwè-ce		***	****	
b.	nèe-sepè-slèw-cùkwé-ce	*!	****!		****
c.	nèe-sepè-slèw-cúkwè-ce	*!	***	*	**
d.	nèe-sepè-sléw-cùkwè-ce	*!	***	**	**

When an accented suffix is present, the same ranking predicts the reassertion of right-aligned primary stress: note that the prefix-stressing and suffix-stressing candidates incur equal violations of PRESERVE EDGEMOST (x_2):

(29) PRESERVE EDGEMOST (x_2) , MAX (x_2) ≫ALIGN(x_2, R) ≫ALIGN(x_2, L)

hii-nées-**wéeyik**-úu-see	PRES-EDGES	MAX (x_2)	ALIGN(x_2 R)	ALIGN(x_2 L)
a. ☞ hì-nès-wèyik-úu-se	*	**		***
b. hì-nés-wèyik-ùu-se	*	**	*!*	*
c. hì-nès-wéyik-ùu-se	**!	**	*	**

The fact that PRESERVE EDGEMOST enables us to account for the non-cyclic interaction between accented prefixes and suffixes in Nez Perce justifies its existence in spite of the non-canonical interaction between phonology and morphology that is central to its evaluation.

4 Nez Perce as a default-to-opposite system

Upon first review, the reversal of alignment triggered by stressed prefixes in Nez Perce may not appear to resemble classic default-to-opposite stress patterns. This sections shows, however, that the analysis of nez perce stress developed here places these facts within the typology of default-to-opposite (or 'conflicting directionality') phenomena proposed in Zoll (2002). Indeed, patterns with the profile of Nez Perce are predicted, in a typology of stress that includes accentually-determined stresses (accents) whose surface distribution is governed by faithfulness, rather than markedness, constraints.

In classic default-to-opposite stress systems, stress is aligned at one word edge in words containing only light syllables, but will fall on the heavy syllable closest to the *opposite* edge in words containing at least one heavy syllable. In most cases of default-to-opposite stress that have been described (Gordon, 2000), primary stress falls on a rightmost heavy syllable, but otherwise is initial (this is the case, for example, in Selkup: Halle and Clements, 1983; Idsardi, 1992).

Zoll proposes that default-to-opposite systems emerge when marked structures are limited in their distribution to either initial or final position, while more general constraints align the unmarked versions of such structures at the opposite edge.

For languages in which stress is either initial (if on a light syllable) or rightmost (if on a heavy syllable), Zoll argues for the existence of positional licensing constraints affecting the distribution of marked stressed syllables (i.e. stressed light syllables). She proposes that such syllables are able to surface *only* when they are in an independently prominent position within the word: for example, the initial syllable of the word. Such constraints may exist quite generally in a language, but their effect will be apparent only when they outrank the general stress alignment constraints for a language, *and* when the general stress alignment constraints would have aligned the marked stress at the opposite word edge.

The analysis of Nez Perce presented in this paper conforms to this general pattern, in there is a constraint (PRESERVE EDGEMOST) that applies only to a subset of stresses in the language, which outranks the general alignment constraints in the language, and whose effect is visible exactly when it requires that a given instance of stress appear at the opposite edge from where the general alignment constraints would have placed it.

What distinguishes Nez Perce from the languages discussed in Zoll (2002) is that the alignment reversal is not triggered by positional *licensing*, but by positional *faithfulness*.

However, Zoll's original discussion is framed only in terms of languages in which the position of stress is a function of properties of the output form. Once we look more broadly, considering also languages in which there is stress (i.e. accent) in the input, we expect to find languages with exactly the profile of Nez Perce, in which it is faithfulness, rather than markedness, that interacts with general

stress alignment in order to produce a default-to-opposite pattern. Nez Perce therefore presents an indirect confirmation of Zoll's analysis of default-to-opposite phenomena, against alternative proposals (such as Gordon, 2000, in which default-to-opposite patterns are an illusion resulting from intonational prominence).

5 Against a previous analysis

The previous analysis of morphologically determined stress in Nez Perce was presented in Crook (1999). Crook provides a thorough overview of the phonolology and morphology of Nez Perce, and is concerned with morphologically determined stress not only in verbs but also in nouns. His account of the leftward attraction of stress onto accented prefixes, however, is largely independent of his account of the different patterns found in nouns, and so can be compared directly with the account proposed in this paper.

Crook develops his analysis within a model of OT that allows constraints to be cyclically re-ranked, consistent with other proposals for cyclic implementations of OT such as Stratal OT (Kiparsky, 2000).

The ability of constraints to be re-ranked is crucial to Crook's analysis of the leftward attraction of stress onto accented prefixes. Crook proposes that accented prefixes trigger a re-ranking in which a constraint *STRESSED LEXICAL HEAD, defined in (30), is promoted over the ALIGN constraints otherwise responsible for the location of primary stress:[8]

(30) *STRESSED LEXICAL HEAD
"Main stress must not be assigned to the lexical head." (Crook, 1999, p. 454)

This constraint will not, by itself, require that stress fall on a leftmost accented prefix: it will be satisfied by stress falling on any non-root morpheme. Crook proposes that stress becomes leftmost because the constraint re-ranking triggered by accented prefixes is accompanied by cyclic *bracket erasure*: after an accented prefix is appended to a word, all interior brackets are erased. Thus, the only morphological constituent distinguishable from the root will be the outermost (i.e. leftmost) prefix, and so the constraint in (30) will mandate that stress fall on that prefix.

Thus, for the purposes of stress assignment, the full bracketed structure in (31a) will be treated as the partially-bracketed structure in (31b).

(31) Original bracketing: *sepéeslèwcùkwèce* 'I make you know by seeing.'
[sepée [sléew [cúukwe]]] -cee
[CAUS [by.seeing [know]]] INC
After bracket erasure:
[sepée [sléew cúukwe]] -cee
[CAUS [by.seeing know]] INC

Applied to the structure in (31b), *STRESSED LEXICAL HEAD will require that stress be placed on the leftmost prefix.[9]

Having thus accounted for the ability of accented prefix to trigger unexpectedly left aligned stress, Crook turns to the complication of accented suffixes. As we have already seen, the re-assertion of rightmost stress by suffixes is *non-cyclic*, in that it does not depend on the relative scope of prefixes and suffixes. A cyclic account such as Crook's, however, predicts that a suffix within the scope of an accented prefix should have the brackets dividing it from the root erased by bracket erasure, and thus

[8] This constraint is also used by Crook to account for stress in noun-noun compounds. In a significant proportion of such cases stress is required to fall on the non-head member of the compound.

[9] It would also be satisfied by stress being placed on the final inflectional suffix, which is plausibly outside the scope of the causative prefix and hence is not subject to bracket erasure, but the suffix is not an accented morpheme and so is not a potential location for primary stress.

predicts that *STRESSED LEXICAL HEAD should be violated by stress falling on such a suffix. Thus in (32), if the accented prefix *nées* triggered total bracket erasure, the suffix *úu* would no longer be morphologically distinguishable from the verb root:

(32) Original bracketing: *hìnàsapàpàynóoca* 'he makes them arrive toward him':

[hii [nées [sepée [[páay] núu]]]] cee
[3 [PLOB [CAUS [[cross] toward]]]] INC

After bracket erasure (triggered by accented prefix *nées*):

[hii [nées [sepée páay núu]]] cee
[3 [PLOB [CAUS cross toward]]] INC

Incorrectly predicted output: *hì-**náa**-sapà-pày-nò-ca
Actual output: hì-nà-sapà-pày-**nóo**-ca

Recall that in the analysis proposed in section , this problem did not arise, because the constraint responsible for primary stress falling on a leftmost prefix (PRESERVE EDGEMOST(x_2)) was *also* satisfied by primary stress falling on an accented suffix, though not by primary stress falling on the verb root. The problem for Crook's analysis is that *STRESSED LEXICAL HEAD will only require stress to fall on a leftmost accented prefix when it is combined with a process of bracket erasure, and once bracket erasure is employed it destroys the ability of suffixes to be distinguished from the verb root.

Crook's solution to this problem is to protect the brackets separating accented suffixes from the root from erasure: bracket erasure is therefore only partial, and brackets separating accented suffixes from their base are not erased. Thus, even after bracket erasure, an accented suffix is still distinguishable from the root for the purposes of a constraint such as *STRESSED LEXICAL HEAD. This revision is illustrated in (33), where the bracket that is protected from being erased by the following accented suffix is circled:

(33) Original bracketing: *hìnàsapàpàynóoca* 'he makes them arrive toward him':

[hii [nées [sepée [[páay] núu]]]] cee
[3 [PLOB [CAUS [[cross] toward]]]] INC

After *partial* bracket erasure (triggered by accented prefix *nées*):

[hii [nées [sepée páay (]) núu]]] cee
[3 [PLOB [CAUS cross] toward]]] INC

With the circled bracket preserved from erasure, the constraint *STRESSED LEXICAL HEAD will be satisfied by the assignment of primary stress *either* to the accented plural object prefix *nées-*, or to the directional suffix *-núu*. As a result, it is the lower-ranked alignment constraints that decide between these two candidates, and so default rightward alignment is reasserted.

With the introduction of partial bracket erasure, however, Crook's analysis ceases to present a truly cyclic analysis of the phenomenon, weakening the attraction also of the cyclic re-ranking of constraints that is also required. Furthermore, the analysis relies upon the fundamentally coincidental fact that the set of affixes that are lexically accented is a union of the set of affixes that trigger constraint re-ranking and bracket erasure (the accented prefixes) with the set of affixes whose brackets are protected from being erased (the accented suffixes). The analysis also requires affixes to be able to *revert* the constraint ranking to one in which *STRESSED LEXICAL HEAD is ranked low, or else unaccented prefixes to the left of accented prefixes would have the pernicious effect of erasing the brackets distinguishing lower accented prefixes from the root, triggering reassertion of rightmost stress. This does not occur.

These same objections will arise in terms of an alternative non-cyclic account framed in terms of of Alderete's (2001) approach to root-affix accent interactions. Alderete proposes that some languages have affix-controlled accentual systems, in which accented affixes 'erase' accentual contrasts on the constituent to which they attach. Like a cyclic account, this approach would predict that prefix-

suffix stress interactions would be sensitive to the relative scopes of the affixes involved; as they are not, we cannot analyze the Nez Perce data as showing that accented prefixes override inner accentual contrasts.

6 Conclusion

This paper has presented an analysis of morphologically-determined stress assignment in Nez Perce that rests upon a constraint – PRESERVE EDGEMOST – that shows a peculiar kind of morphological sensitivity. This constraint is not sensitive to hierarchical morphological structure, in that it is not sensitive to the relative scopes of prefixes and suffixes, but is nonetheless sensitive to linear morphological *boundaries*, being able to distinguish the root from affixes, and to determine which affix is closest to a word edge. This constraint, which is a differential faithfulness constraint that prefers primary stress to be assigned to peripheral non-root accents, was able to account for the fact a leftmost prefixes disrupta the otherwise-rightmost patterns of stress assignment in Nez Perce *only* when it carries the only non-root peripheral accent in a word.

Sensitivity of phonological processes to linear rather than hierarchical morphological constituency has not been widely described in the literature, and in fact goes against the long-established, and generally successful, tradition of accounting for morpho-phonological interactions in *cyclic* terms. Assuming that it is correct to describe the Nez Perce data as non-cyclic, the very existence of this kind of phonological process is theoretically interesting.

Given recent proposals to account for cyclic phenomena in terms of Output-Output correspondence (Benua, 1997, and subsequent work), we might wonder if there is a residue of cases in which the evaluation of output forms is truly sensitive to the morphological constituency of the input, but the sensitivity is constrained to the kind of linear structure proposed here. This is an interesting question for further research, and one which deserves a broader review of the literature on non-cyclic phonology-morphology interactions.

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_Pi_ as a syntactic pro-form in Inuktitut noun-incorporation and beyond

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Previous work on Inuit has analyzed the morpheme *pi* as a 'dummy root' or 'empty stem'; a morphological or phonological filler which satisfies a language-specific requirement that words contain lexical roots. We argue instead that *pi* is a pro-form similar to English '*do so*' and '*one*'. As evidence for this analysis we examine the use of *pi* to avoid repeating constituents, its ability to replace VP-sized constituents, the need for discourse markers in some constructions containing *pi*, similarities with 'stem ellipsis' in Arctic Quebec Inuktitut, and *pi*'s behaviour in noun-incorporation.

1 Background

Inuit (part of the Eskimo-Aleut language family) is a dialect continuum, spoken in Greenland, the Canadian arctic (Labrador, Arctic Quebec, Nunavut, the Northwest Territories), and Alaska. Neighbouring dialects are mutually comprehensible but more geographically distant dialects are not. As illustrated in (1)-(2) below, it is an ergative/absolutive language; however eastern Canadian dialects tend to use a absolutive/oblique pattern (i.e. the antipassive construction, as in (3) below) more extensively (Johns 2001), and may be shifting towards a nominative/accusative alignment.

(1) angunasukti-up taku-lauq-tanga aiviq[1]
hunter-ERG see-DIST.PAST-DEC.3SG.3SG walrus(ABS.SG)
'The hunter saw the walrus.'

(2) angut pisuk-tuq (Johns 2006)
man(ABS.SG) walk-DEC.3SG
'The man is walking.'

(3) angunasukti taku-lauq-tuq aiving-mi
hunter(ABS.SG) see-DIST.PAST-DEC.3SG walrus-OBL.SG
'The hunter saw the walrus.'

Inuit is a polysynthetic language; a single phonological word can contain a verb, light verbs, an incorporated object NP, adjectives, adverbs, modals, tense, aspect, negation, mood, agreement, the copula, etc.

(4) [uqa-limaar-vi]-liu(ng)-inna-nngit-tunga
[speak-all.of-LOCATIVE.NOMINALIZER]-make-always-NEG-DEC.1SG
'I was not always making [libraries].'

* We would both like to thank our supervisor, Alana Johns, and our language consultants, Saila Michael and Raigelee Alorut.

[1] Unattributed examples were elicited by the authors and some appear in Compton and Pittman (2010). We follow the standard orthographic convention of representing [ŋ] with 'ng', [ŋŋ] with 'nng', [ʤ] with 'jj', [ʁ] with 'r', and [ɣ] with 'g'. Retracted vowel allophones of /i/ and /u/ in Greenlandic examples are represented by 'e' and 'o', respectively. Abbreviations include: ABS absolutive case, AP anti-passive marker, DEC declarative mood (called 'participial' in the Eskimoan literature), DIST.FUT distant future, DIST.PAST distant past, ERG ergative case, IMPERF.APP imperfective appositional mood, INDIC indicative mood, NEG negation, OBL oblique case, PL plural, POSS possessive, REC.PAST recent past, and SG singular.

(5) iglu-jjua-liu-lauq-tuq
house-big-make-DIST.PAST-DEC.3SG
'He/she made a big house.'

(6) umingmak-hiu-riaq-tu-qati-gi-tqi-limaiq-tara (Lowe 1985, Kangiryuarmiut)
muskox-hunt-go.for-partner-have.as-again-will.no.more-DEC.1SG.3SG
'I'll never go muskox hunting with him again.'

Noun incorporation of objects contributes to the high degree of polysynthesis. A closed class of light verbs (Johns 2007) obligatorily incorporate a bare NP:

(7) iglu-liu-lauq-tunga
house-make-DIST.PAST-DEC.1SG
'I made a house/houses.'

cf. iglu *or* iglu-it
house(ABS.SG) house-ABS.PL
'house' 'houses'

(8) imiq-taaq-tunga
water-get-DEC.1SG
'I'm fetching water.'

Modals and verb-incorporating predicates can also appear after verbs inside a single phonological word:

(9) ani-juma-junga
leave-want-DEC.1SG
'I want to leave.'

(10) niuvi-rasuaq-tara
buy-try-DEC.1SG.3SG
'I'm trying to buy it.'

One morpheme that appears in words as both a verb and a noun is *pi*. In its verbal usage it can appear as the sole predicative component of a verbal complex, as in (11), or it can appear alongside light verbs or modals, as illustrated in (12):

(11) pi-laaq-tuq
PI-DIST.FUT-DEC.3SG
'He/she will have/get it.'

(12) pi-gunnaq-tuq
PI-can-DEC.3SG
'He/she can take it.'; 'He/she can do it himself/herself.'

In its (primary) nominal usage *pi* can substitute for a noun in noun-incorporation structures, as shown below:

(13) pe-qar-poq (Sadock 1980, WG)
thing-have-INDIC.3SG
'He has something.'

(14) pi-lior-poq (Sadock 1980, WG)
thing-make-INDIC.3SG
'He made something.'

(15) iglu-mi pi-qaq-tuq
house-OBL.SG PI-have-DEC.3SG
'He/she has a house.'

cf. iglu-qaq-tuq
house-have-DEC.3SG
'He/she has a house.'

So, what is *pi*? Sadock (1980) calls *pi* 'the empty stem' and glosses it as 'thing' in his examples. He goes on to say in a footnote that:

> The fact that the stem *pi-* is not just a noun with a very general meaning, but has come to have a purely grammatical significance, is shown by its being able to stand for verbal bases that are not derived from nouns, as well as for those that are. (p.307, italics added)

However, the label 'empty stem' suggests that *pi* satisfies purely morphological requirements in Inuktitut. Johns (2007) calls *pi* a 'dummy root' that is merged into the syntax when no other lexical root is available. However, 'dummy' suggests that this morpheme should be semantically vacuous. Is it? Or is *pi* simply a highly polysemous lexeme? Does it satisfy a phonological or morphological constraint on Inuit words as suggested by Sadock and Johns? Is it some sort of pro-form as its translations as 'thing' or 'do' might suggest?

The answer to what *pi* is depends highly on our assumptions about Inuit wordhood. How does *pi* fit into the various analyses of Inuit wordhood?

Fortescue (1980) argues that Inuit words are built using complex derivational rules that apply to lexical roots and then recursively to derived stems. The application of rules is constrained by a global scope rule that ensures that affixes have scope of the morphemes to their left within words. In Fortescue's system, *pi* is a root/stem that can serve as a host for derivational rules to apply to.

In Johns (2007)'s Root Movement analysis words are built in the syntax, with morpheme order derived through movement. CPs contain a probe or strong feature called 'EPP ROOT' that searches for a corresponding goal feature on lexical roots. Lexical roots (e.g. verbal and nominal roots) match this feature and move (via phrasal roll-up; comp-to-spec movement) to the top of clause. This roll-up derives the surface morpheme order and explains why verbal complexes must have a lexical root at their left periphery. In this analysis, *pi* would satisfy the EPP root requirement when no other root is available. Furthermore, it is necessary to derive morpheme order thru roll-up in words that use it.

Compton and Pittman (2010) argue that phonological words in Inuit correspond to DP and CP phases. This analysis adopts "syntactic hierarchical structural all the way down" (Halle and Marantz 1993). In this analysis, the presence of *pi* is not necessary to derive the morpheme order in words that contain it (as we assume either right-headedness or head movement), nor to serve as a base for derivational rules. Instead, Compton and Pittman's system would treat *pi* is a head in the syntax that is selected by a higher projection. Treating *pi* as a morphological/phonological host would undermine our analysis that what appear to be affixes in Inuit are not really affixes.

2 Data

Let's begin with some of the nominal uses of *pi* listed in Spalding (1998)'s dictionary (pp.82-101, morpheme glosses added):

(16) pi (*n. very gen.*) thing

a. pi-qar-tunga
PI-have-DEC.1SG
'I have some/something.'

b. pi-qa-nngit-tunga
PI-have-NEG-DEC.1SG
'I haven't any.'

c. pi-gi-vaa
PI-have.as-INDIC.3SG.3SG
'he owns it.'

(17) pi-a (Fortescue 1984)
PI-3SG.POSS
'his/her possession/thing'

(18) pi-ga
PI-1SG.POSS
'mine, my possession'

(19) pi-vinik
PI-former
'former thing; thing that once was'

(20) pi-tuqaq
PI-old
'old thing'

(21) pi-tuaq
PI-only
'unique thing'

Notice that Spalding gives a variety of translations for *pi*, including 'some', 'something', 'any', 'it', 'thing', and 'possession'. Spalding also lists the following verbal uses of *pi* (p.101):

(22) pi-vuq / pi-juq / pi-vaa
PI-INDIC.3SG PI-DEC.3SG PI-INDIC.3SG.3SG
'he does it or he gets it'

(23) pi-nngit-tara
PI-NEG-DEC.1SG.3SG
'I didn't get it' or 'I didn't do it'

Fortescue, Jacobson, and Kaplan (1994) list the following additional meanings of *pi* in Yupik dialects (another branch of the Eskimoan language family) as well as in the Eastern Canadian Inuit dialect group and Greenlandic dialects:

(24) AAY pi- 'do, say, act, go'
CAY pi- 'do, say, act, etc.'
NSY pi- 'say, ask for, turn to, happen, etc.'
CSY pi- 'do, say, act, go, etc.'
Sir. pi- 'say, do'
ECI pi- 'do, receive'
GRI pi- 'do (to), say, get, go, happen, marry, concern, mean'

In Aleut, the other branch of Eskimo-Aleut, they note the following cognate of *pi*:[2]

(25) hi- 'say, call, ask for, tell'

Thus within dialects we see a great deal of polysemy in the meaning of *pi* while across dialects/languages we see variation in its meaning.

However, beyond its use as a (polysemous) lexical verb, *pi* can also replace constituents of various sizes. In (26) and (27) below *pi* can replace both a noun-incorporating verb and an incorporated NP (as long as the conjoined clause containing *pi* is accompanied by an appropriate discourse marker such as *mmi* or *ttauq* 'also'):

(26) tiivi-taaq-qqau-junga amma Miali pi-gunnar-mi-juq-(tauq)
TV-get-REC.PAST-DEC.1SG and Mary PI-can-also-DEC.3SG-(also)
'I got a TV and Mary can [get one] too.'

(27) tiivi-taaq-qqau-junga amma Miali pi-gunna-qqau-mmi-juq
TV-get-REC.PAST-DEC.1SG and Mary PI-can-REC.PAST-also-DEC.3SG
'I got a TV and Mary was able to [get one] too.'

Our consultant considered the equivalent of (27) without a discourse marker to be ill-formed:

(28) *tiivi-taaq-qqau-junga amma Miali pi-gunnaq-tuq
TV-get-REC.PAST-DEC.1SG and Mary PI-can-DEC.3SG

In addition to replacing a repeated verb and incorporated object in a conjoined structure, *pi* can also be used when a contrastive conjunction such as *kisiani* 'but' and negation is employed:

(29) tiivi-taa-gasuaq-tunga kisiani pi-gunna-nngit-tunga
TV-get-try-DEC.1SG but PI-can-NEG-DEC.1SG
'I'm trying to buy a TV but can't [get it/one].' (e.g. I'm short of money)

Alternatively, *pi* can replace only the incorporated noun, leaving the incorporating light verb in place:

(30) tiivi-taa-gasuaq-tunga kisiani pi-taa-runna-nngit-tunga
TV-get-try-DEC.1SG but PI-get-can-NEG-DEC.1SG
'I'm trying to buy a TV but I can't get [it/one].'

The morpheme *pi* can also replace a verb and a (non-incorporated) DP in oblique case in an anti-passive construction:

(31) niuvi-ruma-junga tiivi^{r}-mi kisiani pi-gunna-nngit-tunga
buy-want-DEC.1SG TV-OBL.SG but pi-can-NEG-DEC.1SG
'I want to buy a TV but I can't [buy it].' (e.g. it's too expensive)[3]

Pi can also replace a verb and a DP in absolutive case in an ergative-absolutive construction:

[2] These similarities are surprising given that Fortescue et al. estimate that their reconstructed Proto-Eskimo belonged to a period approximately 2000 years ago and Proto-Eskimo-Aleut 4000 years ago.

[3] When asked if this sentence would be acceptable in a context in which the store was out of TVs or the TVs were on their way to the store, our consultant said she would need to add the word *manna* 'now' to the end of the sentence.

(32) niuvi-rasuaq-tara tiivi kisiani pi-gunna-nngit-tara
buy-try-DEC.1SG.3SG TV(ABS.SG) but PI-can-NEG-DEC.1SG.3SG
'I'm trying to buy a TV but I can't [buy it].'

(33) niuvi-ruma-jara tiivi kisiani pi-gunna-nngit-tara
buy-want-DEC.1SG.3SG TV(ABS.SG) but PI-can-NEG-DEC.1SG.3SG
'I want to buy a TV but I can't [buy it].'

(34) niuvi-runna-nngit-tara tiivi amm-lu[4] Miali pi-gunna-nngi-mmi-juq
buy-can-NEG-DEC.1SG.3SG TV and-CONJ Mary PI-can-NEG-ALSO-DEC.3SG
'I can't buy a TV and Mary can't [buy it] also/too.'

However, given that one of *pi*'s polysemous meanings is 'get' or 'receive', is it possible that in these sentences, instead of replacing a constituent, it simply means 'get' (especially since salient arguments can be omitted in Inuit)? In the following sentences, where the verb is 'stab', such an analysis of *pi* simply meaning 'get' is much less likely. Here, *pi* seems to truly be serving to replace the elided constituent:

(35) kapi-guma-tanga tuktu kisiani pi-gunna-nngit-tanga
stab-want-DEC.3SG.3SG caribou(ABS.SG) but PI-can-NEG-DEC.3SG.3SG
'He wants to stab the caribou but he can't [stab it].'

(36) kapi-giaqaq-tanga tuktu kisiani pi-guma-nngit-tanga
stab-must-DEC.3SG.3SG caribou(ABS.SG) but PI-want-NEG-DEC.3SG.3SG
'He must stab the caribou but he doesn't want to [do it].'

Similarly, *pi* can replace a verb like 'sew', whose meaning seems to fall outside of the lexical uses of *pi*.

(37) miqsur-gunnaq-tunga amma-lu Miali pi-gunnaq-tuq-(tauq)
sew-can-DEC.1SG and-CONJ Mary(ABS.SG) PI-can-DEC.3SG-(also)
'I can sew and Mary can also [sew].'

Pi can also replace free adverbials and verbs (again with meanings that diverge from the polysemous lexical verbal uses):

(38) nipikisaaq-tu-mi igla-gunnaq-tunga kisiani Miali pi-gunna-nngit-tuq
quiet-DEC-OBL.SG laugh-can-DEC.1SG but Mary(ABS.SG) PI-can-NEG-DEC.3SG
'I can laugh quietly but Mary can't [do so].'
(Our consultant noted that: "She can laugh, but not quietly.")

[4] Our consultant showed variation using both *amma* and *amma-lu* for 'and', sometimes saying that one sounded better in a particular sentence. The clitic *-lu* also attaches to DPs with the meaning of 'and' or 'too'. For instance (Harper 1979):

a. uvanga=lu
1.SG(ABS)=lu
'Me too.'

b. arnar=lu anguti=lu
woman=lu man=lu
'a man and a woman'

(39) nipikisaaq-tu-mi[5] igla-gunnaq-tunga amma-lu pi-gunnaq-tuq-(tauq)
quiet-DEC-OBL.SG laugh-can-DEC.1SG and-CONJ PI-can-DEC.3SG-(also)
'I laugh quietly and Mary can also [laugh quietly].'
(Our consultant noted that: "I know she could do it; be quiet")

Given the consultant's statements about these examples, the conjoined clause containing *pi* must maintain the meaning of the adverbial, even though it is not present in the second clause.

Interestingly, the consultant observed that the corresponding sentence that repeats the verb and the adverbial "sounds a bit repetitive":

(40) nipikisaaq-tu-mi igla-gunnaq-tunga amma-lu
quiet-DEC-OBL.SG laugh-can-DEC.1SG and-CONJ
Miali nipikisaaq-tu-mi igla-gunnaq-tuq-(tauq)
Mary(ABS.SG) quiet-DEC-OBL.SG laugh-can-DEC.3SG-(also)
'I can laugh quietly and Mary can (also) laugh quietly.'

In addition to the constructions employing *pi*, she also preferred using the enclitic discourse marker *ttauq* with a conjoined subject instead of repeating the verb and adverb:

(41) nipikisaaq-tu-mi igla-gunnaq-tunga amma-lu Miali-ttauq
quiet-DEC-OBL .SG laugh-can-DEC.1SG and-CONJ Mary(ABS.SG)-also
'I can laugh quietly and Mary too.'

However, while able to replace the various constituents above (i.e. incorporating verb and incorporated NP, verb and free object DP, verb and free adverbial, and verb alone), *pi* is not always able to replace similar constituents, as in the examples below:

(42) Speaker A: nipikisaaq-tu-mi pisuk-tunga
quiet-DEC-OBL.SG walk-DEC.1SG
'I am walking quietly.'

Speaker B_1: *pi-junga-ttauq
PI-DEC.1SG-also
Intended meaning: 'I'm [doing so] too/also.'

Speaker B_2: uvanga-ttauq
1SG(ABS)-also
'Me too.'

(43) *iglaq-tunga kisiani Miali pi-nngit-tuq
laugh-DEC.1SG but Mary(ABS.SG) PI-NEG-DEC.3SG
Intended meaning: 'I'm laughing but Mary is not [doing so].'

cf. igla-nngit-tuq
laugh-NEG-DEC.3SG
'is not laughing'

[5] Phonologically free adverbs are derived from nouns, verbs, and (verb-like) adjectives and bear oblique cases like INSTRUMENTAL and VIALIS (Compton and Pittman 2010). In the dialects of our consultants, word-final consonants are often omitted and, perhaps because of this, ACCUSATIVE/OBJECTIVE (e.g. SINGULAR -*mik*) and INSTRUMENTAL (e.g. SINGULAR -*mit*) are no longer clearly distinguished. Consequently, I gloss both of these cases as OBLIQUE. These cases also happen to have become homophonous with LOCATIVE case endings, e.g. SINGULAR -*mi*.

(44) Speaker A: qimmir-mik nani-si-qqau-junga
dog-OBL.SG find-AP[6]-REC.PAST-DEC.1SG
'I found a dog.'

Speaker B_1: *pi-qqau-junga-(ttauq)
PI-REC.PAST-DEC.1SG-(also)
Intended meaning: 'I did too.'

Speaker B_2: uvanga-ttauq
1SG(ABS)-also
'Me too.'

In addition to contexts (or perhaps structures) that do not allow replacement with *pi*, in some instances *pi* can only replace the verb, but not additional elements, such as adverbials:

(45) uqalimaa-gasuaq-tunga sukkait-tu-mi amma-lu Miali pi-gasuaq-tuq
read-try-DEC.1SG slow-DEC-OBL.SG and-CONJ Mary PI-try-DEC.3SG
'I'm trying to read slowly and Mary is also trying to [read], (but not necessarily slowly.)'

Here *pi* can replace the verb *uqalimaa* 'read' but not the adverbial *sukkaittumi* 'slowly', as suggested by consultant's qualification underlined in (45) above.

In sum, while *pi* is able to replace a variety of predicates (including their objects and adverbial modifiers), its use is by no means unrestricted, although the nature of these restrictions is not yet fully understood.[7]

3 Analysis

It would seem that *pi* can replace more than just lexical roots, suggesting it can correspond to a larger constituent in the syntax, such as a VP. Also, its meanings in such sentences seem to extend beyond the meanings it can have in isolation (e.g. *do*, *get*, etc.). Conversely, there are constituents that it cannot replace, or, at the very least, there are context-specific restrictions on how it is interpreted. How do theories of Inuit wordhood handle these facts?

While Fortescue (1980)'s derivational rules would allow the structures we've seen so far to be constructed in the morphology, they would not explain why *pi* can have the meanings it does (e.g. why it can subsume the meaning of a preceding verb and its object or an adverbial). Furthermore, Fortescue's rules cannot explain when *pi* cannot be used; in his system it would be a lexical root/stem/base like any other lexical verb.

If, following Johns (2007), *pi* is added to rescue a derivation that lacks a lexical root, how do we explain when it can refer back to larger constituents? Also, how is it constrained? If its sole function is to provide a root, why are there instances where its use is ungrammatical yet another root can be used felicitously? This suggests that it does more than satisfy a morpho-phonological constraint on wordhood.

Evidence from Arctic Quebec 'stem' ellipsis bears on this discussion. Dorais (1988) states that speakers can omit contextually salient bases:

(46) -juujar-tuq (Dorais 1988)
-seem-DEC.3SG
'looks like'

[6] Some verbs require an anti-passive marker in order to be used in the anti-passive construction.
[7] In particular, it appears that *pi* is able to act as a pro-form when followed by a modal or secondary predicate. It may be that such constructions prevent *pi* from being interpreted with one of its polysemous verbal meanings.

(47) -jja-ngit-tuq (Dorais 1988)
-really-NEG-DEC.3SG
'does not really'

(48) Anaanaa, qamutinnguarani aitsigumalirtunga
anaana qamutik-nnguaq-ganik ai-tsi-guma-liq-junga
mother sled-pretend-POSS.1SG.OBL get-AP-want-begin-DEC.1SG
'Mother, I want to get my toy sled now.'

a. -gunnailutit!
-gunnaiq-lutit
-no.longer-IMPERF.APP.2SG
'Don't you [get it]!'

b. -gumavunga!
-guma-vunga
-want-INDIC.1SG
'I want to [get it]!' (Swift and Allen 2002)

If *pi* is necessary for derivational rules to take as a stem, how are these forms derived? Similarly, if *pi* satisfies a requirement that Inuit words contain roots (for either phonological or morpho-syntactic reasons), why are these forms grammatical?

What if we instead assume that *pi* is a syntactic pro-form in complementary distribution (or free variation) with ellipsis? This seems to be the case in English:

(49) I can [read Japanese] and Mary can [do so] too/also.

(50) I can [read Japanese] and Mary can […] too/also.

This would explain the 'stem' ellipsis data above as well as *pi*'s ability to replace VP-size constituents. It would also explain why *pi* sometimes needs discourse markers like *ttauq* and *mmi* 'too/also', just as English '*do* (*so*)' often sounds odd without such elements.

(51) #I climbed the mountain and Mary did (so).[8]

(52) I climbed the mountain and Mary did (so) too/also.

Analysing *pi* as a pro-form could possibly explain the restrictions on its use, as pro-forms in other languages are picky about what constituents they can replace. For instance, while most pronouns in English replace a full DP, 'one' replaces a smaller nominal constituent:

(53) I saw [that dog]. → I saw [it].

(54) I saw that [dog]. → I saw that [one].

But, what about the various (polysemous) uses of *pi* that do not involve replacement (e.g. do, get, etc.)? Verbal pro-forms in other languages also seem to have polysemous usages as lexical verbs:

[8] This sounds better with contrastive stress on the subjects.

(55) French *faire* ‘make/do’ (Corréard and Grundy 1995)
   a. prepare: *faire du poulet* ‘cook a chicken’
   b. study: *faire une école de commerce* ‘go to business school’
   c. say: *‘bien sûr,’ fit-elle* ‘‘of course,’ she said’
   d. pretend: *faire le courageux* ‘pretend to be brave’

(56) Japanese *suru* ‘do, engage in’ (Kodansha 1995)
   a. iin-tachi-wa tanaka-san-o iincho-ni simasita
      committee-PL-TOP T.-HON-ACC chair-DAT SURU-FORMAL.PAST
      ‘The committee members made Mr. Tanaka the chairperson.’
   b. kono tokei-wa hassen-en simasita.
      this watch-TOP eight.thousand-yen SURU-FORMAL.PAST
      ‘This watch cost 8000 yen.’

(57) Swedish *göra* ‘make, do’ with additional meanings such as ‘cause, write, mean’ (Viberg 2006)

(58) German *machen* ‘make’; *tun* ‘do’ (Nehls 1991)
   a. unspecified action:
      Was machst du hier? ‘What are you doing here?
   b. cause:
      Du machst mich nervös. ‘You make me nervous.’

It appears that pro-forms across a number of languages commonly possess additional polysemous meanings beyond their use as pro-forms.

As for the nominal usage of *pi*, it turns out that other languages also have nominal counterparts of their verbal pro-forms. For instance, the French verbal pro-form *faire* ‘make/do’ has the corresponding nominal *fait* ‘fact’. Similarly, the English noun *deed* shares the same origin as the pro-verb *do* (Oxford English Dictionary, 1989).

4 *Pi* in noun-incorporation

In addition to replacing verbal constituents as illustrated above, *pi* can occur in place of a noun in noun-incorporation constructions (see Sadock 1980, Johns 2007). This is illustrated in (59):

(59) pi-qa-nngit-tuq (South Baffin, Johns 2007)
   PI-have-NEG-DEC.3SG
   ‘He has nothing.’ [Literally: ‘He doesn’t have something.’]

When *pi* incorporates, an additional DP in instrumental case can also occur:

(60) qimmi-mik pe-qar-poq (Greenlandic, Sadock, 1980)
   dog-OBL.SG PI-have-DEC.3SG
   ‘He has a dog.’

We can contrast this with the (perhaps unmarked or default) noun-incorporation construction without *pi*:

(61) qimme-qar-poq (Greenlandic, Sadock, 1980)
   dog-have-DEC.3SG
   ‘He has a dog.’

This contrast is very similar to what Wojdak (2005) discusses for Nuu-chah-nulth noun-incorporation:

(62) łuč?insiikitsiš
łuč?in-siik-mit-siiš
dress-make-PAST-INDIC.1SG
'I made a dress.'

(63) ?usiikitsiš łuč?in?i
?u-siik-mit-siiš łuč?in-?ii
∅-make-PAST-INDIC.1SG dress-DET
'I made the dress.'

(64) *łuč?in?isiikitsiš
łuč?in-?ii-siik-mit-siiš
dress-det-make-PAST-INDIC.1SG

Wojdak uses data of this type to argue for her approach to word-formation and linearization: suffixes are specified as such, and attach to a host on their left within the same DP or CP phase. If there is a phase boundary to the left, and thus no host, then the dummy element is employed. In the noun-incorporation cases above, the verb is a suffix. In (62) it attaches to the host 'dress'. In (63), 'dress' appears with a determiner and is thus within a separate DP phase. There is a phase boundary between 'dress' and the suffixal verb and so the dummy is therefore employed to allow suffixation.

Wojdak's approach to word-formation is similar to that of Compton and Pittman (2010) in that CP and DP phases are employed. The distinction is that we claim that elements are not specified for affixal versus non-affixal status. Instead, everything within a CP or DP phase is grouped into a phonological word at PF. If the elements, such as the noun-incorporating verbs, are not specified as affixes, how do we explain the appearance of *pi* in (59) and (60) where it looks like it is an empty host to an affix?

We propose that *pi* is a pro-form. In its nominal use it can occur where other nouns occur. But, can other nouns occur in the same position as *pi* in constructions like (59) and (60)? First, note that both nouns and *pi* can occur in typical noun-incorporation structures. Example (65) below with an incorporated noun is analogous to (59) with *pi* above:

(65) qimmi-qaq-tunga (South Baffin, Johns 2007)
dog-have/exist-DEC.1SG
'I have a dog.'

How about the structures where *pi* incorporates and a lexical noun occurs outside the verbal complex? It turns out that it is possible to incorporate a noun and have an additional DP in oblique case as long as the oblique is more specific in meaning than the incorporated noun:

(66) qiturna-qaq-tunga niviaqsiar-mik
child-have-DEC.1SG young.girl-OBL.SG
'I have a little girl.' ('I have a child who is a little girl.')

(67) *niviaqsia-qaq-tunga qiturnar-mik
young.girl-have-DEC.1SG child-OBL.SG

Thus lexical nouns seem to have the same distribution as *pi* does in noun-incorporation constructions.[9] Based on this, what is going on when *pi* incorporates? In examples like (59), repeated here as (68), *pi* is a nominal satisfying the syntactic selection requirements of the verb (i.e. noun-incorporating verbs select a noun in the syntax, see Johns 2007).

(68) pi-qa-nngit-tuq (South Baffin, Johns 2007)
PI-have-NEG-DEC.3SG
'He has nothing.' [Literally: 'He doesn't have something.']

In examples like (60), repeated here as (69), *pi* is again behaving just as other nouns do in the language. It is possible for a nominal to incorporate and for there to be an additional DP in oblique case so long as the oblique DP is more specific than the incorporated noun. Here, *pi*, meaning something akin to 'thing', is less specific than 'dog' and so the sentence is possible.

(69) qimmi-mik pe-qar-poq (Greenlandic, Sadock, 1980)
dog-OBL.SG PI-have-INDIC.3SG.
'He has a dog.'

Pi is not behaving as a special dummy element inserted for morphological (affixation) purposes. Instead, it occurs in the syntax in positions where other nominals can also occur. This distribution is consistent with *pi* being a pro-form.

5 Conclusion

A theory that treats *pi* as both a polysemous lexical verb and a category-neutral pro-form captures the fact that it has a set range of meanings when used in isolation, yet can also replace larger constituents (with a potentially unlimited range of meanings). Such an approach also explains why discourse markers such as *mmi* and *ttauq* 'too/also' are sometimes required with *pi* when it is acting as a verbal pro-form; the same is true of English *do (so)*.

This analysis can also explain the stem ellipsis phenomenon in Arctic Quebec Inuit. If the presence of *pi* is not due to a morphological or syntactic requirement that words contain roots, but rather, if the pro-form is selected by a higher projection (in complementary distribution with ellipsis) then these two options mirror the situation in languages like English. So-called 'stem' ellipsis is in fact just syntactic ellipsis.

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[9] We observe an interesting effect of the ability to incorporate a general noun while a more specific noun is left unincorporated using the noun *inuk* which can mean either 'person' or 'Inuit person' depending on the context.

a. inu-qaq-tugut
inuk-have-DEC.1PL
'We have people here.' or 'We have Inuit here.'

Given this dual meaning, it is possible to either incorporate or not incorporate *inuk*. However, both meanings are only possible when *inuk* is incorporated:

b. inu-qaq-tugut arnar-nit
inuk-have-DEC.1PL woman-OBL.PL
'We have Inuit women here.' ('We have Inuit who are women here.')
'We have women here.' ('We have people who are women here.')

c. arnar-qaq-tugut inu-nit
woman-have-DEC.1PL inuk-OBL.PL
only: 'We have Inuit women here.' ('We have women who are Inuit here.')
not: #'We have women here.' (#'We have women who are people here.')

The impossible translation in (c) is ruled out because the instrumental DP must be more specific in meaning than the incorporated noun. The meaning of *inu* as 'person' is more general than 'woman' and thus this interpretation cannot be used in (c). This type of effect in noun-incorporation is not unique to Inuktitut. See for instance Chung and Ladusaw (2003) for Chamorro.

Finally, when *pi* occurs in noun-incorporation it is simply behaving as any other nominal in the language and is inserted to satisfy the syntactic selectional restrictions of the incorporating verb.

In sum, analyzing *pi* as both a category-neutral pro-form and a polysemous lexeme allows us to begin to explain its distribution, its broad range of meanings, and the restrictions on its use. Moreover, such an analysis avoids the need to appeal to an idiosyncratic morpho-phonological constraint stipulating that Inuit words must contain a root. Instead, the presence of *pi* can be argued to fall out from the more general syntactic mechanism of selection.

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Phonetic and phonological evidence for a vowel merger in Southern East Cree[*]

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In this paper, we describe a partial merger of short /i/ and /a/ in Southern East Cree (SEC). We describe spelling difficulties which lead us to believe that I and A are merging into one phoneme in SEC. We then point out that there is little phonological evidence for a contrast between I and A in SEC. Our acoustic analysis provides evidence for a partial merger of I and A in the Coastal SEC communities but not in Inland SEC communities. Our data thus helps explain why Coastal SEC speakers have more difficulty deciding whether to use I or A than do Inland SEC speakers. However, our study does not help solve the problem of the standardization of the orthography of SEC. Identical spellings for each subdialect do not seem possible unless or until the merger of I and A spreads to the Inland subdialect of SEC.

1 Introduction

In this paper, we describe the phonetic and phonological merger of two short vowels in Southern East Cree (SEC), a subdialect of East Cree (EC). Specifically, we study to which extent the two short vowels /i/ and /a/ have merged in SEC. By doing so, we shed light on a problem for the standardization of the EC orthography.

In §2, we situate East Cree within the Algonquian language family, and describe the (sub)dialects of East Cree that form the basis of our study. In §3, we present our hypothesis that short /i/ and /a/ are merging into one phoneme in some (sub)dialects of EC. In §4 and §5, we present orthographic and phonological evidence which support the hypothesis of a merger of /i/ and /a/. In §6, we describe an acoustic study which supports a partial merger of /i/ and /a/ in some (sub)dialects of EC. In §7, we conclude that /i/ and /a/ remain distinct in Inland SEC, but are merging into one phoneme in Coastal SEC. We comment throughout the paper on the relationship between SEC and Northern East Cree (NEC).

2 Situating East Cree within Algonquian

East Cree is part of the Cree-Montagnais-Naskapi (also called Cree-Innu) dialect continuum (see www.atlas-ling.ca). This group of dialects stretches across Canada with a division between the Western and Eastern dialects. This division takes place at James Bay. The Western dialects include Moose Cree, Swampy Cree, Plains Cree and Woodland Cree. The Eastern dialects include East Cree, Naskapi, Innu and Attikamek^{w}. Figure 1 shows the general areas these dialects are spoken. A further division of these dialects distinguishes between non-palatalized and palatalized dialects. East Cree is a palatalized dialect.

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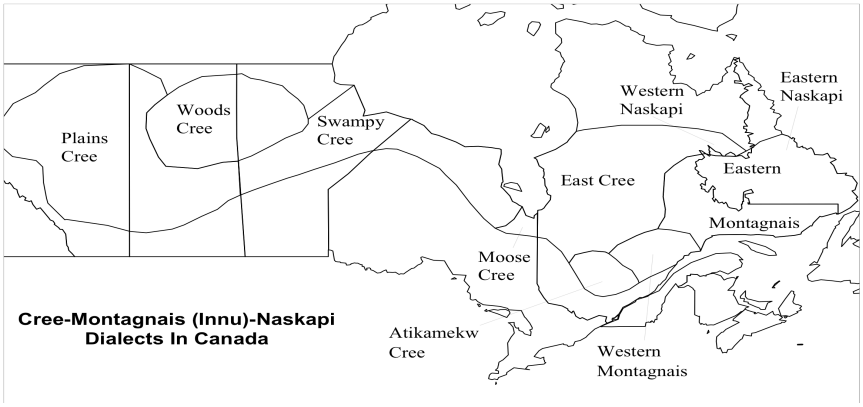
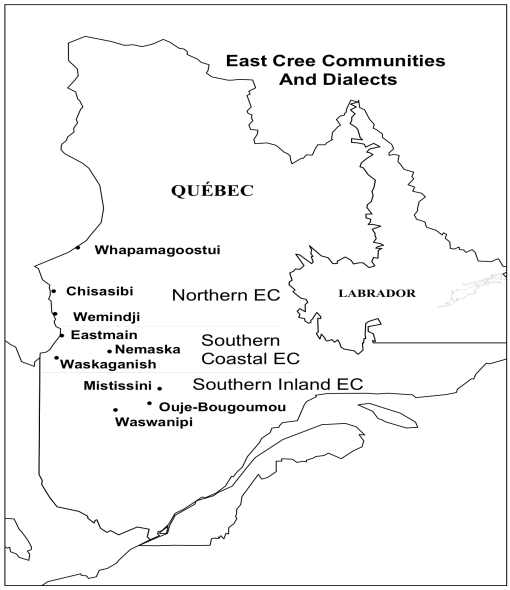
Figure 1 - Cree-Montagnais-Naskapi dialect continuum



There are two main dialects of East Cree; Northern (NEC) and Southern (SEC). The communities where each dialect is spoken are shown in Figure 2.

Figure 2 - Dialects of East Cree



What distinguishes NEC from SEC is the long vowel Ê.[1] In NEC, long Ê has merged with Â whereas in SEC these vowels have remained distinct. As shown in Figure 3, SEC can be further subdivided into the Coastal and Inland sub-dialects. In some ways, the Coastal sub-dialect is similar to NEC; for example, SEC Coastal speakers will often use [j] (spelled with the letter Y), like NEC speakers, where SEC Inland speakers use [n][2]. We will conclude in §7 that NEC and Coastal SEC also share another isogloss: the merger of /i/ and /a/.

[1] Because long *ê* does not contrast with a short *e*, the typical Algonquian practice is to write long *ê* simply as *e*. We depart from this practice to avoid confusion about vowel length.

[2] This reflex of the proto-Algonquian *l as [n] in the Inland dialect is limited to the word *înû* '(aboriginal) person' and compound words of this family, like *înûkamikw* 'friendship center'; otherwise the reflex is [j], for example *yûtin* 'it is windy' in all East Cree dialects.

Figure 3 - Divisions of East Cree

Northern East Cree (Â)	**Southern East Cree (Ê,Â)**	
	Coastal	**Inland**
Wemindji Chisasibi Whapmagoostui	Eastmain Waskaganish	Nemaska Waswanipi Ouje-Bougoumou Mistissini
[j] iyiyû 'Aboriginal person'		[n] înû 'Aboriginal person'

3 A phonemic vowel merger in East Cree

For the most part, the SEC roman orthography is phonemic. However, our evidence suggests that the orthography for short vowels no longer reflects phonemic reality. Example (1) shows how SEC vowels are spelled. (In this paper, we use capital letters for graphemes, slash brackets / / for phonemes, square brackets [ ] for allophones, and an asterisk for proto-Algonquian vowels.[3])

(1) Southern East Cree Vowels

Long				**Short**		
Î	Ê	Â	Û	I	A	U
[iː]	[ɐː, ɛː]	[aː]	[uː]	[ɪ,ɨ, ə]	[ɪ, ɨ, ə, ʌ, ạ]	[ʊ]

In general, the phonetic realizations for each grapheme are distinct, suggesting that the orthography is phonemic. However, the phonetic realizations of short I and A overlap, and herein lies the problem: does SEC have two short unrounded vowel phonemes, /i/ and /a/, as the orthography implies, or does SEC have just one short unrounded vowel phoneme, as the phonetic overlap suggests?

The answer is more nuanced: our evidence suggests that Inland SEC speakers maintain a distinction between /i/ and /a/. In contrast, Coastal speakers are in the process of merging the short unrounded phonemes /i/ and /a/ (it resembles NEC in this respect). This merger in Coastal SEC is partly obscured by the orthographic practice of reflecting the Proto-Algonquian (PA) *i versus *a contrast (Pentland 1979) in the use of separate I versus A spellings. We show that in this case, the spelling system departs from the Phonemic Principle in maintaining an historical distinction that is disappearing in Coastal SEC.

4 Orthographic Evidence

In this section, we show that speakers of Coastal SEC cannot reliably spell the historically separate short unrounded vowel phonemes, *i /i/ and *a /a/. These observations suggest that /i/ and /a/ are merging in Coastal SEC. In contrast, Inland SEC speakers tend to be more accurate in using I for *i /i/ and A for *a /a/.

Coastal SEC is like NEC in this respect: in NEC, *i and *a have merged, at least in unaccented position (MacKenzie 1980:140; see §6 for further discussion). Reflecting this merger, in the NEC standard orthography most of the reflexes of *i and *a are spelled as I (Junker et al. 2002).

Coastal speakers of SEC (from Waskaganish) cannot reliably spell the reflexes of *i and *a. In contrast, older Inland SEC speakers (from Mistissini) can usually spell the reflexes of *i and *a reliably. For example, the plural ending /-Vtʃ/ (PA *-aki; Bloomfield 1946) is spelled -ICH by both Coastal SEC and NEC speakers (2) but spelled -ACH by Inland SEC speakers (2).

(2) a. shiship-<u>ich</u>
'ducks' (SEC Coastal; NEC)

[3] For example, the grapheme Ê stands for the phoneme /ê/, which sounds like [ɐː, ɛː], and which arose from PA *ê.

b. shiship-ach
'ducks' (SEC Inland)

As shown in (3), the old spelling of the final, meaning 'bag' or 'container', alternated between -WIT and -WAT, and sometimes -ÛT (indicating vowel coalescence). Historically this final contained an *a, which Inland SEC speakers consistently spelled as A. During a dictionary workshop in June 2009, facilitated by one of the authors, a new pan-EC spelling was adopted. All the words ending in -WIT, -WAT, and -ÛT were changed into -WIT for consistency. This spelling follows the old NEC dialect spelling, although it is historically inaccurate.

(3) *-w[*a]t* (final for 'bag', 'container')

Old Spelling	**New Spelling**	**Gloss**
shûlîyâwat	shûlîyâwit	'purse, wallet'
âpahîkanuwat	âpahîkanuwit	'tool box'
mishtikuwat	mishtikuwit	'wooden box, trunk'
mûhkumânuwit	mûhkumânuwit	'knife case, box'
nîmâunût	nîmâunuwit	'lunch bag'

As another example, the words in (4) all share the complex final for a vii verb meaning 'morning'.[4] Despite the semantic cues, SEC speakers spelled it with either -IN or -AN. Upon realizing that the meaning was the same, the SEC speakers agreed to spell the final with -AN. This was chosen over -IN because in other related languages in the Cree-Innu family, the same final contains a long -ÂN.

(4) *-(w)âp-[*a]n* (+vii final for 'morning')

Old spelling	**New Spelling**	**Gloss**
îchikwâhtikâpan	îchikwâhtikâpan	'there is frost on the trees in the morning'
îchikwâpin	îchikwâpan	'it is a frosty morning'
petâpin	petâpan	'it is daybreak, sunrise'
miywâpin	miywâpan	'it is a nice, pretty dawn, a nice, clear morning'

A similar (ad-hoc) decision process was used in the same workshop for the initial TASHU- in (5).

(5) *- t[*a]shu-* (initial for 'straight, back to normal')

Old spelling	**New Spelling**	**Gloss**
tishupayû	tashupayû	'it unfolds, smoothes out again, returns to original position'
tashuneu	tashuneu	's/he spreads it (anim.) out straight by hand from being bent'

In summary, the following was observed during Cree language documentation workshops: all speakers of SEC spell PA *i as I. PA *a, on the other hand, is spelled inconsistently as I or A. Coastal speakers from Waskaganish tend to spell both *i and *a as I (as is done in NEC). Inland speakers from Mistissini tend to spell and maintain the historical *i/I vs. *a/A distinction. The above examples of uncertainty surrounding the spelling of /i/ and /a/ suggest that the difference between /i/ and /a/ is no longer clear-cut in Coastal SEC (as in NEC).

The spelling data for Coastal SEC listeners is reminiscent of other findings about what happens when listeners are asked to classify (or in this case, spell) a vowel distinction that they do not make. For

[4] Abbreviations include: vii = verb, inanimate, intransitive; anim(ate); *initial*, *medial*, and *final* refer to morphemes that occur in initial, medial, and final positions in the Algonquian verb complex.

example, in their classic study of American English vowels, Peterson and Barney (1952:179) conclude that "…if a speaker does not differentiate clearly between a pair of sounds in speaking them, he is unlikely to classify them properly when he hears others speak them. His language experience, as would be expected, influences both his speaking and his hearing of sounds."

It is therefore possible that PA *a and *i have merged in Coastal SEC but not in Inland SEC. Such a pattern of merger would be consistent with the [j] vs. [n] difference in certain lexical items discussed earlier with reference to Figure 3. Both patterns are summarized in Figure 4.

Figure 4 - Northern vs. Southern orthography and pronunciation tendencies

Northern	**Southern**	
	Coastal	**Inland**
*a/*i spelled as I		*a spelled as A *i spelled as I
[j] iyiyû 'Aboriginal person'		[n] înû 'Aboriginal person'

We hypothesize, then, that coastal SEC speakers (like NEC speakers) are merging short /i/ and /a/, while Inland SEC speakers are not. In the next part of our paper, we show that a merger would in fact be facilitated by the lack of phonological evidence for a distinction between short /i/ and /a/ in the Cree grammar.

5 Phonological Evidence

The Cree grammar provides little, if any, phonological evidence for a distinction between short /i/ and /a/. The main sources of evidence would come from syncope (optional deletion of unstressed short Vs) and Initial Change (morphologically-conditioned ablaut of the initial vowel in verbs).

5.1 Syncope

The outcomes of syncope are illustrated in (6) and (7). As shown in (6), paying attention to the underlined syllables, both I and A leave aspiration as a trace when they delete after plosives.[5]

(6) Syncope of I and A → [ʰ]

Orthography	**Phonetic**	**Gloss**
â - pih - tûn	[aː - pʰ - ˈtun]	'wednesday'
a - hî - pih - chê - sû	[a̰ - hiː - pʰ - tʃɛː - ˈsuʔ]	'spider'
âh - ta - hî	[aːh - tʰ - ˈhiʔ]	'change'
â - ku - yê - ka - hî - kan	[aː - ku - jɛː - kʰ - ˈhi - kɪn]	'curtain'

In contrast, as shown in (7), when short U deletes, it leaves either a [ʷ] sound or aspiration after plosives. In other words, I and A pattern alike, and differently from U.

[5] Examples of SEC sound files can be found at http://www.ucs.mun.ca/~cdyck/eastcree.htm/SEC_sound_files_1.htm

(7) Syncope of U → [ʷ, ʰ]

Orthography	Phonetic	Gloss
âh - ku - sî - u - ka - mikw	[aː - kʷ - ˈsi - ˈuː - ˈkə - mʊkʷ]	‘hospital’
âh - ku - sû - tâ - pân	[aː - kʰ - ˈsuː - taː - ˈban]	‘ambulance’

5.2 Initial Change

Similarly, short I and A pattern alike with respect to Initial Change (8)-(10). As shown in (8), short I becomes long Ê.

(8) Initial Change: I → Ê

Dictionary Form	Changed form	Gloss
iskwâsam	awên êskwâsahk	‘s/he burns it’
tipâpâtam	awên têpâpâtahk	‘s/he measures it with a tape measure’
chipaham	awên chêpahahk	‘s/he closes it’
miskam	awên mêskahk	‘s/he finds it’
michisimû	awên mêchisimut	‘it (anim) barks’
sichû	awên sêchit	‘s/he/it (anim) urinates’
niskû	awên nêskût	‘s/he resists’
shimitapû	awên shêmitapit	‘s/he is sitting up’
shikuham	awên shêkuhakw	‘s/he crushes it’
wiyâskunichêu	awên wêyâskunichêt	‘s/he is judging’

Short A also becomes long Ê for the most part, although there are alternative outcomes, shown in (9).

(9) Initial Change: A → Ê; SHA → other

a. Canonical pattern

Dictionary form	Changed form	Gloss
akutâu	awên êkutât	‘s/he hangs it up, sets snares’
ashuwêputâu	awên êshuwêputât	‘s/he is putting out a fire with liquid’
tahkunam	awên têhkunahk	‘s/he holds it together’
kanawâpû	awên kênawâpit	‘s/he is watching’
machinam	awên mêchinahk	‘s/he dislikes the looks of it’
nakatam	awên nêkatahk	‘s/he abandons it, leaves it behind, forsakes it’
saskatapû	awên sêskatapit	‘s/he is bored from sitting’
wanishin	awên wênishihk	‘s/he goes astray, gets lost’
yahchinam	awên yêhchinahk	‘s/he pushes it forward’

b. Non-canonical pattern

Dictionary form	Changed form	Gloss
shawêyimêu	awên shâwêyimât	's/he blesses him/her/it (anim)'

In contrast to short I and A, Initial Change of short U creates a distinct outcome, WÊ (along with other patterns, shown in (10)b).[6]

(10) Initial Change: U → WÊ (and other patterns)

a. Canonical pattern

Dictionary form	Changed form	Gloss
utinam	awên wêtinahk	's/he takes it'
kutuwêu	awên kwêtuwêt	's/he makes a fire'
mushtênam	awên mwêshtênahk	's/he is attracted to it'

b. Non-canonical patterns

Dictionary form	Changed form	Gloss
nuwachîu	awên nêwâchit	's/he stops for a meal while travelling'
suskaschinam	awên suskaschinahk	's/he attaches the beaver, otter trap to a forked stick and lowers it into the water'

The historical patterning of IC is similar to the synchronic pattern: historically PA *i and *a became *ê, and proto *o (/u/) became *wê as a result of Initial Change (Pentland 1979:402-3; MacKenzie 1980:187). In other words, Initial Change has never provided good evidence for a distinction between short /i/ and /a/.

In summary, the evidence from phonological patterning should actually facilitate a merger between short /i/ and /a/ instead of working to prevent it. If there is any evidence for a distinction between /i/ and /a/, it is going to be in the pronunciation. In the final section of our paper, we describe the pronunciation of short I and A in Coastal and Inland SEC.

6 Phonetic Evidence

Our phonetic evidence reveals a partial merger of /i/ and /a/ in the Coastal dialect of SEC. The Inland dialect of SEC, however, has maintained a distinction between these two phonemes. The evidence is from an analysis done on the short vowels from a list of words recorded by two speakers of SEC, one Inland speaker and one Coastal speaker. The data from the Coastal speaker shows that I and A have a similar range of pronunciations in non-prominent positions of the word; whereas, the Inland speaker shows no evidence of this merger.

[6] One could argue that I and A do pattern differently, since I displays only canonical Initial Change outcomes while A displays both canonical and non-canonical outcomes. However, a more extensive survey of a wider array of forms would likely show that I and A are truly non-distinct. To illustrate, Burgess (2009) provides an extensive description of Initial Change in Sheshatshiu Innu-aimun (a Naskapi dialect related to SEC). Her study shows no substantive differences between the outcomes for I and A, whereas U is different. Burgess observes both canonical and non-canonical outcomes for Initial Change of I, A, and U in Sheshatshiu Innu-aimun. Her overall conclusion is that the choice of Initial Change outcome is both phonologically and lexically conditioned. This conclusion is consistent with the SEC data and does not detract from our overall point.

6.1 Methodology

Two female native speakers of SEC participated in this study. Each is fluently bilingual in SEC and English with SEC as their first language. The first speaker is a 40 year old woman from Waskaganish who speaks the Coastal dialect of SEC. The second speaker is a 50 year old woman from Mistissini who speaks the Inland dialect.

Data was collected in June 2009 for a pedagogical application of the Eastcree.org website. A list of approximately 200 words was recorded for each speaker. Each word in the list was recorded twice. Where possible, the first word in each word pair was analyzed.

Words spelled with short I, A, and U were measured in PRAAT (http://praat.org) and plotted in MapInfo. The length of the word, the pitch (F0), and first and second formants (F1, F2) were measured. F0 was measured over the full length of the vowel. Measurements for F1 and F2 were taken over 20 milliseconds of the steady-state portion of the vowel to control for the potential influence of surrounding consonants.

The vowels analyzed were initially separated into accented and unaccented categories to see if accent affected vowel production. However, statistical analysis was only possible when the accented and non-accented groups of vowels were combined, due to the small number of pitch-accented short vowels in SEC: in SEC, only one vowel per word is accented (Brittain, 2000).[7] Words that did not contain any syllable with a pitch at least 4 Hz higher than all other syllables were not analyzed.

Some limitations of this study include the fact that tokens were taken from recordings of reading lists, rather than spontaneous speech. We were also not able to control for non-metrical (i.e., segmental) conditioning due to the relatively small number of tokens available for analysis.[8]

[7] Brittain (2000) includes secondary accents in her transcriptions; these, however, do not have phonetic prominence, but instead reflect Brittain's claim that NEC has abstract metrical structure.

[8] However, in our analysis, we observed that for three related words — pahkunahcheshuweu 's/he skins a fox', wîskunahcheshû 'silver fox', and mahcheshû 'fox' — the tokens corresponding to the underlined A were relatively high in the vowel space in the first two words and low in the last word. This observation suggests that there is either free variation, or variation that is not conditioned by the immediately adjacent segments, which are similar in all three words.

6.2 Results

6.2.1. Coastal SEC

In the approximately 200 words analyzed for the Coastal SEC speaker, 100 unstressed and 52 stressed short vowels were measured. Figure 5 shows the formant chart for the stressed short vowels for Coastal SEC. The I shows a nice cluster in the high front quadrant. The U shows a nice cluster in the high back quadrant. In contrast, A is interspersed with these two short vowels.

Figure 5 - Coastal SEC stressed vowels

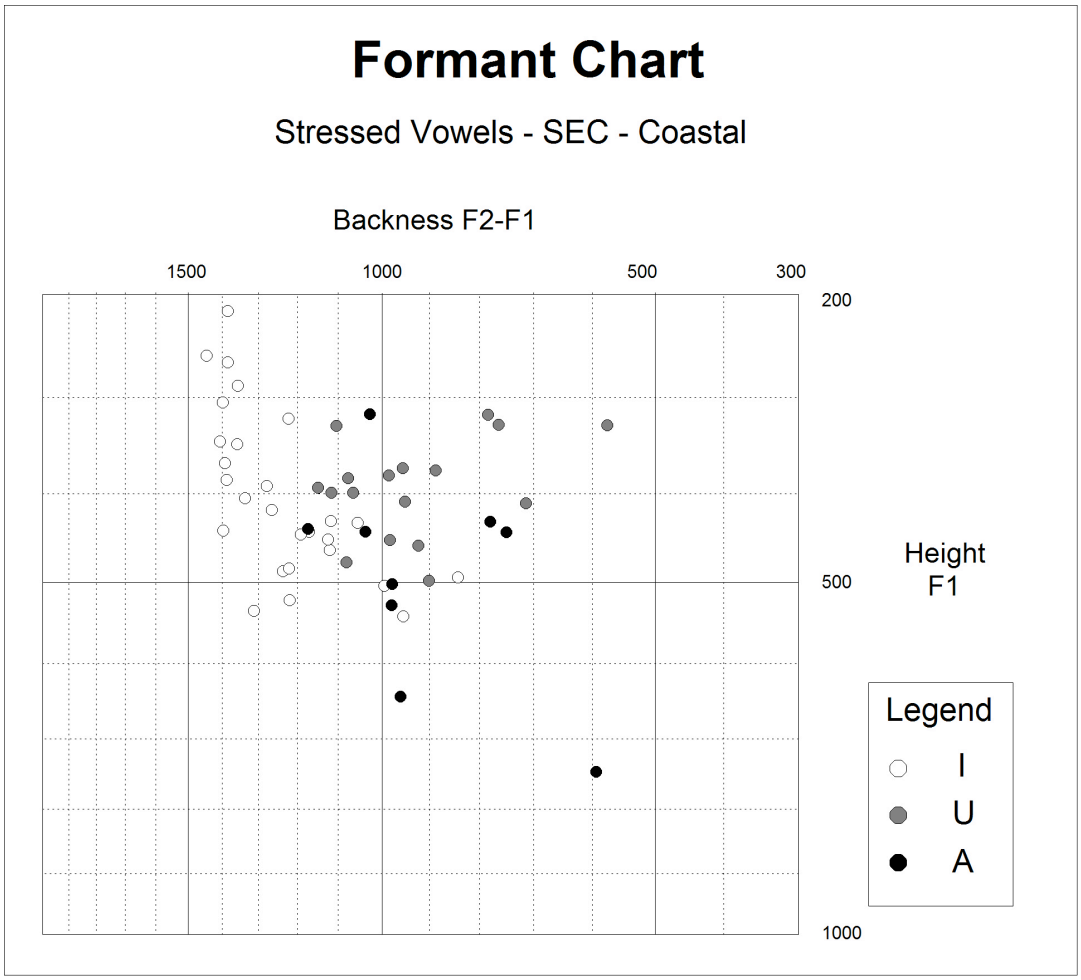
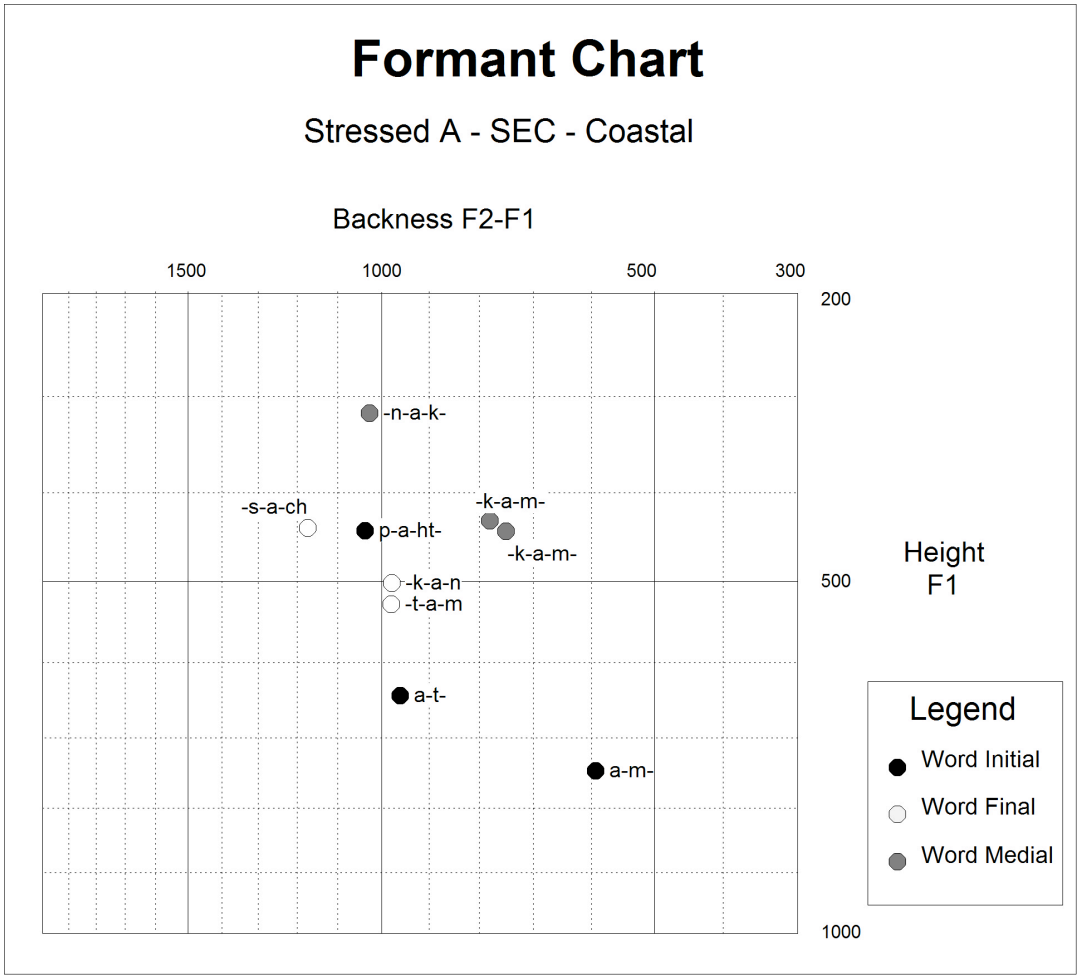


Figure 6 takes a closer look at just the stressed A tokens. The two tokens in the lower quadrant of the chart are the initial vowels in the words: *amiskw* and *atihkw*. The third word-initial A token contains an onset. All other tokens occur in non-word-initial syllables.

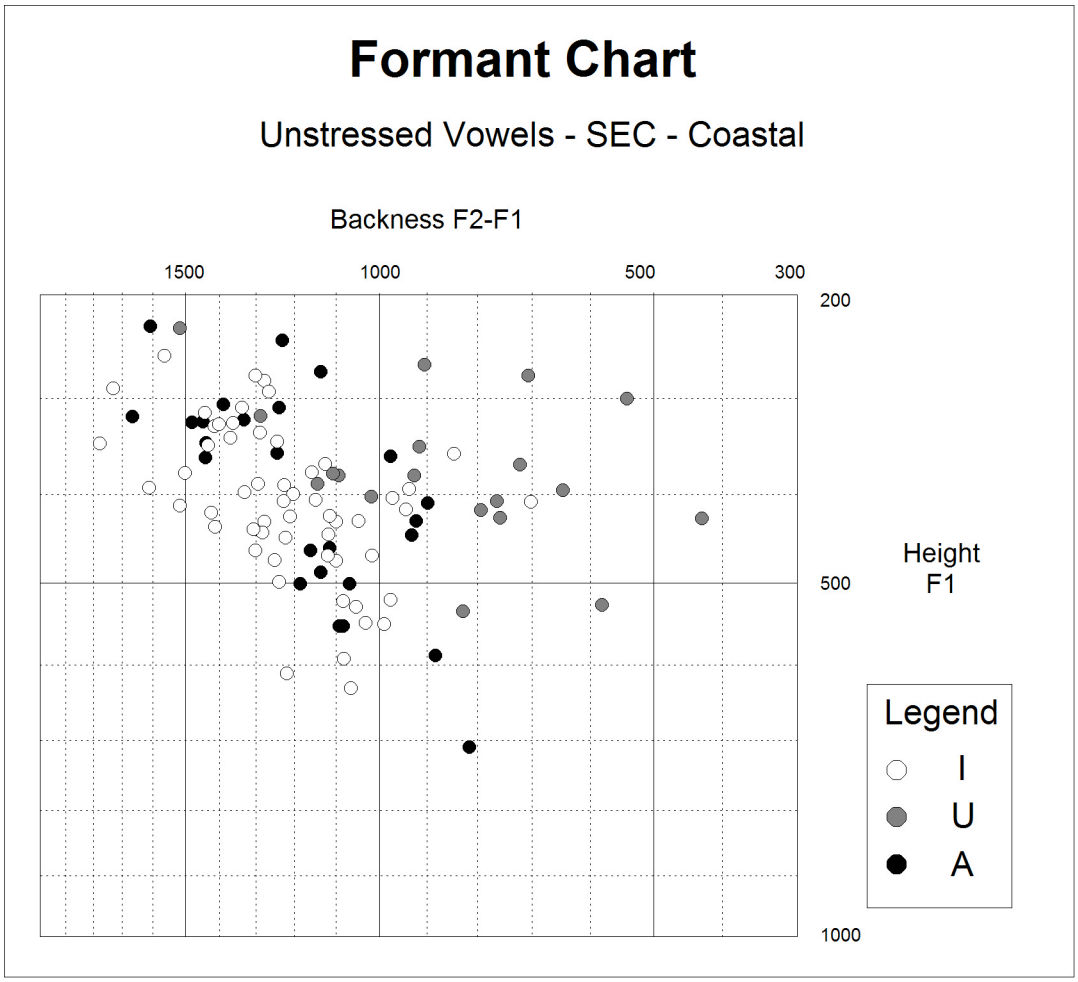
Figure 6 - Coastal SEC stressed A



There is precedence for this pattern of maintaining a contrast in word- or morpheme- initial position: Pentland (1979: 401-2) claims that PA *i and *e merged to /i/ in Cree-Montagnais-Naskapi, except in morpheme-initial position, where the contrast between /i/ and /e/ is maintained in various forms.

Figure 7 shows the distribution of all the unstressed short vowels. In this case, word position did not play a role in the distribution of the unstressed tokens of A.

Figure 7 - Coastal SEC unstressed vowels



The data in Figure 5 - Figure 7 suggests that prominence plays some role in preserving the historical contrast between I and A. Similarly, MacKenzie (1980:140) observes that prominence plays a role in preserving the I vs. A contrast in NEC; short A is raised under stress but is otherwise neutralized with I to [ɪ]:

(11) I vs. A contrast and neutralization in NEC (MacKenzie 1980:140)
- a. citakuhp > [stɛ́kuhp] 'your coat'
- b. nakata:w > [nikitá:w] 'he abandons him'

Moreover, a statistical analysis of all tokens of I and A (both stressed and unstressed) shows that I and A have partly merged in Coastal SEC: there was no significant difference in the values for F1 for A (M= 430.82, SD= 125.52) and I (M= 410.61, SD= 85.10); $t(46)= 0.86$, $p= 0.20$. There was, however, a significant difference in the values for F2 for A (M= 1554.56, SD= 185.66) and I (M= 1646.62, SD= 163.51); $t(55)= -2.52$, $p<0.01$. (Table I and Table II in the appendix show the details of the statistics, calculated in Excel). This suggests that A and I have merged on the height dimension, but not on the backness dimension.

A sample of the analyzed words is shown in (12). The words are spelled with A in SEC but phonetically, they pattern like I. The same words in NEC are spelled with I because in NEC, the merger of I and A has already been implemented in the orthography (Junker et al. 2002).

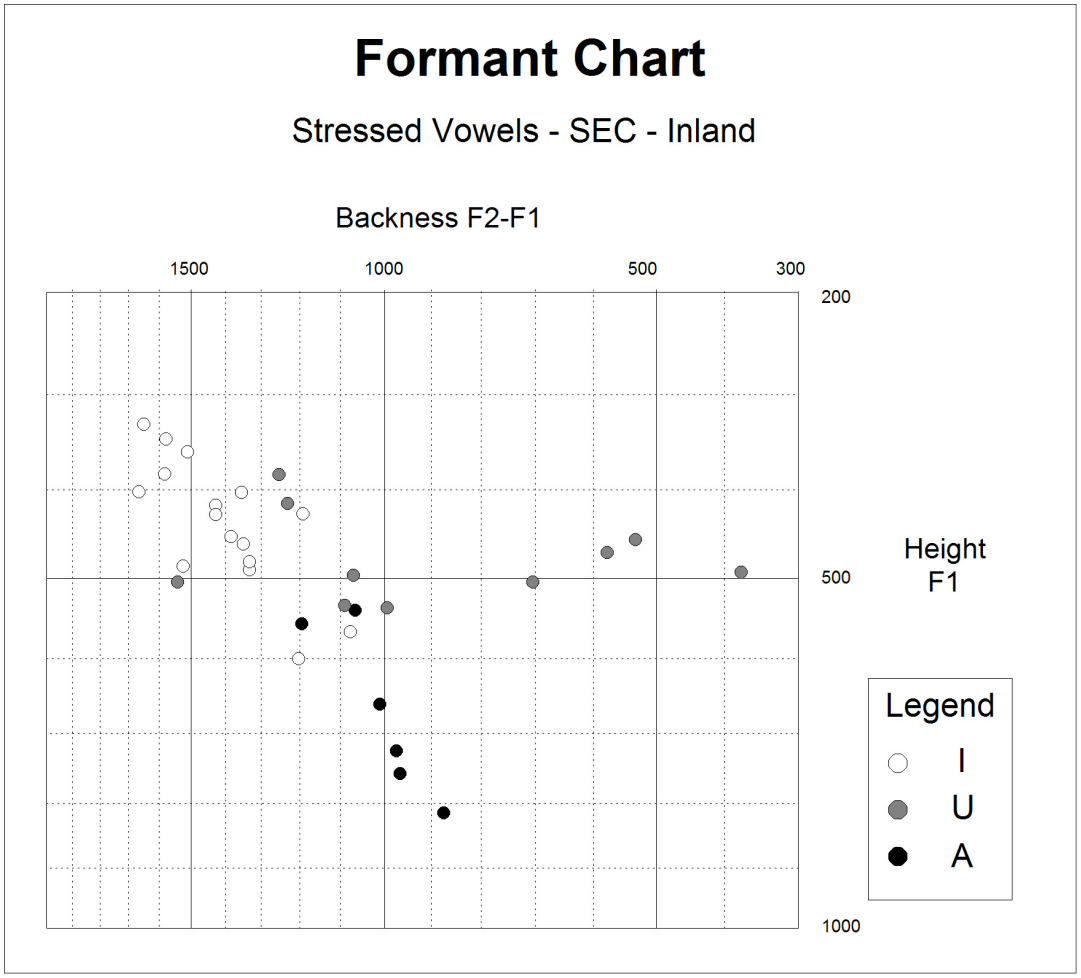
(12) Southern and Northern spellings compared

Southern Spelling	**Northern Spelling**	**Gloss**
atihkukan	atihkukin	‘caribou bone’
atihkamekw	atihkimâkw	‘whitefish’
kûkamekw	-kimâkw	‘salmon’
pahtâwâpush	pihtâwâpush	‘rabbit with the fur singed off’
wâpushunakwân	wâpushunikwân	‘rabbit snare’
tipisitâhtam	tipisitâhtim	‘measure, feet’
namesach	nimâsich	‘many fishes’

6.2.2. Inland SEC

In the approximately 200 words analyzed for the Inland SEC speaker, 151 unstressed and 32 stressed short vowels were measured. Figure 8 shows the formant chart for the stressed short vowels of the Inland dialect of SEC. The A and I occur in fairly distinct vowel spaces. The back U, however, has tokens that stretch into the front vowel space.[9]

Figure 8 - Inland SEC stressed vowels



[9] Similarly, /u/ is fronted in many English dialects; see, for example, the Southern Vowel Shift described in Labov (1998). U fronting will not be discussed further as it does not bear on the topic of this paper.

Figure 9 shows the distribution of stressed A. The patterning is similar to the Coastal dialect (above; see Figure 6) in that the lowest tokens of stressed A are present in onsetless word-initial syllables.

Figure 9 - Inland SEC stressed A

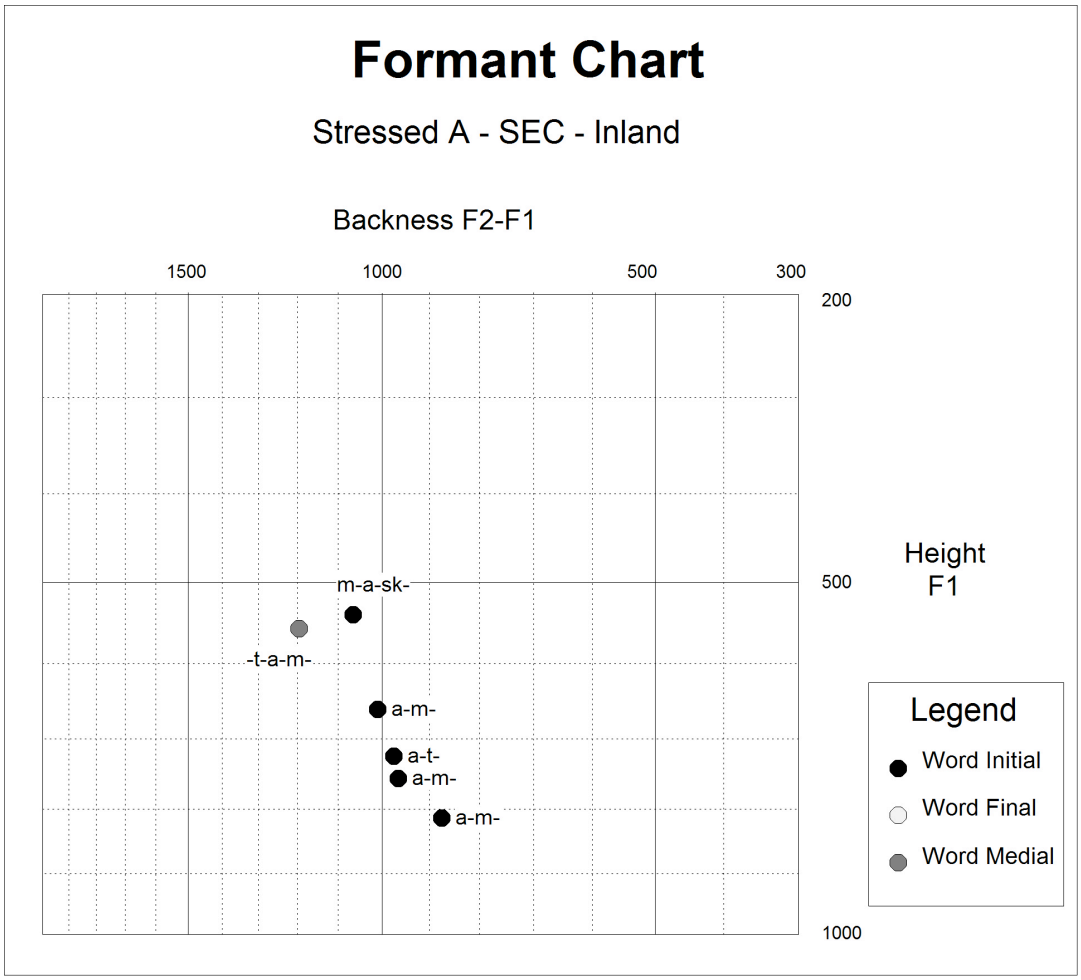
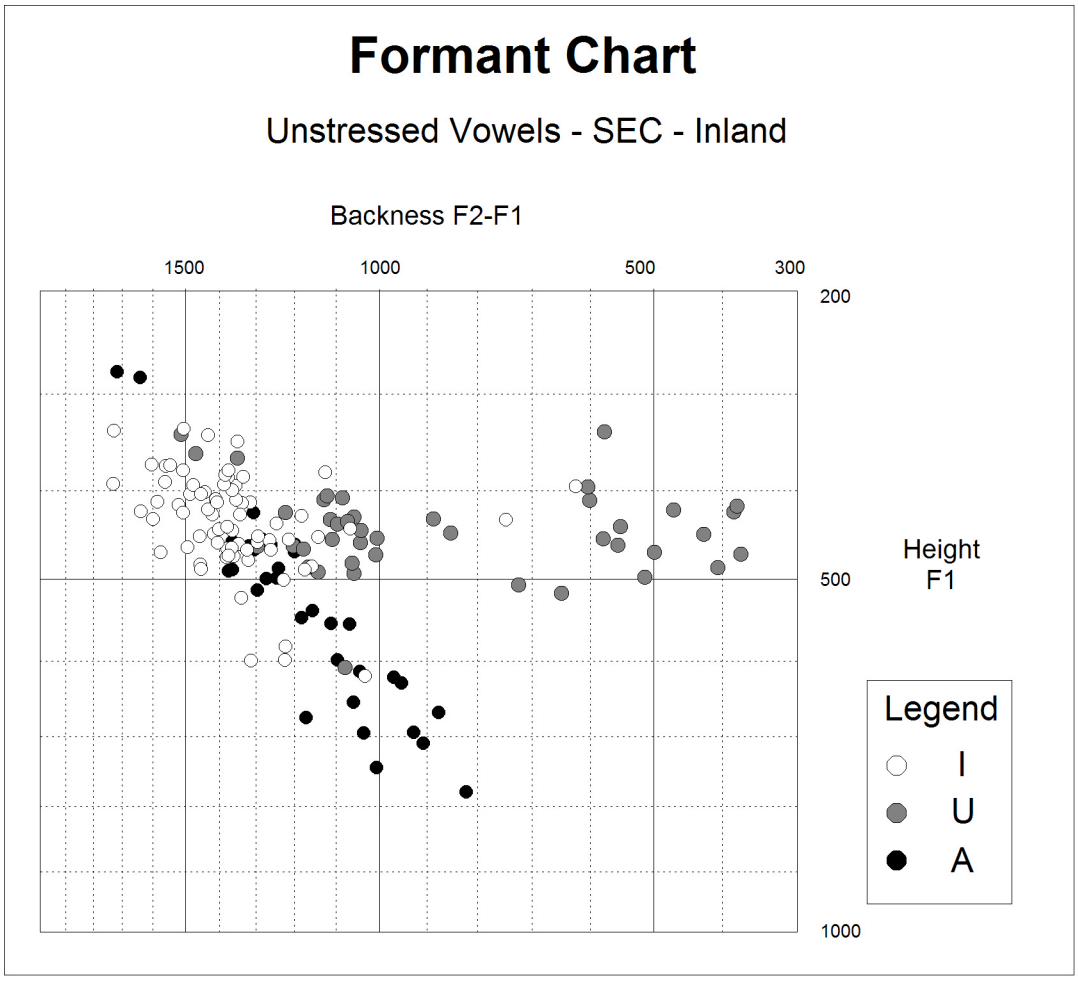


Figure 10 shows all of the unstressed short vowels. The unstressed vowels have a similar distribution to the stressed vowels except that there are more A tokens in the high vowel space.

Figure 10 - Inland SEC unstressed vowels



The data in Figure 8 - Figure 10 suggests that, as in Coastal SEC, prominence plays some role in preserving the historical contrast between I and A in Inland SEC. A statistical analysis of all tokens of I and A (both stressed and unstressed) shows that I and A have not merged in Coastal SEC: there was a significant difference in the values for F1 for A (M= 565.76, SD= 126.77) and I (M= 436.23, SD= 60.04); $t(44)=6.01$, $p<0.01$).There was also a significant difference in the values for F2 for A (M= 1720.40, SD= 96.61) and I (M= 1809.64, SD= 163.20); $t(112)= -3.81$, $p<0.01$. (Table III and Table IV in the appendix show the details of the statistics, calculated in Excel). This suggests that A and I have not merged on either the height or backness dimensions in Inland SEC.

6.3 Phonetic evidence for a merger of I and A in SEC

The data in §6 has shown that there is more phonetic evidence for a distinction between I and A in Inland SEC than in Coastal SEC. It also suggests that in both subdialects, the contrast between I and A was more likely to be preserved in prominent positions (word-initial or accented) than in non-prominent positions (non-word initial or unaccented).

7 Conclusions

Our study has revealed an interesting relationship between NEC and the subdialects of SEC. As shown in Figure 11, there are two types of isoglosses, ones separating NEC from SEC, and ones grouping NEC with Coastal SEC. The isogloss separating NEC from SEC is the merger of long Â and Ê, which occurred in NEC but not in SEC. The isoglosses grouping NEC with Coastal SEC are the partial merger of short I and A, and the [j] pronunciation of PA *l for the word i(y)iyû. In contrast, Inland SEC has not merged short I and A, and uses the [n] pronunciation of PA *l for that word.

Figure 11 - NEC and SEC isoglosses

Northern	Southern	
	Coastal	Inland
merger of Ê and Â	no merger of Ê and Â	
[j] iyiyû 'Aboriginal person'		[n] înû 'Aboriginal person'
merger of I and A		No merger of I and A

We initially undertook the present study in order to address a practical problem: when to use I and A in East Cree orthography. The spelling difficulties described in §4 lead us to believe that I and A were merging into one phoneme in SEC. We pointed out in §5 that there was little phonological evidence for a contrast between I and A in SEC, leaving only phonetic evidence as a potential cue for this contrast. The acoustic analysis in §6 provided evidence for a partial merger of I and A in the Coastal dialect of SEC but not in Inland SEC.

Our data thus helps explain why Coastal SEC speakers have more difficulty deciding whether to use I or A than do Inland SEC speakers. However, our study does not help solve the problem of the standardization of the orthography of SEC. If the distinction between I and A is maintained in the orthography, the spelling is more ad-hoc for Coastal SEC speakers. In contrast, if the orthography were to use one grapheme to represent a merged phoneme, then the spelling system would seem more ad-hoc to Inland SEC speakers. A compromise does not seem possible unless or until the merger of I and A spreads to the Inland subdialect of SEC.

Appendix

Table I - Formant 1 - t-Test: Two Sample Assuming Unequal Variances

	F1-A	*F1-I*
Mean	430.82	410.61
Variance	15755.29	7241.74
Observations	34	83
Hypothesized Mean Difference	0	
df	46	
t Stat	0.86	
P(T<=t) one-tail	0.20	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.39	
t Critical two-tail	2.01	

Table II - Formant 2 - t-Test: Two Sample Assuming Unequal Variances

	F2-A	*F2-I*
Mean	1554.56	1646.62
Variance	34471.41	26735.81
Observations	34	83
Hypothesized Mean Difference	0	
df	55	
t Stat	-2.52	
P(T<=t) one-tail	0.01	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.01	
t Critical two-tail	2.00	

Table III - Formant 1 - t-Test: Two Sample Assuming Unequal Variances

	F1-A	F1-I
Mean	565.76	436.23
Variance	16069.85	3604.84
Observations	38	88
Hypothesized Mean Difference	0	
df	44	
t Stat	6.01	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

Table IV - Formant 2 - t-Test: Two Sample Assuming Unequal Variances

	Variable 1	Variable 2
Mean	1720.40	1809.64
Variance	9334.44	26634.74
Observations	38	88
Hypothesized Mean Difference	0	
df	112	
t Stat	-3.81	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.66	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.98	

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Metathesis in Nivaclé[1]

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Vowel–consonant metathesis in Nivaclé (Matacoan, Argentinean and Paraguayan Chaco) appears to constitute a regular and productive phenomenon; it can be observed in the presence of several inflectional and derivational affixation processes such as pluralization of nouns and nominal/verbal derivation. Following an Optimality-Theoretic approach (Prince and Smolensky 1993 [2004]), I present a unified analysis for metathesis in Nivaclé. I argue that vowel-consonant metathesis in Nivaclé can be accounted for by the interaction of Linearity-IO and higher ranked syllable structure constraints. The avoidance of complex codas and the satisfaction of the *Syllable Contact Law* (Murray and Vennemann (1983), Vennemann (1988)) are the driving forces behind metathesis. I thus argue that metathesis in Nivaclé is motivated by phonological requirements.

1 Introduction

The goal of this paper is to contribute to the understanding of vowel-consonant metathesis in Nivaclé, a Matacoan-Mataguayan language spoken in the Argentinean and Paraguayan Chaco. Metathesis is defined as a process in which, under certain conditions, sounds switch positions with one another. For instance, in a string of sounds where the linear ordering of two sounds is expected to be *xy*, the reverse order – *yx* – is found instead.

Following a constraint based approach, Optimality Theory (Prince and Smolensky 1993 [2004], McCarthy & Prince 1995), I present a unified account for metathesis in Nivaclé. The basic assumption behind OT is that a given surface form is derived from an input by means of a universal set of ranked and violable constraints. A crucial constraint for analyzing metathesis in OT is Linearity, which penalizes the reversal of precedence relations among segments in a string. My analysis of Nivaclé metathesis, thus, draws upon the account of metathesis in Rotuman and Leti presented by McCarthy (1995 [2000]) and Hume (1998), respectively. Both accounts show that the systematic subordination of Linearity to higher ranked constraints explains the change in the linear ordering of segments. Moreover, violations of Linearity are assumed to be evaluated in a gradient manner, that is, each reversal of the segmental linear order incurs a violation of the constraint. Therefore, minimal violations (one) will be optimal.

There are two distinct motivations behind vowel-consonant metathesis in Nivaclé: the avoidance of complex codas and the *Syllable Contact Law* (Murray and Vennemann (1983), Vennemann (1988)). I thus argue that metathesis is motivated by phonological requirements. The data presented here are based on linguistic fieldwork with two Nivaclé consultants SR and FR[2], and the data are compared with Stell (1989) and Campbell & Grondona (2007), whose accounts will be discussed in this paper.

This paper is structured as follows. After presenting some background information and focussing the issues in the contexts of previous studies on the Nivaclé language, Section 2 provides an OT account for VC metathesis in Nivaclé: I argue that the avoidance of complex codas and the satisfaction of the Syllable Contact Law are the driving forces behind this phenomenon. Section 3 discusses the manner in which violations of the Linearity constraint are assessed. Finally, section 4 presents the main conclusions of this paper.

1.1 The problem

In Nivaclé, we can observe roots that alternate in the context of noun pluralisation (i.e. the plural of 'lip' in (1a) is *pas.tes* rather than **pa.se.tes* or **pa.sets*) and roots that do not seem to alternate in the presence of the same suffixes (2.1):

(1) Alternating forms

a.	pa.set	'lip'	pas.te-s	'lips'
b.	a.p'ax	'yarara'	ap.xa-s	'yararas'

[1] My special gratitude to my consultants FR and SR from the community of Uje Lhavos (Paraguay). Many thanks to Patricia A. Shaw, Gunnar Hansson and Molly Babel for valuable feedback and comments, as well as Mario Chávez-Peón and Alain Fabre for questions and suggestions. All mistakes remain my own.

[2] Fieldwork was conducted in Filadelfia, Paraguay, in July, 2009.

c. wa.tɑk	‘meal’	wat.kɑ-s	‘meals’
d. ti.niʃ	‘necklace’	tin.ʃi-s	‘necklaces’
e. ti.sù̀x	‘quebracho(tree)’	tis.xu-j	‘quebrachos’
f. fe.ɬetʃ	‘bowl’	feɬ.tʃe-j	‘bowls’
d. niʃ̀	‘perfume’	nʃi-k	‘perfumes’

(2) Non-alternating forms

(2.1) a. a.ɬu	‘lizard’	aɬu-s	‘lizards’
b. ku.faj.xa.na	‘gift’	xu.faj.xa.na-s	‘gifts’
c. faj.xo	‘charcoal’	fajxo-k	‘charcoals’
d. wat.k͡la	‘property’	wat.k͡la-j	‘properties’
(2.2) e. tos	‘snake’	to.s-is	‘snakes’
f. ka.sus	‘pumpkin’	ka.su.s-ik	‘pumpkins’
g. kum.xat	‘work’	kum.xat-es	‘works’

(Stell 1989 ; author’s fieldwork[3])

Examples in (1) and (2) also show the presence of plural allomorphy in Nivaclé: there are basically three plural allomorphs -s, -j, and -k. Even though their realization is not clearly predictable, the three allomorphs surface with both ‘alternating’ and ‘non-alternating’ root forms.

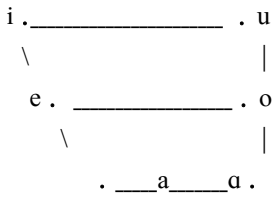
1.1.1 Background

Tables 1 and 2 present the Nivaclé phonemic inventory based on Stell’s (1989) unpublished doctoral thesis.

Nivaclé phonological inventory (based on Stell 1989)
Table 1. Nivaclé consonants[4]

	bilabial	Dento-alveolar	palato-alveolar	palatal	velar	glottal
Ejective stops & affricates	p’	t’ ts’	tʃ’		k’	
Pulmonic stops & affricates	p	t ts kl	tʃ		k	ʔ
Fricatives	f	s ɬ	ʃ			
Nasals	m	n				
Approximants	w			j	w	

Table 2. Nivaclé vowels (each of these six vowels has a glottalised counterpart)



[3] Stress is word final, otherwise noted. Transcriptions follow the IPA. However, for the transcription of glottalised vowels I follow Stell’s notation, namely a hook on top of the vowels.

[4] According to Stell (1989:58) / k͡l / “is a single phonemic segment which has a simultaneous articulation and release of a velar and a dental-alveolar lateral” (Stell 1989:58). The glide /w/ has both labial and velar properties and hence is listed under both place of articulation columns.

In turn, Table 3 illustrates the attested syllable types. Briefly, onsetless syllables (a+b) and simple codas (b+e) are allowed. Also, Stell presents a syllabic consonant: the prefix /ɬ-/, which expresses a second person subject or a third person possessive (c). Stress is predominantly word final.

Table 3. Syllable structure (based on Stell 1989)

	Syllable types	**Morphemic breakdown**	**Syllabification**
a.	V	**ɑ**me ‘no’	**ɑ.**me
		ɬa-n-ku-**a** ‘he likes(sby.)’ 3S-DIR-like-3O	ɬan.ku.**a**
b.	VC	**in**xɑt ‘always’	**in.**xɑt
c.	C	**ɬ**-ʃatiʧ ‘his head’ 3POS-head	**ɬ**.ʃa.tiʧ
d.	CV	**ɬawɑ** ‘flower’	**ɬa.wɑ**
e.	CVC	k’a**fok** ‘raven’	k’a.**fok**
f.	CCV	-**fx**ux ‘toe’ ji-**fx**ux 1POS-toe ‘my toe’	ji**f.x**ux

Stell also notes the presence of two consonants in root-initial position; for instance -kfe ‘ear’, -fxux ‘toe’, -xpek ‘shadow’. However, these are bound roots; they either need to be obligatorily possessed: ji-k.fe ‘my ear’, or modified by a determiner: na-x.pek ‘the shadow’. In both contexts, resyllabification occurs, and a potential complex onset does not get realized.

Of particular importance, note that complexity never occurs in coda position. Simplex codas, but not complex codas are attested. A further distributional observation is that where there is a word-internal coda, the following onset is always of equal or greater sonority.

In regards with the two previous accounts on the language – Stell (1989) and Campbell and Grondona (2007) – there is an issue to be discussed throughout this paper: namely whether the analysis of root alternations should be regarded as vowel deletion (Campbell and Grondona) or metathesis (Stell).

In this regard, Campbell and Grondona analyse root alternation forms as the synchronic residue of historical vowel deletion. Following a derivational approach, they apply internal reconstruction and postulate several sound changes in the history of Nivaclé. An assumption underlying their internal reconstruction is that the variants of a morpheme all stem from a single invariant original form. The alternating forms under consideration are singular and plural nouns (like the data in (1)). In Table 4, according to Campbell and Grondona, a vowel that is present in the left-hand column is missing from the related forms in the right-hand column.

Table 4. Vowel-alternation examples (C&G 2007:5)

1. -paset	‘lip’	-past-es	‘lips’
2. xump’uwałex	‘mountain lion’	xump’uwałx-es	‘mountain lions’
3. xokitajuk	‘lapacho (tree)’	xokitajk-uj	‘lapachos

Following the above morpheme break representations, Campbell and Grondona assume that the Nivaclé roots underwent a change which deleted a vowel when a vowel-initial suffix was added. A reconstruction is postulated (*pas**e**t-es) through the following rule:

(5) **V-deletion V > Ø /__C+V**

	*pas**e**t-es	
V-deletion:	pastes	(~~pa.se.tes~~.)

Some comments are worth mentioning with respect to their approach. First, Campbell and Grondona do not clearly motivate why this vowel deletion rule occurs in the presence of a vowel initial suffix. Second, and most importantly, if syncope is taking place there is no reason to expect the vowel of the root and the vowel initial suffix to be identical. Following Campbell and Grondona's approach, one would have to assume the existence of separate plural suffixes for the examples in (1):-es, -as, -ɑs, -is, -uj, -ej, and –ik. In other words, the suffix allomorph chosen for a given root would be required to have a vowel that matches the root vowel that is targeted by the postulated syncope processes. This 'accidental' identity between the syncopated and the suffix vowel casts doubt on their analysis. Further, the examples in (2.2) show that vowel identity is not required, that is, the vowel present in the plural suffix does not match the vowel quality of the final syllable of the root:

(2.2)	e. tos	'snake'	to.s-is	'snakes'
	f. ka.sus	'pumpkin'	ka.su.s-ik	'pumpkins'
	g. kum.xat	'work'	kum.xa.t-es[5]	'works'

I propose that what it looks like the suffix vowel (i.e. [e] in Table 4) is actually the root vowel that has moved to the right edge of the root as the consequence of vowel-consonant metathesis. In other words, the last vowel and consonant of the root are being metathesized in order to avoid an illicit coda. As established earlier, in the context of Table 3, complex codas do not constitute licit syllable structures in Nivaclé. Consequently, I hypothesise that the plural suffix is –C rather than –VC:

(6) pa.set 'lip' *pa.set-s 'lips' pas.te-**s** 'lips' **Metathesis VC_1-C_2→ C_1V-C_2**

Further, this metathesis pattern is not restricted to plural suffixation. There are sets of data in which a range of consonant-initial derivational suffixes trigger the same root VC metathesis phenomenon:

(7)	a. nɑ.jiʃ	'road'	nɑj.ʃi-mat	'bad road'
	b. fi.nɑk	'tobacco'	fin.kɑ-metʃ	'to have power over tobacco'
	c. k͡lo.t'ax	'burn'	k͡lot.xa-nat	'to get burned'
			k͡lot.xa-ji	'to be burned'
	d. na.matʃ	'axe'	nam.tʃa-waʃ	'mark of an axe'
	e. fe.łetʃ	'bowl'	feł.tʃe-jiʃ	'in the bowl'

(Stell 1989; author's fieldwork)

Although the observed metathesis in these cases is not compelled by complex coda avoidance, it is, I argue, also phonologically motivated.

In (7) the roots are obstruent-final and the suffixes are resonant-initial; the change in the linear order between the final vowel and consonant of the root can be interpreted as a way to optimize the sonority transition between the coda of the root and the onset of the derivational suffix.

When metathesis is not a possible strategy to repair a bad syllable contact, vowel epenthesis seems to occur:

(8) p'ok 'arrow' *p'ko.waʃ p'ok-**i**-waʃ 'mark of an arrow'

(Stell 1989: 211)

With this background, let us return to the consideration of Campbell and Grondona's syncope analysis. For data like (9) Campbell and Grondona assume vowel deletion.

(9) finɑk 'tobacco' fin_k-ɑs 'tobaccos'

[5] Under the present hypothesis that the plural suffix is simply a single consonant, the vowel that surfaces in data such as (2.2 e-h) is considered epenthetic. The epenthetic vowel in Nivaclé is predominantly [i]. Sometimes [e] can be found, though. Stell notes a dialectal variation between [e] and [i] in the plural suffix, which may explain this alternation. Moreover, the [i]~[e] variation may be related to language contact with Spanish, where [e] surfaces as the epenthetic vowel, for instance in pluralisation of nouns:
(i) flor 'flower' flor-**e**s 'flowers'
flower-PL

Table 5. Vowel Deletion	**Metathesis**
finɑk + -ɑs	fin**ɑk** +-s
fin~~ɑ~~kɑs	⊠ fin**kɑs**
fink-ɑs	finkɑ-s

It is not very clear what they would posit for examples in (10):

(10) a. finkɑ-metʃ 'to have power over the tobacco'
b. finkɑ-nox 'smoker'

If the application of internal reconstruction involves analyzing the variants (allomorphs) of a morpheme stemming from a single invariant original form, then the same rules of vowel deletion should apply as in (10) as they do in (9). That is, according to their analysis, one would have to assume again that the derivational suffixes begin with the same (syncopated) root vowel: fin**ɑ**k-**ɑ**metʃ and fin**ɑ**k-**ɑ**nox, respectively. Therefore, not only pluralisation suffixes but also derivational suffixes would need to have vowels identical to the ones that are getting deleted in the final syllable of the root.

The data in (7) may actually reinforce the idea that it is metathesis and not historical vowel deletion at issue here; the concatenation of morphemes results in 'bad syllable contact' (sonority should not rise across a syllable boundary). Thus, metathesis can be seen as a repair strategy.

2 Driving forces behind metathesis

2.1. Syllable structure constraints

The first type of metathesis is motivated by syllable structure constraints; Nivaclé does not allow complex codas. The formation of plural is one area in which metathesis can be observed.

(11) /jijax + /-s/ jij.**xa-**s 'pumas' (*ji.jax-s)
'puma'+/PL/

Based on the above two basic observations, the following constraints are proposed:

(12) Linearity I-O: 'No metathesis'
S_1 and S_2 are a pairing of an input and an output string, and S1 and S2 stand in I-O correspondence.

(13) *Complex $^{[coda]}$: (Codas are simple).
*CC]$_\sigma$ (Kager 1999)

Epenthesis, along with metathesis, is an available repair strategy to avoid complex codas or a 'bad syllable contact'. However, epenthesis is dispreferred relative to metathesis, when given the choice (for example, (2.2)). This suggests that Dep-IO is crucially outranked by both *CC]$_\sigma$ and the Syllable Contact Law (see discussion in section 2.2).

(14) Max-IO: Input segments must have output correspondents ('No deletion').
(Kager 1999)

(15) Dep-IO: Output segments must have input correspondents ('No epenthesis').
(Kager 1999)

I preliminarily posit the following ranking of constraints.

(16) *CC]$_\sigma$ >> Max-IO, Dep-IO >> Linearity-IO

(17)

	/jijax+s/	*CC]$_\sigma$	Max-IO	Dep-IO	Linearity-IO
a.	ji.jaxs	*!			
b.	ji.jas		*!		
c.	ji.ja.x**V**s			*!	
d. ☞	jij.xas				*

Candidate (d) emerges as the optimal candidate because it only violates low ranked Linearity-IO. In turn, candidates (a-c) fatally violate high ranked CC]$_\sigma$, Max-IO and Dep-IO respectively.

2.2 Syllable Contact Law

The driving force behind the second type of metathesis is Syllable Contact Law, which expresses the recurring pattern across languages through which the sonority of the coda should exceed the sonority of the following syllable-initial consonant (onset). Several proposals have been put forward to formalize the concept of sonority (Murray and Vennemann 1983, Vennemann 1988, Clements 1991, Gouskova 2004, among others), which has been the object of extensive debate. For the purpose of my analysis, I assume the following scale:

(18) Obstruents > Resonants> Vowels

The data in (7) – repeated in (19) for convenience –show that concatenation of morphemes may result in a 'bad syllable contact'. Metathesis can be seen as a repair strategy that optimizes the transition from the coda (an obstruent) to the onset (a resonant: nasals or approximants).

Sonority reversals are not licensed

(19) a.	nɑ.jiʃ	'road'	nɑj.ʃi-mat	'bad road'	(*nɑ.jiʃ-**m**at)
b.	fi.nɑk	'tobacco'	fin.kɑ-metʃ	'to have power over tobacco'	(*finɑ**k**-**m**etʃ)
c.	klo.t'ax	'burn'	k͡lot.xa-nat	'to get burned'	(*klo.t'a**x**-**n**at)
			k͡lot.xa-ji	'to be burned'	(*klo.t'a**x**-**j**i)
d.	na.matʃ	'axe'	nam.ʧa-waʃ	'mark of an axe'	(*na.mat**ʧ**-**w**aʃ)
e.	fe.ɬetʃ	'bowl'	feɬ.ʧe-jiʃ	'in the bowl'	(*fe.ɬet**ʃ**-**j**iʃ)

Only the sonority relation between the coda of the root and the onset of the derivational suffix will determine whether metathesis takes place or not. This situation has the following theoretical implications: obstruents (stops, affricates and fricatives) and resonants (approximants) do not comprise sub-sonority scales for the purpose of syllable contact restrictions in Nivaclé. Stops do not seem to be less sonorous than fricatives, otherwise examples like *klo**t.x**a.nat* would incur a violation of the SCL (***t.x**) and metathesis would be blocked. In this sense, it can be posited that (i) stop-fricative sequences (for example: **t.x**) count as a "plateau" (as opposed to a sonority fall), and (ii) sonority plateaus, including "true" ones like **p.k** (obstruent.obstruent) or **j.w** (resonant.resonant) do not count as "bad" syllable contacts:

(20) a.	sa**n**.**j**eʃ	'salary'	R.R
b.	xa**j**-**w**aj		R.R
	1S-complain		
	'I complain'		
c.	nɑ̀**p**.**k**u.nak	'salad'	O.O
d.	ta.nu**k**-**ɬ**as		O.O
	cat-DIM		
	'kitten'		

It is worth highlighting the striking contrast between (19c) and (20d). Metathesis is triggered in the former due to the SCL, but not in the latter, in which a stop followed by a fricative counts as a "sonority plateau". Comparing (20d) to cases like (19d), as well as "true" plateaus like in (20b, c), serves to illustrate the limitations on the SCL and/or the sonority hierarchy proposed in (18). Metathesis fails to be triggered by (pre-existing) stop-fricative sequences (20d) and by (resulting) stop-fricative or (true) plateau sequences (19d).

In an optimality theory analysis, the Syllable Contact Law represents a family of constraints, which can be instantiated for Nivaclé in the following terms:

(21) Syllable Contact Law (SCL) [$*^{[-son]}{}_{\sigma}\ {}_{\sigma}{}^{[+son]}$ Sonority should not rise across a hetero-morphemic syllable boundary (from an obstruent to a resonant).

The interaction between the SCL constraint and the previously proposed constraints is illustrated in the following tableau.

(22) SCL >> Max-IO, Dep-IO >>Linearity-IO

(23)

/finɑk + metʃ/	SCL[$*^{[-son]}{}_{\sigma\,\sigma}{}^{[+son/-voc]}$]	Max-IO	Dep-IO	Lin-IO
a. fi.nɑk.metʃ	*!			
b. fi.nɑ.metʃ		*!		
c. fi.nɑ.k**V**.metʃ			*!	
d. ☞ fin.kɑ.metʃ				*
e. fi.nɑk.ʧem				**!
f. fin.kɑ.ʧem				***!

The most faithful candidate to the input (a) fatally violates SCL and it is thus discarded, and candidates (b-c) violate Max-IO and DEP-IO, respectively. Candidate (d) surfaces as the optimal output because it only violates low ranked Linearity-IO, whereas (e) and (f) violate Linearity-IO twice. In the last section of this paper, I will discuss the way violations of Linearity-IO are assessed.

In essence, the hypothesis I am proposing is that syllable contact markedness contraints are highly ranked in Nivaclé and will trigger metathesis, a Linearity violation, in order to satisfy syllable contact constraints. Under this proposed analysis, an interesting question arises: What happens if suffixation of a resonant-initial suffix to an obstruent-final root should trigger metathesis in order to avoid violating the SCL but the linear reordering of the final vowel and consonant of the root would itself incur a violation of *Complex? Interestingly, vowel epenthesis takes place.

In (24a) VC metathesis is blocked because the expected output: (24b) [ɬaf.ʦ**ku**.**n**ak] would incur a *Complex violation.

(24) /ɬaftsuk/ 'palm tree' + /-nak/ (resultative) 'palm wine'

a. * ɬaf.tsu**k**.**n**ak

b. * ɬaf.**ts**k**u**-nak

c. *ɬa**ft**s.ku-nak

d. *ɬaf.tsu-nak

e. ɬaf.tsuk-**i**nak ✓'palm wine'

Since the first rescue strategy, metathesis, does not result in an acceptable syllabic parse, the "second-best" repair strategy is vowel epenthesis, a Dep-IO violation. In tableau (27) we can see the relative ranking of Dep-IO in regards to Max-IO, and the two processes, metathesis and epenthesis, jointly "conspiring" to eliminate bad-syllable-contact sequences, that is, SCL violations. *Complex is the conditioning factor that gives rise to the variation between one process and the other; it acts as a "blocker" of the default process (metathesis) under certain circumstances.

(25) Complex^{Ons}: (Onsets are simple) (Kager 1999)
*[$_{\sigma}$ CC

(26) SCL, *$_{\sigma}$[CC, *CC]$_{\sigma}$, Max-IO >> Dep-IO >> Linearity-IO

(27)

/ɬaf.tsuk + nak/	SCL[*$^{[-son]}_{\sigma}$ $^{[+son/-voc]}_{\sigma}$]	* $_{\sigma}$[CC	*CC]$_{\sigma}$	Max-IO	Dep-IO	Lin-IO
a. ɬaf.tsu**k**.**n**ak	*!					
b. ɬaf.**tsk**u-nak		*!				*
c. ɬaf**ts**.**k**u-nak			*!			*
d. ɬaf.tsu-nak				*!		
e. ☞ ɬaf.tsuk-**i**nak					*	

3 On the restriction of metathesis

3.1 Scope of metathesis

In this section, two further issues related to metathesis are considered. The first one, illustrated in (28) and (29) deal with the observation that metathesis affects only the final consonant and vowel of the root (28a, 29a). Neither the consonant and vowel of a suffixal morpheme (28b), nor the *O.R consonant sequence across the root-suffix boundary (28c, 29c) gets metathesized:

(28) /k͡lot'**a**x+ji/
a. ✓ k͡lot.**xa**.ji 'to be burned'
b. * k͡lo.ta.xij
c. * k͡lo.taj.xi

(29) /k͡lot'ax+nat/
a. ✓ k͡lot.xa.nat 'to burn oneself'
b. * k͡lo.t'an.xat

What these examples show is a restriction in regards to the output position of the metathesized vowel: it may only shift to the right outer edge of a root.

(30) /k͡lo.t'**a**x +ji/
↺
[k͡lot.x**a**]MCat
[klot.x**a**]σ

In this regard, we can invoke the presence of an alignment constraint – through which the right edge of a morpheme is aligned with the right edge of a syllable – in order to account for the morphological category (the Root) and the syllable structure's alignment.

(31) Align (Root, R; σ, R) The right edge of a root coincides with the right edge of a syllable.
(Kager 1999)

Metathesis motivated by Syllable Contact Law shows that Align (Root, R; σ, R) must be crucially ranked above Max-IO [lar], otherwise the data in (28) cannot be accounted for.

(32) SCL, *Lar/_[-voc], Align (Root, R; σ, R) >> Linearity, Max-IO [lar]

(33)

/k͡lot'ax + ji /	SCL	*Lar/_[-voc]	Align (Root, R; σ, R)	Max-IO [lar]	Lin-IO
a. ☞ k͡lot.xa.ji				*	*
b. k͡lo.t'a.xij			*!		*
c. k͡lot'.aj.xi			*!		*
d. k͡lo.t'ax.ji	*!				
e. k͡lot'.xa.ji		*!			*

It is the hierarchical ranking of Align-Root relative to Max-IO [lar] that explains why candidate (a) and not (b) or (c) emerges as the optimal candidate. Candidates (d-e) fail to comply with the markedness constraints.

3.2 Assessing Linearity violations

Metathesis in Nivaclé only involves the reversal shift of a consonant and vowel in a root; reordering of more/other segments does not take place. For instance, when /-nat/ is suffixed to /klot'ax/, only the /a/ shifts to the outer edge of the root in order to satisfy the Syllable Contact Law. It is not the case that additional segments from the root, e.g *[klt'o.xa] or the suffix metathesize, e.g *[klo.t'ax.tan], *[klot.xan.ta]). In all the three cases the Syllable Contact Law would be satisfied as well. Minimal changes in the ordering of segments seem to be preferred.

In (34), we can see that the actual winning surface form [klot.xa.nat] is the one that incurs the minimal change: only one precedence reversal (indicated by *)

(34) **Precedence relations**

$/\widehat{kl}_1\, o_2\, t'_3\, a_4\, x_5 + n_6\, a_7\, t_8$ /	
a) $\widehat{kl}_1\, o_2\, t_3\, x_5\, a_4\, n_6\, a_7\, t_8$	1<2, 2<3, 3<5, *5<4, 4<6, 6<7, 7<8
b) $\widehat{kl}_1\, o_2\, t_3\, x_5\, a_4\, n_6\, t_8\, a_7$	1<2, 2<3, 3<5, *5<4, 4<6, 6<8, *8<7
c) $\widehat{kl}_1\, o_2\, t'_3\, a_4\, x_5\ t_8\, a_7\, n_6$	1<2, 2<3, 3<4, 4<5, 5<8, *8<7, *8< 6, *7<6

(35)

/k͡lot'ax+nat/	SCL	Linearity-IO
a. ☞ k͡lot.xa.nat		*
b. k͡lot.xan. ta		**!
c. k͡lo.t'ax.tan		***!
d. k͡lo.t'ax.nat	*!	

Returning to (35) a possible – yet not winning – candidate that satisfies the phonotactics of Nivaclé is [klo.t'an.xat]. Just like the optimal candidate [klot.xa.nat], it incurs only one violation of Linearity. However, [klo.t'an.xat] crucially does not satisfy Align-Root, and only (36a) does. In metathesis driven by the Syllable Contact Law, it is often the case in other languages that the consonants in contact are the ones that metathesize (Gouskova 2004: 228). In Nivaclé, however, only the root final vowel and consonant metathesize.

(36)

/k͡l ot'ax+nat/	SCL	*Lar/_[-voc]	Align (Root, R; σ, R)	Lin-IO	Max-IO [lar]
a. ☞ k͡lot.xa.nat				*	*
b. k͡lo.t'an.xat			*!	*	
c. k͡lot. xan. ta			*!	**	*
d. k͡lo.t'ax.tan				**!*	
e. k͡lo.t'ax.nat	*!				

In sum, Align (Root, R; σ, R) is the constraint that helps to determine the emergence of the optimal candidate in the second type of metathesis in Nivaclé, where coda-onset clusters with rising sonority are banned.

4 Conclusions

In this paper, I provided an optimality theoretic account for vowel consonant metathesis in Nivaclé, which takes place in the presence of some inflectional and derivational affixation processes such as pluralization of nouns and nominal/verbal derivation. I also showed how an alternative analysis – historical vowel deletion (Campbell and Grondona 2007) – is not well motivated and fails to account for a wider range of data.

There are two distinct motivations behind vowel-consonant metathesis in Nivaclé. One source of metathesis is constituted by the avoidance of an illicit syllable structure: complex codas or onsets are not allowed in Nivaclé. The other source of metathesis comprises the optimization of the sonority contact in coda-onset clusters. Both sources constitute well-attested cross linguistic tendencies to avoid (i) complex syllable margins, and (ii) the rising of sonority values across syllable edges. *CC]$_{\sigma}$ and the SCL, in interaction with Linearity-IO successfully captured the two generalization patterns respectively.

In addition, ranking Align (Root, R; σ, R) over Linearity-IO accounted for the segments that switch positions with one another. Only the (last) vowel of the root may shift to its right outer edge, across the root-final consonant. Furthermore, violations of Linearity-IO are gradiently evaluated: only the form that incurs in a minimal violation emerges as the optimal output. These patterns confirm the cross-linguistic tendency for metathesis (Hume 2004): (i) it involves adjacent segments, and (ii) ordering reversals are preferred at the end of roots and words, because word position and proximity constitute significant factors for speech processing (Mielke and Hume 2001).

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Is there "pragmatic skewing" in East Cree?

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The goal of this paper is to examine 2↔1 (YOU-I) person combinations in East Cree and test Heath's (1998) claim about the effects of what he calls 'Pragmatic Skewing' in these combinations. We present new data, based on an extensive documentation effort conducted with native speakers of Northern and Southern dialects of East Cree. Our data now consists of complete paradigms (12 in the Northern and 9 in the Southern dialect) for all known stem variations (MacKenzie et al., 2010a-b).

Based on a typological study of Australian and Native American languages, Heath observes that subject/object combinations for 2nd and 1st persons are "fused, opaque (difficult to segment) or unusually complex". He claims that transparent combinations are avoided for pragmatic reasons that resemble politeness strategies in other languages reported by Brown & Levinson (1978). For Algonquian languages, he claims that subject and object markers for 2↔1 combinations compete for a single slot. We examine his claims, systematically comparing 2↔1 combinations for degrees of differentiation. We also compare local person combinations with mixed combinations. We find that the degree of differentiation varies according to order, verb stem and sometimes paradigm. We also find that the only strategy that can be identified is one of number neutralization for plural combinations, which goes against one of Heath's further predictions. We conclude that there is limited evidence for 'pragmatic skewing' strategies occurring in East Cree.

1 Introduction

YOU-I person combinations raise interesting questions for linguistic theory, ranging from the universality of certain person hierarchies to the structural organization of particular languages, as well as questions about face-to-face communication constraints and their cross-linguistic realizations. Starting from the general observation that YOU-I combinations are not transparent in many languages, Heath (1991 and 1998) hypothesizes that languages exhibit a set of avoidance strategies, which he calls "pragmatic skewing" [PS]. The PS hypothesis was originally developed (Heath, 1991) in relation to Heath's own work on Australian Aboriginal languages and extended (Heath, 1998) to a typological survey of Native American languages. At the beginning of the latter paper, Heath anticipates the limitations of such a general overview: "I apologize in advance for the inevitably cursory treatment of individual languages, many of which deserve amplified synchronic/historical discussion…" (Ibid, p.87)

The goal of our paper is to take a deeper look at his claims of 'opacity' regarding 2↔1[1] forms in transitive verbs in Algonquian languages. We will focus on a specific Algonquian language, East Cree [EC] in order to test Heath's PS hypothesis. EC is an Algonquian language of the Cree-Naskapi-Innu continuum of dialects. It is spoken in James Bay in Northern Quebec by 13000 speakers in 9

[1] Person notation: 2= 2nd person singular ('you'), 2p= 2nd person plural ('you-all'), 2(p)= 2nd person singular or plural ('you or you-all'), 1= 1st person singular ('I'), 1p= 1st person plural exclusive ('we', excluding you) 21p= 1st person plural inclusive ('we', you & I), 1(p)= 1st person singular or plural exclusive ('I or we', excluding you), 3= 3rd person singular ('s/he'), 3p= 3rd person plural ('they'), 4(p)= 4th person singular or plural (obviative, i.e. 'her/his/they're son'), 5(p)= 5th person singular or plural (further obviative, i.e. 'her son's friend(s)').

communities. There are 2 main dialects; Northern (NEC) and Southern (SEC). The SEC further consists of 2 sub-dialects, Coastal and Inland. Although we are testing the PS hypothesis using both dialects, only NEC examples are used throughout. Unless otherwise noted, all comments apply equally to both dialects and sub-dialects. EC has an inflectional structure that uses theme signs in a manner that closely resembles the Proto-Algonquian system reconstructed by Bloomfield (1946). This makes EC a particularly good language to test Heath's claim, since theme signs are vital in differentiating persons in transitive forms, and Heath relies exclusively on Bloomfield's reconstructions for his analysis of Algonquian. In order to test the PS hypothesis, we rely on large data sets resulting from an extensive documentation effort of verb paradigms conducted with native speakers of the Northern and Southern dialects of EC.[2] We devise and employ a "degree of differentiation" evaluation tool to cross-examine this data.

We begin by outlining Heath's PS hypothesis in greater depth. In section 3, we describe the inflectional morphology of EC necessary to this discussion. We provide a critique of Heath's methodology as a justification for our own in section 4. In section 5 we outline the results of our testing of the PS hypothesis on EC.

2 The Pragmatic Skewing Hypothesis (Heath, 1991 & 1998)

The basis for the PS hypothesis is Heath's comparative typological generalizations about the transparency of person markers in transitive forms. His first generalization is that {2,1}↔3[3], or mixed forms are fairly regular and irregularities that are present seem to be consistent cross-linguistically. (Heath, 1998: p.84) Thus mixed forms are relatively easy for linguists to dissect, analyze, and categorize. This is contrasted with his second generalization, that 2↔1[4], or local forms are consistently irregular and confound cross-linguistic generalization. (Ibid) Thus local forms are relatively more difficult to dissect, analyze or categorize. In fact, Heath remarks that local forms frequently have 2nd and 1st person markers that are "fused, opaque (difficult to segment), or unusually complex." (p.83)

There could be a variety of different explanations for this phenomenon. But Heath hypothesizes that transparent 2nd and 1st person markings in local forms are avoided since they are "bluntly 'familiar' hence not appropriate in polite discourse." (p.84) What Heath has in mind with the term PS, is that social-pragmatic forces lead to the blurring of markers in local forms, which are otherwise clearly distinguished in mixed forms. PS can range from "slight uncertainty about morpheme identifiability to actual loss of information…" (p.86) Heath likens this to similar work done on 'face' by Brown & Levinson (1978). They were interested in how the various politeness strategies of speakers of different languages affect the actual form of an utterance. They made the claim that "a social pressure could in fact leave its imprint on grammatical structure." (Brown & Levinson, 1978: p.263) Heath claims that PS is a similar force that can have an effect on the grammar of a language. The classic example he points to is the omission of 2nd and 1st person pronouns in conversational Japanese (2a-b), as compared with formal Japanese (1a-b) (our example).

(1) a. watashi-wa anata-wo aishiteru
1-TOP 2-OBJ *love*.PRES
'I love you'

b. anata-wa watashi-wo aishiteru
2-TOP 1-OBJ *love*.PRES
'you love me'

(2) a. aishiteru
love.PRES
'I love you'/'you love me'

b. aishiteru
love.PRES
'I love you'/'you love me'

[2] We wish to thank Cree Programs from the Cree School Board for a joint collaborative language documentation effort over the years.

[3] {2,1}↔3 = 2→3 (i.e. you love her/him), 1→3 (i.e. I love her/him), 2→3p (i.e. you love them), 1→3p (i.e. I love them), … see 3.1.6 for a full listing of EC mixed forms.

[4] 2↔1 = 2→1 (i.e. you love me), 1→2 (i.e. I love you), 2p→1 (i.e. you-all love me), 1→2p (i.e. I love you-all), … see 3.1.6 for a full listing of EC local forms.

The systematic dropping of both pronouns in conversational Japanese has been explained as being due to pragmatic restrictions in the use of 'familiar' terms which is related to politeness. Such a phenomenon is what drives opacity, such as the seeming ambiguity between (2a) and (2b),[5] in local forms in Heath's opinion.

If pragmatic forces can affect local forms in the grammar, then there are many conceivable shapes that this could take. Based upon Australian Aboriginal and Native American languages, Heath sketches a list of 12 different 'strategies' to avoid pragmatically sensitive situations (3).

(3) Pragmatic Skewing avoidance strategies

#	description	formalization
1	marker disguised by partial phonological distortion	2n?-1n or 2n-1n?
2	one of the two markers expressed by isolated suppletive allomorph	2n?-1n or 2n-1n?
3	one of the two markers (elsewhere nonzero) expressed by zero	Ø-1n or 2n-Ø
4	number neutralization, i.e. use of "pl" for semantic "sg"	2-1n or 2n-1
5	1st or 2nd dual marker merged with (or replaced by) 3rd dual person marker	3n-1 or 2-3n
6	entire combination expressed by unanalyzable portmanteau	X
7	entire combination expressed by zero (special case of portmanteau)	Ø
8	inclusive (21) marker replaces 1st or 2nd dual marker for entire combination	21n
9	merged 21 marker is part of both 1↔2 & 2↔1 combinations	[2/1]n-1n or 2n-[2/1]n
10	subject and object markers compete for a single slot	2n or 1n
11	co-occurring 1st and 2nd dual markers are widely separated	2n- … -1n
12	combinations with identical segments differ in tone	tonal overlay

(Heath, 1998; pp.85-6)

Focusing on the Algonquian language family, Heath based his analysis upon Bloomfield's (1946) reconstruction of Proto-Algonquian forms. He claims that while they do not fit neatly into any of the 'strategies' they do fall short of 'maximal transparency'. This judgement is due to his opinion that the Proto-Algonquian inflection system is "cumbersome" since "the person/number category of each transitive participant is recovered by addressees by piecing together information distributed over the prefix, the (inner) theme suffix, and the outer suffixes." (p.88) For Heath, ultimately this system "lacks the transparency that we would get with separate subject and object slots…" (Ibid) Focusing then specifically upon Goddard's (1979a) description of Delaware, Heath claims that this particular Algonquian language employs avoidance strategy #10 in conjunct local forms: "subject and object markers compete for a single slot." (Ibid, p.86)

3 EC verb inflectional morphology

Before discussing the inflectional morphology, we will introduce some background information regarding EC verbs. We also discuss theme signs in detail since they play such an important role in differentiating forms and this is the first time that an analysis of theme signs has been undertaken for EC.

3.1 Background

3.1.1 Verb classes

There are 4 classes of verbs in EC, as in other Algonquian languages, based on animacy of subject for intransitive verbs and animacy of object for transitive verbs (4).

[5] Although by focusing on the grammar exclusively Heath disregards prosodic and discourse factors, minimally prosodic cues would be present and sufficient to disambiguate (2a) from (2b), if not discourse cues, such as *desho* 'don't you' with (2b).

(4) Verb classes

	animate	inanimate
intransitive (1 argument)	Animate Intransitive (VAI) e.g. misinaasuu 'she (her name) is written down'	Inanimate Intransitive (VII) e.g. misinaataau 'it is written'
transitive (2 arguments)	Transitive Animate (VTA) e.g. misinihwaau 'she writes him (his name) down'	Transitive Inanimate (VTI) e.g. misiniham 'she is writing it.'

We focus here on verbs with an animate object, Transitive Animate verbs (VTA), because they are the only ones with two animate person forms where pragmatic forces could arise.

3.1.2 Orders

In EC, as in other Algonquian languages, there are 3 different orders: independent, conjunct, and imperative. The independent order (5a-b) is used primarily in main clauses and can easily be distinguished by the inclusion of person prefixes. The conjunct order (6a-b) is used most frequently but not exclusively for subordinate clauses and lacks personal prefixes. The imperative order is used only for giving commands and also lacks personal prefixes. We will focus exclusively on the independent and conjunct orders, since the imperative lacks combinations of opposing forms (i.e. 2→1 & 1→2) as the subject is always a 2nd person.

Independent order: personal prefix + verb stem + suffixes

(5) a. chi-waapim-i-n
2-*see*-1OBJ-2↔1
'you see me'

b. chi-waapim-iti-n
2-*see*-2OBJ-2↔1
'I see you'

Conjunct order: verb stem + suffixes

(6) a. waapim-i-y[6]-in
see-1OBJ-y-2→1
'when you see me, …'

b. waapim-isk
see-2OBJ.3→2
'when s/he sees you, …'

The independent order has been described by Goddard (1974: p.323) as being much more agglutinative in nature, as it tends towards a one-to-one ratio of meaning to form. By contrast, the conjunct is much more fusional, as it tends towards a combination of meanings in a single form. Suffixes in the conjunct tend to be a portmanteau; the suffix *-isk* (6b) represents 2nd person object and 3→2. This is part of the evidence which led Goddard (1967, 1974) to posit that the conjunct is older and therefore the main set of conjugations from which the independent order was 'built'. These differences, and the fact that the independent has become the more common form of the two, has led to some reconstruction and innovations in the conjunct (i.e. theme signs, see 3.6). Due to these differences, we will undertake separate analyses of each order when judging the transparency of local forms.

3.1.3 Conjugations (Inflection within orders)

Within each order there are a number of different conjugations (7). All independent and conjunct examples will be in indicative neutral form (which is represented with a null morpheme) unless there is a conjugation morpheme specified in the interlinear gloss (for a list of conjugation morphemes see 3.2.5).

[6] This is a connective *-y*, placed between 2 vowels of different suffixes (Ellis 1971: p.78; Wolfart 1973; p.80)

(7) Conjugations Types by Order in EC

order	conjugation Type	meaning
Independent	01 Indicative Neutral	(present)
	02 Indicative Neutral - Subjective	'It seems that, …' (dream or appearance)
	03 Indicative Preterit	'… should…' (recommendations, opinions & suggestions)
	05 Indirect Present	'It looks from here that …' (events perceived at a distance)
	06 Indirect Present - Subjective	'It seems that ...' (dreams or appearance perceived at a distance)
	09 Dubitative Neutral	'I think, maybe, …' (speculation or guessing)
	10 Dubitative Preterit	'Apparently, …' (infer event happened in past, but didn't witness it)
Conjunct	11 Indicative Neutral	'When …' (various functions in subordinate clauses)
	12a Indicative Neutral - Subjective	'If/when …' (event that must happen before another does)
	12b Indicative Neutral - Habitual /Iterative	'Whenever …' (habitual events relative to others)
	13 Indicative Preterit	'When…'
	14 Dubitative Neutral	'I don't know if…' (when there is a doubt about the event)
	15 Dubitative Preterit	'If only… could (have)…' (speaker didn't know then, but knows now)
	16 Dubitative Preterit 2	'If only… could…'

3.1.4 Person hierarchy

The most commonly known element of Algonquian languages is the person hierarchy which places 2nd person above 1st persons.[7] This has gained notoriety because it runs counter to the cross-linguistic 1st above 2nd person hierarchy argued by the majority of typologists.[8] This hierarchy also orders speech act participants (SAP), or 2nd & 1st persons, above 3rd persons, and animate above inanimate (8).

(8) Person Hierarchy

2 →1	→3 →4 →5	→0 → 0'
SAP	non-SAP	
animate		inanimate

3.1.5 Direction

A further classification of VTA forms is the concept of direction. (Bloomfield, 1961; Hockett, 1966; Goddard, 1967). This is concerned with the relationship of the arguments in relation to their position upon the person hierarchy (9).

[7] For an argument against the universality of this hierarchy in the Algonquian language family, and for a more general hierarchy of Speech Act Participants (2nd and 1st persons) unordered and outranking 3rd persons, see Macaulay (2009).

[8] For a critical discussion of this tradition see Cyr (1996) and Junker (2002).

(9) Direction

direction	**DIRECT**			**INVERSE**		
Form	2	→	1	1	→	2
Grammatical relationship	subject	→	object	subject	→	object
Relative position on hierarchy	**higher**	➡	**lower**	**lower**	⬅	**higher**

"Direct" forms are those in which the subject appears higher on the person hierarchy than the object (i.e. 2→1). "Inverse" forms are those in which the object appears higher on the person hierarchy than the subject (i.e. 1→2).

3.1.6 Paradigm organization

There are 3 main categories that we can use to categorize the range of transitive forms in EC: local, mixed, and 3rd person. In local forms both arguments are 2nd and 1st persons (2↔1). In mixed forms one argument is a 3rd person and the other is either a 2nd or 1st person ({2,1}↔3). In 3rd person forms both arguments are 3rd persons (3↔{4(p),5(p)} & 4(p)→5(p))[9]. These full listing of forms in each categories can be represented in a paradigm template (10).

(10) VTA paradigm template[10]

combination	direct	inverse
Local	2→1	1→2
	2p→1	1→2p
	2(p)→1p	1p→2(p)[11]
Mixed	2→3	3→2
	1→3	3→1
	2p→3	3→2p
	21p→3	3→21p
	1p→3	3→1p
	2→3p	3p→2
	1→3p	3p→1
	2p→3p	3p→2p
	21p→3p	3p→21p
	1p→3p	3p→1p
	2→4(p)	4(p)→2
	1→4(p)	4(p)→1
	2p→4(p)	4(p)→2p
	21p→4(p)	4(p)→21p
	1p→4(p)	4(p)→1p
3rd Person	3→4(p)	4(p)→3
	3p→4(p)	4(p)→3p
	3→5(p)	5(p)→3
	3p→5(p)	
	4(p)→5(p)	

[9] 4(p) (or 3') is a 3rd person with obviative marking and 5(p) (or 3'') is a 3rd person with further obviative marking. 3rd persons have this additional distinction because only one of them can be chosen as being talked about in a discourse. The one that is being talked about is called proximate, all the other ones must be obviative ('the other') and must be marked as such.

[10] There are passive forms (X→{2, 1, 2p, 21p, 1p, 3, 3p, 4(p)) which have been left out of this representation since they are not relevant to the current discussion.

[11] For a discussion of the neutralization of number in these forms see 3.2.4 and 5.2.

3.2 Inflection

The structure of an EC verb is complex (11). It must contain a verb stem and personal suffixes. It may also include a personal prefix, other suffixes and preverbs.

(11) Typical analysis of an EC verb

person prefix	preverbs	verb stem	suffixes (theme, personal, obviative, plural, conjugation)
ni	chii wii	waapiht	aa-n
ni	chii wii	waapim	aa-w-ich

With the exception of preverbs, which do not factor into the testing of the PS hypothesis, it is important to take a look at the details of each element of EC inflection.

3.2.1 Personal prefix

In EC there are 3 personal prefixes, appearing only on local and mixed forms in the independent order: *chi-*, *ni-*, and *Ø-*. *Chi-* is present whenever one of the arguments is a 2nd person. *Ni-* is present whenever one of the arguments is a 1st person and when the other argument is not a 2nd person. The personal prefix is null when there are only 3rd persons present. The selection of which argument gets realized has been posited to be one piece of evidence of the 2→1 person hierarchy (9).

3.2.2 Verb stems

There are 8 different stem types for TA verbs in EC, each represented by the verbs in (12).

(12) Verb Stems

stem	verb[12]	gloss
consonant	waapihti**y**-aau	's/he shows her/him'
	waapi**m**-aau	's/he sees her/him'
h	saachi**h**-aau	's/he loves her/him'
hw	wiimaa**hw**-aau	's/he goes around her/him'
t	naa**t**-aau	's/he goes to her/him'
shw	mini**shw**-aau	's/he cuts her/him'
sw	iskwaa**sw**-aau	's/he burns her/him'
iw	misk**iw**-aau	's/he finds her/him'
irregular	**paashiw**-aau	's/he brings her/him'

3.2.3 Person suffixes

These suffixes indicate person and number and are found after the theme sign and usually before the conjugation suffix. The following examples show forms found in the independent (13) & (15) and conjunct (14) & (16). In some cases, there are short (13) and long (15) forms of the same suffix in the independent. In the conjunct there is some variability of the same suffix between different conjugations; compare (14) with (16).

(13) chi-waapim-i-**n**
2-*see*-1OBJ-**2↔1**
'you see me'

(14) waapim-it-**ikuch**
see-2OBJ-**1↔2P**
'when I see you-all…'

[12] Since verbs cannot stand alone without inflection, the default dictionary 01 independent indicative neutral 3→4(p) form is cited here.

(15) chi-waapim-i-**naa**-waa
2-*see*-1OBJ-**2↔1**-CONJ#12
'it seems that you see me'

(16) waapim-iti-w-**aakw**-aa
see-2OBJ-W-**1→2P**-CONJ#14
'I don't know if I see you-all…'

3.2.4 Plural suffixes

There are different sets of plural suffixes that can be used in combination with certain persons. For 2nd person the plural suffix is *-naawaa* (17) (the short form is *-waa*). For 1st person the plural is *-naan* (18) & (19) (the long form is *-naanaa*). For 3rd persons, three different suffixes that can be used to mark plurality: *-ich* (19), *-waa* (20), and *-nich(ii)* (21). In local forms there is a number neutralization for singular or plural 2nd persons when combined with a plural 1st person (18). Unlike local forms, mixed forms do not have such neutralization (19).

(17) chi-waapim-i-**naawaa**
2-*see*-1OBJ-**2PL**
'we see you'

(18) chi-waapim-i-**naan**
2-*see*-1OBJ-**1PL**
'we see you/you-all'

(19) ni-waapim-aa-**naan**-**ich**
1-*see*-DIR-**1PL**-**3PL**
'we see them'

(20) waapim-it-**waa**-u
see-2→3-**3PL**-u
'when you see them…'

(21) chi-waapim-aa-chichaa-**nich(ii)**
2-*see*-DIR-CONJ#9-**3PL**
'I think, maybe, you see them'

3.2.5 Conjugation suffix

Each conjugation has a corresponding suffix (22). These suffixes are usually verb final (23) although with some conjugations their position will vary (24).

(22) Conjugations Types by Order in EC

Order	Conjugation Type	NEC	SEC
Independent	01 Indicative neutral	-Ø	-Ø
	02 Indicative neutral - subjective	-waa	-waa/ii
	03 Indicative preterit	-h	-ht
	05 Indirect present	-tik	
	06 Indirect present - subjective	-tikaa	
	09 Dubitative neutral	-chichaa	-che
	10 Dubitative preterit	-htaakupin	-htaakupane
Conjunct	11 Indicative neutral	-Ø	-Ø
	12a Indicative neutral - subjective	-aa	-e
	12b Indicative neutral - habitual/iterative	-h	-h
	13 Indicative preterit		-pan
	14 Dubitative neutral	-kwaa	-kwe
	15 Dubitative preterit	-kupinaa	-kupane
	16 Dubitative preterit 2	-aakwaa	

(23) chi-waapim-i-naa-**waa**
2-*see*-1.OBJ-2→1-**CONJ#02**
'it seems that you see me'

(24) chi-waapim-aa-**tik**-ich
2-*see*-DIR-**CONJ#05**-3PL
'it looks from here that you see them'

3.3 Theme signs

While there is a consensus that theme signs are suffixes which provide the main distinction between the direct and inverse forms, there is disagreement regarding exact definitions. The dissention is related to the way theme signs have undergone revision or innovation since their Proto-Algonquian forms, as seen in Bloomfield's (1946) reconstructions.

Although the actual forms of some suffixes differ, the pattern of forms in the independent order of Cree and some other Algonquian languages is fairly consistent (25).

(25) Selected analyses of theme signs in the Independent Order

Forms	Marking	Bloomfield (1946) Proto-Algonquian	Hockett (1966) Potawatomi	Ellis (1971) Moose Cree	Wolfart (1973) Plains Cree	Goddard (1979a) Delaware	Hamilton (2009) East Cree
{2,1}→3, 3→4(p)	direct	*-aa~ee	-a-	-ā	-aa~ee	-aa~Ø	-aa[13]
3→{2,1}, 4(p)→3	inverse	*-eke~w	-ukw-	-ekw~o	-ekw	-əkw~ē	-iku
2→1	local direct?	*-i	-Ø-	-i	-i	-ī	-i
1→2	local inverse?	*-eθene	-un-	-eθe	-iti	-əl	-iti

In mixed and 3rd person forms, there is agreement that they mark direct and inverse relationships between the arguments. But what the theme signs mark in local forms is a matter of some debate (i.e. Hockett, 1966; Wolfart, 1973; Hockett, 1993; Brittain, 1998; Macaulay, 2009).

Looking at the different analyses of theme signs in the older conjunct order helps clarify the issue. EC theme signs pattern in an identical manner to their historical Proto-Algonquian forms (26).[14]

[13] SEC retains the historical long *-e* form in 3rd person direct forms. The NEC *-aa* is most likely derived from the SEC-*e* after this vowel changed to *-aa* in NEC; it is not necessarily straight from PA.

[14] Bloomfield's forms have been noted by Goddard for their failure "to segment *-*a*· in certain forms" (Goddard 1979a: p.87) here the 3→4(p) form, but the original null theme sign category is retained, whereas Goddard collapsed the null with the *-*aa* (Ibid).

(26) Theme signs in Conjunct Order

	Hamilton (2009) East Cree[15]		Bloomfield (1946) & Goddard (1979a) Proto-Algonquian	
marking	theme	form(s)	theme	form(s)
direct	-aa	3→4(p)	*-aa	3→4(p)
inverse	-iku	4(p)→3	*-eke/w	4(p)→3
2 object	-iti	{3,1}→2	*-εθ	{3,1}→2
1 object	-i	{3,2}→1	*-i	{3,2}→1
3 object	-Ø	{2,1}→3	*-Ø	{2,1}→3

Independent order direct (*-aa*) and inverse (*-iku*) theme signs are found only in conjunct 3rd person forms. Independent order local theme signs (*-iti* & *-i*) are also found in all conjunct 2nd and 1st person objects. This suggests that these theme signs in independent local forms might be marking the object. However other analyses of these theme signs have found different patterns, given the extension of direct and inverse theme signs into mixed forms (27).

(27) Alternate analyses of theme signs in the conjunct order

	Wolfart (1973) Plains Cree		Goddard (1979a) Delaware	
term	theme	form(s)	theme	form(s)
direct	-aa	{2p,21p,1p}→{3,3p,4(p)},{3,4(p)}→5(p)	-aa	3→{4(p),5(p)}
	-Ø	{2,1}→{3,3p,4(p)}	-Ø	{2,1}→3
inverse	-ekw/o	{3,3p,4(p)}→{2p,21p,1p},{4(p),5(p)}→3	-əkw/ē	3→{2,1},{4(p),5(p)}→3
	-Ø	{3,3p,4(p)}→{2,1}		
direct local	-i	2→1	-ī	2→1
inverse local	-it	1→2	-əl	1→2

Wolfart and Goddard have used consistent categories across the independent and conjunct orders in their analyses, forcing them to posit null theme suffixes which alternate with overt ones. But each had data which justified their respective analyses. Wolfart had null theme signs in both the mixed direct and inverse forms with singular local arguments ({2,1}↔{3,3p,4(p)}). Goddard had the null theme sign in direct mixed 3rd person singular and plural forms ({2,1}→3), where the corresponding inverse forms ({3→{2,1}) are marked with an inverse theme sign. Goddard has also noted that there are older records of Delaware forms which pattern like Proto-Algonquian; however these forms have undergone "innovations" which have also caused changes in person suffixes. (Goddard, 1979a; p.87)

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[15] This is dependent upon the 3→2 suffix *-isk* being analyzed as *-it(i)+k* (or PA*-*εθ+k*) and 3→1 suffix *-it* being analyzed as *-i+t* (or PA*-*i+t*). EC [i] represents a merger of 3 different sounds, PA*[a] (MacKenzie, 1980) PA*[i] (Bloomfield, 1946; Ellis 1971; MacKenzie, 1980) and PA*[i], so we cannot tell by looking at the surface form if this analysis is correct. But, one clue is that mutation, or palatalization, occurs in EC before a PA*[i] ([t]→[θ] / PA[i]). The stem *naataau* is sensitive to this process and we can see that this occurs with 3→1 in (i) which hints that this suffix has an underlying PA*[i].

(i) aah naa**sh**-i-t
whenever go-1OBJ-3→1
'Whenever s/he goes to me…'

(ii) aah naa**t**-isk
w*henever go*-3→2
Whenever s/he goes to you…'

The 3→2 suffix in (ii) does not undergo this process and means that it is either a PA*[a] or PA*[e]. Although we have no phonological process to give us hints, we have the analyses of other theorists. Bloomfield identifies the PA 3→2 as **eθk* including the theme sign *-*εθ*. (Bloomfield, 1946: p.102) Ellis identifies the Moose/Swampy Cree 3→2 as *-esk*, which also seems to include the theme sign *-eθ*. (Ellis, 1971: p.90) This would seem to hint that *-it(i)* has a PA*[e] and that *-isk* includes this marker

So the different analyses of conjunct order theme signs can be attributed to the degree to which the language has undergone rebuilding or innovation, causing their use to differ, in various degrees, from historical Proto-Algonquian forms. Given the patterning of theme signs across the orders, EC independent order local forms will be labelled as object marking rather than marking direction (28).

(28) Analysis of theme signs in East Cree

	Independent Order		Conjunct Order	
term	theme	forms	theme	forms
direct	-aa	{2,1}→3, 3→{4(p),5(p)}	-aa	3→4(p)
inverse	-iku	3→{2,1}, {4(p),5(p)}→3	-iku	4(p)→3
2 object	-iti	1→2	-iti	{3,1}→2
1 object	-i	2→1	-i	{3,2}→1
3 object			-Ø	{2,1}→3

When comparing EC with revised Proto-Algonquian forms, we can see that they pattern identically in both the independent and conjunct (29).

(29) Comparison of theme signs in revised Proto-Algonquian & East Cree

	Independent Order			Conjunct Order		
term	forms	PA	EC	forms	PA	EC
direct	{2,1}→3, 3→{4(p),5(p)}	*-aa~ee	-aa	3→4(p)	*-aa	-aa
inverse	3→{2,1}, {4(p),5(p)}→3	*-eke~w	-iku	4(p)→3	*-eke~w	-iku
2 object	1→2	*-eθene	-iti	{3,1}→2	*-eθ	-iti
1 object	2→1	*-i	-i	{3,2}→1	*-i	-i
3 object				{2,1}→3	*-Ø	-Ø

Thus EC has a theme sign marking system which has undergone the least changes from Proto-Algonquian and makes EC an ideal language to test Heath's claims about PS in Bloomfield's reconstructions.

4 Methodology

4.1 Heath's methodology & definition of transparency: some concerns

In order to test the pragmatic skewing hypothesis, Heath begins with a definition of transparency.

> A maximally transparent system would be one where all 1↔2 combinations are of the schematic type 'lm-2m' of a 1st- and a 2nd-person marker ("m"). The relative ordering and even adjacency of the two markers is subject to language-specific adjustment. Each marker may be internally multimorphemic, maximally, e.g., '1-Fem-Pl-Agent' with person, gender, number, and case components. (Heath, 1998: p.85)

In this definition, first and second person markers should be identifiable and contrastive in a consistent manner (i.e. across transitive and intransitive forms) to be labelled maximally transparent. The most immediate concern with this definition is that the label of 'maximally transparent' will only be reserved for languages based upon their ease of linguistic analysis. It is clear that fusional languages will be much more likely to be labelled 'opaque' since they are difficult to segment and thus open to varying interpretations. By comparison, since isolational and agglutinative languages are much easier to segment, they would be more likely identified as being more transparent. It seems that there is a clear bias in Heath's definition towards languages with clear observable and contrasting pronouns. Beginning with a definition of the phenomenon one wishes to examine which favours some subjects over others is problematic.

In addition, given the varying structural properties of languages, using a blanket definition of transparency is problematic. Is a language like Latin, with a freer word order yet with an extensive inflectional system, any more transparent or opaque than languages like English or French, which have a strict word order and less inflectional morphology? Word order should count in some and not in others. Is the familiarity trait that distinguishes French *tu* from polite *vous* neutralized in English *you*? Which feature (case, number or familiarity?) counts for transparency or opacity for French *tu-te-vous* contrast where *tu* is nominative singular familiar, *te* accusative singular familiar and *vous* nominative or accusative, plural, familiar and polite? Features which count for maximal transparency or neutralization may vary from language to language. These issues must be addressed before such a typological study can be undertaken.

A larger problem than the definition itself is Heath's methodology; which uses this definition as the basis for comparison. It is with his idea of maximal transparency that Heath compares the local forms of many different Native American languages. However judging local forms in relation to an external standard without comparing them with other forms in the language is problematic. It is not possible to determine how differentiation is made between first and second persons by looking exclusively at local forms. Using English as an example, the forms in (30) & (31) fall short of being maximally transparent since *you* is ambiguous for number (and case[16]).

(30) **you** saw me
2.SG/PL.NOM/ACC *see*.PST 1.SG.ACC

(31) I saw **you**
1.SG.NOM *see*.PST **2.SG/PL.NOM/ACC**

Therefore if only local English forms are compared with Heath's definition of transparency, they could be seen to fall into Heath's pragmatic skewing strategy #4: "number neutralization, sometimes including the use of 'pl' for the semantic 'sg'." (Heath, 1998: 85) However, the restricted comparison of only local forms against an external standard misses the insight of Heath's intuition regarding local forms; that 2nd and 1st person markers are 'opaque' and 'irregular' **in relation to the mixed forms of the same language**. The important point here is simply that local forms tend to be relatively less transparent than the standard level of transparency of mixed forms in a given language. Going back to the English example above, we can see that comparing the local forms (30) & (31) with mixed forms (32) & (33), shows that the ambiguity in *you* is consistent throughout all person combinations.

(32) **you** saw her/him
2.SG/PL.NOM/ACC *see*.PST 3.SG.ACC

(33) s/he saw **you**
3.SG.NOM *see*.PST **2.SG/PL.NOM/ACC**

It would be a mistake to call such 'opacity' a local form phenomenon without getting a sense of the level of transparency within the mixed forms of the same language. It is important to begin with a definition of transparency which judges local forms by the relative language internal standard of mixed forms.

We would like to propose a language internal definition of transparency which will allow us to identify local forms in which 'pragmatic skewing' might occur. First and foremost, local forms must be marked in a different manner from mixed forms in a language. If this does not occur then there is no justification to differentiate local from mixed forms. Secondly, the differential marking that occurs in local forms must obscure at least one distinction which is made in mixed forms. The local forms must involve a lesser degree of differentiation. If they involve the same or an increasing level of differentiation, 'pragmatic skewing' is not applicable. Lastly, the motivation behind the obscuring of distinctions otherwise made must be due to pragmatic (i.e. extra-grammatical) forces. Thus all three of these elements must be present for 'pragmatic skewing' to have occurred.

[16] Although word order clarifies any 'opacity' by means of case, there is an asymmetry in overt representation of case between 2nd & 1st person and so it falls short of the kind of maximal transparency Heath defines.

4.2 Differentiation: how to measure it?

Now that we have a language internal definition of transparency, we need to devise a method by which we can compare forms in a language. Taking a hint from the concept of direction (see 3.6), we have developed a simple scale called the Degree of Differentiation (DoD). This scale represents the differential marking of person markers between 'direct' and 'inverse' VTA forms involving the same persons (i.e. 2→1 & 1→2). It can also be used to compare the differential marking of other features, for example the number feature (i.e. singular and plural). The number of differences in the marking of the subject and object within a combination will be counted. These differences will be limited to those in form alone; all prosodic or discourse cues will be ignored.[17] The number of differences alone will give is the ranking of the combination on the DoD. For example, a baseline of 0 DoD would cover forms in which there is no differentiation made in the structure (and the entire weight placed upon prosodic or discourse cues for differentiation), such as in conversational Japanese (34) & (35).

(34) ~~watashi-wa~~ ~~anata-wo~~ aishiteru
~~1-TOP~~ ~~2-OBJ~~ *love*.PRES
'I love you'

(35) ~~anata-wa~~ ~~watashi-wo~~ aishiteru
~~1-TOP~~ ~~2-OBJ~~ *love*.PRES
'you love me'

A value of 1 DoD would be applied to a case in EC in which the only differentiation is the inclusion of a theme sign on one form, such as 2nd person object in (37), but not the other which is null, such as 3rd person object in (36).

(36) aah waapim-**Ø**-aakw
whenever see-**3OBJ**-2.PL
'whenever you-all see her/him…'

(37) aah waapim-**it**-aakw
whenever see-**2.OBJ**-2.PL
'whenever s/he sees you-all…'

The forms in which overt theme signs provide the only differentiation would constitute a value of 2 DoD, (38) & (39).

(38) chi-chiih waapim-**i**-htaakupin
2-PST *see*-**1.OBJ**-CONJ#10
'apparently you had seen me'

(39) chi-chiih waapim-**iti**-htaakupin
2-PST *see*-**2.OBJ**-CONJ#10
'apparently I had seen you'

The difference between the English forms in (30) & (31), below as (40) & (41), would constitute a value of 4 DoD, one for each change in word order position of the subject and the object,[18] and another for the change in case of the 1st person singular pronoun, *me*↔*I*.

(40) **you** saw me
2.SG/PL.NOM/ACC *see*.PST 1.SG.ACC

(41) I saw **you**
1.SG.NOM *see*.PST **2.SG/PL.NOM/ACC**

More important to the current paper, forms in which the theme signs combine with two different suffixes would constitute a value of 4 DoD, (42) & (43).

(42) waapim-**i**-y-**in**-aa
see-**1.OBJ**-y-**2→1**-CONJ#12A
'if/when you see me…'

(43) waapim-**iti**-**aan**-aa
see-**2.OBJ**-**1→2**-CONJ#12A
'if/when I see you…'

[17] Heath's analysis excluded prosodic or general discourse cues, so we do the same for sake of comparison. In doing so, we are not claiming that prosodic cues are not part of the grammar or a language. It is a limitation of the field of language typology that data on prosodic cues (and other discourse cues) is not generally available.
[18] Counting in this manner allows us to compare pronoun marking in fixed word order languages.

The strength of this scale is that it will allow us to calculate an average score separately for local forms and for mixed forms. Critically, it will also allow for an ease of comparison between both forms. Assuming that the level of differentiation made in the mixed forms is the average, we can then compare the local forms to see if they differ. It will also allow us to see where differences lie, if there are any.

One important caveat we must make is that the DoD scale is only intended for language internal comparison. Given the problems outlined earlier in relation to Heath's definition of maximal transparency, it is difficult to compare languages, even similar ones, in regards to a relative concept like transparency. We do not intend the DoD scale to be used to compare languages for typological purposes. It is purely for determining if a language is indeed a candidate for having undergone PS. It is only after such a determination has been made that typological comparisons can begin to be drawn, and then only regarding things such as avoidance strategies.

4.3 Testing with the Degree of Differentiation (DoD) scale

In order to test Heath's PS hypothesis in relation to East Cree, we will use the DoD scale to measure differentiation between combinations. We will compare templates for all paradigms made from VTA verbs of differing stem types documented in the NEC and SEC Verb Paradigm Databases (MacKenzie et al., 2010a-b). Then, we will compare the average DoD scores for all local forms with the average of all mixed[19] forms. Since we have seen that there are important differences between the independent and conjunct orders (see 3.1.2), we will compare combinations separately within each order. If higher DoD levels are found in mixed forms in relation to local forms in either average or corresponding comparisons further analysis will be needed. This analysis will attempt to discover the cause(s) of the difference(s) and how or if they relate to Heath's hypothesis and his avoidance strategies. If equal or lower DoD levels are found in mixed forms and local forms cannot be seen as being less transparent, then the PS hypothesis will be deemed to not apply to EC. No further analysis will be necessary.

5. Testing the PS hypothesis

In the following sections, we will outline the degrees of transparency in EC inflection by comparing the DoD scores of opposing forms in a series of tables beginning with local forms and ending with mixed forms. Within each comparison, we will present the independent and then the conjunct order. We will compare the transparency of forms at the end of each sub-section. We will first look at direct-inverse combinations and then number neutralization for some persons. We will conclude by discussing another contrast between forms occasionally at play in EC, verb stem variation.

5.1 Average comparison in direct-inverse combinations

5.1.1 Local forms

In the independent order, 1st person object and 2nd person object theme signs *-i* & *-iti* provide the only contrast between direct and inverse forms, and this is consistent throughout independent local forms (44), (45) & (46). The only time that any other differentiation is made is in the 2(p)↔1p forms in conjugation 10 (46). Here the 1st person plural suffix is shown in its long form (*-naanaa*) in the direct and short form (*-naa*) in the inverse. In addition, the short plural suffix is in a different position in the inverse, which breaks up the *-htaakupin* conjugation 10 suffix (*-iti-htaa-**naa**-kupin*). The long version is in the more common position, in between the theme suffix and the conjugation suffix (-i-**naanaa**-htaakupin).

[19] We will only be using {2,1}↔3 to represent mixed forms and exclude obviative 4th person forms, since these forms are marked with an extra morpheme (proximate forms are unmarked), thus potentially inflating results with the DoD scale.

(44) Template of 2↔1 independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
2→1	chi	-**i**-n	-**i**-naa-waa	-**i**-naa-tik	-**i**-naa-tikaa	-**i**-naa-chichaa	-**i**-htaakupin
1→2	chi	-**iti**-n	-**iti**-naa-waa	-**iti**-naa-tik	-**iti**-naa-tikaa	-**iti**-naa-chichaa	-**iti**-htaakupin
DoD		**2**	**2**	**2**	**2**	**2**	**2**

(45) Template of 2p↔1 independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
2p→1	chi	-**i**-naawaau	-**i**-naaw-i-waa	-**i**-naawaa-tik	-**i**-naawaa-tikaa	-**i**-naawaa-chichaa	-**i**-naawaa-htaakupin
1→2p	chi	-**iti**-naawaau	-**iti**-naaw-i-waa	-**iti**-naawaa-tik	-**iti**-naawaa-tikaa	-**iti**-naawaa-chichaa	-**iti**-naawaa-htaakupin
DoD		**2**	**2**	**2**	**2**	**2**	**2**

(46) Template of 2(p)↔1p independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
2(p)→1p	chi	-**i**-naan	-**i**-naan-i-waa	-**i**-naanaa-tik	-**i**-naanaa-tikaa	-**i**-naanaa-chichaa	-**i**-naa**naa**-htaakupin
1p→2(p)	chi	-**iti**-naan	-**iti**-naan-i-waa	-**iti**-naanaa-tik	-**iti**-naanaa-tikaa	-**iti**-naanaa-chichaa	-**iti**-htaa-naa-kupin
DoD		**2**	**2**	**2**	**2**	**2**	**5**

In addition to direct and inverse theme signs *-i* & *-iti* providing differentiation, the conjunct order often has person suffixes, such as *-in* & *-aan,* in the majority of cases. The 2↔1 forms in (47) use both of these suffixes, with the conjugation 15 suffix showing initial vowel harmony. The 2p↔1 forms in (48) vary in differentiation; from minimally using only using theme signs (in conjugation 14 & 15), to maximally using theme signs plus personal suffixes and a plural suffix (*-(i)ch*) on the inverse form (conjugation 11, 12a & 12b). The 2(p) ↔1p forms in (49) are similar to independent order local forms, in that they only employ theme signs for differentiation.

(47) Template of 2↔1 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2→1	-**i**-y-**in**	-**i**-y-**in**-aa	-**i**-y-**in**-h	-**i**-w-**in**-aa	-**i**-w-**i**-p**i**naa	-**i**-y-**in**-aakwaa
1→2	-**it**-**aan**	-**it**-**aan**-aa	-**it**-**aan**-h	-**iti**-w-**aan**-aa	-**iti**-w-**aa**-p**aa**naa	-**it**-**aan**-aakwaa
DoD	**4**	**4**	**4**	**4**	**6**	**4**

(48) Template of 2p↔1 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2p→1	-**i**-y-**aakw**	-**i**-y-**aakw**-aa	-**i**-y-**aakw**-h	-**i**-w-aakw-aa	-**i**-w-aaku-pinaa	-**i**-y-**aak**-aakwaa
1→2p	-**iti**-**kuch**	-**iti**-**kuch**-aa	-**iti**-**kuch**-h	-**iti**-w-aakw-aa	-**iti**-w-aaku-pinaa	-**it**-**aan**-aakwaa
DoD	**4**	**4**	**4**	**2**	**2**	**4**

(49) Template of 2(p)↔1p conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2(p)→1p	-**i**-y-aahch	-**i**-y-aahch-aa	-**i**-y-aahch-h	-**i**-w-aahch-aa	-**i**-w-aahch-i-pinaa	-**i**-y-aaht[20]-aakwaa
1p→2(p)	-**it**-aahch	-**it**-aahch-aa	-**it**-aahch-h	-**iti**-w-aahch-aa	-**iti**-w-aahch-i-pinaa	-**it**-aaht-aakwaa
DoD	**2**	**2**	**2**	**2**	**2**	**2**

In summary, nearly all independent local forms consistently show 2 DoD, with a combined average of 2.2 DoD. Conjunct local forms show greater differentiation, from 2 to 5 DoD, with a combined average of 3.4 DoD. This initial look does not seem to point to any opacity, however it is too early to draw conclusions by looking at local forms alone.

5.1.2 Mixed forms

Independent mixed forms also show contrast most frequently with the direct and inverse theme signs *-aa* & *-iku*. Occasionally there are forms which have additional differentiation with person suffixes, such as with the short form of 2p, *-waa*, which shows up as *-wi* in 2p→3 in conjugation 02 (52). The following tables (50-54) show mixed forms with a singular 3rd person ({2,1}↔3), and they are representative of the typical differentiation in 3rd person plural mixed forms as well.

(50) Template of 2↔3 Independent Order inflectional endings

DIR.	PR	01	02	05	06	09	10
2→3	chi	-**aa**-u	-**aa**-waa	-**aa**-tik	-**aa**-tikaa	-**aa**-chichaa	-**aa-**htaakupin
3→2	chi	-**ikw**[21]	-**iku**-waa	-**iku**-tik	-**iku**-tikaa	-**iku**-chichaa	-**iku**-htaakupin
DoD		**2**	**2**	**2**	**2**	**2**	**2**

(51) Template of 1↔3 Independent Order inflectional endings

DIR.	PR	01	02	05	06	09	10
1→3	ni	-**aa**-u	-**aa**-waa	-**aa**-tik	-**aa**-tikaa	-**aa**-chichaa	-**aa**-htaakupin
3→1	ni	-**ikw**	-**iku**-waa	-**iku**-tik	-**iku**-tikaa	-**iku**-chichaa	-**iku**-htaakupin
DoD		**2**	**2**	**2**	**2**	**2**	**2**

(52) Template of 2p↔3 Independent Order inflectional endings

DIR.	PR	01	02	05	06	09	10
2p→3	chi	-**aa**-waa-u	-**aa**-**wi**-waa	-**aa**-waa-tik	-**aa**-waawaa-tikaa	-**aa**-waa-chichaa	-**aa**-htaa-waa-kupin
3→2p	chi	-**iku**-waa-u	-**iku**-**waa**-waa	-**iku**-waa-tik	-**iku**-waawaa-tikaa	-**iku**-waa-chichaa	-**iku**-htaa-waa-kupin
DoD		**2**	**4**	**2**	**2**	**2**	**2**

[20] *t-ch* alternation

[21] Here there are 2 different analyses; 1. *-ikw* suffix can be seen as a combination of the inverse theme sign *-iku* and the 3rd person ending *–u*; 2. 3rd person ending is null for inverse mixed forms with a 2nd and 1st person singular subject. We chose the second analysis for counting the lowest possible DoD.

(53) Template of 21p↔3 Independent Order inflectional endings

DIR.	PR	01	02	05	06	09	10
21p→3	chi	-**aa**-ni-u	-**aa**-ni-waa	-**aa**-naanaa-tik	-**aa**-naanaa-tikaa	-**aa**-naanaa-chichaa	-**aa**-htaa-naa-kupin
3→21p	chi	-**iku**-ni-u	-**iku**-ni-waa	-**iku**-naanaa-tik	-**iku**-naanaa-tikaa	-**iku**-naanaa-chichaa	-**iku**-htaa-naa-kupin
DoD		**2**	**2**	**2**	**2**	**2**	**2**

(54) Template of 1p↔3 Independent Order inflectional endings

DIR.	PR	01	02	05	06	09	10
1p→3	ni	-**aa**-naan	-**aa**-naan-i-waa	-**aa**-htaa-n	-**aa**-naanaa-tik	-**aa**-naanaa-tikaa	-**aa**-naanaa-chichaa
3→1p	ni	-**iku**-naan	-**iku**-naan-i-waa	-**iku**-htaa-n	-**iku**-naanaa-tik	-**iku**-naanaa-tikaa	-**iku**-naanaa-chichaa
DoD		**2**	**2**	**2**	**2**	**2**	**2**

In the conjunct order, the level of contrast varies considerably. Differentiation ranges minimally by one form being marked with a theme sign, in some 2p↔3 (57) and 21p↔3 (58) forms. Maximally, in the 1p↔3 (59) conjugation 15 form, theme signs, person suffixes and a plural suffix (*-(i)ch*) in the inverse form are in contrast. The following tables (55-59) show the contrast made in singular 3rd person forms ({2,1}↔3), and are representative of the similar distinctions that occur in plural 3rd person mixed forms.

(55) Template of 2↔3 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2→3	-**it**	-**it**-aa	-**it**-h	-**aa**-w-**it**-aa	-**aa**-u-**t**-i-pinaa	-**it**-aakwaa
3→2	-**is**-**k**	-**is**-**k**-aa	-**is**-**k**-h	-**is**-**k**-waa	-**is**-**k**-u-pinaa	-**is**-**k**-aakwaa
DoD	**3**	**3**	**3**	**4**	**4**	**3**

(56) Template of 1↔3 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
1→3	-**ik**	-**ik**-aa	-**ik**-h	-**aa**-w-**ich**-aa	-**aa**-u-**ch**-i-pinaa	-**ik**-aakwaa
3→1	-**i**-**t**	-**i**-**ch**-aa	-**i**-**t**-h	-**i**-**k**-waa	-**i**-**k**-u-pinaa	-**i**-**t**-aakwaa
DoD	**3**	**3**	**3**	**4**	**4**	**3**

(57) Template of 2p↔3 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2p→3	-aakw	-aakw-aa	-aakw-h	-**aa**-w-aakw-aa	-**aa**-w-aaku-pinaa	-**aa**-w-aakwaa
3→2p	-**it**-aakw	-**it**-aakw-aa	-**it**-aakw-h	-**it**-aakw-aa	-**it**-aaku-**ku**-pinaa	-**isk**-**aak**-aakwaa
DoD	**1**	**1**	**1**	**2**	**3**	**3**

(58) Template of 21p↔3 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
21p→3	-ihkw	-ihkw-aa	-ihkw-h	-**aa**-w-ihkw-aa	-**aa**-w-ihku-pinaa	-ihk-aakwaa
3→21p	-**it**-ihkw	-**it**-ihkw-aa	-**it**-ihkw-h	-**it**-ihkw-aa	-**it**-ihku-**ku**-pinaa	-**it**-ihk-aakwaa
DoD	**1**	**1**	**1**	**2**	**3**	**1**

(59) Template of 1p↔3 conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
1p→3	-**ichihch**	-**ichihch**-aa	-**ichihch**-h	-**aa**-w-**ichihch**-aa	-**aa**-u-**chihch**-i-pinaa	-**ichiht**-aakwaa
3→1p	-**i**-y-**imiht**	-**i**-y-**imihch**-aa	-**i**-y-**imiht**-h	-**i**-y-**imihch**-aa	-**i**-y-**imiht**-i-pinaa	-**i**-y-**imiht**-aakwaa
DoD	**3**	**3**	**3**	**4**	**4**	**3**

In summary, independent direct and inverse mixed forms are differentiated by theme signs (2 DoD), with a few forms showing differences between short and long personal prefixes (3 DoD). The average DoD throughout all mixed forms is 2.1. In conjunct mixed forms, the differentiation varied considerably; with differentiation ranging from a theme sign in one form, 1 DoD, to those involving theme signs, personal suffixes and plural markers, 5 DoD. The average DoD throughout all conjunct mixed forms is 3.1. We will use this as the baseline and see how the local forms from section 5.1.1 compare.

5.1.3 Comparison

By comparing the average local DoD values with the mixed ones, we can see that there is no evidence to argue for systematic person opacity in local forms (60).

(60) Average Degree of Differentiation values[22]

form	independent	conjunct
local	2.2	3.4
mixed	2.1	3.1

In both the independent and conjunct orders, local and mixed forms are marked with a relatively equal degree of differentiation. In the independent order, the two degrees of differentiation are the direct and inverse theme signs, with extra contrast coming from an occasional difference between short and long personal suffixes. In the conjunct order, marking is variable, from at least a theme sign marking distinction between forms with the same personal suffix, to a variety of contrasts involving theme signs, personal suffixes and plural markers. But in regards to our DoD scale, it seems that marking is consistent within orders between local and mixed forms.

5.2 Number neutralization

Our data show some evidence for opacity due to number neutralization in some local forms (I-YOU combinations only) that do not take place in mixed combinations. Number neutralization is the

[22] The values for the Southern dialect (i) differ slightly in local forms. Independent forms are only distinguished by theme signs, with no extra distinction. Conjunct forms have a lesser degree symmetry between some direct and inverse forms, with contrasting personal suffixes (ii), which contrasts with the symmetry in (iii), brought forward from conjugation 14 in (48).

(i) Average DoD values across dialect

dialect	Northern		Southern	
form	independent	conjunct	independent	conjunct
local	2.2	3.4	2.0	3.6
mixed	2.1	3.1	2.1	3.1

(ii) a. waapim-i-w-aakw-aa
see-1OBJ-w-2p→1-conj#14
'when you-all see me, …'

b. waapim-iti-w-aakw-aa
see-2OBJ-w-1→2p-conj#14
'when I see you-all, …'

(iii) a. waapam-u-w-ekw-e
see-1OBJ-w-2p→1-conj#14
'when you-all see me, …'

b. waapam-it-aaku-ch-e
see-2OBJ-1→2p-PL.conj#14
'when I see you-all, …'

fourth in Heath's avoidance strategies list, and is defined as sometimes including the use of plural for semantic singular. Heath did not identify this strategy in his paper when discussing Algonquian, nor the data we give below.

Number neutralization happens for several person inflections in East Cree. It is typically found for obviative third persons, sometimes called fourth persons, in all person combinations: mixed (2↔4(p), 1↔4(p), 2p↔4(p), 21p↔4(p), 1p↔4(p)), or third persons (3↔4(p), 3p↔4(p)). Number neutralization also happens for the second person, however, it is limited to combinations with the first person plural: 2(p)↔1p. Everywhere else there is no number neutralization of the second person. Because of the asymmetry in the number neutralization pattern, this qualifies as an avoidance strategy, as defined by Heath.

The tables below show that both in the independent and the conjunct order, number is neutralized in 2nd persons when they combine with 1st person plural (DoD of 0), but not when they combine with 3rd persons (DoD of 1 and more).

5.2.1 Independent order

When combined with a 1st person plural argument, 2nd person singular and plural arguments are marked in the same manner. In (61) & (62) there is no degree of differentiation between these two forms.

(61) Template of 2→1p & 2p→1p independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
2→1p	chi	-i-naan	-i-naan-i-waa	-i-naanaa-tik	-i-naanaa-tikaa	-i-naanaa-chichaa	-i-naanaa-htaakupin
2p→1p	chi	-i-naan	-i-naan-i-waa	-i-naanaa-tik	-i-naanaa-tikaa	-i-naanaa-chichaa	-i-naanaa-htaakupin
DoD		**0**	**0**	**0**	**0**	**0**	**0**

(62) Template of 1p→2 &1p→2p independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
1p→**2**	chi	-iti-naan	-iti-naan-i-waa	-iti-naanaa-tik	-iti-naanaa-tikaa	-iti-naanaa-chichaa	-iti-htaa-naa-kupin
1p→**2p**	chi	-iti-naan	-iti-naan-i-waa	-iti-naanaa-tik	-iti-naanaa-tikaa	-iti-naanaa-chichaa	-iti-htaa-naa-kupin
DoD		**0**	**0**	**0**	**0**	**0**	**0**

When combined with a 3rd person plural argument, 2nd person plural is distinguished from 2nd person singular with the addition of an additional plural morpheme *-waa* (or its longer form *-waawaa*). In (63) & (64) there is exactly one degree of differentiation which represents the inclusion of this plural morpheme.

(63) Template of 2→3p & 2p→3p independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
2→3p	chi	-aa-w-ich	-aa-w-ich-aa	-aa-tik-ich	-aa-tik-ich-aa	-aa-chichaa-nichii	-aa-htaakupin-ich
2p→3p	chi	-aa-**waa**-w-ich	-aa-**waa**-w-ich-aa	-aa-w**aawaa**-tik-ich	-aa-**waawaa**-tik-ich-aa	-aa-**waa**-chichaa-nichii	-aa-htaa-**waa**-kupin-ich
DoD		**1**	**1**	**1**	**1**	**1**	**1**

(64) Template of 3p→2 & 3p→2p independent order inflectional endings

DIR.	PR	01	02	05	06	09	10
3p→**2**	chi	-iku-ch	-iku-w-ich-aa	-iku-tik-ich	-iku-tik-ich-aa	-iku-chichaa-nichii	-iku-htaakupin-ich
3p→**2p**	chi	-iku-**waa**-w-ich	-iku-**waa**-w-ich-aa	-iku-**waa**-tik-ich	-iku-**waawaa**-tik-ich-aa	-iku-**waawaa**-chichaa-nichii	-iku-htaa-**waa**-kupin-ich
DoD		**1**	**1**	**1**	**1**	**1**	**1**

2nd person plural forms are distinguished from singular ones by a plural morpheme in mixed forms. But it seems that when two plural arguments are combined in a local form, the plurality of both cannot be expressed in the inflection. Thus the 2nd person plural in 2p↔1p forms cannot be represented in the inflection and this resulting form mirrors 2↔1p forms. This suggests that singular is used to represent plural in these neutralized forms.

5.2.2 Conjunct order

Similar to the independent order, when combined with a 1st person plural argument, 2nd person singular and plural arguments in the conjunct order are marked in the same manner. In (65) & (66) there is no degree of differentiation between these two forms.

(65) Template of 2→1p & 2p→1p conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2→1p	-i-y-aahch	-i-y-aahch-aa	-i-y-aahch-h	-i-w-aahch-aa	-i-w-aahch-i-pinaa	-i-y-aaht-aakwaa
2p→1p	-i-y-aahch	-i-y-aahch-aa	-i-y-aahch-h	-i-w-aahch-aa	-i-w-aahch-i-pinaa	-i-y-aaht-aakwaa
DoD	**0**	**0**	**0**	**0**	**0**	**0**

(66) Template of 1p→2 & 1p→2p conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
1p→**2**	-it-aahch	-it-aahch-aa	-it-aahch-h	-iti-w-aahch-aa	-iti-w-aahch-i-pinaa	-it-aaht-aakwaa
1p→**2p**	-it-aahch	-it-aahch-aa	-it-aahch-h	-iti-w-aahch-aa	-iti-w-aahch-i-pinaa	-it-aaht-aakwaa
DoD	**0**	**0**	**0**	**0**	**0**	**0**

When combined with a 3rd person plural argument, 2nd person plural is distinguished from 2nd person singular by person suffixes and/or plural morphemes. In (63) & (64), forms with 1 DoD are differentiated by a person suffix in one form, and 2 DoD by person suffixes in both. Forms with 3 DoD contrast in person suffixes in both and a plural morpheme in one form, and 4 DoD by person suffixes and plural morphemes in both.

(67) Template of 2→3p & 2p→3p conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
2→3p	-**it**-**waau**	-**it**-**waa**-w-aa	-**it**-**waau**-h	-aa-w-**it**-aa-nichii	-aa-u-**t**-i-pinaa-nichii	-**it**-aakwaa-**waa**-nichii
2p→3p	-**aaku**-**ch**	-**aaku**-**ch**-aa	-**aaku**-**ch**-h	-aa-w-**aakw**-aa-nichii	-aa-w-**aaku**-pinaa-nichii	-**aa**-w-aakwaa-nichii
DoD	**4**	**4**	**4**	**2**	**2**	**3**

(68) Template of 3p→2 & 3p→2p conjunct order inflectional endings

DIR.	11	12a	12b	14	15	16
3p→**2**	-is-ch	-is-**k**-waa-w-aa	-is-**k**-**waau**-h	-is-**k**-**waa**-w-aa-nichii	-is-ku-pinaa-nichii	-is-**k**-aakwaa-**waa**-nichii
3p→**2p**	-it-**aaku**-ch	-it-**aak**-waa-w-aa	-it-**aaku**-**ch**-h	-iti-w-**aakw**-aa-nichii	-it-**aaku**-ku-pinaa-nichii	-it-**aa**-w-aakwaa-nichii
DoD	**1**	**2**	**4**	**3**	**1**	**3**

2nd person plural forms are distinguished from singular ones by person suffix(es) and possibly plural morpheme(s) in mixed forms. But when two plural arguments are combined in a local form, the plurality of both cannot be expressed in the inflection. The 2nd person plural in 2p↔1p forms cannot be represented in the inflection by a different person suffix and this resulting form mirrors 2↔1p forms by having the 1p person suffix *-aahch*. In a similar manner as in the independent order, the inclusion of a plural morpheme to represent the 2nd person plural is not possible either. This suggests that singular is used to represent plural in these neutralized forms in the conjunct as well.

5.2.3 Summary & discussion

In EC, regardless of order, local 2nd singular and plural persons only are neutralized when combined with a 1st person plural argument: singular 2nd person forms are used to represent plural 2nd person arguments. When combined with 3rd person plural arguments, there is no number neutralization and different means are used in both orders: 2nd person singular and plural persons are differentiated in the independent order with a single plural morpheme and in the conjunct order using one or two person suffix(es) and possibly one or two plural morphemes.

We find that in the Cree-Innu language family, two different patterns of number neutralizations in local forms can occur: 2(p)↔1p in East Cree, Atikamekw, Betsiamites Innu, Moisie Innu, and Plains Cree or 2p↔1(p) in Davis Inlet Innu, Moose Cree and Swampy Cree. (MacKenzie, 1980: p.154) The generalization for the Cree language family seems to be that, depending on the dialect, the marking of one singular local person gets included in a plural local one, when interacting with the other plural local person. That this neutralization occurs in a local form combination but not in a mixed form supports Heath's hypothesis about an avoidance strategy.

In the conclusion of his 1998 paper, Heath further hypothesized that skewing would first affect the singular combinations (YOU-I), not the plural ones. The Cree pattern of number neutralization in plural local combinations but not in singular ones is thus unexpected. It shows that the prediction about singular combinations being the first target of PS is not borne out. It also shows, since a singular form is used, that neutralization does not necessarily occur through a plural marker, thus questioning the 'avoidance strategy' explanation.[23]

5.3 Additional methods of differentiation

Some stems add further levels of differentiation as well. Of the 7 stem types attested, 2 of them, the *t* and *iw* stems, show variation in stem shape depending upon the initial sound of the following inflectional suffix. The final [t] sound in the *t* stem undergoes mutation (or palatalization) to [θ] when the inflectional stem begins with a historical [i] sound. (Ellis, 1971; Wolfart, 1973; MacKenzie, 1980) The 1st person object theme suffix has an historical [i] and the mutation adds another degree of contrast between the direct and inverse forms in all local combinations in the independent (69).

[23] If a functional-cognitive explanation were sought, one could wonder why interactions of an individual (I or YOU) with a group (US or YOU-all) would be more pragmatically sensitive than interaction between two individuals (YOU-I). A purely grammatical explanation might resort to strategy number 10, the idea that the two plural local morphemes compete for a single slot, while mixed plural morphemes do not (the 3rd person plural slot being more peripheral). The asymmetry of plural morpheme slots between 3rd and local person would be consistent with Heath's claim of messiness.

(69) a. chi-naa**sh**-i-n
2-*go*-1OBJ-2↔1
'you go to me'

b. chi-naa**t**-iti-n
2-*go*-2OBJ-2↔1
'I go to you'

This mutation also occurs in all conjunct local and mixed forms with a 1st person object (70).

(70) a. aah naa**sh**-i-t
whenever go-1OBJ-3→1
'whenever s/he goes to me…'

b. aah naa**t**-it
whenever go-1→3
'whenever 1 go to her/him…'

With *-iw* stems direct and inverse local forms in both the independent and conjunct orders are differentiated to an extra degree by a stem alternation. In direct local forms the stem ends in *-iw*, whereas the stem in inverse local forms end in *-aa* (71) & (72).

(71) a. chi-miskiw-i-n
2-*find*-1OBJ-2↔1
'you find me'

b. chi-miskaa-ti-n
2-*find*-2OBJ-2↔1
'I find you'

(72) a. miskiw-i-y-in
find-1OBJ-y-2→1
'when you find me, …'

b. miskaa-t-aan
find-2OBJ-y-1→2
'when I find you, …'

6 Conclusion

Having a large set of data available to us has allowed us to probe the validity of the Pragmatic Skewing Hypothesis. Measuring the Degree(s) of Differentiation (DoD) has proven to be a useful tool to carefully analyze our data. We found one piece of evidence in the Cree language family supporting Heath's claim that local forms in Algonquian languages are less transparent than mixed forms, one he had not identified himself. It is the number neutralization of one of the local persons when interacting with another plural local one. In East Cree, it concerns the 2nd person ('you' or 'you-all') when interacting with first person plural ('us but not you'). However, both the fact that a singular rather than a plural form is used for neutralization as well as the fact that singular only interactions are not targeted first by an avoidance strategy are not consistent with the details of his hypothesis.

Our data allows us to strongly question Heath's claim of opacity about person marking for local forms. We can see clearly that local singular forms are not marked in a manner that is different from mixed forms in EC. Most plural forms are not either. Except from the 2(p)↔1p case, there is no evidence to show that there are any distinctions which are made in mixed forms that are not made in local forms. Therefore EC provides little support for Heath's claim that local forms in Algonquian languages in general are any less transparent than mixed forms. There is no lack of transparency for singular local forms combinations. The avoidance strategy of having only one argument realized in the single prefix before verb forms (in the independent order) seems to be an observation about the nature of the how distinctions are made in EC, and possibly Algonquian languages in general, rather than one about local forms in particular. While such a system of differentiation in local forms looks more opaque than an external ideal system of 'maximal transparency' modelled after English-like languages, it is consistent with how distinctions are made throughout the East Cree language.

> Time and again, what at first appears to be a knotty problem of linguistic analysis smoothes out, as if, approaching a language with patience and reverence, we relax and let it show us how it works-instead of trying to force matters into some conceptual frame of reference we have imported, perhaps without realizing it, from elsewhere. (Hockett, 1993; p.315)

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Small but significant - body part incorporation in Washo

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Verb stems in Washo, a North American isolate spoken in the Lake Tahoe region, are formed from two bound morphemes (initial and final) that combine into a single inflectable stem (Jacobsen, 1964, 1980). Three different types of nominal elements are found inside verbs in Washo: direct objects in logically transitive verbs, instrumental classifiers in syntactically transitive verbs, and nominal roots without an overt verb root. In this paper I claim that the first phenomenon constitutes noun incorporation (NI) while the second two do not, presenting evidence from the introduction of discourse referents, as well as external modification to the incorporated element.

1 The problem

There are three types of nominal elements inside verbs in Washo: direct objects in intuitively transitive or ditransitive verbs, as in (1a)[12], instrumental classifiers in syntactically transitive verbs, as in (1b), and nominal roots without an overt verb root, as in (1c).

(1) a. John tuʔmáʔami
John ø-tuʔm+aʔam-i
John 3SUBJ-foot+into.water-IMPF
'John is putting his foot into water.'

b. t'ánu pélew ʔugát'ɨgi
t'anu pelew ø-ug+at'ɨg-i
person rabbit 3SUBJ-with.club+kill.SG-IMPF
'Someone killed a rabbit (with a club-like object).'

c. digumgó:zihayi
di-gum-go:ziʔ-ha-i
1SUBJ-REFL-pig-CAUS-IMPF
'I am making a pig out of myself.' AL, cf. Jacobsen 1964:557

In this paper I claim that the first construction, as in (1a), constitutes (albeit limited) noun incorporation. I present evidence from the introduction of discourse referents by body part initials, and verb-external modification to the incorporated element. The layout of this paper is as follows. In §2 I cover relevant background information on the Washo language and its verbs, and in §3 I present original

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[1] The following abbreviations are used in this paper: 1, 2, 3 = '1st, 2nd, 3rd person', SG, PL = 'singular, plural', SUBJ, OBJ = 'subject, object', AOR = 'aorist', ATTR = 'attributive', CAUS = 'causative', INDIC = 'indicative', INCH = 'inchoative', IMPF = 'imperfective', INS = 'instrumental', LOC = 'locative', NMLZ = 'nominalizer', POSS = 'possessive', REFL = 'reflexive', and SR = 'switch reference'.

[2] All examples were collected during the author's fieldwork trips in March and August-September 2009, unless otherwise cited.

data demonstrating body part incorporation. In §4 I show evidence supporting an incorporation analysis, and in §5 I offer directions for further research.

2 Background

2.1 The Washo language

The Washo language is spoken in California and Nevada near Lake Tahoe.[3] As of 2009, there were approximately ten to fifteen fully fluent native speakers.[4] Although some researchers consider Washo to be part of the Hokan genetic stock, for the purposes of this paper, I will follow the more conservative position that it is a genetic isolate.

Word order in Washo is 'subject – (optional adjunct) – object – verb', with some flexibility; this is shown schematically in (2).

(2) Washo word order:
S ({LOC, INS, etc.}) O V

As expected in a head-final language, modifications precede their heads (e.g. adjectives precede nouns). Nominal arguments fall into a Nominative/Accusative case alignment; that is, transitive and intransitive subjects pattern with each other while objects pattern separately. There are no overt case marking on lexical noun phrase arguments, that is, subjects and objects; however, there is post-positional marking on peripheral arguments and adjuncts (e.g. locative and instrumental).

Washo verbs display prefixal agreement with the subject, and sometimes the object.[5] Third person agreement indicates whether or not the object is expressed in a lexical noun phrase. Verbal tense, mood, and aspect are indicated through suffixes. Pronouns are only used for emphasis. Other potentially interesting verbal morphology includes pluractional reduplication, reflexives, causatives, etc.

2.2 Bipartite verbs

Washo verbs are composed of two[6] bound morphemes that combine into a single inflectable stem In earlier work, these morphemes were called the 'lexical prefix' and the 'dependent stem' (Jacobsen, 1964, 1980); for the purposes of analytical neutrality, I will refer to them as the 'initial' and the 'final'. Bipartites can be intransitive, as in (3a), or transitive, as in (3b).

(3) a. dipá:ši
di-p+aš:-i
1SUBJ-fall+in-IMPF
'I fell in.'

b. geséhuk'i
ge-se+ihuk'-i
3OBJ-by.heat+dry-IMPF
'She[7] dried it outside.'

The meaning and transitivity of bipartite verbs are built compositionally (Lemieux, 2010). The final is the root of the verb; some initial is required for lexicalization. Finals and initials can both be sorted into various categories of like morphemes, such as *paths, result states,* and *attributes*, for finals,

[3] Fun fact: the name "Tahoe" comes from the Washo word *daʔaw*, meaning 'lake'.
[4] Cf. PC with Alan Yu.
[5] Agreement with objects occurs when the object is a speech participant, that is, first or second person.
[6] Monomorphemic verbs do exist in Washo but are less common than bipartites and do not participate in the construction in question, so will not be further discussed in this paper.
[7] Gender is not marked in Washo agreement or pronouns, so I will interchange 'she' and 'he' freely when appropriate in glossing.

and *manners of motion, instruments,* and *body parts,* for initials. Examples can be found in Table 1.

Finals:			
	paths	-ahad ‘across’	-itiʔ ‘down(wards)’
	result state	-a:baš ‘kill/die.PL’	-ipu ‘stab’
	attribute	-ileg ‘red’	-ilpil ‘blue’
Initials:			
	manner (of motion)	Mu- ‘run.SG’	p’- ‘crawl’
	instrument (of change of state)	de- ‘with hand’	ug- ‘club’
	body parts	dule- ‘hand’	tuʔm- ‘foot’

Table 1: Types of finals and initials in Washo verbs

When combined with attribute finals, body part initials restrict the scope of the attribute to just that body part. For example, in (4), the attribute ‘blue’ does not describe the entire subject (i.e., does not mean ‘He is blue.’), but rather just his eyes.

(4) tugílp’ili
ø-tug+ilp’il-i
3SUBJ-eye+blue-IMPF
‘He is blue-eyed.’ Jacobsen 1964:109

When combined with path finals, however, body part initials display attributes of incorporated objects.

3 Body part incorporation

3.1 The facts

In intuitively transitive yet syntactically intransitive verbs, as in (1a), repeated here as (5), body part initials are direct objects.

(5) John tuʔmáʔami
John ø-tuʔm+aʔam-i
John 3SUBJ-foot+into.water-IMPF
‘John is putting his foot into water.’

In (5), *tuʔm-* ‘foot’ combines with *-aʔam* ‘in water’ to yield the verb *tuʔmaʔam* ‘to have/put one’s foot in(to) water’. The known initials that participate in these constructions denote body parts, as seen in Table 2.

Washo	**Gloss**
tuʔm-	‘foot’
dule-	‘hand’
tug-	‘eye’
c’ig-	‘buttocks’
k’il-	‘head’

Table 2: Washo incorporating initials

Verb meanings seem idiomatic in the case of *tug-* ‘eye’; that is, verbs incorporating tug- ‘eye’ have a meaning of ‘look’, as in (6).

(6) c’ɨːk’ɨ tugítiʔi
c’ɨːk’ɨ ø-tug+itiʔ-i
spider 3SUBJ-eye+downward-IMPF
‘The spider is looking down.’

However, this meaning of *tugitiʔ* as ‘look down’ can be derived easily, as follows. First, the compositional meaning of ‘eye’ plus ‘down’, gives ‘have or put eye downwards’; then, real-world knowledge of the function of having eyes in a certain position or direction yields the meaning of ‘look’ in that direction.

Combinations of body part initials and path finals otherwise display straightforward compositional meanings, i.e. ‘arm’ and ‘down’ yield the verb meaning ‘to put one’s arm down’, etc. It should be noted that the meanings of body part initials encompass broader swaths of the body than their English glosses indicate. For example, *dule-* ‘hand’ can refer to not only a hand or an arm[8], but also a wing, as in (7).

(7) sí:su lák’aʔ gáliŋlu dulá?ami
si:su lak’aʔ g-aliŋ-lu ø-dule+aʔam-i
bird one POSS-arm 3SUBJ-hand+into.water-IMPF
‘The bird put its wing into the water.’

Similarly, *c’ig-* ‘buttocks’ can refer to a tail as well, as in (8). The hyponymous argument (Haugen, 2008), here ‘tail’, is not a direct object but rather an oblique argument.

(8) gá:p’ɨllu c’igáʔami
g-a:p’ɨl-lu ø-c’ig+aʔam-i
POSS-tail-INS 3SUBJ-butt+into.water-IMPF
‘It put its tail into the water.’

3.2 Valence

As mentioned previously, verbs with these incorporated body parts are syntactically intransitive, as in (9a). The impermissibility of the unexpressed object marker is a diagnostic of syntactic intransitivity in Washo verbs, as shown in (9b), which is intended to mean ‘He put it (his head) down’, but which is not a licit construction. It appears then that the inclusion of body part initials reduces the number of arguments of the root (ie. final) by one.

(9) a. méhu k’iléti?i
mehu ø-k’ile+iti?-i
boy 3SUBJ-head+down-IMPF
‘The boy$_i$ put his$_i$ head down.’

b. ∗gek’iĺeti?i
ge-k’ile+iti?-i
3OBJ-head+down-IMPF
Intended: ‘He$_j$ put it (his$_j$ head) down.’

Adding the valence-increasing (causative) morpheme *-ha*, as in (10) and (11), makes the verb transitive. The new direct object of the verb is the possessor of the incorporated element. This means that the body part does not have to belong to the subject of the verb, as in (10).

[8] The English words ‘hand’ and ‘arm’ have a single equivalent in Washo.

(10) Tim Ryan (díme?a) tu?má?amhayi
Tim Ryan (dime?-a) ø-tu?m+a?am-ha-i
Tim Ryan (water-LOC) 3SUBJ-foot+into.water-CAUS-IMPF
'Tim put Ryan's foot into the water.'

When the subject and object differ in person, this lack of necessary identity between subject and body part is easy to demonstrate. In (11), the body part 'foot' belongs to the second person object, not the first person subject.

(11) mitu?má?amhayi
mi-tu?m+a?am-ha-i
1SUBJ.2OBJ-foot+into.water-CAUS-IMPF
'I am putting your foot into the water.'

In (12), the body part 'foot' belongs to the first person object, not the third person subject.

(12) Ryan (díme?a) letu?má:šhayi
Ryan (dime?-a) le-tu?m+a:š-ha-i
Ryan (water-LOC) 1OBJ-foot+in-CAUS-IMPF
'Ryan put my foot into the water.'

The inclusion of the unexpressed object marker *ge-* in (13) demonstrates conclusively that these formerly intransitive verbs have become transitive verbs with the inclusion of the causative morpheme.

(13) gek'iĺeti?eti?hayi
ge-k'ile+iti?-eti?-ha-i
3OBJ-head+down-INCH-CAUS-IMPF
'He_k made him_l put his_l head down.'

4 Evidence for an incorporation analysis

4.1 Discourse referents

Body part initials introduce a discourse referent, as seen in (16).

(14) súku? ŋáwaya c'igíwe?i ?ida yéc'išéti?i
suku? ŋawa-a ø-c'ig+iwe?-i ?ida ø-yec'iš-eti?-i
dog ground-LOC 3SUBJ-butt+down-IMPF and 3SUBJ-dirty-INCH-IMPF
'The dog_m put its $butt_n$ on the ground and $it_{m/n}$ got dirty.

The agreement marking in (14) allows the subject of the second verb to be still the subject of the first verb, so it could be argued that the entity getting dirty in the second clause is merely the subject of the first, ie. '… and the dog got dirty'. However, meta-linguistic commentary from multiple speakers confirmed that in the sentence in (14), 'it is the butt that is dirty'.

In (15) the first person marking on the initial verb is not repeated on the second verb. The switch reference (SR) marker on the first verb indicates that the subject of the next clause will be different (Jacobsen, 1964, 1983).[9] Therefore the third person marking on 'burn' unambiguously refers to 'hand'.

[9] The lack of SR marking in (16) can be explained with reference to Peachey (2006)'s observation that switch reference in fact indicates disjunct reference. Sequential clauses in which the subject of the second is a proper subset of the subject of the first do not get marked with the SR morpheme. In (16) we can assume that a butt is a proper subset of a dog, thus negating the need for an SR marker on the first verb.

(15) díʔyuya didulá:šaš dópoši
diʔyu-a di-dule+a:š-aʔ-š ø-dopoš-i
fire-LOC 1SUBJ-hand+in-AOR-SR 3SUBJ-burn.up-IMPF
'I put my hand$_p$ in the fire (and) it$_p$ got burned up.'

As no other possible antecedent exists for the subject of dopoš 'burn up', I conclude that the referent is being introduced by *dule-* 'hand' in the previous clause. It may be interesting to note that the body parts are specific, rather than generic, as in the English verb 'baby-sitting'.

4.2 External modification of incorporated body parts

The verb-internal body part initial can be doubled by a verb-external lexical noun, as in (16). This noun is marked with the instrumental case.

(16) John tuʔmáʔami t'í:yeli máyaplu
John ø-tuʔm+aʔam-I t'i:yeli mayab-lu
John 3SUBJ-foot+into.water-IMPF big foot-INS
'John is putting his big foot into water.'

The body part initial can also be modified by a verb-external adjective alone, also marked by the instrumental case, as in (17).

(17) John t'í:yelilu tuʔmáʔami
John t'i:yeli-lu ø-tuʔm+aʔam-i
John big-INS 3SUBJ-foot+into.water-IMPF
'John is putting his big foot into water.'

West Greenlandic (Sadock, 1980) has a similar pattern of verb-external modification of verb-internal incorporates. In (18a), a modified noun phrase is shown outside a regular verb, while in (18b) that same modifier remains external while the noun has been incorporated into the verb. This similar construction is especially interesting because both Washo and West Greenlandic use the same case, the instrumental, for marking these external modifiers.

(18) West Greenlandic
a. Sapanngamik kusanartumik pisivoq
sapannga-mik kusanartu-mik pi-si-voq
bead-INS beautiful-INS thing-get-INDIC-3SG
'He bought a beautiful bead.'

b. Kusanartumik sapangarsivoq
kusanartu-mik sapangar-si-voq
beautiful-INS bead-get-INDIC-3SG
'He bought a beautiful bead.'

External adjectives are also attested modifying *tug-* 'eye' in 'look' constructions. (19a) shows the optional lexical noun phrase, and (19b) shows the instrumental adjective alone modifying the incorporated noun (IN).

(19) a. c'ɨ:k'ɨ tugítiʔi haʔwaʔ gitwigilu
c'ɨ:k'ɨ ø-tug+itiʔ-i haʔwaʔ git-wigi-lu
spider 3SUBJ-eye+down-IMPF four REFL-eye-INS
'The spider is looking down with his four eyes.'

b. c'ɨ:k'ɨ ha?wa?lu tugíti?i
c'ɨ:k'ɨ ha?wa?-lu ø-tug+iti?-i
spider four-INS 3SUBJ-eye+down-IMPF
'The spider is looking down with four eyes.'

If a body part initial can be modified by a verb-external element, it follows that it was a constituent with that element at some point in the derivation.

4.3 Incorporation vs. classification

The noun incorporation in this paper so far has involved locative/directive finals. Washo also has change of state finals that take nominal initials; Jacobsen called these 'instrumental prefixes'. Examples of these include *ug-* 'club-like object' and *d-* 'stone'. These initials act as classifiers for instrumental adjuncts (e.g. *ma?aklu* 'with a stick'), and can be implicit, as in (20), or specified with a lexical noun, as in (21a-b).

(20) t'ánu pélew ?ugát'ɨgi
t'anu pelew ø-ug+at'ɨg-i
person rabbit 3SUBJ-with.club+kill.SG-IMPF
'Someone killed a rabbit (with a club-like object).'

(21) a. t'ánu pélew t'í:yeli má?aklu ?ugát'ɨgi
t'anu pelew t'i:yeli ma?ag-lu ø-ug+at'ɨg-i
person rabbit big wood-INS 3SUBJ-with.club+kill.SG-IMPF
'Someone killed a rabbit with a big stick.'

b. ?itmugáyamlu gawgát'ɨgi
?it-mugayam-lu ge-ug+at'ɨg-i
INS.NMLZ-club-INS 3OBJ-with.club+kill.SG-IMPF
'He killed it with a club.'

Body parts can be also be instruments, such as *de-* 'with hand', as in (22) (compare to *dule-* 'hand' in (15)). These body part initials are not like the kind we've seen to date; rather they pattern just like other instrumental initials.

(22) bedíli? ledéšɨl
bedili? le-de+išɨl
match 1OBJ-with.hand+give
'Hand me the match!' Jacobsen 1964:552

A specified instrument must be compatible with the instrumental initial, as in (23). If the instrument does not fall within the classification of the initial, the sentence is illicit, as in (24).

(23) t'ánu pélew dat'ɨgi d´e?eklu
t'anu pelew ø-d+at'ɨg-I de?eg-lu
person rabbit 3SUBJ-with.stone+kill.SG-IMPF stone-INS
'Someone killed a rabbit with a stone.'

(24) * ?itmugáyamlu gadát'ɨgi
?it-mugayam-lu ge-d+at'ɨg-i
INS.NMLZ-club-INS 3OBJ-with.stone+kill.SG-IMPF
* 'He killed it (with a stone) with a club.'

In contrast to the nominal-like body part initials seen previously, these instrumental initials cannot be modified by external modifiers. In (25) the adjective *t'i:yeli* 'big' on its own cannot modify an instrument of the action of killing, i.e. *ug-* 'with a club'.

(25) ∗ t'ánu pélew t'í:yelilu ʔugát'iɬgi
t'anu pelew t'i:yeli-lu ø-ug+at'iɬg-i
person rabbit big-INS 3SUBJ-with.club+kill.SG-IMPF
* 'Someone killed a rabbit with a big (club-like object).'

When the author elicited the sentence in (25), the speaker provided meta-linguistic commentary that one couldn't say (25) because one 'hadn't said what was big'. No such objection was raised about any of the prior examples of incorporated objects. I conclude that initials such as *ug-* 'with a club' classify instruments but are not syntactic objects and do not introduce discourse referents.

5 Summary

In this paper I have shown that body part initials in Washo bipartite verbs are incorporated nouns. Their nominal affiliation is indicated in their ability to introduce discourse referents and to be modified by verb-external elements. Instrumental initials, on the other hand, are not instances of noun incorporation, but are merely modifiers of the change of state indicated by the root of the verb.

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About the count-mass distinction in Yudja: a description

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This paper is a description of the count-mass distinction in Yudja (Tupi). In the literature on the count-mass distinction, the impossibility of combining nouns with numerals is considered a universal property of mass nouns (named 'signature property'). In this paper I will present a description of the distinction between count and mass nouns based on Yudja (family Juruna, Tupi stock, spoken by 294 people in the Xingu Indigenous Park, Mato Grosso Brazil) a number-neutral language where a combination of factors suggest that all nouns can be combined with numerals without the intervention of classifiers or measure phrases. In consequence, I argue that Yudja might lack a count-mass distinction.

1 Introduction

Chierchia (1998a, 1998b, 2010) discusses three differences between count and mass nouns. Firstly, we can consider the atomicity criterion, by which count and mass nouns can be atomic. What distinguishes count nouns from mass nouns is that count nouns can have a singular (||tree|| = {a, b, c}) and a plural denotation (||trees|| = {a+b, a+c, b+c, a+b+c}) while mass nouns have a number-neutral denotation (||water|| = {a, b, c, a+b, a+c, b+c, a+b +c}). The second criterion is plurality. Count nouns can be attached to number inflection while bare nouns are always mass. As a consequence, mass nouns cannot be pluralized because they are already plural. Finally, the third criterion is the combination of nouns with numerals. Count nouns can be directly combined with numerals, but mass nouns depend on measure phrases or classifiers to individuate an appropriate counting level (Chierchia 1998b; 353).

In the literature on the count-mass distinction, three types of languages have been described (Chierchia 1998a, 2010). Classifier languages (such as Mandarin) do not have obligatory number marking and in these languages nouns cannot be combined with numerals without the use of classifiers:

(1) san *(ge) nanhai
three CL boy
'three boys'

(2) yi *(ben) shu
one CL book
'one book'

In these languages, there are different classifiers for count and mass nouns (Cheng and Sybesma 1998; Chierchia 2010; 10). The classifier *ge* for instance cannot combine with prototypical mass nouns unless it triggers a change in interpretation and forces a count interpretation:

(3) ?? san ge xue
three CL blood
'three portions of blood'

The second type of languages includes the number-marking languages (such as English) where mass nouns cannot be pluralized (examples from 4 to 10 are from Chierchia 2010):

(4) That blood is RH Positive

(5) ?? Those bloods are RH Positive

(6) That gold weighs two ounces

(7) ?? Those golds weigh two ounces

Also, in these languages the determiner system is sensitive to the mass/count distinction. There are determiners that go with any kind of nouns (in English, *the* and *some*), other determiners are restricted to count nouns (in English *a* and *every*) and finally some determiners can only go with plural and mass nouns (in English, *most* and *all*):

(8) the/some boy the/some boys the/some water

(9) a/every boy * a/every boys * a/every water

(10) *most/all boy most/ all boys most/ all water

Finally, these languages are characterized by the existence of fake mass nouns (nouns that are cognitively count but have the distribution of mass nouns). In the examples below, 'furniture' has the same interpretation as the count noun 'violet'. In this perspective, 'furniture', but not 'snow' is a fake mass noun:

STUBS 'Stubbornly Distributive Predicates'
(11) Those violets are small (only distributive)

(12) That furniture is small (only distributive)

(13) ?? That snow is small
(Schwarzchild 2007)

Finally there are number-neutral languages, which do not fit in the current typologies of count-mass systems. Number neutral languages such as Dëne S ųłiné (Athapaskan language) are characterized by generalized bare arguments (nouns occur bare in argument positions):

(14) k'ásba nághiłnígh
chicken perf-1sg-buy O
'I bought a chicken'

(15) ł ị dëneyuaze theʔáł
dog boy-dim perf-bit/chew O
'The dog bit the little boy'
(Wilhelm 2008; 45)

Also, these languages have no plural inflection or plural inflection is optional:

(16) Larry ʔịłághe ʔejëre nághéłnígh
Larry one bovine perf-buy O
"Larry bought one cow'

(17) Larry ʔejëre nádághéłnígh
Larry bovine dist-perf-buy O
'Larry bought several cows/ cattle'
(Wilhelm 2008; 45)

These languages do not have numeral classifiers: numerals combine directly with nouns, but some mass nouns require a measure phrase (see 20 and 21):

(18) solághe k'ásba
five chicken
'five chickens'

(19) solághe dzol
five ball
'five balls'

(20) * solághe bër
five meat

(21) solaghe nedadhi bër
five pound meat
(Dëne S ųłiné Chierchia 2010; 104)

In Dëne, measure phrases are optional for some nouns compatible with numerals (such as *tthe* 'stone', *ke* 'shoe') and they are required for other nouns (such as *lígofí* 'coffee', *jíetué* 'wine', *suga* 'sugar' (Wilhelm 2008; 48)). In Yudja, the language I will focus on, measure phrases are always optional.

In sum, in what concerns number-neutral languages, across languages evidence shows that plurality does not play a role in the distinction between count and mass nouns, but that instead only numerals may distinguish count and mass nouns. While this has been claimed to hold universally, we will see that things are different in Yudja, a number neutral language where the use of numerals does not allow us to distinguish mass nouns from count nouns.

2 Yudja, a number-neutral language: basic properties

Yudja is a bare noun language where nouns can occur in argument position without articles or number inflection (such as Mandarin, Cantonese, Thai and Dëne (Wilhelm 2008)):

(22) ali ba'ï ixu
child paca to eat
"The/a/child(ren) eat(s)/ate the/a paca(s)"

The nouns that can be modified by the plural morpheme {-i-} are [+ human] nouns (Fargetti 2001), but this morpheme is optional (as we saw in (22) a bare noun can be interpreted as singular or plural):

(23) Senahï kota ixu
man snake to eat
'A/The man/men ate a/the snake(s)'

(24) Senahï-i kota ixu
man snake to eat
'(The) men ate a/the snake(s)'

(25) kota senahï-i ixu
snake man-pl to eat
'(The) snake ate the men'

(26) * Kota-i senahï ixu
snake-pl man to eat

(27) * Senahï kota-i ixu
man snake-pl to eat

In Yudja, all nouns can be combined with all quantifiers without restriction. Consider the quantifiers *itxïbï* (many), *urahu* (a lot/big), *xinaku* (little/small) and *kïnana hinaku* (few). *Itxïbï* and *kïnana hinaku* mean 'many' and 'few' containers, respectively. *Urahu* and *xinaku* quantify masses. In case they are associated to a 'strict' count noun (such as [+human] nouns), then the meaning will be adjectival (*urahu* meaning 'big' and *xinaku* meaning 'small'):

Milk

(28) Itxïbï ahuanama txa
many milk
'Many containers of milk'

(29) Urahu ahuanama txa
A lot milk
'A lot of milk in a single place'

(30) Xinaku ahuanama txa
Little milk
'Little milk in a single place'

(31) Kïnana hinaku ahuanama txa
few milk
'Few containers of milk'

Child

(32) Itxïbï ali
many child
'Many children'

(33) Urahu ali
big child
'The child is big'

(34) xinaku ali
small child
'The child is small'

(35) kïnana hinaku ali
few child
'Few children'

The last criterion to be considered is the distribution of numerals in Yudja. As we can see below nouns can be directly combined with numerals and that is consistent with all nouns:

Blood

Conventional context: Tamariku brought three ((tubes of))[1] blood to the hospital.

[1] I did not use the expressions in double parenthesis during the elicitation. All the examples presented from

(36) Txabïu Tamariku apeta dju wï
three Tamariku blood to bring
'Tamariku brought three blood(s)'

Unconventional context: someone cut his finger and dropped a little bit of blood near the school, and also dropped blood near the hospital and near the river (the blood drops have different sizes and shapes):

(37) Txabïu apeta ipide pepepe
three blood on the floor to drip.redupl (three events)
'Three bloods dripped on the floor'

Sand
Conventional context: the children went to the beach to play. When they returned they brought three ((containers of)) sand:

(38) Txabïu ali eta awawa
three child sand to get
'Children got three sand(s) in the beach'

Unconventional context 1: the children dropped a little bit of sand near the school and a little bit near the hospital (the drops have different sizes and shapes):

(39) Yauda ali eta apapa
two child sand drop.redupl
'Children drop two sand(s)'

Unconventional context 2: the children have two containers with sand. They dropped both of them and this resulted on one single puddle:

(40) Yauda ali eta apa
two child sand drop
'Children drop two sand(s)'

Water
Conventional context: a woman brought three ((containers of)) water to the school:

(41) Txabïu idja y'a dju wï
three woman water to bring
'Woman brought three water(s)'

Unconventional context 1: a woman brought three containers with water; they fell at the same moment and make one big puddle on the floor:

(42) Txabïu y'a ipide lapa
three water on the floor to fall
'Three water fell on the floor'

Unconventional context 2: someone brought a container with water and this person dropped a little bit of water near the school, some near the hospital and some near the river (the drops have different sizes and shapes):

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36 to 41 were based on contexts represented by pictures/ drawings.

(43) txabïu y'a ipide pepepe
three water on the floor to drip
'Three water dripped on the floor'

In contrast to Dëne and other languages described in the literature, in Yudja any noun can combine directly with a numeral without the intervention of a measure phrase or classifier. In that case, the signature property, to be discussed below, might not be a universal and the count-mass distinction might not be grammaticalized in Yudja.

3 Discussion

As was mentioned before it has been claimed that there are few properties that distinguish count nouns from mass nouns in a constant way across languages. One of them is the *signature property*. The signature property is the impossibility of combining mass nouns directly with numerals (Chierchia 2010; 104). In general, a suitable measure phrase (like *pound* in *three pounds of sugar*) or a classifier-like phrase (container words like, *cup* in *three cups of sugar)* is required to combine a numerical expression with a mass noun. This universal has been claimed to hold in all three type of languages we discussed in section one: number marking languages (44, 45), classifier languages (46, 47) and number-neutral languages (48, 49):

English (Number-marking languages)
(44) Thirty three tables/ pieces of that pizza $[_{NumP}$ Num $N_{COUNT}]$

(45) * Thirty three bloods/ waters/ golds $[_{NumP}$ Num $N_{MASS}]$

Mandarin (Classifier language)
(46) * san rou
three meat

(47) san bang rou
three CL meat
'three pounds of meat'

Dëne (Number-neutral language)
(48) * solaghe bër
five meat

(49) solaghe nedadhi bër
five pound meat
'Five pounds of meat'
(Chierchia 2010)

So far it has been reported in the literature that the numeral phrase $[_{NumP}$ Num $N_{MASS}]$ is either ungrammatical or requires a reinterpretation of sorts ('coercion' or 'type-shifting'). David Lewis (*apud* Chierchia (2010)) introduced the concept of a *universal packager*[2] that turns mass nouns into count nouns using standardized or otherwise naturally occurring bounded amounts of a substance/material. This works well for some nouns (the sentence *I drank three beers* implies the standard servings of beers: bottles, glasses) but this kind of shift is not available for all mass nouns in English (*? I need three bloods; ? I*

[2] Another form of shifting of mass nouns into count nouns is the mapping from kinds (*dog, wine*) to subkinds: (i) *I like only three wines: chardonnay, pinot, chianti*; (ii) *I like only three dogs: Irish setters, golden retrievers, and collies*.

bought three golds). A fundamental fact about coercion is that mass nouns can be directly combined with numerals, but only if a standardized/conventional packager is involved. As a consequence, both *beer* and *blood* are incompatible with numerals when a non-standardized/unconventional 'packager' is involved. Consider the contexts below:

(50) *Context 1*: João went to a crime scene and he saw two drops of blood on the floor: a small one near the bed where the victim is and another slightly bigger one on the kitchen's floor.

(51) *Context 2*: João went to a bar and he saw two drops of beer on the floor: a big one near the main entrance and a small one near his table.

In these contexts (50 and 51), it is not possible to say **João saw two bloods/ * João saw two beers*, i.e., coercion is not possible when unconventional measuring phrases are involved. Now, recall Yudja data (from 36 to 42). In the previous section we saw that contrary to the signature property universal, in Yudja, nouns can be combined with numerals in standard and non-standard contexts. In other words, it is not the case that mass nouns require measure phrases when combined with numerals. Wilhelm (2008), based on Dëne, hypothesizes that numeral-neutral nouns can be combined with numerals if the denotation of numerals includes an atom-accessing function (OU). An atom-accessing function (OU) "gives a number of 'object units' (i.e atoms) in a plurality" (Wilhelm 2008). In this perspective:

(52) English *three,* Dëne *taghe*
[[three]]/ [[taghe]] = λP λx [P (x) & OU (x) = 3] ('a function from a set P (of atoms and sums) onto that subset of P containing the sums of three object unit/ atoms')

Wilhelm (2008; 49) shows that other bare noun languages (Thai, Mandarin, Cantonese) share a split between count and mass noun in different ways. In Mandarin, one of these languages, count nouns are only compatible with a general classifier *ge* 'CL unit' (Doetjes 1997; *apud* Wilhelm 2008; 49). In Mandarin and Cantonese then, count nouns are compatible with classifiers that only name existent minimal units, while "mass nouns require measure or container classifiers which create minimal units" (Cheng & Sybesma 1999). In languages with numeral classifiers, Wilhelm argues that OU is introduced not by numerals but by the classifiers used to mediate nouns and numerals:

(53) General classifier: Mandarin ge 'unit'
[[ge]] = λn λP λx [P (x) & OU (x) = n] where n is a natural number
(Wilhelm 2008; 55 – based on Kang (1994) for Korean and Krifka (1995) for English)

In this perspective, the function that allows numerals to count nouns is part of the lexical meaning of numerals in languages as Dëne and part of the meaning of classifiers in languages such as Mandarin and Korean.

(54) Wilhelm typology

	I: Number inflection	II: Numeral classifier	III: Bare nouns
Nouns	sg vs pl	Number-neutral	Number-neutral
Numerals	OU function	No OU function	OU function
Example	English	Chinese	Dene, Yudja

In sum, in Yudja, we observed that all nouns can be combined with numerals, in other words, it is not the case that mass nouns require measure phrases when combined with numerals. One approach that could be considered to explain the violation of the signature property is Wilhelm's proposal (2008). She argues that the combination of numeral-neutral nouns with numerals is possible because of an atom-accessing function (OU). This function would be part of the lexical meaning of the numerals in languages such as Dëne and Yudja and part of the meaning of the classifiers in classifier languages.

4 Final remarks

In Yudja, bare nouns are number-neutral. If there is a distinction between count and mass nouns in Yudja it is not based on the compatibility of nouns with numerals or the availability of pluralization, or the distribution of quantifiers. As we discussed, all nouns can be directly combined with numerals and the use of measure phrases or plural morphology is optional. As a consequence, Yudja is different from other languages discussed in current typologies of mass-count systems. We argue that numerals include in their denotation an atom-accessing function (Wilhelm 2008). This could be an initial hypothesis to be explored to explain why numeral-neutral nouns can be combined with numerals without requiring the use of measure phrases in Yudja. A question that has been left for further research is whether the count-mass distinction is really a universal categorization of nouns or whether it is an epiphenomenon, the result of a conjunction of properties (such as use of numerals, use of pluralization, use of particular determiners) that some languages present but not others.

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Variations on vowel devoicing in Northern Paiute[1]

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Northern Paiute word-final vowels can be voiced, or voiceless. The domain of voicelessness may optionally extend leftward; however the leftward limit on this domain is categorically restricted - it can only extend up until the main stressed syllable. I offer an OT account for this variable phenomenon, assuming a distinction between what I term (i) freely unranked constraints in the spirit of Anttila (1995), Reynolds (1994), and Itô & Mester (1997), which sacrifice the notion of parallellism (i.e., the idea that all constraints interact in a *single* hierarachy) and (ii) crucially unranked constraints, which sacrifice the notion of strict dominance (i.e., the idea that constraint violations are never added up for different constraints). I propose that freely unranked constraints result in the categorical optionality of vowel devoicing, while crucially unranked constraints result in the gradient optionality associated with the domain of voicelessness.

1 Introduction

Northern Paiute word-final vowels can surface as either voiced or voiceless. This is shown by the data in (1a-c), which shows that both fully-voiced, and final-vowel devoiced forms are attested:

(1) a. tsoʔápa ~ tsoʔápḁ
/tsɔʔapa/
'ghost; spirit'

b. maɣɔ́pa ~ maɣɔ́pḁ
/makɔpa/
'to break one's word'

c. tíípɨ ~ tíípɨ̥
/tiipɨ/
'earth; ground'

The domain of voicelessness may optionally extend leftward – i.e., it may be the case that the final syllable devoices, or it may be the case that the final and penultimate syllable devoice, or it may be the case that the final, penultimate and ante-penultimate syllable may devoice, etc. This is shown by the data in (2).[2]

(2) [supírakʷaru] ~ [supírakʷatu̥] ~ [supírakʷḁtu̥] ~ [supítḁkʷḁtu̥]
/supitakʷatu/
"to know; to understand"

1 All data is taken from Thornes 2003. This paper grew from a term paper for LING 510.

2 Note that according to Thornes, voicing is not distinctive in Northern Paiute - rather, consonants contrast along a dimension of fortis/lenis, where a fortis consonant is ideally realized as a geminate voiceless stop, and a lenis consonant is ideally realized as a voiced fricative (Thornes 2003:29).

The leftward limit on this variable domain of voicelessness is categorically restricted, however. The domain never extends to or beyond the main stressed syllable - i.e., the main stressed syllable, never surfaces as voiceless, and pretonic syllables are likewise never devoiced by this devoicing process[3]. This is shown by the data in (3). No matter what the length of the word, voicelessness never spreads onto the main stressed syllable, or any pretonic syllable.

(3) a. [tɬástɨ̥pɨ̥]
/tɬastɨpɨ/
'frozen; ice'

b. [supítɨ̥kʷɨ̥atu̥]
/supitakʷatu/
'know; understand'

c. [yoŋótɬkɨ̥čɨ̥kʷi̥]
/yoŋotika'yakʷi/
'used to have supper'

d. [sakʷápo̥kʷo̥kʷɨ̥čɨ̥kʷi̥]
/sakʷápokʷokʷačakʷi/
'would lie around in a muddy place'

The phenomenon described can be categorized into two different types of variation. One: a categorical variability with respect to whether devoicing occurs or not. Two: a gradient variability associated with the size of the devoicing domain (if devoicing does indeed occur). In this paper I propose that the categorical variability can be accounted for by what I term "freely-ranked constraints"- where this type of constraint-ranking sacrifices the OT tenet of parallelism, such that the candidate evaluation splits into two separate evaluations. Second, I propose that the gradient variability can be accounted for by what I term "crucially unranked constraints"- where this type of constraint-ranking sacrifices the OT tenet of strict-dominance, such that two constraints may be equally ranked. I will exploit gradient violations of constraints ranked in this manner (i.e., crucially-unranked constraints), in order to account for the data patterns above. Before proceeding, however, I will provide an outline of basic Northern Paiute phonology.

2 Basic Northern Paiute phonology

In this section, I provide a sketch of basic Northern Paiute phonology; this description is based on Thornes (2003).

The vowel inventory is given in (4); Northern Paiute has a five-vowel system, and all of these contrast for length.

(4) Phonemic Vowel Inventory: (Taken from Thornes 2003:20)

i	ɨ	u
		ɔ
	a	

The consonant inventory is given in (5). Thornes argues that voicing is not distinctive in Northern Paiute, but that consonants instead contrast according to a fortis/lenis distinction, where a fortis consonant is ideally realized as a voiceless geminate, and a lenis consonant is ideally realized as a voiced fricative.

3 Pretonic syllables may surface as voiceless, however, due to other voicing phenomena.

Thornes notes, however, that there is quite a range with respect to how fortis and lenis consonants can be produced; in general, the voiceless allophones of the lenis stops only occur as the onset of devoiced syllables.

(5) Phonemic Consonant Inventory: (Based on charts from Thornes 2003:17 and Thornes 2003:3)

	bilabial	**alveolar**	**alveo-palatal**	**labio-velar**	**velar**	**glottal**
stop	p	t		k^w	k	ʔ
fortis stop	pp	tt		kk^w	kk	
fricative			s			
fortis fricative			ss			
affricate		ts	č			
fortis affricate		tts	[4]			
nasal	m	n			ŋ	
fortis nasal	mm	nn				
glide			j	w		h
fortis glide			č	k^w		

As for phonotactics, the basic syllable is CV(V). Consonants clusters are either rare, or non-existent, depending on one's analysis. The only possible candidates for consonant clusters are fortis stops in medial position (where they are realized as geminates), or glottal (ʔ or h) plus sonorant sequences. I will later suggest that these glottal plus sonorant sequences are amenable to an analysis as single segments – i.e.,as pre-glottalized, or pre-aspirated sonorants.

Stress is assigned regularly in Northern Paiute: Bimoraic syllables, if they are the first or second syllable, will bear primary stress (6a-c). If neither the first nor second syllable is bimoraic, the second syllable will bear primary stress (6d-e). Bimoraic syllables in positions other than first or second from the left will not bear primary stress (6f-g).

(6) 1st or 2nd syllable bimoraic

a. [húúɾɬ] /huutɬ/ 'river'
b. [qáíba] /kaipa/ 'mountain'
c. [tiwáú] /tiwau/ 'again, also'

Neither 1st nor 2nd syllable is bimoraic

d. [yapá] /ya'pa/ 'ipos (wild carrot)'
e. [kiɾɬ] /kitɬ/ 'groundhog'

Bimoraic syllables not in 1st or 2nd position do not bear primary stress

f. [miyákai] /miakai/ 'to go off somewhere'
g. [pahónayai] /pahɔnayai/ 'to be tired/sleepy'

The generalisation is that the syllable bearing the second mora (from the left) of each word bears primary stress. Every other mora following primary stress takes a secondary stress (unless devoiced) (Thornes

4 Thornes provides no fortis counterpart for /č/; he also notes that /č/'s distribution is limited.

2003:64). The major phonetic correlate of stress, according to Thornes, is high-pitch.

3 Free ranking: Accounting for the categorical optionality of devoicing

In this section, I give an account for the categorical optionality associated with devoicing – i.e., the issue of whether or not a given word has final-word devoicing or not.

As for the source of devoicing, I will assume that the trigger for devoicing is introduced at the prosodic word level - specifically, that a [+SG] feature is introduced at the right-edge of the prosodic word, to demarcate a word or phrase boundary (cf. Trubetzkoy 1939). I formalize this edge-boundary phenomenon into the following constraint:

(7) **MarkEdgeSG = Align (PrWd, R, [+SG], R)**
Align the right edge of the PrWd, to the right edge of a [+SG] feature.
(Assign a violation for every PrWd that lacks a [+SG] feature aligned to its right edge)

This is an alignment constraint that assigns a violation to every prosodic word that lacks a [+SG] feature aligned to its right edge. To satisfy this constraint, we thus require an output [+SG] feature that was not present in the input - incurring a standard violation of Dep-Feat, defined as in (8).

(8) **Dep-Feat**
A feature in the output has a corresponding feature in the input. (no insertion)
(Assign a violation for every output feature that lacks an input correspondent)

I propose that MarkEdgeSG and Dep-Feat are "freely-ranked," such that the evaluation may either rank MarkEdgeSG above Dep-Feat, or may rank Dep-Feat above MarkEdgeSG. The evaluation of the candidate set is thus split into two subhierarchies, each of which selects an optimal output (cf. Kager 1999:406). For one branch of the evaluation, C1 is ranked above C2, and for the other branch C2 is ranked above C1. This is illustrated by the tableaux in (9); with two branches in the evaluation, we derive two different optimal outputs. Branch one ranks MarkEdgeSG over Dep-Feat, and thus will choose a candidate with devoicing – i.e., candidate b). Branch two ranks Dep-Feat over MarkEdgeSG, and thus will choose a candidate with no devoicing – i.e., candidate a).

(9)

Branch One: MarkEdgeSG>>Dep-Feat		
/tsoʔapa/	MarkEdgeSG	Dep-Feat
a. tsoʔápa	*	
b. ☞tsoʔápḁ		*

Branch Two: Dep-Feat>>MarkEdgSG		
/tsoʔapa/	Dep-Feat	MarkEdgeSG
a. ☞tsoʔápa	*	
b. tsoʔápḁ		*

This accounts for the categorical variability associated with final-word devoicing. In the next section, I address the gradient variability associated with final-word devoicing.

4 Crucial unranking: Accounting for the gradient optionality of the devoicing domain

Recall the variation in the domain of devoicing (when it does occur.) The domain of voicelessness varies in size such that the domain may be merely the final syllable – i.e., only the final syllable devoices. Or the domain may be the last two syllables, or the last three syllables, up until the point that the domain of devoicing consists of every post-tonic syllable.

(10) [supírakʷaru] ~ [supírakʷatu̥] ~ [supírakʷḁtu̥] ~ [supítḁkʷḁtu̥]
/supitakʷatu/
"to know; to understand"

To account for this gradient optionality, I assume the following two constraints - (i) Align([SG], L, PrWd, L), which motivates the right-edge [SG] feature targeting more than just the right-edge, and (ii) SonVoi, a constraint that requires sonorants to be voiced. In what follows, I will refer to Align([SG], L, PrWd, L) as SpreadSG.

(11) **Align ([SG], L, PrWd, L) (aka SpreadSG)**
Align the left edge of a [+SG] feature with the left edge of the PrWd.
(Assign a violation for every σ btw the left edge of a [+SG] feature and the left edge of PrWd)

(12) **SonVoi:**
Segments that are [+son] are [+voice].
(Assign a violation for every segment that is [+son] and [-voi])

I propose that these two constraints are crucially unranked, such that strict dominance no longer applies. This means an absolute violation of C1 is just as bad as an absolute violation of C2. Two candidates which differ only on their absolute violations of C1 and C2 thus cannot be evaluated between based on their absolute violations. A standard OT assumption is that at such a point, the evaluation must turn to look at gradient violations. I propose that the gradient violations considered for two crucially unranked constraints, C1 and C2, is the sum of C1 and C2 violations.

Consider now where C1=SonVoi and C2= Align([SG], L, PrWd, L), as shown in the tableau in (13). Each of the attestable output forms from (2) (repeated in (10)), while having different violations of SonVoi and SpreadSG each, have the same total sum violations of SonVoi and SpreadSG. Candidate a) has one voiceless vowel, and so has one violation of SonVoi. It also has four SpreadSG violations, however, as four syllables intervene between the left-edge of the prosodic word, and the [+SG] feature. Candidate b) only has three violations of SpreadSG, since there are only three syllables intervening between the left-edge of the prosodic word and the [+SG] feature, but since two vowels are devoiced, it has two violations of SonVoi. As for candidate c), it has even fewer SpreadSG violations than candidate b), since only two syllables intervene between the left-edge of the prosodic word and the [+SG] feature; however since the [+SG] feature has spread so far, there are three devoiced vowels and therefore three violations of SonVoi. Each candidate has the same number of sum violations, thus each is evaluated as optimal. This allows each form to surface. I suggest that this is what accounts for the gradient variability associated with the devoicing domain.

(13)

/supitak^{w}atu/	SonVoi:	Align ([SG], L, PrWd, L)	Sum
a. ☞su.pí.ta.k^{w}a.tu̥	*	****	5
b. ☞su.pí.ta.k^{w}ḁ.tu̥	**	***	5
c. ☞su.pí.tḁ.k^{w}ḁ.tu̥	***	**	5

One thing to note is that the fully-voiced candidate has no violations of either SonVoi or SpreadSG – this means that the freely-ranked constraints, MarkEdgeSg and Dep-Feat, must outrank the crucially-unranked constraints SonVoi and SpreadSG, otherwise we would wrongly predict the fully-voiced form to always surface. The tableaux in (14) and (15) show how we can derive all four attested forms; in branch one, where MarkEdgeSG outranks Dep-Feat, the fully-voiced candidate (candidate a) gets ruled out. This then allows the devoiced candidates (candidates b-d) to pass through the evaluation, and surface as equally-optimal. In branch two, Dep-Feat outranks MarkEdgeSG, and thus rules out the devoiced candidates; in this branch, the fully-voiced output surfaces as optimal.

(14)

Branch One	Freely Ranked		Crucially Unranked		
/supitakʷatu/	MarkEdgeSG	Dep-Feat	SonVoi	Align([+SG], L, PrWd, L)	
a. su.pí.ta.kʷa.tu	*!				0
b. ☞su.pí.ta.kʷa.tu̥		*	*	****	5
c. ☞su.pí.ta.kʷḁ.tu̥		*	**	***	5
d. ☞su.pí.tḁ.kʷḁ.tu̥		*	***	**	5

(15)

Branch Two	Freely Ranked		Crucially Unranked		
/supitakʷatu/	Dep-Feat	MarkEdgeSG	SonVoi	Align([+SG], L, PrWd, L)	
a. ☞su.pí.ta.kʷa.tu		*			0
b. su.pí.ta.kʷa.tu̥	*!		*	****	5
c. su.pí.ta.kʷḁ.tu̥	*!		**	***	5
d. su.pí.tḁ.kʷḁ.tu̥	*!		***	**	5

Note that I assume that there is only one [+SG] feature for each of candidate b-d, and that this [+SG] feature multiply links to the devoiced segments.

At this point there are still other candidates to rule out. For example, recall that the devoicing domain never spreads onto or beyond the main-stressed syllable. What rules out a fully-devoiced candidate? I suggest that this is is ruled out via the phonetics-phonology interface. Recall that the main phonetic correlate of stress in Northern Paiute is high-pitch. If we thus represent stress phonologically with a high-tone feature, we can posit a constraint as in (16), which militates against voiceless tone-bearing units. I assume such a constraint to be phonetically motivated, as voiceless segments lack a periodic cycle, and therefore cannot bear pitch. Pitch being the phonetic realization of phonological tone, this suggests that voiceless segments cannot easily realize a phonological tone.

(16) ***V́[-VOICE]:**
Vowels bearing tone are not specified [-VOICE]
(Assign a violation for every tone-bearing vowel specified as [-VOICE])

This assumes, however, that [+SG] segments are [-VOICE], however, which need not be the case. (16) thus does not rule out a candidate that is fully-voiced and [+SG], i.e., a candidate with breathy-voiced vowels [sṳ.pí̤.ta̤.kʷa̤.tṳ]. As breathy-voice is cross-linguistically rare, however, I assume such a candidate to be ruled out by a highly-ranked markedness constraint like (17).

(17) ***[+VOI]/[+SG]:**
Segments are not specified as both [+VOICE] and [+SG]
(Assign a violation for every segment specified as both [+VOICE] and [+SG])

Consider next a candidate where every syllable except the stressed syllable is devoiced. To rule out this candidate, I assume (cf. Gafos 1993, Archangeli & Pulleyblank, Ni Choisáin & Padgett 1997) that gapped representations are universally disallowed. The assumption is that the GEN, the component of the grammar that produces candidates for evaluation, will not produce a candidate like (18a), where a feature skips over segment(s). This means the proposed candidate must have a representation like (18b), where there are two [+SG] features, and therefore two Dep-Feat violations, in addition to not having a better cumulative score.

(18) a. b.

To summarize to this point, in order to account for the different dimensions of optionality associated with Northern Paiute's devoicing phenoma, I've made use of two kinds of non-canonical rankings: “free-ranking” and “crucial unranking.” Two “freely-ranked” constraints, C1 and C2, will split the evaluation process into two branches, such that each branch yields their own optimal candidate. Two “crucially unranked” constraints are evaluated cumulatively, such that if there are n candidates (where n is a natural number) with an equal number of C1 + C2 violations, the evaluation will yield n optimal candidates. Under the analysis proposed here, both types of rankings/strategies are required. If it were the case that MarkEdgeSG and Dep-Feat were crucially unranked as opposed to being freely-ranked, then we would predict the fully-voiced candidate to always surface, as shown by the tableau in (19).

(19)

	Crucially Unranked			Crucially Unranked		
/supitakʷatu/	Mark Edge	Dep-Feat		SonVoi	Align([+SG], L, PrWd, L)	
a. ☞su.pí.ta.kʷa.tu	*		1			0
b. ☹su.pí.ta.kʷa.tu̯		*	1	*	****	5!
c. ☹su.pí.ta.kʷa̯.tu̯		*	1	**	***	5!
d. ☹su.pí.ta̯.kʷa̯.tu̯		*	1	***	**	5!

And if SpreadSG and SonVoi were freely-ranked as opposed to being crucially unranked, then we wouldn't be able to derive all of the attestable outputs. If they were freely-ranked, and split the evaluation, then one branch would rank SonVoi over SpreadSG; in this case, the candidate with the least number of SonVoi violations, i.e., candidate b), will surface as optimal.

(20)

Branch One	Freely Ranked	
/supitakʷatu/	SonVoi	Align([+SG], L, PrWd, L)
b. ☞su.pí.ta.kʷa.tu̯	*	****
c. ☹ su.pí.ta.kʷa̯.tu̯	**!	***
d. su.pí.ta̯.kʷa̯.tu̯	**!*	**

The other branch, where SpreadSG is ranked over SonVoi would derive the candidate with the least number of SpreadSG violations, i.e., candidate d), as the optimal candidate. Under no evaluation branch, however, could the attested middle-ground candidate, candidate c), surface as optimal.

(21)

Branch Two	Freely Ranked	
/supitakʷatu/	Align([+SG], L, PrWd, L)	SonVoi
b. su.pí.ta.kʷa.tu̯	**!**	*
c. ☹ su.pí.ta.kʷa̯.tu̯	**!*	**
d.☞su.pí.ta̯.kʷa̯.tu̯	**	***

5 Blocking and transparency

A question one might ask at this point is as follows: should the devoicing phenomena under discussion be properly dealt with in the phonology, or could it just be a low-level phonetic phenomena? In this section, I show that the phenomena under discussion shows a clear phonological pattern, in that its spreading process is subject to both blocking and transparency. I then suggest a possible analysis for the blocking and transparency, but conclude by pointing out problems with the analysis proposed.

5.1 Data and generalisations

The generalisations for the blocking and transparency patterns are as follows: i) syllables with sonorant onsets block the devoicing process, and ii) syllables with bimoraic nuclei are transparent to the devoicing process. This is shown by the data in (22) and (23) respectively; (22) is a minimal pair; the example in a) shows a stem that optionally devoices. (22b) shows the same stem, with a sonorant-initial suffix attached. This form always surfaces as fully-voiced; forms with word-final with devoicing are unattested, as are forms where the final sonorant-initial syllable is skipped, and the penultimate syllable is devoiced. The sonorant-initial suffix thus appears to block the devoicing process.

(22)a. apíc̬a
/apika/
'to speak (PL); to discuss'

b. apíjana *apíjana̬ *apíc̬ana
/apika-na/
speak.PL-PTCP
'when speaking/discussing'

The example in (23a) shows a stem with an applicative suffix, followed by a generic tense suffix -ti. This form is subject to the normal devoicing pattern. (23b) shows (nearly) the same stem, with the same applicative suffix, but this time followed with the punctual suffix -u, such that the word-final syllable is bimoraic. Notice while the bimoraic syllable remains voiced, unaffected by the devoicing phenomena, the penultimate syllable may surface as devoiced. Syllables with bimoraic nuclei thus appear transparent to the devoicing process.

(23)a. tsatábir̥kak̬i̥t̬i
/tsa-tabi-t̥ka-k̥i-ti/
IP/-noon-eat-APL-TNS
'allow to eat lunch'

b. tsat̥ka̬k̥u
/tsa- t̥ka- k̥i-u/
IP/-eat-APL-PNC
'allowed to eat'

The question now is how both of these patterns can be accounted for. More specifically, as I have formulated the devoicing process as a spreading [+SG] feature, in terms of alignment, the question is why misalignment would be considered optimal to avoid devoicing bimoraic syllables, but not be considered optimal to avoid devoicing sonorant-initial syllables. In what follows I outline steps towards a possible analysis of these phenomena.

The structure of the argument will be as follows: First, I will assume that there exist highly-ranked markedness constraints against both devoiced sonorant-initial syllables, and devoiced bimoraic

syllables. Second, I will reformulate MarkEdgeSG (recall, the alignment constraint that introduces the devoicing to begin with), such that it is evaluated gradiently, in terms of feet. The result of this reformulation is that in order to avoid feet intervening between the [+SG] feature and the right-edge of the prosodic word, syllables will avoid being parsed into feet. Third, I will suggest a mapping between parsing and voicing, the idea of which is that voiced syllables must be parsed into feet. Because I have assumed highly-ranked markedness constraints against devoiced sonorant-initial and bimoraic syllables, these syllables must be voiced, and must therefore be parsed. The trick to the proposed argument is that while bimoraic syllables can be parsed into binary feet on a moraic level, sonorant-initial syllables can only be parsed into degenerate monomoraic feet. The transparent/misaligned candidate for sonorant-initial syllables, I will suggest, is ruled out by Foot-Binarity.

5.2 Constraints on devoicing syllables

The first step, then, is to define markedness constraints against both devoiced sonorant-initial syllables, and devoiced bimoraic syllables. As for sonorant-initial syllables, we have already defined a constraint militating against devoiced sonorants; this is repeated in (24).The question to ask at this point is why sonorant onsets, but not sonorant nuclei, would block devoicing.

(24) **SonVoi:**

Segments that are [+SON] are [+VOICE].
(Assign a violation for every segment that is [+SON] and [-VOICE])

I suggest that this asymmetry between onsets and nuclei can be derived with a re-analysis of the phonemic inventory. Recall that Northern Paiute in general has a CV(V) syllable structure, the only exception being glottal (ʔ or h)-sonorant sequences. For the purposes at hand, note that the sonorant in the h-sonorant sequences always surfaces as devoiced (25). I suggest that the ʔ/h-sonorant sequences are not really exceptions, but that Northern Paiute contrasts a regular sonorants series against pre-glottalized sonorant series and pre-aspirated sonorant series[5]. I further suggest that regular sonorants and pre-aspirated sonorants differ in their phonological representations such that pre-aspirated sonorants are marked as [+SG].

(25)a. [pahm̥ú] ~[pam̥ú]
/pahmu/
'tobacco'

b. [puhḿ̥ɨtsɨba] ~[puḿ̥ɨtsɨba]
/puhmɨtsɨpa/
'to blink'

c. [pɨ́ɨ́hw̥ana] ~[pɨ́ɨ́w̥ana]
/pɨ́ɨ́hwana/
'to scrape fur off a hide'

The difference between sonorant onsets and sonorant nuclei, then, is that the sonorant onsets are underlyingly marked as [-SG], and must stay voiced to avoid violating a faithfulness constraint. In other words, the expected devoiced candidate *apíj̃anm̥ is ruled out by Ident-IO(SG). Because obstruents and vowels, on the other hand, aren't underlyingly marked for the feature [±SG], they do not violate Ident-IO (SG) when they devoice.

5 Historically, there was a pre-aspirated series (Molly Babel, p.c.)

As for the observation that bimoraic syllables never devoice, I will arbitrarily stipulate the self-conjoined constraint in (26); this follows the template of Local Conjunction (Smolensky 1993), such that two violations of SonVoi within the domain of a nucleus are counted as worse than a single violation within that domain. This will rule out the expected devoiced candidate *tsatɬkąkɬų.

(26) **(SonVoi & SonVoi)nuc:**

Two violations of SonVoi within a nucleus is disallowed.
(Assign a violation for every nucleus that contains two violations of SonVoi)

5.3 Generalized Alignment: Reformulating MarkEdgeSG as a gradient constraint

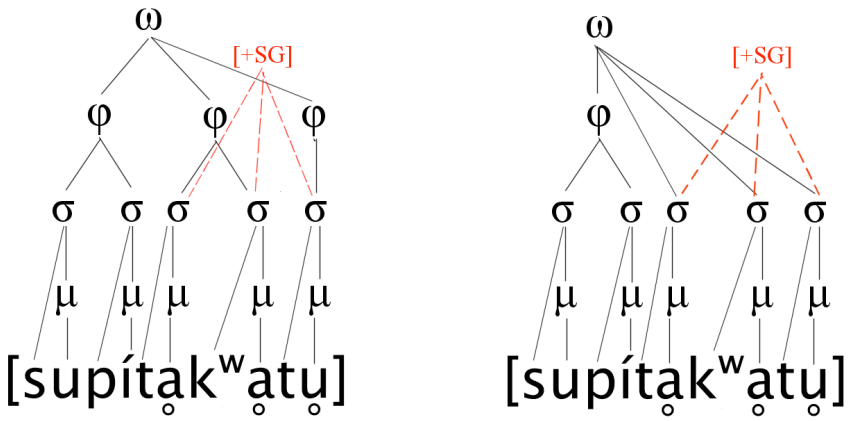
The second step in the argument is the reformulation of the constraint that introduces the [+SG] feature, MarkEdgeSG. The proposed reformulation situates the proposed alignment constraint within a stricter framework for Generalised Alignment constraints. More specifically, it takes into account Mester & Padgett's (1994) proposal that the violations associated with Generalised Alignment constraints are calculated gradiently, in terms of the prosodic units directly dominated by the prosodic unit being aligned. Assuming a prosodic hierarchy where the segmental tier is directly dominated by a moraic tier, which itself is directly dominated by a syllabic tier, which in turn is directly dominated by a foot tier, the foot tier being dominated by a prosodic word tier, then if prosodic feet are being aligned, violations are calculated in terms of intervening syllables. If syllables are being aligned, gradient violations are calculated in terms of intervening mora, etc. Because MarkEdgeSG aligns a prosodic word to a [+SG] feature, this means that the constraint violations should be calculated in terms of feet, as below in (27):

(27) **Revised MarkEdgeSG** = Align (PrWd, R, [+SG], L)

Assign a violation for every φ that intervenes between the PrWd's right edge, and the left edge of a [+SG] feature.

This re-formulation of MarkEdgeSG will motivate syllables to remain unparsed, in order to avoid multiple violations of the constraint – i.e., a representation as in (28b), where the intervening syllables remain unparsed into feet, to avoid feet intervening between the left edge of the [+SG] feature and the right-edge of the prosodic word, will be preferable to the representation in (28a), where the syllables are parsed into feet, and two feet intervene between the left edge of the [+SG] feature and the right-edge of the prosodic word (i.e., where there are two gradient violations of MarkEdgeSG).

(28) a. b.



One problematic issue in formulating the constraint as in (27) is that a fully-voiced candidate lacks a [+SG] feature at all. This makes it impossible to calculate the number of intervening feet (and therefore

the number of gradient MarkEdgeSG violations), since the constraint necessarily makes reference to a [+SG] feature. I propose to formalise this necessity as a definedness condition, such that the constraint is only defined for input forms which have a [+SG] feature. Failure to meet this definedness condition, I suggest, leads to an absolute violation, which counts as a worse violation than a gradient one.

With the above reformulation of MarkEdgeSG, we derive the consequences that voiceless syllables must remain unparsed. The third step required for the argument is as follows: I suggest this consequence (i.e., the unparsedness of voiceless syllables) is complementary to a restriction that voiced syllables *must* be parsed. At this point I will stipulate this as a constraint in (29); whether such a restriction can be motivated or derived by independent principles is a question I leave for future speculation.

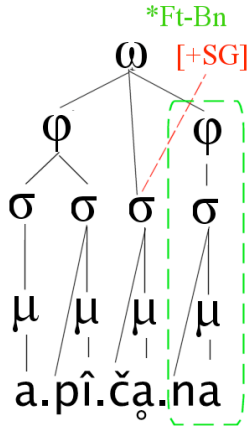
(29) **[+Voi] σs → Parsed σ**

Voiced syllables are parsed into feet.
(Assign a violation for every voiced syllable that is not dominated by a foot.)

5.4 Ruling out transparency/misalignment for sonorant-initial syllables

Now that the pieces are in place, consider the apparent pattern of blocking with sonorant-initial syllables. We know that sonorant-initial syllables must stay voiced in order to satisfy a high-ranking Ident-IO(SG). Because voiced syllables must be parsed due to (29), this means that sonorant-initial syllables must be parsed. A transparent candidate, then, must have a representation as in (30), where the voiced sonorant-initial syllable is parsed as a degenerate monomoraic foot.

(30)



I suggest that such a candidate is ruled out by a high-ranking Ft-Bn (Foot Binarity) constraint. This is shown by the tableau in (31).

(31) Branch 1: MarkEdgeSG >> Dep-Feat

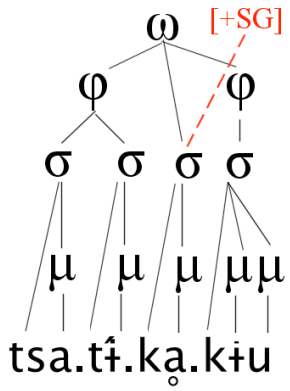
				Freely ranked		Crucially Unranked	
/apikana/	IdentSG	SSP	Ft-bn	MarkEdgeSG	Dep-Feat	SonVoi	Align([+SG], L, PrWd, L)
a. ☞a.pî.ǰa.na				*abs			
b. a.pî.ča.n̥ḁ	*!					**	***
c. a.pî.ča.nḁ		*!			*	*	***
d. a.pî.c̥a.na			*!	*grad	*		

Note that if it weren't for the intervention of Foot-Binarity, the transparent candidate would be considered optimal, because where the fully-voiced candidate has an absolute violation of MarkEdgeSG, the

transparent candidate has only a gradient violation of it.

Consider next the case of transparency with bimoraic syllables. The self-conjoined constraint in (26) requires that bimoraic syllables be voiced. And because voiced syllables must be parsed (by (29)), this means that bimoraic syllables must be parsed. A transparent candidate with a bimoraic syllable must then have a representation as in (32). The difference between the previous example (30), and (32), is that the relevant syllable which must be parsed, can be parsed as a bimoraic foot:

(32)



This means that unlike the previous example, there is no intervention of Foot-Binarity to rule out the transparent candidate. The fully-voiced candidate is thus judged as worse than the transparent candidate, since the former has an absolute violation whereas the latter only has a gradient violation, of MarkEdgeSG. This is illustrated by the tableau in (33).[6]

(33) Branch 1: MarkEdgeSG >> Dep-Feat

	(SonVoi & SonVoi)nuc:	Freely Ranked		Crucially Unranked	
		MarkEdgeSG	Dep-Feat	SonVoi	Align([+SG], L, PrWd, L)
a. tsa.tɬ̓.ka.kɬu		*abs!			
b. tsa.tɬ̓.kạ̥.kɬụ̥	*!		*	***	**
c. ☞ tsa.tɬ̓.kạ̥.kɬu		*grad	*	*	**

6 Conclusion

In this paper, I have touched on several different issues. One issue I've addressed is optionality, arguing that optionality can be derived in at least two ways: one, by violating parallelism, and splitting the evaluation into two branches, and two, by violating strict dominance, and allowing two constraints to be equally ranked, their violations being calculated cumulatively. For the analysis proposed, both evaluation procedures are required to account for the phenomenon at hand. A question that remains, however, is how to know when a grammar will split the candidate evaluation process, or when a grammar will choose to

6 Alice Lemieux pointed out a problematic candidate, where only the final vowel of the final bimoraic syllable devoices – i.e., [tsa.tɬ̓.ka.kɬụ̥]. If the [+SG] feature attaches directly to the final segment, then there would be no violations of MarkEdgeSG, gradient or absolute, as no feet would intervene between the left edge of the [+SG] feature and the right edge of the prosodic word. We would then predict this unattested candidate to be optimal. However, it does not, and in fact, a broad generalisation regarding the phenomenon at hand is that while the domain of voicelessness is gradient, it nonetheless spreads in a quantized manner, such that if any segment in a syllable devoices, the entire syllable devoices (recall that the preceding onset for the voiceless vowels likewise surfaces as voiceless.) Whatever accounts for this quantized property would rule out the problematic candidate, however the exact manner in which this quantized property should be captured (i.e., whether through a constraint requiring all segments within a syllable to match for their [±SG] value, or a stipulation that features marking specific prosodic boundaries must attach to specific prosodic categories, etc.) is a question for further research.

evaluate constraints cumulatively. In other words, are there ways to predict when two unranked constraints will result in the evaluation splitting, or the evaluation assessing the relevant constraints cumulatively?

A second issue I've touched on is that of absolute and gradient violations of alignment constraints. I've proposed that an absolute violation of MarkEdgeSG occurs when a candidate fails to meet its definedness condition. Otherwise, it is evaluated gradiently, in the sense of Mester & Padgett (1994). One question to ask at this point is whether other instances of "absolute" alignment phenomena in the literature could be formalised in such a manner.

The final issue I will address is my proposed correlation between parsed syllables and voiced syllables. This relates to larger questions regarding the phonology-phonetics interface: What does it really mean for something to be unparsed? How do different languages interpret this difference phonetically? And how exactly should this mapping from prosodic representations to phonetic output/realisation be captured? While at this point I have stipulated this mapping from prosodic structure to phonetic realisation as an OT constraint, it is not at all clear that such a mapping should have the same status as markedness/faithfulness constraints like Ft-Bn or Ident-IO.

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