

Allomorphy in Pre-Pronominal Prefixes

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1 Introduction

- Variations in allomorphy are common in Kanien'kéha:¹

(1) **Verbs:** Pronominal Prefixes

a. kanò:n:we's
ka-nonhwe'-s
NA-like-HAB
'She/it likes it.'

b. watá:wens
w-atawen-s
NA-SWIM-HAB
'She/it swims.' (Dative:2203)

(2) **Nouns:** Noun Suffixes²

a. okà:ra'
o-kahr-a'
NP-eye-NSF
'Eyes' (Dative:256)

b. ó:nenhste'
o-nenhst-'
NP-CORN-NSF
'Corn' (Dative:1545)

- In (1), the form of the neuter agent pronominal prefix is conditioned by the initial segment of the stem. In (2), the form of the noun suffix is conditioned by the morphological class of the root.

1.1 Pre-Pronominal Prefixes

- Pre-pronominal prefixes also exhibit allomorphy:

(3) wa'katá:wen'
wa'-k-atawen-'
FACT-1SGA-SWIM-PUNC
'I swam' (McDonald, 2023a:1)

(4) wesewatá:wen'
we-swa-atawen-'
FACT-2PLA-SWIM-PUNC
'You all swam' (McDonald, 2023a:1)

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²I do not take variation between noun prefixes like *o-* and *ka-* to be allomorphic: see Boles, n.d. for a preliminary analysis of noun prefix variation based on an Agree operation. See also Rolle, 2023 for a more formal overview of what constitutes allomorphy.

- These prefixes also seem to undergo other complicating processes, which might be described as fusion, discontinuities, and/or unexpected allomorphy conditioning:

(5) aonsaionhtén:ti
a-ons-a-ion-ahenti
 OPT?-REP?-OPT?-FL.A-go?[PUNC]
 (Dative:3749)

(6) sha'teharáhtatskwe'
 sh-a'-te-ra-arahat-s-kw'
 COIN-FACT?-DUP?-MSG A-run-HAB-R.PST
 (Dative:4598)

1.1.1 Previous Work

- Of the existing literature, I made particular reference to:³
 1. Diaz, Koenig, and Michelson, 2019 provide an analysis of Oneida pre-pronominal prefixes. There are very few differences in this domain compared to Kanien'kéha, so the puzzles, and many of their solutions, are nearly identical. However, they use a different framework, Information-Based Morphology. As a result, the central claims on patterns of allomorphy differ.
 2. Martin, 2023 contains an organized description of the allomorphs of most pre-pronominal prefixes. Being a pedagogical work, these allomorphs are stated in a way that is learner-oriented. Since my analysis is designed to provide a theoretical account, it necessarily diverges in places.⁴ These different analyses should not be taken as incompatible.

1.1.2 Claims

- I argue that all allomorphy in the pre-pronominal prefixes can be modeled using very simple principles:
 1. Underlying morphemes are always ordered in the same way.
 - The set of possible morpheme strings can be approximated using the template in Table 1, where each slot is optional.⁵
 - Note that there are no repeating slots in the template (c.f. Bonvillain, 1973; Michelson, 2020).
 2. Allomorphy within the pre-pronominal prefixes can be entirely described with the following mechanisms:
 - (a) **Inward-facing, phonologically-conditioned allomorphy** (like pronominal prefixes).

³In a way, anyone glossing a form is making a claim about the nature of the allomorphs. However, since creating parses is often a prerequisite to teaching or analyzing the language, I do not take these instances as making such claims unless otherwise specified. For example, some works have glossed the repetitive + factual morpheme combination *sa-* as REP.FACT. However, since the distinction is not relevant to their analyses, it is not clear whether this gloss is making the specific claim that the morphemes have fused, or whether it represents a lack of attempt to address an irregularity.

⁴Since teaching allomorphs is done by providing all possible surface forms, while a theoretical account is driven to reduce as many surface forms to single underlying forms as possible, these analyses can actually result in opposite results.

⁵This does not claim that the generative morphosyntactic mechanism is a template (see Crippen, 2019 for a description of some of the problems associated with using templates as theoretical models). This template is merely a convenient representation of adjacency and complementary distribution. Certain combinations of morphemes predicted by this template are ungrammatical and will not be generated, such as TRANS-CIS (Bonvillain, 1973) Rather, this template can be seen as a proper superset of all possible outputs of the syntax.

Slot	Outer	Translocative	Duplicative	Modal	Repetitive/Cislocative
Morphemes	Coincidental	Translocative	Duplicative	Factual	Repetitive
	Partitive			Optative	Cislocative
	Negative			Future	
	Contrastive				

Table 1: Simplified Template for Pre-Pronominal Prefixes in Kanien'kéha

- (b) **Outward-facing**, **morphologically**-conditioned allomorphy, based on the presence or absence of a preceding morpheme (to be seen).
 - (c) **Fusion** between certain combinations of morphemes
3. The pre-pronominal prefixes are a part of a domain for phonological processes both in combination with the pronominal prefixes and on their own.

2 Selection of Allomorphy Puzzles

- Since going through every morpheme combination would take a lot of time (and patience), we're going to look at the most puzzling cases.
- Appendix A contains a full list of allomorphs and phonological processes required to derive surface forms.

2.1 Factual + Repetitive

- The repetitive and the future combine transparently in the sequence FUT-REP:

(7) sewakahténkion
s-wak-ahtenki-on
REP-1SGP-leave-STAT
'I had [already] left'
(Dative:4053)

(8) én:keke'
en-k-k-'
FUT-1SGA-eat-PUNC
'I will eat it'
(Dative:4698)

(9) enskahtén:ti
en-s-k-ahtenti
FUT-REP-1SGA-leave
'I'll go home'
(Dative:4515)

- With the factual this order is seemingly reversed:

(10) sakhiá:ton'
s-a-k-hiaton-'
REP?-FACT?-1SGA-write-PUNC
'I wrote again' (Dative:3422)

(11) sakakia'tawi'tshera'níkhon'
s-a-k-akia'tawi'tseranikhon-'
REP?-FACT?-1SGA-sew.shirt-PUNC
'I sewed the shirt again' (Dative:4014)

- Suggests that the modal prefix can appear in multiple "slots" in the template.
- However, inwardly-conditioned allomorphy is reduced:

(12) sakhiá:ton'
s-a-k-hiaton-'
REP?-FACT?-1SGA-write-PUNC
'I wrote again' (Dative:3422)

(13) wa'khiá:ton'
wa'-k-hiaton-'
FACT-1SGA-write-PUNC
'I wrote [it]' (Dative:4124)

- **Proposal:** the sequence *sa-* cannot be broken down, and actually represents a fusional form FACT.REP.
- Further puzzle: a preceding prefix causes a vowel *-u-* to appear:

(14) tonsaionhséntho'
t-on-sa-ion-ahsentho-'
DUP-?-REP.FACT-FI.A-CRY-PUNC
'[It] cried again' (Dative:4520)

(15) ionsakheiatewennáta'ahse'
i-on-sa-khei-atwennata'ahs-'
TRANS-?-REP.FACT-1SG>FI-call-PUNC
'[...] I called her back' (Dative:4488)

- **Proposal:** this vowel is part of the FACT.REP form which surfaces when there is material preceding it.
- This type of allomorphy is clearly attested with the 2SG>1SG pronominal prefix series (Martin, 2023; McDonald, 2023b):

(16) takhró:ris
tak-hrori-s
2SG>1SG-tell-HAB
'You tell me' (Martin, 2023:66)

(17) iah tehsekhó:ris
iah te-hsk-hrori-s
NEG NEG-2SG>1SG-tell-HAB
'You don't tell me' (Martin, 2023:66)

- Summary of allomorphs:

Morpheme(s)	Preceding Material?	
	No	Yes
REP.FACT	<i>sa-</i>	<i>-onsa-</i>

Table 2: Repetitive-Factual Allomorphs

- Benefits:
 1. "Slots" do not swap depending on the morpheme.
 2. Accounts for the reduction of allomorphic variation in the presence of the repetitive.
 3. Accounts for the presence of *-u-* being conditioned on the presence of the specific combination of factual and repetitive.

2.2 Factual + Duplicative

- The duplicative combines with the optative and future modal prefixes in the sequence DUP-MODAL:

(18) tahotèn:tshon
t-aa-ro-tenhsth-on
DUP-OPT-MSGP-win-STAT
'[...] he should have won' (Dative:4760)

(19) ténhsta'ne'
t-en-hs-t-a-'n-'
DUP-FUT-2SGA-stand-JR-INCH-PUNC
'You will stand' (Dative:1603)

- Seemingly reversed with the factual:

(20) Owirà:'a wa'tionhsénhto'.
 o-wira-'a wa'?'-t?-i-onhsenhto-'
 N.A-baby-DIM FACT?-DUP?-FL.A-CRY-PUNC
 'A baby cried.' (Dative:4519)

- Again, causes problems for the template.
- Additionally, different patterns of phonologically-conditioned allomorphy:

(21) a. wetewahní:non'
 we-twa-hninon-'
 FACT-1INCL.PLA-buy-PUNC (Da-
 tive:4438)
 b. wa'tkatónhewe'
 wa'?'-t?-k-atonhew-'
 FACT?-DUP?-1SGA-sweep-PUNC
 (Dative:4512)

(22) a. teseneriahsharíhtha'
 te-sni-eriahshariht-ha'
 DUP-2DUA-break.a.heart-HAB (Da-
 tive:2622)
 b. wa'tisahén:rehte'
 wa'?'-ti?-sa-henreht-'
 FACT?-DUP?-2SGP-scream-PUNC
 (Martin, 2023:85)

- **Proposal:** the sequence *wa't(i)-* cannot be broken down, and represents a fusional form FACT.DUP.
- Summary of allomorphs:

Morpheme(s)	Following Segment	
	{/s/,/t/}	Elsewhere
FACT.DUP	<i>wa'ti-</i>	<i>wa't-</i>

Table 3: Factual-Duplicative Allomorphs

- Note the lack of final *e-* in the fused form.
- Provides an account for an old puzzle:

"In addition, the *e* of several pronominal prefix and prenominal prefix alternants such as the dualic *t-/te-* [...], although it is not clear whether the *e* of these alternants is actually epenthetic.

For example, the *e* of the dualic alternant *te-* occurs before a consonant cluster in the form *wa'tekté:ni'* 'I changed it' (*wa'-tek-teny-*, FACT-DU-IA-change-PUNC)[...]. However, this environment does not describe completely the occurrence of *e* in these prefixes. On the one hand, the *e* can break up sequences of consonants that are permitted elsewhere. Thus, the dualic *te-* always occurs word-initially, even before single consonants, e.g., *tekaré:rens* 'I race' (*te-k-areren-s*, DU-1A-race-HAB), and it occurs before a cluster with initial *h* in *wa'tehskténion'* 'you change it for, on me' (*wa'-te-hsk-teny-on-*, FACT-DU-2/I-change-BEN-PUNC)." (Michelson, 1988:135)

- In short, the duplicative seems to have an epenthetic *-e-* only in certain cases.
- This analysis describes the distribution of these cases: epenthetic *e* can only surface with the fusional form *wa't-*.

2.3 Duplicative and Outer Prefixes

- The duplicative surfaces as *te-* in isolation:

(23) Tehniiáhse tehniksà:'a Mary wa'thatihthá:ren'
te-hni-iahse **te-hni-ksa-'a** Mary wa't-rati-htharen'
 DUP-MDU A-live.together DUP-MDU A-child-DIM Mary FACT.DUP-MPLA-talk-PUC
 'Two boys talked to Mary' (Dative:4522)

- The addition of a preceding prefix causes the sequence *-a'* to be inserted:

(24) sha'teharáhtatskwé' (25) na'teiri'tsowá:nens
 sh-**a'**-te-ra-arahtat-s-kw'
 COIN-?-DUP-MSG A-run-HAB-R.PST n-**a'**-te-ie-ri'tsi-owanen-s
 '[...] when he was running [often]'
 (Dative:4598) PART-?-DUP-FL.A-lip-big-HAB
 '[...] of her big lips' (Dative:970)

- Proposal:** *-a'* is part of the duplicative (Diaz, Koenig, and Michelson, 2019).
- Diaz, Koenig, and Michelson, 2019 analyze the trigger for this allomorph as the following set of prefixes:

(26) peripheral={*coincident, partitive, negative, contrastive, translocative, factual*}

- Having accounted for the factual in Section 2.2, the remaining prefixes correspond exactly to those that can occur before the duplicative as laid out in Table 1.
- Proposal:** the duplicative has the allomorph *-a'te-*, which is triggered when there is preceding material.
- Summary of allomorphs:

Morpheme(s)	Preceding Material?	
	No	Yes
DUP	<i>te-</i>	<i>-a'te-</i>

Table 4: Duplicative Allomorphs

- Notice the similarity FACT.DUP forms in Table 3.
- Since allomorphs with initial *w-* lose that *w* when there is preceding material, we can find some striking "minimal" pairs:

(27) ia'tekaráhtats (28) ia'tkaráhtate'
 i-a'te-k-arahtat-s i-a't-k-arahtat-'
 TRANS-DUP-1SG A-run-HAB TRANS-FACT.DUP-1SG A-run-PUNC
 'I run towards there' (Martin, 2023:151) 'I ran towards there' (Martin, 2023:151)

- (27) has a duplicative, and (28) has both a factual and a duplicative.

- The only local difference is the presence of the *e*.⁶
- This alternation is confirmed by the aspect: (28) is in the punctual.

2.4 The Contrastive and the Negative, featuring the Translocative

- Many different proposals about the nature of the contrastive and its relationship to the negative (c.f. Bonvillain, 1973; Brinklow et al., 2024; Diaz, Koenig, and Michelson, 2019).
- **Proposal:** the contrastive has the form *thi-* before consonants and *th-* before vowels.
- **Proposal:** the negation prefix has the form *te-* before consonants and *th-* before vowels.
- Summary of allomorphs:

Morpheme(s)	Following Segment	
	V	C
NEG	<i>th-</i>	<i>te-</i>
CONTR	<i>th-</i>	<i>thi-</i>

Table 5: Contrastive and Negative Allomorphs

- As a result, the contrastive and negative do not contrast before vowels.
- Syntactic diagnostic: the negative always occurs with a negation particle, most commonly *iah* (Katya Morgunova, p.c.).
- Puzzle with the translocative:

(29) *iah tho khiewaké:non*
iah tho th-ie-wak-e-n-on
 NEG there NEG-TRANS-1SGP-go-INCH?-STAT
 '[...] I didn't go there' (Dative:4080)

- Two options: (i) this analysis is wrong, or (ii) the translocative starts with a vowel.
- **Proposal:** all forms of the translocative underlyingly begin with the vowel /i/, not the consonant /j/.
- Further evidence: the coincident and partitive also have different forms before consonants and vowels:

(30) a. *shiki:teron*
shi-k-i'tron
 COIN-1SGA-reside (Dative:4473)
 b. *sha'tehnihnén:ies*
sh-a'te-hni-hneni-es
 COIN-DUP-MDUA-be.tall-HAB (Da-
 tive:4971)

(31) a. *niió:re'*
ni-io-re'
 PART-N.P-be.far.STAT (Dative:116)
 b. *na'tkahshén:then'*
n-a't-k-ahshenthen-'
 PART-FACT.DUP-1SGA-cry-PUNC
 (Dative:4288)

⁶Note that this means that in cases where epenthesis would be triggered between the duplicative and the pre-pronominal prefix, the prefixes of the two forms would be indistinguishable.

- The translocative always selects for the vowel forms:⁷

(32) shiahà:rawe'
sh-iaha'-ra-w-'
 COIN-TRANS.FACT-MSGA-arrive-PUNC
 '[...] when he arrived' (Dative:4053)

(33) nia'teka'seréhtake
n-i-a'te-ka-e'sreht-ake
 PART-TRANS-DUP-N.A-car-measure
 'All kinds of cars' (Dative:4575)

- We can analyze the surface forms as resulting from glide formation:

(34) NEG-TRANS-... → NEG-/ie/-... → /th/-/ie/-... → /thie/... $\xrightarrow{\text{Glide Formation}}$ /thje/...

- This is in line with a modular theory of linguistics, where allomorph selection precedes phonology.
- Such effects are also visible elsewhere in the language:

(35) wetewahní:non'
we-twa-hninon-'
 FACT-1INCL.PLA-buy-PUNC (Da-
 tive:4438)

(36) wekià:iako
we-ti-ahi-a-ko
 FACT-1INCL.DUA-fruit-JR-pick[PUNC]
 (Dative:4954)

3 Theoretical Implications

3.1 Fusion Interactions

- In this analysis, I proposed fusion in the configurations DUP-FACT and FACT-REP.
- What about DUP-FACT-REP?

(37) Owirà:'a tonaionhséntho'
 o-wira-'a t-**onsa**-ion-ahsenthó-'
 NP-baby-DIM DUP-REP.FACT-FL.A-CRY-PUNC
 'A baby cried again [...]' (Dative:4520)

- REP.FACT "blocks" FACT.DUP: we don't get **wa'titsionhséntho'*.
- Suggests that fusion begins closest to the root and proceeds outwards.
- In Distributed Morphology, Fusion is usually stipulated as a separate operation that occurs prior to Vocabulary Insertion (Halle and Marantz, 1994).
- However, if Fusion and Vocabulary Insertion proceed in the same direction, that architecture does not capture this generalization.

⁷In a footnote, Diaz, Koenig, and Michelson, 2019 also note the problems the translocative causes with an analysis of phonologically-conditioned allomorphy: "It is tempting to analyze the distribution of the allomorphs with and without *i* as phonological: allomorphs with the vowel occur before consonants, and allomorphs without the vowel occur before vowels. However both allomorphs occur before a following *y*. Forms with *i* occur before pronominal prefixes that begin in *y* while forms without *i* occur before the *y* of the translocative prepronominal prefix."

- Supportive of architectures that unify Fusion with VI (such as Haugen and Siddiqi, 2016).⁸
- Regardless of implementation, the following generalization should be explored:
 - (38) **Hypothesis:** Given a configuration of morphemes $C - B - A - \dots - \surd$, where fusion is available for sequences $C - B$ and $B - A$, the fusion of $B - A$ will bleed the fusion of $C - B$.

3.2 Patterns of Allomorphy

- Pre-pronominal prefix allomorphy: **inward-facing** phonology, **outward-facing** morpheme presence.
- Pronominal prefix allomorphy: **inward-facing** phonology and lexical items, **outward-facing** morpheme presence (Martin, 2023).
- Derivation and aspect suffix allomorphy: **inward-facing** morphological class.
- Prefix and suffix allomorphy is totally disjoint, patterns to a certain degree with phonological and syntactic domains:

	Pre-Pronominal Prefixes	Pron. Prefixes + Reflexives		Verb Stem ⁹
Phonology	$a \rightarrow e / _ \{s,t\}$	awa \rightarrow on ¹⁰		Joiner Insertion
Allomorphy		Inward: Phonology Outward: Preceding morpheme	Inward: Lexical ¹¹	Inward: Morph. Class
Morphosyntax		Clitics?	Agr. Clitics ¹²	Voice+v ⁰ Phase?

Table 6: Characteristics of Different Subword Domains

- **Question:** do we expect patterns in allomorphy conditioning to correlate with phonological and morphosyntactic domains?

3.3 Outward-Conditioned Allomorphy

- Analysis relies on a particular pattern of allomorphy: the presence of a preceding morpheme is the trigger.
- Well-supported by suppletive *tak-/-hsk-* case, can be extended to others.
- This type of allomorphic conditioning is not mentioned in the literature on allomorphy that I've surveyed.
- **Question:** is this type of allomorphy attested in other languages?

⁸On the other hand, such architectures predict the existence of phonologically-conditioned fusion, where the presence of fusion is conditioned by phonological material that has already been inserted in the same phase. No such cases are yet visible in the pre-pronominal prefixes.

⁹The Northern Iroquoian verb stem is typically defined as including reflexives/semi-reflexives, incorporated nouns, the verb root, and derivational suffixes (Coon, 2023; Michelson, 1988). However, based on the phonological and allomorphic patterns listed, I group the reflexives and semi-reflexives with the pronominal prefixes. I re-use the term "verb stem" for convenience and because roots + derivational affixes still qualify as a stem.

¹⁰(Michelson, 1988:39)

¹¹(Martin, 2023:81; Michelson, 1988:152)

¹²(Coon, 2023)

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A Allomorphs and Relevant Phonological Processes

A.1 Pre-Pronominal Prefix Allomorphs

These allomorphs are divided into tables by templatic position slot, starting with the innermost. Fusional allomorphs are grouped with their innermost component. Allomorphs are conditioned inward by phonology (segments, occasionally prosody) and outwards by the presence of a preceding morpheme.

Morpheme(s)	Allomorph	Inward Conditioning	Preceding Morpheme?
REP	/tsi/	{/s/,/t/}	
"	/s/		
FACT-REP	/usa/		Yes
"	/sa/		
OPT-REP	/ausa/		
CIS	/ti/	{/s/,/t/}	
"	/t/		
FACT-CIS	/uta/		Yes
"	/ta/		
OPT-CIS	/auta/		

Table 7: Allomorphs for the Repetitive, Cislocative, and their fusions

Morpheme(s)	Allomorph	Inward Conditioning	Preceding Morpheme?
FACT	/we/	{/s/,/t/}	
"	/e/	{/s/,/t/}	Yes
"	/wa/	{/w/}	
"	/a/	{/w/}	Yes
"	/waʔ/		
"	/aʔ/		Yes
DUP-FACT	/waʔti/	{/s/,/t/}	
"	/aʔti/	{/s/,/t/}	Yes
"	/waʔt/		
"	/aʔt/		Yes
TRANS-FACT (Kahnawà:ke)	/iaʔ/	($\mu\mu$)	
"	/iaha/		
OPT	/aa/		
FUT	/ Δ /		

Table 8: Allomorphs for the Factual, Optative, Future, and their fusions

Morpheme(s)	Allomorph	Inward Conditioning	Preceding Morpheme?
DUP	/t/	V	
"	/te/		
"	/aʔt/	V	Yes
"	/aʔte/		Yes

Table 9: Allomorphs for the Duplicative

Morpheme(s)	Allomorph	Inward Conditioning	Preceding Morpheme?
TRANS	/i/	V	
"	/ie/		
TRANS (Ahkwesáhsne)	/iVh/	(μ)	

Table 10: Allomorphs for the Translocative

Morpheme(s)	Allomorph	Inward Conditioning	Preceding Morpheme?
PART	/n/	V	
"	/ni/		
COIN	/sh/	V	
"	/shi/		
NEG	/th/	V	
"	/te/		
CONTR	/th/	V	
"	/thi/		

Table 11: Allomorphs for the Outer Prefixes

A.2 Relevant Phonological Processes

A.2.1 Pre-Pronominal Prefixes Only

- A-Raising:

$$/a/ \rightarrow [e]/_{-}\{/s/,/t/\}$$

- Initial W Dissimilation?:

$$/w/ \rightarrow \emptyset/\#_{-}\{/o/,/u/\}$$

A.2.2 Pre-Pronominal and Pronominal Prefixes

- The No-Wawa Rule (Michelson, 1988):

$$/awa/ \rightarrow [u]$$

- H-Fortition?:

$$/h/ \rightarrow [r]/\#_{-}$$

A.2.3 Word-Level

- Glide Formation:

$$/i/ \rightarrow [j]/_{-}V$$

- Laryngeal Simplification (Michelson, 1988):

$$/?/ \rightarrow \emptyset/_/h/$$

- S-affrication:

$$/s/ \rightarrow [ts]/_{-}/j/$$

- Laryngeal Lengthening (Michelson, 1988)