Special characters: â ê É á é í ó ė š

Variation in prosodic structure across Algonquian

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We report on the motivation, methods, and preliminary findings of a new Algonquian Prosodic Structure Working group (established spring 2022).[i] This group includes researchers of five Algonquian languages—Arapaho, Blackfoot, Cheyenne, Ojibwe, and Plains Cree—with plans to expand to other languages. Our current focus compares phonological generalizations at morpheme edges in order to determine the prosodic structure of each language. By considering related languages with similar morphosyntax, our eventual aim is to determine how the grammar of prosodic structure may vary and how it is constrained.

Our preliminary results show that each of the five languages exhibits different phonological generalizations at the preverb-stem versus initial-final boundaries, even though the specific phonological processes vary across the languages. For languages where phonological descriptions exist, our findings often confirm those descriptions, but sometimes raise possible alternative morphophonological analyses. For other languages our findings are novel. We argue there are at least two possible prosodic structures within Algonquian: preverbs may be parsed as separate prosodic constituents or as prosodic adjuncts.

In the next section, we motivate our research project and broader goals. After this, we explain our assumptions about prosodic structure and how this structure relates to the Algonquian template. We then detail our methods of investigation and preliminary results before concluding.

MOTIVATING FACTORS

Why a Within-Family Approach?

The phonology of utterances is widely recognized as having a relationship to morphosyntactic structure, showing isomorphism in some cases and mismatches in others (cf. Kaisse 1985; Nespor and Vogel 2007 [1986]). Early work on prosodic phonology relied on language typology to illuminate points of parametric variation in grammar (Peperkamp 1997; Nespor and Vogel 2007 [1986]; Selkirk 1986, 1996). However, it is difficult to determine whether variation in prosodic structure across different languages derives from differences in syntax or differences in the phonological grammar. Our approach is to study languages within a single language family with similar morphosyntactic templates. This largely eliminates the variable of syntax, and differences in prosodic structure are thus likely derived from different phonological grammars.

Why Algonquian Languages?

Over the last decade there has been a renewed interest in prosodic structure and how it relates to syntactic structure (for example, Match Theory in Selkirk 2011 and overviews of the field in Bennett and Elfner 2019 and Elfner 2018). Recent work has begun to focus on polysynthetic languages, because exhibit many properties which are useful for testing various theories of syntax-prosody correspondence at the word and phrase level (e.g., Bogomolets 2020, 2021; Miller 2018; Miller and Sande 2021; Weber 2020, 2022; and case studies in Bogomolets and van der Hulst *to appear*). Relative to Algonquian languages, words contain extreme phonological length and morphosyntactic complexity, extensive agglutinative morphology, free word order, multiple "lexical" morphemes or roots within a morphological word, and head-marking (see Baker 1996; Mattissen 2004; Nichols 1986), as well as "word"-internal syntactic adjuncts (Déchaine and Weber 2018; Fenger 2020; Mathieu et al. 2017; Piggott and Travis 2013; Weber 2022).

Why Now?

A comparative project of this size was not possible until now, because many Algonquian languages only recently received rich documentation, especially thanks to computational tools. This documentation includes lexical resources and speech corpora we can use to probe for prosodic structure. Lexical resources are excellent for determining segmental alternations across paradigms but often include no information about suprasegmentals, such as stress, pitch, and intonation. Speech corpora may not include systematic data which could be used to build paradigms, but contain rich information on suprasegmental properties.

Relating Prosodic and Morphosyntactic Structure

In this section we discuss our assumptions about prosodic structure, the basic morphosyntactic structure of Algonquian languages, and our hypotheses about how the two correspond.

Prosodic Structure

Linguistic utterances consist of hierarchical sets of units. These units organize into hierarchical prosodic structures which derive from—but are not necessarily isomorphic with—syntax (Downing 1999; Hayes 1989; Hall 1999; Inkelas 1990; Itô and Mester 2012; Kaisse 1985; Kiparsky 1982; Nespor and Vogel 2007 [1986]; Pierrehumbert and Beckman 1988; Selkirk 1984, 1986, 2011). We analyze the prosodic structure of the Algonquian verbal complex in terms of two "word"-level prosodic categories of the Prosodic Hierarchy: Prosodic Word (PWd) and Prosodic Stem (PStem).

These prosodic units define the domains for phonological processes and generalizations, including segmental alternations and prosodic information like stress and phrasal pitch contours. In our current work, we focus on segmental alternations at morpheme edges, and use these to infer the presence of prosodic boundaries and constituents, as detailed in the Methods section. The

prosodic constituents correspond to spans of positions on the complex Algonquian verbal template, to which we turn next.

The Algonquian Template

A simplified template for verbal complexes is given in (1) and exemplified with Plains Cree words (Wolvengrey 2001; see Bloomfield 1946 and Goddard 1990 for the Algonquian template). The stem (in brackets) is prototypically multimorphemic, with morphemes named by their position within the stem (e.g. "initial" and "final"). The initial is minimally and prototypically a root, while the final is a verbalizing *v* head (e.g. Branigan et al. 2005; Brittain 2003; Bruening 2001:122; Hirose 2003; Mathieu 2007; Quinn 2006; Slavin 2012). "Preverbs" are a heterogeneous class of grammatical and lexical morphemes. The stem and preverbs may be preceded and followed by inflectional affixes marking person and other grammatical categories. This template abstracts away from more complex details; each position may itself be morphologically complex, and there may be other positions not shown here, such as prefinals, postradicals, etc.

(1) Plains Cree (Arppe et al. 2022; Wolvengrey 2001)

person–	preverbs–	[initial	–final]$_{stem}$	–suffixes	
		pim	–ohtê	–w	'S/he walks along.'
	sâpo–	pim	–ohtê	–w	'S/he walks past.'
ki–	sâpo–	pim	–ohtâ	–n	'You walk past.'

An open question is how these position classes map onto different prosodic constituents, to which we turn next.

Relation Between Prosodic Structure and the Template

Previous work on Algonquian prosodic structure has focused on mapping syntactic analyses to prosodic structure, with less focus on whether phonological processes correlate to that structure

(Branigan et al. 2005; Mathieu et al. 2017; Piggott and Travis 2013; Russell 1999; Russell and Reinholtz 1997). In contrast, we focus on deriving prosodic structure in a "bottom up" fashion based on phonological generalizations that hold across positions in the morphosyntactic template. A key question is whether such templates constitute a single undifferentiated structure (H1), or whether they contain a single core structure with adjuncts attached (H2), or whether they contain multiple units (H3). These three hypotheses are shown in (2), although they do not exhaust all possible hypotheses about how the morphological template could be parsed into prosodic structure.

(2) Hypotheses about prosodic structure relative to the Algonquian template

H1 ((prefixes– preverb– initial –final –suffixes)$_{\text{PStem}}$)$_{\text{PWd}}$

H2 (prefixes– preverb– (initial –final –suffixes)$_{\text{PStem}}$)$_{\text{PWd}}$

H3 (prefixes– (preverb–)$_{\text{PStem}}$(initial –final –suffixes)$_{\text{PStem}}$)$_{\text{PWd}}$

To probe for prosodic structure, we consider domain-delimited phonological generalizations the templatic positions. We assume that if two domains—i.e. two strings of templatic positions—exhibit the same phonological generalizations, then both domains are parsed into prosodic structure in the same way. In this way we determine a set of prosodic structures for each language which are compatible with the generalizations. The resulting structures can then be compared across languages.

METHODS

This section outlines our process of annotating textual resources in order to determine phonological generalizations at morpheme boundaries. We describe in detail how we map those generalizations to a prosodic structure, using an illustration from Cheyenne.

Resources

Our resources include textual and audio data structures. The textual data comes primarily from

dictionaries, grammars, and annotated corpora (Blackfoot: Frantz and Russell 2017; Genee and Junker 2018; Weber et al. 2023; Cheyenne: Fisher et al. 2006; Arapaho: Cowell and Moss 2011; Salzmann 2012; Plains Cree: Wolvengrey 2001; https://itwewina.altlab.app [Arppe et al. 2022]; https://korp.altlab.app [Arppe et al. 2020]; Ojibwe: Ojibwe People's Dictionary 2022).

We extracted fully inflected words into spreadsheets and added a surface morphemic analysis. We then annotated each word with unique underlying forms (URs) for each morpheme. These URs were frequently created by us during the annotation process, although some lexical resources already included morphemic analyses which we could use or modify. The URs allowed us to sort inflected words into derivational paradigms of preverbs, initials, and finals "on the fly". In this way we were able to easily see morphophonological alternations, from which we posit phonological generalizations regarding different templatic positions. An excerpt of the spreadsheet for Ojibwe is shown in Table 1, sorted by the "Final UR" column to sort words with the final *-abi* 's/he sits, stays' together.[ii] The fifth column is a surface analysis of the orthographic word into morphemes. The examples in this column show that the final is *-abi* after consonants, but *-bi* after long vowels. (Ojibwe <e> and doubled letters are long vowels.) Spreadsheets like this allow us to see that there is an alternation *-abi* ~ *-bi,* to posit an underlying form /-abi/ 'sit, stay' and a deletion rule that we return to in our results section. For Ojibwe, this frequently confirms the UR in the Ojibwe People's Dictionary (2022), but for some of the other languages these analyses are novel.

INITIAL UR	INITIAL GLOSS	FINAL UR	FINAL GLOSS	SURFACE ANALYSIS	GLOSS
aasw-	leaning against	-abi	s/he sits, stays	aasw-abi	s/he sits leaning against something
ap-	onto or against something	-abi	s/he sits, stays	ap-abi	s/he sits on something
deb-	enough, adequate, reach	-abi	s/he sits, stays	deb-abi	s/he has enough room to sit

apiit-	to a certain extent, degree, rate, or speed	-abi	s/he sits, stays	apiit-abi	s/he comes up to a certain height when seated
zhig-	urinate	-abi	s/he sits, stays	zhig-abi	s/he urinates sitting
anwe-	rest	-abi	s/he sits, stays	anwe-bi	s/he rests
ishkwe-	at the end, last	-abi	s/he sits, stays	ishkwe-bi	s/he sits at the end
giizhoo-	warm	-abi	s/he sits, stays	giizhoo-bi	s/he sits in a warm place, lives in a warm house

TABLE 1: Partial annotated spreadsheet for Ojibwe

One potential confound is that the textual resources are written in various vernacular orthographies, which tend to be conservative and obscure details of pronunciation such as speaker variation or surface-level allophony. Orthographic conventions also tend to be based on implicit knowledge of the Algonquian position classes (e.g. in some orthographies a hyphen is used to demarcate preverbs, which suggests particular phonological generalizations that may not be accurate or well-described). To address this, in the future we plan to create phonetic transcriptions for analysis whenever the lexical resources include systematic audio files. Systematic paradigms for some alternations may only be available by working with speakers to record and transcribe forms. However, at the present time we have only worked with written resources, and the process described in the following section reflects these kinds of data sources.

Process

We orient all data generalizations to the traditional Algonquian morphological template and position classes (Bloomfield 1946; Goddard 1990). We define prosodic constituents on the template using standard methods (Hall 1999; Nespor and Vogel 2007 [1986]) by determining phonological generalizations across spans or edges of positions (cf. Tallman 2021). At this stage of our project we restrict ourselves to morphemes in the ‘preverb’ and ‘initial’ positions. The

reason is that this allows us to diagnose the presence of prosodic boundaries between the preverb and the stem, which is what distinguishes the three hypotheses in (2). Preverbs are frequently described as separate phonological domains within the Algonquian word (Bloomfield 1946:103; Goddard 1990:478), meaning that this boundary is likely to show unique phonological characteristics relative to the initial position in most languages. However, the phonological generalizations which underlie these claims are often left inexplicit or not laid out systematically, which is a gap our research intends to fill.

Many roots freely occur in preverb and initial positions, allowing us to compare morphophonological alternations and the generalizations that drive these alternations in both positions. As a concrete example, consider the root *ame-* 'along' in Cheyenne, (3), which can occur as an initial or a preverb.[iii] (Examples are given in Cheyenne orthography, which is broadly phonemic. Note that <e> is typically pronounced as a high front vowel, though occasionally as a mid front vowel. The overdot represents voicelessness.)

(3) Cheyenne (Fisher et al. 2006)

prefix–	preverbs–	[initial	–final]$_{stem}$	–suffixes	Translation
É–		[**ame**	–méohe]		'He's running.'
É–		[sóhp	–a'xe]		'He took off.'
É–	**amė**–	[sóhp	–a'xe]		'He ran by.'

In the initial position, (4), the root is *ame-* before consonants and *am-* before vowels. In the preverb position, (5), the root is *ame-* regardless of the following segments.

(4) Cheyenne root *am-* ~ *ame-* 'along' in initial position

É-[**ame**-tó'hóna]. 'He's swimming by.'

É-[**am**-évone]. 'The sound went by.'

(5) Cheyenne root *ame-* ‘along’ in preverb position

É-**ame-**[táhoo’e]. ‘He’s riding along.’

É-**ame**-[é’kotsen]-óho. ‘He’s got his arm around her as he walks along.’

In the initial position, there is an <e> ~ ∅ alternation at the right edge of this root which avoids consonant or vowel sequences across the initial-final morpheme boundary. In the preverb position, this root ends invariably in <e>. To our knowledge, these morphophonological alternations have not been laid out systematically, as in (4) and (5), nor described phonologically in this way for Cheyenne.

We conclude from this that there is a prosodic boundary at the right edge of preverbs with a phonotactic restriction against <m>. This explains why *ame-* ‘along’ never alternates with *am-* in this position. There is also some prosodic domain which includes the initial and final positions (and possibly more) where consonant and vowel sequences are avoided across morpheme boundaries. This partial prosodic structure is shown in (6), with the known prosodic boundaries shown with parentheses. Because this structure is based on a single root alternation, we abstract away from the question of what to label the prosodic domains in (6). Even so, the right edge boundary after the preverb means that this partial prosodic structure is only compatible with H3 from (2), or something like it.

(6) Partial prosodic structure in Cheyenne

prefixes– preverb–) (initial –final –suffixes

By considering a number of different roots which exhibit different processes, we are able to create more accurate phonological generalizations and to build up a fuller picture of the prosodic structure.

RESULTS

In this section we present preliminary findings using the methods described above, with a focus on phonological generalizations at the edges of the preverb and initial positions. We show that despite their similar morphosyntax, these languages exhibit variation in terms of phonological evidence and prosodic structure.

Generalizations about initials

All five languages exhibit a set of alternations at the right edge of initials. These are not yet fully enumerated, but frequently involve consonant and vowel alternations with zero, some of which were described in earlier work (e.g., Bloomfield 1946:90–93). Most languages are said to have some form of vowel epenthesis between consonants, though we have found that the alternations in some languages are compatible with alternative analyses. We focus here on Ojibwe, since the environments for epenthesis and palatalization are well-described (Kaye and Piggott 1973; Truitner and Dunnigan 1975).

As shown in (7), some finals begin in a short vowel after an initial that ends in a consonant, such as *deb-* 'enough', but that vowel deletes after an initial ending in a long vowel, such as *giizhoo-* 'warm'.[iv] Interestingly, some finals with an <i> ~ ∅ alternation are analyzed as beginning in a short vowel, such as *-izi* '(anim.) be', while others begin in a consonant, such as *-shin* 'lie', and the <i> is epenthesized between consonants. On its own, the <i> ~ ∅ alternation in (7) cannot explain why *-izi* '(anim.) be' is analyzed as beginning in a vowel, and *-shin* is analyzed as beginning in a consonant.

(7) Ojibwe finals beginning in short vowels (Ojibwe People's Dictionary 2022)

/-abi/	deb-**a**bi	'S/he has enough room to sit.'	giizhoo-bi	'S/he sits in a warm place.'
/-izi/	deb-**i**zi	'S/he is satisfied.'	gizhoo-zi	'S/he is warm [person].'
/-shin/	deb-**i**shin	'S/he, it (anim.) lies fitting in.'	gizhoo-shin	'S/he lies in warmth.'

There is another correlate of epenthesis, which is palatalization of a preceding <t>. In (8), the initial *apiit-* 'so much' occurs with <t> before underlying vowels, but with a <ch> before the epenthetic <i>. Our point here is that the palatalization data is also compatible with the opposite analysis, where palatalization occurs before underlying vowels but not epenthetic vowels. In fact, this alternative analysis would unite the behavior of underlying short /i/ and long /iː/, because palatalization also occurs before long /iː/, as in *apiich-ii* 's/he does something at a certain rate or speed'. We believe that a systematic consideration of morpheme alternations such as these may bring other traditional analyses into question.

(8) Ojibwe finals and palatalization (Ojibwe People's Dictionary 2022)

/-abi/	apii**t**-abi	'S/he comes up to a certain height when seated.'
/-izi/	apii**t**-izi	'S/he is a certain age.'
/-shin/	apii**ch**-ishin	'S/he, it (anim.) lies so thick.'

Some languages also exhibit alternations at the left edge of initials. Blackfoot initials undergo alternations at the left edge when they occur after a prefix, regardless of whether it ends in a consonant or a vowel. Restricting the discussion to initials that begin in a consonant followed by a short vowel: there is [i]-epenthesis before initials that begin in an obstruent, (9), and there is nasal deletion for initials that begin in nasals, (10).[v]

(9) Blackfoot initials beginning in obstruents (Frantz and Russell 2017:91)

	prefix–	preverbs–	[initial	–final]$_{stem}$	–suffixes	Translation	
a.			**pon**	–ihtáá	–t	'Pay!'	Left edge
b.		áaks–	**ipon**	–ihtaa	–wa	'She will pay.'	After C
		áká–	**ípon**	–ihtsi	–wa	'He is dead.'	After V

(10) Blackfoot initials beginning in nasals (Frantz and Russell 2017:182–183)

	prefix–	preverbs–	[initial –final]$_{stem}$	–suffixes	Translation	
a.			**mokáki**	–t!	‘Be smart!’	Left edge
b.		áak–	**okaki**	–wa	‘She will be smart.’	After C
	n–	iká–	**ókaki** –ssko	–a–wa	‘I have “wised him up”.’	After V

The alternations in (9) and (10) are summarized in (11). Crucially, there is a separate set of roots which begin in a vowel in all environments, and there are no roots which begin in an obstruent or nasal in all environments, suggesting the roots in (11) begin in an underlying consonant. Thus, there is a conspiracy of processes which avoids [+cons] segments at the juncture between a prefix/preverb and an initial.

(11) Blackfoot root alternations in initial position

UR	Left edge	After C	=	After V	Gloss
/pon-/	pon-	**i**pon-		**i**pon-	‘cease’
/mokaki-/	**m**okaki-	okaki-		okaki-	‘bring’
(none)	*p, *m	*p, *m		*p, *m	

Generalizations about preverbs

Four of the five languages (Cheyenne, Arapaho, Plains Cree, Ojibwe, but not Blackfoot) have restrictions at the right edge of preverbs. Cheyenne allows preverbs to end in a vowel, (12a), or a glottal fricative <h> or stop <’>, (12b). Arapaho limits endings to a vowel or a glottal fricative <h>, but not the glottal stop <’>, and Plains Cree and Ojibwe require preverbs to end in a vowel.

(12) a. Cheyenne preverbs ending in vowels

év**a**-	‘back, return’	he’an**á**-	‘easy’

am**e**-	‘along’	he’n**é**-	‘spread out, distributed’
hó’k**o**-	‘must’	màs**ó**-	‘suddenly, in a group’

b. Cheyenne preverbs ending in glottal consonants

mė**h**-	‘could have, would have’
tšėške**’**-	‘little’

This right edge restriction is enforced with active phonological processes, primarily a process that looks like phonological epenthesis. For any initial which alternates between having a right-edge consonant before vowels and a right-edge high vowel before consonants, the related preverb always ends in a final high vowel, as in (13). (For some languages, this generalization holds only at an abstract level, and later processes like coalescence or deletion obscure the preverb-final high front vowel.) Initials that end in a vowel exhibit other patterns of alternation. This suggests that roots like those in (13) end in an underlying consonant, and that a high front vowel is epenthesized at the right edge of preverbs.

(13)	Initial	Preverb	Gloss
Cheyenne	am- ~ am**e**-	am**e**-	‘along’
Arapaho	ceb-/cow-[vi] ~ ceb**i**-	ceb**i**-	‘along’
Plains Cree	pim- ~ pim**i**-	pim**i**-	‘along’
Ojibwe	bim- ~ bim**i**-	bim**i**-	‘along’
(none)	*...C- ~ …Ci-	*...C-	

Our analysis of preverb-final [i] as an epenthetic vowel contrasts with the traditional Bloomfieldian analysis, which treats this vowel as a particle-forming suffix /-i/ which attaches to roots (Bloomfield 1946:103–104,116–117). What our account adds is the observation that the

distribution of preverb-final [i] is phonological. First, it occurs after preverbs ending in a consonant (or certain non-glottal consonants in Cheyenne and Arapaho), but not preverbs ending in a vowel. Second, [i] is motivated by a phonological edge restriction: all preverbs must end in a vowel (or certain glottal consonants in Cheyenne and Arapaho). Regardless of whether the [i] is epenthetic or underlying, our argument is that the distribution of [i] provides evidence for a prosodic boundary at the right edge of preverbs in Plains Cree, Ojibwe, Cheyenne, and Arapaho.

In contrast, Blackfoot has no restrictions at the right edge of preverbs, which can end in a vowel (14a), consonant (14b), consonant cluster (14c), or geminate consonant (14d). In addition, roots have the same realization in initial and preverb positions in Blackfoot, without alternations.

(14) Blackfoot preverbs ending in…

a. Short vowels

s**a**-	‘out’
isim**i**-	‘secretly’
ka’t**o**-	‘assist’

b. Consonants

ikka**m**-	‘fast’
paahtsi**k**-	‘barely’
miista**p**-	‘away’

c. Consonant clusters

ipo**’t**-	‘reciprocal’
pi**sst**-	‘inside’
ikka**hs**-	‘humorous, funny’
ssk**a’**-	‘extremely’

d. Geminate consonants

i**ss**-	‘young, in front’
ki**pp**-	‘might’ (please)
ma**tt**-	‘again’

Within-family variation

Comparison across the five languages reveals parametric variation in prosodic structure. Our findings show that Ojibwe and Plains Cree both have phonotactic restrictions at the right edge of

preverbs. This is compatible only with H3 from (2), because only this hypothesis has a prosodic boundary at the right edge of preverbs. Under H3, each preverb is parsed as a separate prosodic domain, converging with previous research (Branigan et al. 2005; Piggott and Travis 2013; Russell 1999). The prosodic structure of Cheyenne and Arapaho is less certain at this time, though not *in*compatible with H3. Blackfoot has no restrictions at the right edge of preverbs, meaning there is no evidence for a prosodic boundary there. Blackfoot is compatible with H2, where the preverb is not parsed into a separate prosodic constituent. This kind of structure explains Blackfoot because we can say that there is a prohibition against [+cons] segments to the right of each juncture outside of the stem+suffixes domain, which forms a separate PStem and which exhibits distinct phonological processes, such as vowel epenthesis only between consonants (Weber 2020:234–259).

These two prosodic structures make different predictions regarding minimal size constraints. A prosodic constituent like the PStem may exhibit a lower bound on size (Downing 1999; Hall 1999; McCarthy and Prince 1999). Lexical preverbs which are Pstems in languages like Plains Cree and Ojibwe are minimally bimoraic. Together with the constraint against consonants at the right edge of preverbs, this means that preverbs are minimally either CVV or CVCV, (15). Blackfoot preverbs are expected to have no minimal size, because Blackfoot preverbs are not parsed to a PStem constituent. Consequently, preverbs in Blackfoot may be as small as V, CV, or VC, (16); see also Weber (2022).

(15) Minimal preverbs in Plains Cree

*V

*CV

*VC

(16) Minimal preverbs in Blackfoot

V	a-	‘IPFV’
CV	sa-	‘out’
VC	on-	‘hurry’

CVV pê- ‘hither’

CVCV pimi- ‘along’

The observations of right edge restrictions and minimal size constraints provide converging evidence that Blackfoot prosodic structure is something like H2 rather than H3 and that there is variation in prosodic structure across Algonquian.

CONCLUSION

Our findings confirm that all languages in our present study exhibit different phonological generalizations at the preverb-stem vs. initial-final boundaries. These differences encompass a range of phonological processes, including epenthesis, deletion, vowel coalescence, and more. We have reported on some of these processes, and continue our work to enumerate others. The processes may target the right edges of preverbs or initials, the left edges, or both edges within a single language.

Our findings also highlight variation in prosodic structure across the five languages. Preverbs are parsed as PStems in Plains Cree, Ojibwe, Cheyenne, and Arapaho, but not in Blackfoot. Under our analysis, the difference in prosodic structure results from different phonological grammars, rather than a difference in morphosyntax. We interpret the [i] which follows a preverb in all languages except for Blackfoot as an epenthetic vowel at the right edge of a PStem rather than a derivational morpheme /-i/ (e.g., Piggott and Travis 2013). Part of our contribution to Algonquian linguistics is to point out areas where alternative phonological analyses are available.

Finally, our research raises questions about the labels used in our prosodic structures. We have implicitly assumed that the morphological stem maps to a PStem constituent (Downing 1999), with the suffixes typically incorporated into this constituent. These PStems also have many properties typically associated with the PWd, such as minimal size restrictions and generalizations

about stress and/or syllabification. Because of this, many researchers label this stem+suffixes domain a PWd (e.g., Russell 1999 for Plains Cree). Our preliminary findings do not answer the question about labels but do show that "word"-like phonological properties in polysynthetic languages are distributed across several prosodic constituents.

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[i] The authors thank the audiences at the 54th Algonquian Conference and the 2023 LSA Annual Meeting for their comments.

[ii] The full spreadsheet includes columns for each templatic position within words, including the initial and final (shown here), multiple preverbs, and more.

[iii] We focus here on lexical preverbs and set grammatical preverbs aside for future research because they tend to exhibit a distinct set of characteristics. Frequently they occur in a fixed order at the left edge of the preverb domain and are phonologically smaller than lexical preverbs.

[iv] Ojibwe has a short <o> vowel as well, but we could not find clear examples of a final beginning in <o> after a consonant and a long vowel.

[v] There are more patterns of alternation for roots that have a long vowel in the first syllable (Weber 2020:261–262).

[vi] This Arapaho root (underlyingly /cew-/) also has vowel and consonant alternations related to a process of regressive vowel harmony (Cowell and Moss 2011:20–22). This does not affect our argument regarding epenthesis.