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Morphology in the Muskogean languages[1]

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Abstract
The indigenous languages of the Americas exemplify a number of uncommon typological patterns, especially in their morphology. Here, that rich morphology is illustrated via the Muskogean languages of the southeastern United States. Muskogean languages are agglutinative, but even more interesting and uncommon patterns emerge in an analysis of their morphology. These include subtractive morphology, suppletion, infixation, ablaut, and the use of suprasegmentals. These morphological patterns present considerable complexity. Inflected verbs in narratives and conversation often reflect more than one of the morphological processes. This morphological complexity also demonstrates characteristics of being nonlinear, of being prosodic yet not aligning with neat prosodic boundaries, of not having direct correspondence between grammatical categories and surface segments or suprasegmentals, or having more than one of those characteristics. Six of the seven Muskogean languages are still currently spoken by fluent first language speakers, and many of the tribal nations who represent these languages are involved in ongoing documentation and revitalization efforts, often in partnership with linguists. Thus, despite their highly endangered status, excellent existing documentation and new questions in research create an opportunity to collect even more intricate inflected forms that will enrich models of morphology and morphological theory while having broader impacts, like supporting tribal language revitalization.

1 | INTRODUCTION

The languages native to the Americas are noteworthy for their morphology, especially the Muskogean languages, leading to significant developments in linguistic theory. Tribes originally located in the southeastern United States spoke Muskogean languages, with some tribes forced westward due to

the Indian Removal Act of 1830. Consequently, these communities and languages now extend even further geographically west, to Texas and Oklahoma.

The language family consists of seven languages. Six still have fluent speakers: Choctaw, Chickasaw, Creek (Seminole, Muskogee), Hitchiti-Mikasuki,[2] Alabama, Koasati, and Apalachee.[3] All of the Muskogean languages are highly endangered. The relationships between these languages and others in the Southeast have been much discussed (i.e., discussions in Crawford, 1975 and Hardy & Scancarelli, 2005). General consensus holds that the closest relationships are between Choctaw and Chickasaw (sometimes termed the Western Muskogean branch), between Koasati and Alabama, Hitchiti and Mikasuki, then finally positing Creek as perhaps showing the most difference with its relatives.

Mithun (1999: 465) suggests why this family is so interesting: "[v]erb morphology is elaborate and variable across the [Muskogean] languages" and highly agglutinative in nature. The inflectional paradigm of a single agentive Creek verb, published in an appendix of Martin's (2011a) grammar, spans 12 pages (Martin, 2011a: 423–435). Muskogean verbs exhibit morphology that covers most of the range of word-building processes, including prefixing, suffixing, infixing, circumfixing, ablaut/internal changes, use of suprasegmentals, suppletion, truncation, all covered here, as well as reduplication, noun incorporation, polysynthesis, and more.

Extensive and rich documentation for these languages provides significant resources for both academic research and language revitalization. Martin (2004) and Sturtevant (2005) provide excellent historical overviews of research on Muskogean languages.[4] Of particular importance are early scholars and missionaries like Albert Gaschet, John Swanton, and Cyrus Byington, all of whom made valuable contributions. The Muskogean family was a focus of one of the many bibliographies of Native American languages compiled by the Bureau of American Ethnology's James Constantine Pilling (Pilling 1889). Notably, the late Mary Haas spent a significant portion of her early career in linguistics focused on the Muskogean language family and the Southeast more generally, making highly significant contributions to comparative and proto-Muskogean (i.e., Haas, 1938, 1940, 1941, 1947, 1949), among other areas. Comparative and historical studies of Muskogean have received considerable attention (i.e., Booker, 1977, 1980, 1981, 1993, 2005; Broadwell, 1987, 1993; Martin & Munro, 2005; Munro, 1993, 1997; Munro & Gordon, 1982). Booker (1991) is an annotated bibliography of the language family, and Martin (2011b) constitutes a more recent bibliography of Muskogean languages.

Most languages of the Muskogean family benefit in having documentation that includes one or both of a detailed dictionary and a reference grammar, with Creek (Martin & Mauldin, 2000; Martin, 2011a), Koasati (Kimball, 1991, 1994), and Chickasaw (Munro & Willmond, 1994, 2008) each having both, and Alabama (Sylestine, Hardy, & Montler, 1993) and Choctaw (Broadwell, 2006) each having one of those items. Many of these were published in the last two decades. Augmenting those is an extensive set of journal articles and book chapters, including grammar sketches of four languages (Hardy & Scancarelli, 2005).[5]

This impressive array of deeply analyzed Muskogean data has had considerable impact on linguistics. In the realm of syntactic theory, data from Choctaw have informed theories of syntactic relations (Davies, 1981, 1984b, 1986, 1998; Davies & Dubinsky, 1991; Munro & Gordon, 1982), binding (Broadwell, 1990), and lexical categories (Haag, 1996, 1997), as well as enhanced scholarly understanding of active/stative languages. Phonological theory has drawn on analyses of patterns in Muskogean languages, as exemplified by the comment of Martin and Johnson (2002: 30) regarding Creek accent as in Haas (1977a):

> [s]oon after Haas published her findings, others began to notice that level tone accent in nonfinite forms could be described insightfully as iambic stress (Halle & Vergnaud, 1987, cited in Hayes 1995, Hayes, 1985; 1995:64–67, and Jackson, 1987). In fact, data from Creek level tone accent are now commonly cited in discussions of iambic stress.

A related metrical phenomenon in the Western Muskogean languages, the so-called Rhythmic Lengthening, lengthens short vowels in even-numbered, non-final open syllables. The analysis by

Munro and Ulrich (1984) of these facts invokes metrical structure and Kiparsky's theory of Lexical Phonology (Kiparsky, 1982), and Hayes (1995) presents a detailed iambic metrical analysis of Rhythmic Lengthening in Choctaw.

Muskogean agglutinative verbs and their diverse morphological processes provide rich data sets and insights for linguistic theory. In the next sections, I focus on the morphology of the languages in this family, showing the instantiation of typologically varied word-building processes. One goal is to describe those morphological features that are typologically uncommon, while also demonstrating how Muskogean languages instantiate these features. A second goal is to show how these uncommon morphologies can interact. Because of existing analyzed data, uncommon typological patterns, and current research projects with speakers of a number of Muskogean languages, the prospect of newer and richer data sets for investigation is very likely to emerge, fueling new avenues of theoretical investigations.

2 | AFFIXATION AND AGGLUTINATIVE PROPERTIES

Affixation predominates in Muskogean verbs, whether prefixes, suffixes, infixes, or circumfixes. Overall, Muskogean nouns allow fewer categories or markers in terms of affixation, while verbs are richly inflected, marking grammatical relations, locatives, directionals, instrumentals, tense, aspect, modality, evidentiality, and mood. Verbal morphology can affect valency via causatives or applicatives (see Martin 2000, for example), and there are morphological markers of clause combining like switch reference and complementizers. The various grammatical categories contrast with a language where similar concepts are lexically realized, like English.[6]

To illustrate this, (1) shows inflected Chickasaw forms of the verb *takchi* "to tie it."[7]

(1) Chickasaw affixed verbs from paradigms of *takchi* "to tie it"

a.	ishtakchitaam	'Did you tie it[8]?'
	ish-takchi-taam	
	2SG.A-tie-Q.PST	
b.	hooibaatakchi	'they tied it with her'
	hoo-ibaa-takchi	
	3PL.A-COM-tie	
c.	hooittibaatakcha'ni	'they can/might tie it together'
	hoo-itti-ibaa-takchi-a'ni	
	3PL.A- RECP-COM-tie-POT	
d.	hashittibaatakcha'chi	'y'all are going to tie it together'
	hash-itti-ibaa-takchi-a'chi	
	2PL.A-RECP-COM-tie-INCOMPL	
e.	ishibaatakcha'ntok	'you could have tied it with her/him'
	ish-ibaa-takchi-a'ni-tok	
	2SG.A-COM-tie-POT-PST	

These examples illustrate aspects of morpheme order in the verb. Munro (2005: 139) notes that Chickasaw verb stems may combine with up to six additional elements (pronominals, modality, and tense/aspect) and even more if the verb stem includes reflexives, reciprocals (like 1c–d), or applicatives (like the comitative suffix in 1b–e). Co-occurrence restrictions between grammatical categories influence how many possible affixal combinations there are. And as Section 4 shows, Muskogean languages also display nonlinear morphophonology.

Switch-reference morphology plays a prominent role in Muskogean clausal morphology by marking whether or not subjects in subordinate clauses co-refer with the subject of the matrix verse (2a) or whether the two have different subjects (2b).

(2) Switch reference in Choctaw (Broadwell, 2005: 193)

      a.   Kaah   sa-banna-haatokoo-sh,   iskali' ittahobli-li-tok

            car   1SG.P-want-because-SS   money   save-1SG.A-PST

            'Because I wanted a car, I saved money.'

      b.   Kaah   banna-haatok<u>o</u>,   iskali' ittahobli-li-tok

            car   want-because.DS   money   save-1SG.A-PST

            'Because he wanted a car, I saved money.'

Broadwell (2005) notes that /-t/ or /-sh/ marks same subject while different subject is marked by nasalizing the verb's final vowel making it homophonous with the case suffixes. McKenzie (2015) surveys switch reference in 69 North American indigenous languages and notes that while homophony with some morpheme is typologically common for switch-reference markers, it is not always with the case markers as seen in Muskogean. More research into switch reference is called for. Broadwell notes that "the interplay between switch-reference marking and topic continuity needs more careful study" (2005: 197), while Munro comments that "Selection of particular connectives and switch-reference markers is an aspect of Chickasaw discourse structure that would reward further study" (2005: 148).

3 | INFIXES AND CIRCUMFIXES

Muskogean languages also display less common morphology such as circumfixes and infixes. The data in (3) show how Chickasaw negation functions in a circumfixal fashion, with an irrealis pronominal prefix occurring in combination with the negative suffix, *-o* to negate an action. Generally, pronominals are prefixal aside from first person singular agent (3a). Note that the first person singular pronominal is a suffix in declaratives (3a–b) and a prefix in negatives (3c).

(3) Chickasaw circumfixes

    a. takchili   'I am tying it'

    takchi-li

    tie-1SG.A

    b. ishtakchitok   'you tied it'

    ish-takchi-tok

    2SG.A-tie-PST

    c. aktakcho   'I am not tying it'

    ak-takchi-o

    1SG.A.IRR-tie-NEG

    d. chiktakcho   ' you aren't tying it'

    chik-takchi-o

    2SG.A. IRR-tie-NEG

    e. chiktakchokíshatok 'you hadn't tied it yet'

    chik-takchi-o-k-ísha-tok

    2SG.A.IRR-tie-NEG-IRR-NEG.INCOMP-PST

When the prefixes are used without the negative -*o*, they indicate hortative forms, as in *iktakchi'* (*ik-takchi-'*) "let him/her tie it," requiring also a glottal stop as suffix. While the Chickasaw irrealis is a prefix, its cognate in Alabama "appears variously as a suffix, infix, or prefix with the shapes -*ki, -ikko, -ki-, -kii-,* or *ik-*" (Montler & Hardy, 1991: 1) along with another strikingly familiar element, an –*o* suffix:[9]

(4) Infixing in Alabama negation (Montler & Hardy, 1991: 4–5)[10]

	Affirmative	Negative	Analysis	Gloss
a.	talwa	takílwo	ta<kí>lw-o	'sing'[11]
	bassi	bakísso	ba<kí>ss-o	'poor'
b.	hoopa	hokíipo	ho<kíi>p-o	'sick'
	ooti	okiito	o<kíi>t-o	'kindle'
c.	liska	lisíkko	lis<ík>k-o	'beat'
	libatka	libatíkko	libat<ík>k-o	'cooked'
	baski	basíkko	bas<ík>k-o	'long'
d.	afaaka	afaíkko	afa<ík>k-o	'laugh'
	naaɬíika	naaɬiíkko	naaɬi<ík>k-o	'talk'
	balaaka	balaíkko	bala<ík>k-o	'lie down'

Alabama has two additional infixing patterns. Montler and Hardy (1991:2) show an affix, *-l-*, which alternates between distribution as a prefix (5a) versus as an infix (5b–c); they describe the *[i]* as epenthetic breaking up illicit consonant clusters:

(5) Alabama middle voice and infixation patterns (Montler & Hardy, 1991: 2)

	Middle Passive	Gloss	Transitive	Gloss
a.	il-pa (*lpa)	'be eaten, food'	(i)pa	'eat'
	il-bi	'be killed, killing'	(i)bi	'kill'
b.	choo-l-pa	'be bought, sale'	choopa	'buy'
	oo-l-ti	'be kindled, kindling'	ooti	'kindle'
c.	ho-li-sso (*holsso)	'be written, book'	hosso	'write'
	ta-li-lwa	'be sung, song'	talwa	'sing'

When we see infixation, the distribution of the morpheme *-l-* is following the nucleus of the initial syllable. If the resulting form would create an unsyllabifiable string of consonants, the morpheme surfaces with the epenthetic vowel following it, so as *-li.*

Finally, the second person agent pronominals in Alabama divide into two sets, one, *is-* (with a post-sonorant variant of *-his-*), surfacing as prefix (6a) or infix (6b) and the other, *-chi*, as either a suffix (6c) or infix (6d).

(6) Alabama second person "mobile" affixation

	Verb	**Gloss**	**2s-inflected**	**Gloss**	**Analyzed**
a.	nochi	'fall asleep'	isnochi	'you fall asleep'	is-nochi
				prefix	<2S>fall.asleep
b.	afaaka	'laugh'	afaahiskati	'you laughed'	afaa<is>ka-ti
				infix	<2S>laugh-PT
c.	bitli	'dance'	bitchila	'you're about to dance'	bitli-chi-la
				suffix	dance<2S>-IRR
d.	talwa	'sing'	talchiwola	'you sang'	tal<chi>wa-o-la
				infix	sing<2S>-PFV-IRR

The data includes additional complexities in Alabama, including vowel elision and the irregular patterning of *nochi* with the so-called control series of the active or agent pronominals.

4 | INTERNAL STEM CHANGES AND SUPRASEGMENTALS

Perhaps the most complex aspect of Muskogean morphology and phonology is the ablaut system of the Muskogean verb, characterized by Haas (1938, 1940). Termed "verb grades" (cf. Nicklas, 1975), this complex system of internal segmental and suprasegmental changes includes vowel length, gemination, and pitch accent. Comprehensive discussions include comparative work (Booker, 1977, 1980; Martin, 1994) and analyses focused on particular Muskogean languages (e.g., for Choctaw, Nicklas, 1974, 1975, 1979; Ulrich, 1986, 1987; for Alabama, Hardy & Montler, 1988b).

While the phonological aspects of this system are reasonably well documented, the semantics are less so. As noted by Munro and Willmond (1994) for Chickasaw and by Broadwell (2006) for Choctaw, not all the grades are equally productive, and some uses are lexicalized. Grades mark different aspectual meanings, but a verb's lexical aspect, or aktionsart, is not always compatible with the aspectual qualities of a particular grade. The full nature of the restrictions between the morphological aspect of grades and the aktionsart individual verbs is "not well understood, and needs more careful examination" (Broadwell, 2006: 161). Importantly, this and other excellent and insightful analyses go beyond description, providing the foundation for theoretical treatment and the exploration of related implications.

Ulrich (1986) analyzes an extensive number of distinct (yet phonologically interconnected) grades and is likely the most comprehensive and complete phonological treatment because it includes the largest number of distinct grade formations (six) and the grades' interactions with syllable structure, rhythmic lengthening, and accent.

(7) Choctaw verb grades (adapted from Ulrich, 1986, Chapter 6)

	Grade Type	Verb	Grade Form	Gloss of Grade Form
a.	**h-grade/instantaneous**	famah	fáhmah	'he was just whipped'
		habishkoh	habihíshkoh	'he just sneezed'
		okchah	ohókchah	'he just woke up'
b.	**n-grade/incompletive[12]**	bashlih	báshlih	'he keeps cutting it
		atobbih	atómbih	'she's still paying'
		halallih	halánlih	'he's holding on to it'
c.	**hn-grade/iterative**	atobbih	atohóbbih	'she keeps paying'
		halallih	halahállih	'he keeps pulling it'
		amanoolih	amanohólih	'he keeps telling me
		chopah	chohópah	'he keeps buying'
d.	**y-grade/intensive[13]**	nokshoopah	nokshóyyopah	'he finally got scared'
		bashah	báyyashah	'he finally got cut'
		obah	óyyobah	'it finally rained'
		kachih	káyyachih	'she finally sold it'
e.	**g-grade**	talowah	tálloowah	'he finally sang'
		patolilih	páttoolilih	'I finally touched it'
		anopolih	anóppoolih	'She's finally talking'
f.	**glottal-grade/'-grade**	hilhah	híilhachah	'he danced and he…'
		chopah	ikchópoh	'he didn't buy it'

Ulrich (1986) notes that when the glottal grade, seen in various inflected forms in (7f), Ulrich (1986) notes that when it is used, it has a meaning that varies along with its particular affixes, shown above as they express different functional information; the first example includes switch reference suffix, and the second one includes the ireless/negative pattern of circumfix and –*o* suffix.

The generalizations and example forms of the grade patterns appear in (8), analyzed into morphological components. Other affixation has been stripped off for ease of analysis in highlighting the relevant patterns.

(8) Patterns of Choctaw verb grades

	Grade Type	Description	Analysis
a.	**h-grade/instantaneous**	Accent penult vowel, infix –h post-penult	f<áh>ma
b.	**n-grade/incompletive**	Accent and nasalize penult vowel	b<ą́>shli
c.	**hn-grade/iterative**	Infix h- after penult, accent and nasalize penult	ato<hǫ́>bbi
d.	**y-grade/intensive**	Accent penult, infix geminate yy before copy of penult	<óyyo>ba
e.	**g-grade**	Lengthen penult, geminate preceding C, accent preceding V	t<állo>owa
f.	**glottal-grade/'-grade**	Accent and lengthen penult vowel	h<íi>lha

As (8) shows, the penultimate vowel is the locus for implementing the grade effects, and the grades make use of one or a combination of the same basic elements, primarily suprasegmental: accent, length (C and/or V), nasalization, laryngeals, and glides. The intricate and interwoven elements of this aspectual marking are not phonologically contained within the boundaries of a single prosodic element such as a syllable or even a foot, making it a challenge to express the descriptive generalizations in terms of some linear segmental string.

A considerable amount of phonological knowledge is necessary to correctly form verb grades: the verbal base; the penultimate syllable; the appropriate manifestation of the nasal; and in some grades, the generation of a copy of the penult vowel (which must bear an accent), as well as the prosodic conditions where the various permutations occur, for example, when the penultimate syllable is open or closed, light or heavy. A host of phonological conditions requires sophisticated knowledge in order to determine the surface shape of an inflected verb grade form, as well as morphological awareness of the base form and affixes.

Referencing the penultimate syllable suggests an active metrical foot. Prosodic morphology-oriented accounts using feet were proposed throughout the 1980s and 1990s, including Ulrich (1986, 1987, 1994), Lombardi and McCarthy (1991), Weeda (1992), Hammond (1993), among others. Building even further on the metrical tools noted earlier in this paper's introduction, analyses of the ablaut system treated the internal phonological modifications within the prosodic morphology theoretical framework. Lombardi and McCarthy (1991) drew on prosodic circumscription and authentic units of

prosody, for example, an iambic foot and an affixed mora, to analyze surface phonological patterns of ablaut in Choctaw. Authentic units of prosody like the foot are key components of the Prosodic Morphology Hypothesis (McCarthy and Prince 1986), and invoked in competing analyses like Hammond (1993), Ulrich (1994), and, later, Restle (2002).

While these analyses rightfully (in my opinion) draw on insights that moraic and metrical phonology provide the key underpinnings to analyzing the verb grades, they fall short in limiting the scope of the phenomena analyzed. For a counterpoint from another (unrelated) Native American language, Fitzgerald (2012) examines a wide range of rhythmic and prosodic morphological data from Tohono O'odham that bear on the role of quantity, including gemination and vowel lengthening. A similar in-depth analysis of quantitative phenomena in a Muskogean language simply is not out there. The above analyses of Choctaw provide obscured glimpses of the morphophonology of quantity, but what is still lacking is a deeper comprehensive analysis of the many quantitative processes that play a role in Choctaw (or any of the Muskogean languages). I return to this point in subsequent sections.

5 | SUBTRACTIVE MORPHOLOGY

Subtractive morphology, where deletion serves to mark some grammatical function, occurs in five of the Muskogean languages. Subtractive morphology provides another rich example of how morphological processes in Muskogean languages go beyond a straightforward additive, item, and arrangement type of affixation. The most significant theoretical discussions in the literature focus on Koasati, but Broadwell (1993) and Martin (1994) note that five of the Muskogean languages invoke subtractive elements, especially in plural morphology. Broadwell (1993) uses related subtractive processes in plural and repetitive verb formation to argue that Chickasaw, Choctaw, Alabama, Koasati, and Mikasuki constitute a Southern Muskogean branch of the language family, following Munro (1985c,1987a, 1993).

Mikasuki deletes the rhyme of the penultimate syllable to mark the contrast between singular versus plural forms, shown in (9). While (9a–c) shows that this can target a medial short or long vowel in an open syllable, (9b) shows that it is truly rhyme deletion since the coda consonant in a closed syllable is also deleted.

(9) Mikasuki (Broadwell, 1993, via David West pc)

	Singular	Plural	Gloss
a.	hofaali	hofli	'to take off, pull out (sg obj)/(pl obj)'
b.	yikifli	yikli	'to grasp, knead (obj)/(pl obj)'
c.	nifaaka	nifka	'to be chipped (sg)(pl)'

Kimball (1991) outlines a robust pattern in Koasati where subtractive morphology forms plurals. Within a trisyllabic singular verb, all or some of the rhymes of the medial syllable of the singular are deleted in plural formation. The target of the subtractive process applied to this medial syllable represents both open and closed syllables and can be a long vowel (10a), a diphthong (10b), a vowel plus coda consonant (10c), or in some cases, just the coda consonant (10d).

(10) Koasati subtractive plural formation (Kimball, 1991)[14]

	Singular	Plural	Gloss
a.	ataká:li-n	atákli-n	'to hang something '
	icoktaká:li-n	icoktákli-n	'to open one's mouth'
	acokcaná:ka-n	acokcánka-n	'to quarrel with someone'
	albití:li-n	albítli-n	'to place on top of'
	atiní:li-n	atínli-n	'to burn something'
	facó:ka-n	fásoka-n	'to flake off'
	apołó:ka-n	apółka-n	'to sleep with someone'
b.	aponáyli-n	aponní:ci-n	to wrap something up'
	onasanáyli-n	onasanní:ci-n	'to twist something on'
c.	pitáffi-n	pítli-n	'to slice up the middle' (this set 1983)
	tipásli-n	típli-n	'to be pick something off'
	tiwápli-n	tíwwi-n	'to open something'
	simátli-n	símmi-n	'to cut up tanned skin'
	yiłápli-n	yíłłi-n	'to tear something down'
	wilaplí:ci-n	willí:ci-n	'to tear up the earth'
d.	akapóska-n	akapó:ka-n	'to be pinched'
	łatófka-n	łató:ka-n	'to melt'
	labósli-n	labó:li-n	'to extinguish something'
	libátli-n	libá:li-n	'to get burned by a hot solid or liquid'
	asipátlin	asipá:lin	'to get a splinter'

While the original discussions by Kimball (1983, 1985) handled this via a series of rules doing deletion and replacement of parts of the verb base, following analyses invoked an approach invoking a rime template. Martin (1988) treated this as dissociation of a prosodic constituent, and Lombardi and McCarthy (1991) used prosodic circumscription of the final syllable of the root, applying the delete operator to remove syllabification. The segmental material reassociates into the preceding syllable, which means only the onset consonant surfaces, since it can change its affiliation into a coda with that syllable. A similar approach is found in Weeda (1992).

Some of the recent phonological treatments of this phenomena have drawn on approaches relying on Optimality Theory's faithfulness (or anti-faithfulness) constraints, as in Kurisu, 2001, Horwood, 2002.

For example, Kurisu (2001) uses lexically specified constraints in analyzing Koasati, ranking a ban on deletion in singular forms ranked more highly than a ban on deletion in plural forms. A constraint ranked between them forces morphological exponence to have a phonological interpretation; deletion is that exponence. The relational approach contrasts with Trommer and Zimmermann (2014), who invoke mora affixation in their analysis of Alabama subtractive morphology, where they argue that when the affixed moras have defective prosodic structure, subtractive processes are one of the possible outcomes.

While these analyses in different ways draw on moraic phonology in accounting for these phenomena, it is not clear that they sufficiently integrate the pervasive and complex influence played by prosody in Muskogean family. The interrelated moraic and prosodic patterns call for an approach that better exploits an analysis where all the morphological and phonological systems are working together.

6 | SUPPLETION

Suppletion is the process where semantically related words surface with essentially different shapes, lacking predictability in their form with regard to other paradigm members, instead of showing regularity of form and phonological similarity in a given word's paradigm. Classic examples of suppletion in English are *go, went (*goed)* which contrasts with regular paradigmatic and phonologically similar formal patterns of *walk, walked*.

Numerous Native American languages exhibit suppletion in verbs when indicating grammatical number, as noted in Booker (1982), and suppletion is well attested in Muskogean languages. As observed by Haas (1948), Heath (1980), and others, it is especially attested in verbs of stance or motion, known as positional or classificatory verbs. Positional verbs in Muskogean have received a fair amount of attention by scholars of Muskogean languages and by linguists interested in suppletion or in how grammars utilize shape. Haas (1948) further notes intriguing characteristics of these verbs with regard to their behavior when the nouns involved with predicates are cloth or liquids. Nouns representing cloth objects, such as handkerchiefs, surface with a dual marked verb, intransitive when they function as subjects and the transitive stem when functioning as objects.[15]

Formal properties of suppletion in Muskogean show that it can be partial or full. Heath (1980) describes a set of Choctaw verbs as having partial or full suppletion to mark distinctions in number, aspect (which he characterizes as distinctions between unmarked, distributive, and repetitive), or perhaps also membership in a lexical-semantic class. Martin (2011a: 197) describes Creek suppletion in distinguishing number, with (11) showing singular, dual, and triplural forms. Data from Martin (2011: 199–200) illustrates the suppletive nature of grammatical number for positional verb stems, both intransitive (11a, c–e) and transitive (11b).[16]

(11) Creek suppletion (Martin 2011: 199)

	Singular	Dual	Triplural	Gloss
a.	leyk-itá	ka:k-itá	apo:k-itá	'to sit'
b.	leyc-itá	ka:y-itá	apo:y-itá	'to set, seat'
c.	aɬ-itá	wilak-itá	foll-itá	'to go about'
d.	noc-íta	nochoy-íta	noceyc-itá	'to sleep'
e.	feyk-itá	feyhok- íta	fayic-itá	'to turn'

Examples (11d–e) further show that some of the dual (or plural, where paradigms show only a two-way number contrast) suppletive forms include an internal element, *-ho-*. Intransitive triplurals can also show internal modification, where *-ic-* or *-yc-* replace the stem-final k found in singular forms. Creek suppletion reinforces the point in the previous section that Muskogean morphology frequently intertwines more than one of these typological patterns. Data from Chickasaw make this point even more nicely.

Positional verbs in Chickasaw also show suppletion and a three-way number contrast in verbs. The paradigms below, such as exemplified by the examples in (12a), show that the dual form shows full suppletion, with no similar segments, and the triplural form is partially similar, showing partial suppletion.

(12) Chickasaw positional verbs and suppletion[17] (Munro, 2006: 4–6)

Singular	Dual	Triplural	Gloss
a. bínni'li	chí'ya	binoht mája	'to be sitting'
b. híkki'ya	hí'li	hiyoht mája	'to be standing'
c. ánta	áshwa	áyya'sha	'to stay, live, be located'
d. fóyyokha	albí'ha	albihat mája	'to be inside'
e. tí'wa	káyya'a	kahat mája	'to be lying down'

Like Creek, Chickasaw has suppletion intersecting with another typological pattern, but here, it is with ablaut. Munro (2006) notes that the triplurals are typically used in concert with *mája*, the plural auxiliary, and that the non-triplural forms are grade forms of related verbs. For example, the singular form in (12a), *bínni'li,* is a g-grade form of *biniili*, "to sit down (punctual)." In (13), graded examples from (12) are shown with details about which grade is involved and what base the grade operates on. In addition, the number of the suppletive form is indicated. While the data are primarily showing graded forms for non-triplurals, (13f) shows that triplurals do on occasion represent a grade.

(13) Chickasaw verb grades and suppletion (entries in Munro & Willmond, 1994)

	Suppletive Form	Number	Grade	Base verb
a.	bínni'li	SG	g-grade	biniili
b.	híkki'ya	SG	x-grade	hika
c.	hí'li	DU	g-grade	hili
d.	ánta	SG	n-grade	atta
e.	áshwa	DU	n-grade	ashwa
f.	áyya'sha	TRI	y-grade	asha
g.	fóyyokha	SG	y-grade	fokha
h.	albí'ha	DU	g-grade	albiha
i.	tí'wa	SG	g-grade	tiwa
j.	káyya'a	DU	y-grade	kaha

The interaction of suppletion with the prosodically driven grade process adds a uniquely Muskogean dimension to this process. The patterns in (13) also demonstrate yet another context where prosody plays a role in how the different types of morphology surface.

7 | CONCLUSION

The Muskogean languages exhibit an extraordinary constellation of typologically interesting features, as shown in this overview of the most uncommon morphology processes they display. Theoretical linguistics have drawn on analyses of Muskogean languages, and the descriptive documentation is detailed for most of the languages, potentially fostering novel insights about how linguistic theories operate.

The patterns here were meant to accomplish two things. First, by trying to give examples that isolated particular characteristics, a clearer exposition of the distinct typological categories was possible, although at the cost of less morphological complexity in individual words. Simpler, more cleaned up types of examples isolate these characteristics in such a way as to highlight them. However, each section also built on the morphological characteristics shown in earlier sections to show how these features combine and surface together in an intricate way.

With the volume of text collection and analyses both complete and ongoing, much more complex linguistic examples of Muskogean verbs exist, particularly in a narrative context. Current documentation and revitalization collaborations provide opportunities to augment what we know of these languages to enrich typology and linguistic theory and to mobilize those findings back into communities to support their efforts to maintain and revitalize their heritage languages.

ENDNOTES

[1] Where no source is indicated, the example comes from my own field notes. Examples from the various languages reflect Muskogean conventions of doubling a vowel or consonant to indicate length, using /'/ to signalize a glottal stop, and underlining vowels when they are nasalized. This paper follows the Leipzig glossing conventions wherever possible; the following abbreviations are used: NOM=nominative; DAT=dative; PST=past; PST.4==fourth past tense; RECP=reciprocal; IRR=irrealis; REAL=realis; HAB=habitual; DEDUC=deductive; Q=question marker; Q.PST=past tense question; COM=comitative; QUOT=quotative; POT=potential; INCOMPL=incompletive; NEG.INCOMPL=negative incompletive; SG=singular; DU=dual; PL=plural; SW=switch reference; CONN=connective, clause connector; 1SG.A=first person singular agent/actor; 1SG.A.IRR=first person singular agent/actor, irrealis;

2SG.A=second person singular agent/actor; 2PL.A=second person plural agent/actor; 2SG.A.IRR=second person singular agent/actor, irrealis; 3PL.A=third person plural agent/actor.

2 Martin (2011b) identifies Hitchiti and Mikasuki (or Miccosukee) as the same language group, but spoken by tribal groups who were identified with different names, although Mithun (1999) characterizes them as dialects closely related.

3 The sole documentation for Apalachee is a bilingual Spanish–Apalachee facsimile of letter written in 1688 (Haas, 1949), although Mithun (1999) notes that Gatschet (1884) claims a Cuban archive in Havana has additional material. See Kimball (1987b, 1988a) for additional detail.

4 See also Goddard (2005).

5 Other works including fieldwork, primary sources, or sociolinguistic information include: **Apalachee** Smith (1860); Toomey (1918); Haas (1949); Kimball (1987b, 1988a); **Alabama** Rand (1968); Davis and Hardy (1984, 1988); Hardy and Davis (1988, 1993); Chiu (1987); Hardy and Montler (1988a, b, 1991a, b); Lupardus (1982); Montler and Hardy (1990, 1991); Halmari (1998); H. Hardy (2005), Fitzgerald et al. (2015) **Chickasaw** Gatschet (1889); Munro (1985, 1987, 1998, 1999, 2000, 2005); Pulte (1975); Payne (1980, 1982); Humes and Humes (1973); Scott (1981); Walker (2000); Gordon (1987); Gordon and Munro (2007); Gordon, Munro and Ladefoged (2000, 2001); Gordon (2003, 2004, 2008); Chickasaw Language Committee et al. (2012); Fitzgerald and Hinson (2013, 2016); Hinson, Humes and Humes (2015); **Choctaw** Byington (1870, 1915); Badger (1977); Nicklas (1974, 1975); Heath (1980); Davies (1981, 1984a, b, 1986, 1998); Broadwell (1990, 1991, 1992, 1998, 2005); Haag (1994, 1996, 1997); Williams (1995); Haag and Willis (2001); Byington (1870, 1951); Ulrich (1986, 1987, 1988, 1989, 1993, 1994); **Creek/Muskogee/Seminole** Loughridge and Hodge (1890); Brinton (1870); Haas (1938, 1945, 1950, 1977a, b, c); Nathan (1977); Booker (1988, 1992); D. Hardy (1988, 1992, 1994, 2005); Innes et al. (2004); Martin (1987a, b, 1988, 1989, 1991a, b, 1993, 1994, 1999, 2010, 2011b); Johnson and Martin (2001); Gouge (2004); Haas and Hill (2015); **Koasati** Haas (1944); Kimball (1983, 1985, 1987a, 1988b, 1990, 1993, 2010); Rising (1990, 1992); Langley and Langley (2010); Koasati Language Committee (2013); Gordon, Martin, and Langley (2015a, b); and **Mikasuki** Boynton (1982, 1983); Derrick-Mescua (1980); West (1962, 1974a, b, c); Cypress and Martin (2006).

6 See Morgan (2016) for work analyzing Chickasaw data on adult second language acquisition of morphology.

7 Munro (2005: 139) notes a Chickasaw verb can have at least seven parts, including the verb stem itself.

8 The third person object can get a singular or plural reading, and pronominals do not indicate gender, so for convenience sake, this is given one translation, but *him, her,* or *them* are also possible readings for the objects in (1).

9 See Booker (1980) and Martin and Munro (2005) for discussion of related historical developments.

10 Montler and Hardy (1991: 5–6) note that forms with a prothetic /i/ take the negative as a prefix, *(i)la, ík-lo* "come" and that negation comes as suffixation for stems with either a final sequence of two light syllables or an open heavy syllable, and which have a *-li* suffix in affirmative forms, like *hap-li-chi, hapkíícho* "bathe someone." An additional complication is the causative suffix, *-chi*, which triggers lengthening in the preceding vowel.

11 Negatives should be interpreted as in these representative glosses: "do not sing" (4a) and "not poor" (4b).

12 In the n-grade in Choctaw, when the targeted penultimate vowel precedes a geminate /l/ or /b/, there is instead a homorganic nasal in coda position; note that this is not the case in the hn-grade, where vowels can surface as nasalization in the same context, rather than trigger a nasalized consonant for the first half of those geminates.

13 Ulrich (1986) treats g-grade and y-grade as distinct, despite both having the semantic meaning of "finally," Nicklas (1975) treats them as the same grade.

14 Additional changes in the forms represent other phonological processes (Kimball 1991, Martin 1993).

15 Indeed, the article starts with Cherokee classificatory verbs as a way of framing the discussion of similar patterns in Creek.

16 See Johnson (2016) for a treatment of Creek suppletion as regards the identity of the notion root.

17 The dual and triplural forms of "to be inside" could also be *albí'ya, albiyat máa,* respectively, and the dual form of "to be lying down" may also be *káyya'ha*.

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