ON THE DIRECTIONALITY OF ANALOGY IN A DHEGIHA PARADIGM[1]

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This paper documents a case of analogy from the first person to the third in the Dhegiha languages. It discusses the significance of this example for historical linguistics in general and proposes that higher frequency in discourse of the first-person form in the case of cognition verbs explains why the direction of analogical change was reversed in this verb.

[KEYWORDS: Siouan, Dhegiha, Omaha, defective verb, analogy]

1. Introduction. In the Neogrammarian model, exceptionless sound laws are fully deterministic, but the same cannot be said of analogy, which is by definition irregular and unpredictable. Yet, it is possible to some extent to constrain the space of hypotheses involving analogy, and research on the general principles of analogy is of utmost importance for historical linguistics. The most successful generalization involving analogical change is without doubt the observation that in personal paradigms, the third-person singular is nearly always the form on which leveling is based. One particular instance of this type of leveling has been referred to as Watkins's Law, according to which the third person can be reanalyzed as being zero-marked, and the resulting stem is generalized to the whole paradigm by addition of the regular affixes (Watkins 1962).

The directionality of analogy from third person to first or second is also attested even when the third-person singular is not reanalyzed as being zero-marked. For instance, in the perfect paradigm in Vedic, there was an *ā*/*a* alternation between first- and third-person singular, due to the effect of the Brugmann/Kuryłowicz law (Kuryłowicz 1927 and Fortson 2010:205).[2] In later stages of the language, the first-person stem in *a* tends to be be replaced by a stem in *ā*

[1] Glosses follow the Leipzig Glossing rules, except for prox = proximate (on which see Eschenberg 2005). The underscore _ in a verb form indicates where the personal prefixes are inserted, in the case of verbs with discontinuous stems. In Lakhota, capital *A* indicates an ablauting final vowel, which is realized as *a*, *e*, or *iŋ* depending on the presence of particular enclitics. I would like to thank Anton Antonov, Romain Garnier, two anonymous *IJAL* reviewers and various associate editors for useful corrections and comments on previous versions of this work. I am responsible for any remaining mistakes. This article is dedicated to the memory of Bob Rankin.

[2] Proto-Indo-European **o* becomes *ā* in Sanskrit in open syllables and *a* in closed syllables, including contexts such as **oCH*, where *H* is a laryngeal.

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TABLE 1
ANALOGY FROM THIRD SINGULAR TO FIRST SINGULAR IN THE PARADIGM OF KṚ 'do' IN SANSKRIT

Person	PIE	Original Paradigm	Analogical Paradigm
1sg	*k^we-$k^wór$-*h2e*	*cakár-a*	*cakā́r-a*
2sg	*k^we-$k^wór$-*th2e*	*cakár-tha*	*cakár-tha*
3sg	*k^we-$k^wór$-*e*	*cakā́r-a*	*cakā́r-a*

whose source can only be the third singular (Whitney 1962:283–89); see table 1. Here, the third person is not reanalyzed as zero-marked (since there is a third-person suffix *-a*), but the long vowel stem is generalized to the first person.

The validity of the 3 > SAP directionality in analogical leveling has been tested in various language families and is apparent even in direct/inverse systems, where analogy operates from third-person to SAP forms and affects plural forms before affecting singular ones (see Goddard 1965 on Arapaho, Dahlstrom 1989 on Plains Cree, and Jacques and Antonov [n.d.] for a general overview of these phenomena in Algonquian).

Counterexamples, where a first- or second-person form resists analogy better than the third-person singular form, do occur when a phonological alternation is leveled across the board. For instance, in Attic Greek, where the labiovelars become dentals before front vowels and labials in most other contexts (Fortson 2010:253), most verbal and nominal paradigms should present alternations between dental and labial stops in words whose last stem consonant was a labiovelar. A labial consonant would have been expected before endings in non-front vowels (for instance, in the first-person singular *-ō* of the present thematic paradigm) and dentals before front vowels (for instance, the third-person singular *-ei*). Yet, no verb shows such an alternation, as the labiovelars have been generalized everywhere: both the first-person singular *λείπω léipō* < **léik^w-ō* 'I leave' and the third-person singular *λείπει léipei* < **léik^w-ei* 'he leaves' have a labial *p* from **k^w*, though *t* would have been expected in the third person.

However, this does not count as analogical leveling from the first person to the third, as the third-person plural also has a non-front vowel *λείπουσι léipousi* < **léik^w-onti* 'they leave', and some tenses, such as the future (*λείψει léipsei* < **léik^w-s-ei* 'he will leave'), have consonant-initial endings where the labial is expected in all forms by applying the regular sound laws.

Genuine examples of analogical leveling where the third person is renewed on the basis of the first person are extremely rare, and any such case deserves to be reported and carefully documented.[3] Yet, Siouan languages offer one uncontroversial example of analogy from the first person to the

[3] Cases where the second person is renewed on the basis of the first-person singular may be less rare; note, for example, the case of some Turkish dialects (Saygın and Wilson 2002). The relative sensitivity of the first and the second person to analogy is not discussed in this paper.

TABLE 2
BASIC CORRESPONDENCES OF PROTO-SIOUAN *r, *R, AND *y IN DAKOTAN AND DHEGIHA LANGUAGES

	Lakhota	Yankton/Sisseton	Omaha	Kansa	Osage	Quapaw
*y	čh	čh	ž	ž	ž	ž
*r	y	y	ð	y	ð	d
*R	l	d	n	d/ǰ	t/c	t
*r/i_	čh	čh	ð	y	ð	d
*kr	gl	hd	gð	l	l	kd
*xr	ȟl	hd	xð	xl	?	?
*wr	bl	md	bð	bl	br	bd
*ky	čh/kč	čh/kč	gð	l	l	kd
*xy	ȟč	ȟč	xð	xl	?	?
*wy	čh/pč	čh/pč	bð	?	br	?

second and third, involving the verb 'to think'. This paper presents a detailed account of this analogical change and provides possible explanations of why specifically this verb underwent analogy in this direction. Most of the work on comparative Siouan is unpublished (though available from the Siouan Archive),[4] so this paper first presents the accepted knowledge on Siouan reconstruction, mainly based on the model in the *Comparative Siouan Dictionary* (Rankin et al. 2015).

Section **2** presents the correspondences and reconstructions for the consonants *y , *r, and *R, which are relevant for understanding the case of analogy discussed in this paper. Section **3** discusses the main clusters containing these consonants. Next (**4**), I describe the verb paradigms of *r stem verbs and show that the paradigm of the verb *ebðé* 'I think' in Omaha, which originally belonged to a different conjugation type, was remodeled following the *r stem verb conjugation on the basis of the first person: the third person is renewed, while the first person is inherited. Finally, in **5**, I discuss a possible explanation for the directionality of analogy in the case of this verb.

2. Reflexes of simple *r, *R, and *y in Dakotan and Dhegiha. There is evidence in Mississippi Valley Siouan languages of at least three distinct proto-phonemes—*r, *R, and *y—before oral vowels. These phonemes merge as *r* in Chiwere and Winnebago but are kept partially distinct in Dakotan and Dhegiha, according to the correspondences in table 2 (correspondences before nasal vowels are not indicated).

These correspondences are valid word-initially or between vowels, except those involving the clusters *ky- and *wy- (see below). In Kansa and Osage,

[4] This archive is maintained by the Hidatsa specialist John Boyle and is freely distributed to all interested scholars.

TABLE 3
BASIC CORRESPONDENCES OF PROTO-SIOUAN *r, *R, AND *y IN DAKOTAN AND DHEGIHA LANGUAGES

	Proto-Siouan	Lakhota	Omaha	Kansa	Osage	
*y	*yo_phe	čho_pȟÁ	žúhe	žophé	žó_pše	wade
	*yá·pE	čhápa	žábe	žábe	žápe	beaver
	*yá·že	čhažé	žáže	žá·že	žáže	name
	*yeká	čhečá	žegá	žegá	žeká	thigh, leg
	*yá·phe	čha_pȟÁ	žáhe	žáphe		stab
	*e/aya-ʔį	ečhíŋ, ečháŋmi	ežǫmį	ažį́, ažamį	ažį́, ažámį	think
*r	*ra-	ya-	ða-	ya-	ða-	by
*R	*ru-	yu-	ði-	yü-	ðu-	by
	*xurá	ȟuyá	xiðá	xüyá	xúða	eagle
	*rÉ	yÁ	ðé	yé	(*a*)ðée	go
	*Ró·te	loté	núde	dó·je	tóoce	throat
	*(*i*-)Rekší	lekší	inégi	iǰégi	įcéki	uncle (MB)
	*Rá	lá	wana+	da	tá	ask
	*Ré·že	lézA	néže	jéže	céže	urine
	*Ré	o_lé	u_né	o_jé	o_cé	hunt, look for

the outcomes of *R are palatalized as *ǰ* and *c* respectively before *e* (merging with **ht*).

Table 3 illustrates the first three correspondences; in this table and other tables below, only Lakhota, Omaha, Kansa, and Osage are presented. The cognate sets are from Rankin et al. (2015), but the Lakhota and Osage data were rechecked against Ullrich (2008) and Quintero (2010), respectively, and adapted to the spellings in these dictionaries. As for the Omaha data, forms not found in the Dorsey text corpus (Dorsey 1890) are indicated by the symbol + and are taken directly from the *Comparative Siouan Dictionary*.

In some possessed nouns (especially body parts), there is a special correspondence with *čh* in Dakotan against *ð* : *y* : *ð* : *d* in Dhegiha, as shown in table 4. This correspondence is interpreted as the effect of paradigm leveling, due to a sound change **r*- > *čh* after the third-person possessive prefix *i*-, even before nasal vowels (see Rankin 2005 and Rankin et al. 2015). It is never attested in verbs, even those with a locative *í*- prefix; for example, **íre* regularly yields *íðe* 'see, find' in Omaha and *iyé_ya* 'find' in Lakhota (not **ičhé*).

Before nasal vowels, **r* and **R* merge as *n* in Dakotan and Dhegiha languages in nearly all contexts (see Michaud, Jacques, and Rankin 2012), but this issue is not discussed in this paper, as it has no relevance to the issue at hand. In addition, there is a residue of words showing irregular correspondences, such as 'mosquito' (Lakhota *čhaphúka*, Omaha *náhǫga*, Kansa *yáphąįge*, Osage *yáphąįge*, Quapaw *daphąke*), but these cases are most likely *Wanderwörter*

TABLE 4
PROTO-SIOUAN **r* AFTER THE POSSESSIVE **i-* PREFIX

Proto-Siouan	Lakhota	Omaha	Kansa	Osage	
**i-ré·ži*	*čheží*	*teðéze*	*yéze*	*ðéezeg*	tongue
**i-rá·ɣu*	*čhaǧú*	*ðǫ́xį+*	*yáxü*	*ðǫɣu*	lung
**i-ráke*	*čhaká*		*ho yáge*		palate/gills
**i-rą́·h-ka*	*čhaŋkȟáhu*	*nǫ́kka*	*nąkka*	*nąhka*	spine

TABLE 5
PROTO-SIOUAN **kr-*, **xr-*, AND **wr-*

	Proto-Siouan	Lakhota	Omaha	Kansa	Osage	
**kr-*	**kré·pE*	*glépA*	*gðébe*	*lébe*		vomit
	**krézE*	*glézA*	*gðéže*	*léze*	*léze*	spotted
**xr-*	**krá*	*gla-*	*ðigða+*	*layá*		untie
	**xroke*	*ȟlókA*	*xðúge*	*xlóge*		hole, nostrils
	**xro*	*ȟló*	*xðúde*			snort
**wr-*	**awró*	*abló*		*abló*	*ábro*	shoulder
	**hąwre*	*haŋblé*	*hǫ́bðe*	*hąblé*	*hǫ́bre*	dream
	**wráska*	*blaská*	*bðáska*	*bláska*	*bráaska*	flat
	**wréh-(ka)*	*blečá-*	*bðékka*	*blékka*	*bréhka*	thin

and do not reflect the correspondences of inherited words. Therefore, they are not taken into account here.

3. Reflexes of clusters. There were some clusters with **r* or **y* as the second element in Proto-Mississippi Valley Siouan.[5] Examples of **wr-*, **kr-*, **sr-*, **sř-*, and **xr-* are plentiful, as is illustrated by the data in table 5 (many additional examples could be added).

Examples of clusters with *y* as a second element are much more restricted, and table 6 contains all known examples (from Koontz 1983 and Rankin et al. 2015). In Dhegiha, clusters in **Cy-* merge with their **Cr-* counterparts.[6] In Lakhota, the **y-* element in **Cy-* clusters changes to *č* word-internally, and the previous segment is preserved (and undergoes fortition, in the case of **wy-*). Word-initially, **wy-* and **ky-* apparently merge with **y* as *čh-*.[7]

[5] The contrast between **r* and **R* was neutralized in clusters; the reflexes of the liquid in clusters are more similar to those of **R*, but here I follow the transcription generally adopted in the *Comparative Siouan Dictionary*.

[6] The 1 > 2 portmanteau prefix presents a unique correspondence; given the well-known tendency of local forms to be irregular and display usual developments (Heath 1998), no attempt to explain these forms is made here.

[7] The 1 > 2 prefix does not always appear word-initially, but we can safely assume that analogical pressure would have removed the expected *čh-*/*pč-* allomorphy.

TABLE 6
PROTO-SIOUAN **ky-*, **xy-*, AND **wy-*

	Proto-Siouan	Lakhota	Omaha	Kansa	Osage	
**ky-*	**kyé·wrą*	*wikčémna*	*gðéba*	*léblą*	*lébrą*	ten
	**kyetą́*	*čhetáŋ*	*gðedǫ́*	*ledą́*	*letǫ́*	hawk
	**kyąšká*	*čhaŋšká*	*gðąšká+*			raptor
	**rukyą*	*i_yúkčaŋ*	*wa-ðígðǫ*	*í_yülą*	*í_ðilą*	know
**xy-*	**xyá*	*Ȟčá/waȟčá*	*waxðá*	*xlá*		bloom, flower
**wy-*	**e-w-ye*	*epčÁ*	*ebðé*		*ébre*	I think
	**rąwyE*	*napčÁ*			*wa-nǫ́bre*	eat, swallow
	**w-yi-*	*čhi-*	*wi-*			1 > 2 prefix

TABLE 7
PARADIGM OF THE VERB **re* 'go' IN SIOUAN LANGUAGES

		Lakhota	Winnebago	Chiwere	Omaha	Osage	Kansa	Quapaw	Ofo
1sg.A	**wre·*	*blÁ*	*tée*	*hajé*	*bðé*	*brée*	*bne*	*bde*	*até·kna*
2sg.A	**šre·<*yre·*	*lÁ*	*šeré*	*slé*	*šné*	*šcée*	*hne*	*tte*	*šté·kna*
Base	**re·*	*yÁ*	*rée*	*lé*	*ðé*	*aðée*	*yé*	*dé*	*té·kna*

4. Verbal paradigms. The paradigm of **r-* initial verb stems (including verbs with the instrumental prefixes **ra-* 'by mouth' and **ru-* 'by hand') constitute a distinct conjugation class in Mississippi Valley Siouan languages. The paradigms in these languages are provided in table 7 (see Koontz 1983; 1990).

The first- and second-person forms result from the first singular **w-* and second-person **y-* prefixes respectively which occur in the so-called syncopating paradigms.[8] In all languages except Lakhota, the **y-* prefix becomes *š* in this paradigm by obstruentization.[9] That **y-* , rather than **š-* , should be reconstructed here is shown by other syncopating paradigms such as that of the glottal stop stems; for example, the second-person form of *ʔǫ́* 'be, do' in all Dhegiha languages is *žǫ́* 'you do, you are', which can only be from **y-ã̀ < *y-ʔã̀*.

In Omaha and other Dhegiha languages, the verb *ebðé, eðé* 'think' follows the same conjugation as **r* stem verbs, as shown in table 8.[10] However, its

[8] The non-syncopating regular active and stative paradigms, whose correspondences are quite complex between Siouan languages, are not discussed here, as they are not relevant to the topic at hand. The term "syncopating" is used because the prefixes in these paradigms, **w-* and **y-*, lack a vowel, unlike their equivalents in the regular paradigm.

[9] The absence of *š* in Lakhota might be secondary; in Omaha, second-person forms of **r-*stem verbs have variants in *hn* and *n* instead of *šn* in the text corpus.

[10] This verb has a discontinuous stem *e_ðe*. The element *e-* is probably originally a demonstrative related to Omaha *é* 'that'.

TABLE 8
PARADIGM OF THE VERB **e_ye* 'think' IN SIOUAN LANGUAGES

		Lakhota	Omaha	Osage	Expected Omaha
1sg.A	**wre·*	*epčÁ*	*ebðé*	*ébre*	*ebðe*
2sg.A	**šre· < *yre·*		*ešné*	?	??
Base	**re·*		*eðé*	*éðe*	**eže*

Lakhota cognate *epčÁ* 'I think', a defective verb attested only in the first singular, belongs to the set of forms with **wy-* in Proto-Siouan.

There is little doubt that these two verbs are cognate and that the first-person form should be reconstructed with **wy-*, a cluster also attested in the comparison between Lakhota *napčÁ* 'swallow' and Osage *wa-nǫ́bre* 'eat (it)'.[11] Not only are these verbs phonologically compatible, they occur in the same constructions; Omaha *ebðé, eðé* 'think' and Lakhota *epčÁ* can only be used with a complement clause (in Omaha, the verb *síðe* 'think of' is used when the P is not a complement clause), which can appear before (example 1) or after (2) the verb (see also Ullrich 2008).

(1) ǫ́kʰaži nudǫ́hǫga akʰá é wakʰa–báži ebðégǫ
no leader PROX:SG that mean–NEG 1SG:think

á–bi–amá.
say–PROX–EVD

'"No, the leader did not mean that, I think," said the former'. (Dorsey 1890:177.19–178.1)

(2) nį́kašįga ðižúbaži kíji, égǫwé'ǫ gǫðawáðe ebðégǫ.
man injure when do.this.way desirable 1SG:think

'I think that when one man injures another, it is desirable to repay him'. (Dorsey 1890:13, 438)

This morphosyntactic property should also be reconstructed back to Proto-Mississippi Valley Siouan.

Since the cluster *pč* is extremely rare in Lakhota, the dearth of cognates is not surprising. Moreover, the parallelism with the group **ky-*, which merges with **kr-* in Dhegiha but remains distinct as *kč* in Lakhota, confirms that **wy-* is indeed the correct reconstruction for the correspondence *pč* in Lakhota to *bð* in Omaha.

Thus, in the Dhegiha paradigm for the verb *ebðé* 'I think', the first person should be identical to that of an *r-* stem, since **wy* and **wr* merge as *bð* Omaha and *br* in Osage, according to the correspondences shown in table 6.

[11] The *wa-* prefix in Osage is the antipassive; the antipassive form *wa-nápčA* 'swallow' also exists in Lakhota. This word is apparently not attested in other Dhegiha languages.

TABLE 9
FOUR-PART ANALOGY

	'go'	'think'
1sg	*bðé*	*ebðé*
3sg	*ðé*	**eže > eðé*

However, the third person should not have the same reflexes in Dhegiha: **e-ye* should have yielded **eže* instead of the attested form *eðé* in Dhegiha. The third-person *eðé* 'he thinks' is the expected form of an **r* stem verb, not that of a **y* stem verb.

For the second person, it is unclear what the outcome of **e-y-ye* or **e-s-ǐye* would have been; while **eže* is the most likely outcome, we cannot exclude the possibility that the second-person form *ešné* is the regular phonetic reflex from **e-y-ye* (since **y* otherwise merges with **r* when occurring as second element of clusters), in the absence of other examples of **-yy-* in Siouan.

As was briefly suggested in Rankin et al. (2015), the only available explanation for the irregular *ð* in the form *eðé* 'he thinks' is analogical leveling based on the model of **r* stem paradigms, taking the first person as the pivot form. It is impossible to argue that *ð* is the regular outcome of **y* in Dhegiha in intervocalic position, since clear examples of *ž* from **y* are attested word-internally (see table 2). It is thus a plain example of four-part analogy (Hock 1991:167–75); see table 9.

The verb **e_ye* 'think' in Siouan was the only syncopating **y-* initial stem and had a unique conjugation. In Lakhota, it lost the second- and third-person forms (it is the only defective verb of this type), while in Dhegiha, the third- and perhaps the second-person forms were renewed on the basis of the first-person singular.

5. The directionality of analogy. Mississippi Valley Siouan languages attest a very rare type of analogy, from first person to third person. In Omaha, the third-person plural and TAM morphology are marked by suffixes, so that no other form of the paradigm could have served as a basis for the *ð* in *eðé* 'he thinks'.

An explanation for the preservation of the first-person form *epčÁ* 'I think' in Lakhota (and the loss of the rest of the paradigm) and the directionality of analogy in the paradigm of *ebðé, eðé* 'think' in Dhegiha can, however, be provided by the relative frequency of the first-person singular for verbs of cognition such as 'think' and 'know'.

The Omaha corpus (Dorsey 1890) was conveniently retranscribed and corrected by Robert Rankin (Rankin 2008) and is therefore fully searchable. As shown in table 10, the most common verbs of cognition meaning 'think' or

TABLE 10
PARADIGM OF THE VERB **e_ye* 'think' IN SIOUAN LANGUAGES

Person	'think'		'think, suspect'		'know'	
1	*ebðé(gǫ)*	172	*éžǫmį*	7	*iðáppahǫ*	42
2	*ehné(gǫ)*, *ené(gǫ)*, or *esňé(gǫ)*	114		0	*íšpahǫ*	28
3	*eðé(gǫ)*	22		0	*íbahǫ*	29

'know' in Omaha occur more often in the first-person singular than in the third person by a considerable margin. This strong tendency is verified in other languages too, as Google counts can easily show for any major language.

The higher frequency of the first-person singular form for verbs of cognition offers a plausible explanation for both the anomalous direction of analogy (from first singular to third singular) and the development of defective verbs only attested in the first singular. It has been observed that "frequency leads to memory strength and fast lexical access, so that frequent items are less susceptible to analogical leveling" (Haspelmath and Sims 2010:276). Therefore, it is not altogether surprising that different frequency patterns lead to different directions of analogical leveling.

As far as I know, the only documented case of analogical leveling where the third-person singular is remade on the basis of the first outside of Siouan is found in English. Some dialects of English appear to have generalized the first singular form *am* of the verb *to be* (Dillard 1975:163). It is this dialect in which Elliot Blaine Henderson's poems were written.[12] It is unclear whether the frequency hypothesis proposed here to account for the paradigm of the verb 'to think' in Dhegiha could also be applied to this dialect of English. This topic must be left for future research.

REFERENCES

DAHLSTROM, AMY. 1989. Morphological change in Plains Cree verb inflection. Folia Linguistica Historica 9:59–72.

DILLARD, JOEY LEE. 1975. Perspectives on Black English. The Hague: Mouton.

DORSEY, JAMES OWEN. 1890. The Dhegiha Language. Washington, D.C.: Government Printing Office.

ESCHENBERG, ARDIS. 2005. The article system of Umoho (Omaha). Ph.D. dissertation, State University of New York at Buffalo.

FORTSON, BENJAMIN. 2010. Indo-European Language and Culture: An Introduction. Oxford: Blackwell.

GODDARD, IVES. 1965. Sketch of Arapaho linguistic history. Ms.

HASPELMATH, MARTIN, AND ANDREA SIMS. 2010. Understanding Morphology. New York: Routledge.

[12] I am indebted to two anonymous *IJAL* reviewers who both pointed out this example independently of each other.

HEATH, JEFFREY. 1998. Pragmatic skewing in 1 ↔ 2 pronominal combinations in Native American languages. IJAL 64:83–104.

HOCK, HANS HEINRICH. 1991. Principles of Historical Linguistics. Berlin: Mouton de Gruyter.

JACQUES, GUILLAUME, AND ANTON ANTONOV. n.d. The direction(s) of analogical change in direct/inverse systems. Ms.

KOONTZ, JOHN. 1983. Siouan syncopating r-stems. Napao: A Saskatchewan Anthropology Journal 13:11–23.

_____. 1990. Central Siouan syncopating stem. Paper presented at the Tenth Siouan and Caddoan Linguistics Conference, Lawrence, Kansas.

KURYŁOWICZ, JERZY. 1927. Les effets du schwa en indoiranien. Prace Filologiczne 11:201–43.

MICHAUD, ALEXIS; GUILLAUME JACQUES; AND ROBERT RANKIN. 2012. Historical transfer of nasality between consonantal onset and vowel: From C to V or from V to C? Diachronica 29:201–30.

QUINTERO, CAROLYN. 2010. Osage Dictionary. Norman: University of Oklahoma Press.

RANKIN, ROBERT. 2005. Quapaw. Native Languages of the Southeastern United States, ed. Janine Scancarelli and Heather K. Hardy, pp. 454–540. Lincoln: University of Nebraska Press.

_____. 2008. James Owen Dorsey's The Dhegiha Language. Siouan Archive. <http://glottolog.org/resource/reference/id/472063>.

RANKIN, ROBERT L.; RICHARD T. CARTER; A. WESLEY JONES; JOHN E. KOONTZ; DAVID S. ROOD; AND IREN HARTMANN, eds. 2015. Comparative Siouan Dictionary. Leipzig: Max Planck Institute for Evolutionary Anthropology.

SAYGIN, AYŞE PINAR, AND STEPHEN WILSON. 2002. Paradigm reanalysis and the representation of morphologically complex words in Turkish. Proceedings of the Chicago Linguistic Society 38:286–98.

ULLRICH, JAN. 2008. New Lakota Dictionary. Bloomington, Ind.: Lakota Language Consortium.

WATKINS, CALVERT. 1962. Indo-European Origins of the Celtic Verb: The Sigmatic Aorist. Vol. 1. Dublin: Dublin Institute for Advanced Study.

WHITNEY, WILLIAM DWIGHT. 1962. Sanskrit Grammar. Delhi: Motilal Banarsidass. [Reprint of 5th ed., 1924.]