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Forward

For nearly four decades, Siouanists and Caddoanists have been meeting on a yearly basis to present and discuss topics relating to the language, cultural practices of the autochthonous peoples who inhabited large portions of the interior of the North American continent before the arrival of Europeans. The Siouan and Caddoan Languages Conference prides itself on its receptiveness to new scholars and on its dedicated attendees, many of whom have been central fixtures of the conference. The SCLC is welcoming of indigenous scholars and community members, and tries to balance theoretical presentations with applied linguistics and subjects of anthropological interest.

I have been coming to the SCLC every year since 2012 (with an unfortunate exception of the 2017 in Joplin, MO), and it is undoubtedly the conference I spend the most time planning for and talking about. It was also there that I first met Bob Rankin, who later was extremely kind and patient to answer my many emails about Siouan diachrony and issues about writing about indigenous languages while trying to balance what linguists want to read versus what native scholars can find useful. We all lost an important fixture of the Siouanist community with his passing.

My introduction to Siouan languages came through John Boyle, who shared the wonder of Siouan languages with his students during his time at Northeastern Illinois University. I can remember taking his Advanced Grammatical Analysis: Mandan class in 2010, where I was introduced to Mandan for the first time. I had no idea at the time that my focus would shift from topics relating to teaching students who speak English as a second language to theoretical linguistics until that class. I was so taken with Mandan that it has served as a constant topic of research for the better part of a decade.

Mandan also served as a jumping-off point into other Siouan languages, leading to work with Hidatsa and Crow, and dabbling in Caddo and Arikara. Getting a foot in the door can often be very difficult for learners and researchers who have no prior experience with languages and communities such as the ones we work with at the SCLC, but the community has been extremely welcoming and encouraging. Some of my favorite people are ones who I have met in pursuing the documentation and study of Siouan and Caddoan languages, and even if academic positions around the country cause us to not live near each other, I hope that the SCLC encourages us all to stay in contact and to stay engaged in each other's work.

It is in the spirit of that encouragement that I broached the topic of a proceedings for the SCLC during the January 2018 meeting of the Linguistic Society of America/Society for the Study of the Indigenous Languages of the Americas in Salt Lake City. After talking with people including (but not limited to) Saul Schwartz, Catherine Rudin, John Boyle, and Lewis Gebhart, I made the case that Siouanists and Caddoanists come to the SCLC, but there is often no publication on the topics presented to act as a public record of our work. This lack of publications on these language families is a shame, and the lack of easily-accessible resources may very well be a limiting factor in getting new scholars and learners to start working with them. During the business meeting at this year's SCLC, I offered to edit a proceedings volume if there were any interested parties. I had expected only a handful of people to accept, but I was delighted to receive nearly a

dozen submissions, all of which are included here in these proceedings.

These proceedings represent the first time since 1992 that the Siouan and Caddoan Languages Conference has produced a written collection of the works presented. For the first time in over a quarter-century, the SCLC will have a published work associated with the research conducted over the past year. Furthermore, this work is available through the generosity of NEIU's Library and their Digital Commons. These Digital Commons will ensure that this work is accessible permanently and in such a way that access to these materials are not restricted. It is vital that we remove barriers to accessing knowledge and ideas if we are to remain relevant in this day and age. It is my hope that future conferences bring future proceedings, and that this becomes an annual tradition: moving our collective knowledge from our lips onto our fingertips, where other can take part in the conversations and debates we are having, even if they were unable to come to the conference. Having an annual proceedings also increases the relevance of the SCLC and our work; while I do not think anyone involved in the SCLC over the past few years imagines that the SCLC will be as large or formal as some other conferences such as the Algonquian Conference or FAMLi, I personally want to use these proceedings as a way to elevate overall awareness of Siouan and Caddoan languages. For these reasons and more, I was happy to volunteer to organize these papers.

I have organized the papers according to alphabetical order of their titles, since I did not want to seem like I was prioritizing one area of study over another if I were to organize them by topic or language (e.g., all the syntax papers are grouped together, all the Mississippi Valley papers are grouped together, etc.). Ten papers wound up being included in the final count, representing the work presented by the majority of conference participants. I strongly encourage people in the future to contribute to subsequent volumes. While putting these proceedings together did take up not a small amount of time, that time is nothing compared to the amount of time dedicated to the study of these languages by the scholars whose works appear here. I have enjoyed reading all these papers during the editing process, and I want to thank Justin McBride again for generously hosting the conference at Northeastern State University, and I hope to see everyone again next year in Broken Arrow, OK at SCLC 39!

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Adverbial clauses in Hoocąk: A case of weakly grammaticalized subordination*

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Abstract: The goal of this paper is to give an overview of the structure and meaning of adverbial clauses in Hoocąk. This topic is interesting for two reasons. First, Hoocąk lacks most of the morphosyntactic features that are usually associated with adverbial clauses in European languages (e.g. infinite verb forms, subjunctive mood, alternative word orders, etc.). And secondly, Hoocąk has a number of sentence-final enclitics that indicate adverbial-like relation between the subordinate clause and main clause. However, these enclitics are not always subordinating conjunctions like the European ones. Some may appear with complement clauses as well, and even with main clauses. The question that will be answered is: are there really adverbial clauses (from a morphosyntactic point of view), and how can they be distinguished from complement clauses. It will be shown that there are indeed very small morphosyntactic differences between complement clauses and adverbial clauses. This result confirms the idea that subordination is only very weakly grammaticalized in Hoocąk (and probably in other Siouan languages too).

Keywords: adverbial clauses, subordinating and non-subordination conjunctions, Hoocąk, clause linkage

1. Introduction

Adverbial clauses are subordinate clauses that modify–in a broad sense–the predicate of the main clause and/or the entire main clause. They replace paradigmatically adverbials of the main clause and are hence a structural part of the main clause. The state of affairs expressed in adverbial clauses have certain semantic relations to the main clause such as time, location, manner, and many others. These semantic relations between adverbial clause and main clause resemble the ones that adverbials have. This traditional definition of adverbial clauses may serve as a guideline for the exploration of this type of subordinate clauses in an individual language. The postulated paradigmatic relationship between adverbials and adverbial clauses usually does not hold for all kinds of adverbial expressions, and the proposed semantic relations between adverbial clause and main clause need not be expressed exclusively by adverbial clauses, or are not expressed by adverbial clauses in a language at all (see van der Auwera 1998; Van Valin & LaPolla 1997; Thompson, Longacre & Hwang 2007). In addition, the morphosyntactic properties of adverbial clauses vary within a language as well as from language to language.

The goal of the proposed paper is to give an overview of the structure and meaning of adverbial clauses in Hoocąk. This topic is interesting for two reasons. First, Hoocąk lacks most of the morphosyntactic features that are usually associated with adverbial clauses in European languages (e.g. infinite verb forms, subjunctive mood, alternative word orders, etc.). And secondly, Hoocąk has a number of clause-final enclitics that indicate adverbial-like relations between the subordinate clause and main clause. However, these enclitic are not subordinating conjunctions like the European ones. Some may appear with complement clauses as well, and even with main clauses.

The questions that will be answered in this paper is: are there really adverbial clauses (from a morphosyntactic point of view), and how can they be distinguished from complement clauses. It will be shown that there are indeed very small morphosyntactic differences, mostly distributional differences, between complement clauses and adverbial clauses. This confirms the genral impression that subordination is only very weakly grammaticalized in Hoocąk (and probably in other Siouan languages too).

The data for this paper come from the DOBES corpus of Hoocąk texts digitally archived at The Language Archive of the Max Planck Institute for Psycholinguistics in Nijmegen; the Netherlands.[1] The corpus of glossed and transcribed audio and video recordings was compiled during a five years project "Documentation of the Hoocąk language" financed by the Volkswagen Foundation (2003-2008).

2.   Semantic and morphosyntactic properties of adverbial clauses in Hoocąk

   i. Adverbial clauses modify (in a broad sense) the predicate of the main clause.
  ii. The preferred structural position of adverbial clauses correspond to the positions adverbials of the same semantic type occupy in the normal declarative clause; i.e. they appear either in the PF-1 position immediately before the main clause predicate, or in the PI position before the core argument NPs. Adverbial clauses may easily be moved to a position after the main clause predicate, though.
 iii. Adverbial clauses are structurally almost identical to main clauses. They are always finite, i.e. the subordinate verbs are fully inflected for person. There is no instance of the suppression of person indexing in adverbial clauses even if the subject/actor of the adverbial clause is coreferential with an argument of the main clause. Suppression of person indexing is often possible in complement clauses.
 iv. In addition, adverbial clauses take tense and mood/ modality marking almost independently. This does not hold for the illocutionary force.
  v. Adverbial clauses are often marked by means of clause-final enclitics that indicate the semantic relation between adverbial clause and main clause, or they are marked by means of the definite article (no specific semantic relation is indicated here), or they are not marked at all.

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[1]See the website of the DOBES funding initiative of the Volkswagen Foundation (http://dobes.mpi.nl). The glossed texts, audio and video files of the Hoocąk documentation project are stored in the digital archive of the Max-Planck-Institute for Psycholinguistics called "The Language Archive"; the corresponding URL is: http://dobes.mpi.nl/projects/hocank/. The website of this DOBES project can be found under the following URL: http://www2.uni-erfurt.de/sprachwissenschaft/Vgl_SW/Hocank/index_frames.html.

    vi. The clause-final enclitics that often mark adverbial relations are =*regi* (SIM/LOC), =*ų* (SIM), =*ga* (CONT), =*gają* (SEQ), =*gi*/=*giži* (TOP), =*ge*/=*gejinį* (CAUSAL). However, these enclitics are neither obligatory, nor do they indicate subordination in all cases. Some of these enclitics can be found also with complement clauses or even just with main clauses.

3. Some structural properties of the Hoocąk clause

Hoocąk is a SOV language. The verbal predicate is obligatory and appears very regularly at the end of the clause. All other NP-constituents in SA, SU, A, U, and other functions, as well as adverbials of different kinds are optional and almost always precede the clausal predicate. The structural patterns found in the corpus are remarkably regular. They are summarized in Table 1.

Table 1: Order of constituents in the clause

pre-clausal position	clausal positions						post-clausal position
P^{pre}	P^{I}	P^{F-4}	P^{F-3}	P^{F-2}	P^{F-1}	P^{F}	P^{post}
	adverbial	S$_A$/A	U$_{REC}$	S$_U$/U	adverbial	**predicate**	
'eegi	*saanįk 'eeja že'e*			*woorák haanįwįna že'e*	*coowéxjį*	*ha'e haakjenehé*	
and then	on that side			out story	just a little	I'll talk about it	

‘I'm going to talk about our story on that side.’

(1)   WIL010

    'Eegi,   saanįk 'eeja že'e woorák haanįwįna   že'e coowéxjį
    'eegi   saanįk 'eeja že'e woorak ha<ha>nį-wį=ra   že'e coowexjį
    and.then side   there that story <1E.A>.have.NTL-PL=DEF that just.a.little
    ha'e haakjenehé.
    ha'e_haa=kjenehe
    talk.about\1E.A=FUT
    ‘I'm going to talk about our story on that side.’

The first expression in utterance (1) is *'eegi* ‘here, and then’. This word is intonationally clearly separated from the rest of the utterance. It is classified as adverb in the Hoocąk Lexical Database[2] contrasting with *'eeja* ‘there’, but it has no deictic function in this context. *'Eegi* is very often used as a kind of introduction to the next clause or episode in a narration quite comparable to ‘and then’, which is very common in oral narrations. It fills hence the pre-clausal position in Table 1. In addition, *'eegi* often fills pauses between different constituents in a clause. Another word,

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[2]The Hoocąk Lexical Database (HLD) is a Toolbox database that includes all lexical entries from previous lexical sources such as Marino (1968), Miner (1992), Zeps (1996) and from our own fieldwork during the DOBES documentation project. In addition, about half of all entries have been checked and cross-checked with different speakers and enriched with elicited example sentences (see also Helmbrecht & Lehmann 2010).

that is frequently used in these functions is *hegų́*, which is glossed variously as 'that way, well, whatever, then' in the HLD. This pre-clausal position may be filled also with nominal appositions.

The next expression in (1) is *saanįk 'eeja že'e* 'on that side'. This expression refers to one of the different sides of the family of the speaker. It contains the general marker of locative adverbials *'eeja* 'there', which is classified as locative adverb in the HLD. This adverbial fills the P^I position which is frequently filled by temporal adverbials in the corpus. In this context, this expression represents the topic of the utterance. Adverbs with a local and modal meaning can be found in this position likewise.

The next expression is *coowéxjį* 'a little bit'. A second clausal position that is filled with adverbials is the P^{F-1} position immediately to the left of the predicate. This position is preferably filled with locative adverbials either local adverbs or complex locative phrases. If there are two adverbials in a clause, the first one in P^I is usually a temporal adverbial and the second one in P^{F-1} a locative adverbial.

If there are NPs in the clause that refer to the referents of the core arguments in S_A, S_U, A, and U role, these appear in P^{F-4} and P^{F-2} position always preceding the predicate and in between the adverbials, if there are any. Transitive clauses with A and U NPs are rare in the corpus, though. If there are two core argument NPs in the clause, their order is usually A preceding U thus disambiguating the semantic roles agent and patient, if both are third person singular.

There are almost no underived ditransitive verbs in the Hoocąk lexicon. The only ditransitive verb in the lexicon is *hok'ų́* 'to give' (see Hartmann 2015:1274) and the question arises how the two undergoer arguments U_{PAT} and U_{REC} are ordered vis-à-vis each other and the A argument. I did not find instances with three NPs (A, U_{REC}, and U_{PAT}) in the corpus, but will present elicited examples of this type below (see (6) and (7)). The corpus does only provide examples with two U NPs. It seems that the default order is U_{REC} preceding U_{PAT}; compare the subsequent examples in (2)-(4).

(2)   WTR004

hixųųnųxjį	*hanįharegi*		*waagax*	*hocieja*	*žeežeesge*
hi-xųųnų=xjį	ha-nįhe=regi		waagax	hoci='eeja	žee-žeesge
1E.U-be.small=INTS	1E.A-be/PROG=SIM/LOC		school	house=there	that-thus

Mąą'ųňą		*'eeja*	*nąącgera*	*waak'ųną*
Mąą'ų=ra		'eeja	nąącge=ra	ho<ha>k'ų=ną
Earthmaker=DEF		there	heart=DEF	<1E.A>GIVE=DECL

'When I was really small, in school, I gave my heart to the Earthmaker.'

(3)   DOL250

mąąnįkisak	**haksika**		*žee*	*waak'ų*
mąąnįkisak	**haksik=ga**		**žee**	ho<ha>k'ų
Christmas	**third.daughter=PROP**		**that**	<1E.A>give(OBJ.3SG.REC.3SG)

'I gave that to Haksika for Christmas'

(4)   JON006

tee	*žee*	***Gracega***	*žee*	*waak'ų*		*že'e.*
tee	žee	**Grace=ga**	**žee**	ho<ha>k'ų		že'e
here/this	that	**Grace=PROP**	**that**	<1E.A>give(OBJ.3SG.REC.3SG)		that

'I gave that to Grace.'

All three examples from different texts and different speakers suggest that the preferred order is U$_{\text{REC}}$ > U$_{\text{PAT}}$ > predicate. The patient U NP directly precedes the verbal predicate, and is in turn preceded by the U$_{\text{REC}}$ NP. The A argument is marked pronominally on the verb in all three cases. Note that the speaker in WTR004 (2) marks the recipient NP with the generalized locative marker *'eeja* 'there', which is otherwise used only for locative adverbials. In the same text, the speaker uses an alternative ordering with regard to the two U NPs some utterances below; compare (5).

(5) WTR013

hišge tee	*žeesge nįgitawiną*		**nąącgera**	**Mąą'ųňą**	**hinįkra**
hišge tee	žeesge nįį-gi-taa-wi=ną		**nąącge=ra**	**Mąą'ų=ra**	**hinįk=ra**
also this thus	1&2-APPL.BEN-ask.for-PL=DECL		**heart=DEF**	**Earthmaker=DEF**	**son=DEF**

horak'ųwiną
ho<ra>k'ų-wi=ną
<2.A>give-PL=DECL
'and I ask you this: you give your heart to the Earthmaker's son'

The order of U$_{\text{PAT}}$ and U$_{\text{REC}}$ is reversed in this example and there is no special focus or emphasis associated with this ordering.

However, the order of major constituents is more liberal than Table 1 suggests. If I check the fieldnotes I elicited with some of the Hoocąk consultants, most noteworthy with Phil Mike and Bill O'Brien, than it seems that much more syntactic variability is possible than the majority patterns found in the text corpus suggests. Thus the template representation of the constituent order above should rather be taken as a summary of these majority patterns. The elicited examples (6) and (7) below demonstrate a) that the order U$_{\text{REC}}$ and U$_{\text{PAT}}$ may be reversed without a change in meaning, and b) that the temporal adverbials may appear likewise at different places in the clause, even between the core argument NPs. However, to the best of my knowledge, I never found such examples in the text corpus.

(6) PM (II:45)

Johnga	*waagaxra*	*Billga*	**s'iigają**	*haganįjiiną*
John=ga	waagax=ra	Bill=ga	**s'ii=gają**	haganį=jii=ną
J.=PROP	book=DEF	B.=PROP	**long.time=SEQ**	take.sth.to.so=come.arrive=DECL

'John brought the book to Bill late'

s'iigają Johnga   waagaxra Billga haganįjiiną
Johnga **s'iigają**   waagaxra Billga haganįjiiną
Johnga waagaxra **s'iigają**   Billga haganįjiiną
*Johnga waagaxra Billga haganįjiiną **s'iigają**

The adverbial *s'iigają* 'late' may appear in clause-initial position (P$^{\text{I}}$), between the core argument NPs (A, U, and between U$_{\text{PAT}}$ and U$_{\text{REC}}$), and immediately before the predicate. The only position that is not possible is the position after the predicate.

(7) PM (II:45)

hąąpnúp   hįjihúwira   Johnga   Billga   waagaxra
hąąp-nųųp hį-jiihu-wi=ra   John=ga Bill=ga   waagax=ra
day-two   1I.A-come.PAST-PL=DEF   J.=PROP B.=PROP book=DEF

haganįjiiną
haganį=jii=ną
take.sth.to.so=come.arrive=DECL

'Two days ago, John brought the book to Bill.'

hąąpnúp hįjihúwira Johnga   waagaxra   Billga   haganįjiiną
Johnga   Billga   waagaxra **hąąpnúp   hįjihúwira** haganįjiiną
*Johnga   Billga   waagaxra haganįjiiną **hąąpnúp   hįjihúwira**

Similar patterns hold for the rather complex adverbial *hąąpnúp hįjihúwira* 'two days ago' which is actually an adverbial clause that can be translated literally as 'we (INCL) came beyond/ past two days'; cf. (7).

It is an important morphosyntactic property of adverbial clauses in Hoocąk that they occur in the same structural slots as adverbials do, in P^I and in P^{F-1} position.

4.   Types of adverbial clauses

The following types of adverbial clauses can be distinguished in Hoocąk (cf. Helmbrecht in prep). Note that some of the types of adverbial clauses listed in Table 2 are not really grammaticalized in Hoocąk.

Table 2: Types of adverbial clauses in Hoocąk

1		=*regi* (SIM/LOC)
2.		=*ga* (CONT)
3.	**Temporal clauses**	=*gają* (SEQ)
4.		*keenį ... =nį* (ANT.IN...ANT.FIN)
5.		other construction with temporal meanings
6.	Locative clauses	
7.	Manner clauses	
8.	Purpose and reason clauses	
9.	Circumstantial clauses	
10.	Simultaneity clauses	
11.		counterfactual conditionals
12.	**Conditional clauses**	negative conditionals
13.		concessive conditionals
14.		other functions of =*gi*/=*gižį* (TOP)
15.	Concesssive clauses	
16.	Substitutive clauses	
17.	Addititve clauses	

In the reminder of this paper, I will present two kinds of adverbial clauses, temporal adverbial clauses and conditional adverbial clauses. They are at least weakly grammaticalized in Hoocąk and they could serve as a kind of prototype for all other adverbial clauses.

5.   Temporal adverbial clauses

Adverbial clauses that express some kind of temporal relation with regard to the main clause are very frequent in our text corpus. The state or event expressed in the adverbial clause may temporally precede the event in the main clause, may follow it, and/or may show some kind of temporal overlap with the main clause event. There are four enclitics that are frequently used to indicate temporal relations between adverbial clause and main clause. They could be considered as a kind of subordinate conjunctions, but they deviate from this classification quite often. There are many instances in the corpus, where they appear with an independent main clause with no subordinating function. These enclitics will be discussed individually in the subsequent sections.

5.1.   =*regi* (SIM/LOC)

The enclitic =*regi* (SIM/LOC is used to express an anterior temporal relation and sometimes to express simultaneity. These two main uses of this form will be illustrated with some textual examples.

(8)   BOF023

’Eejaxjį	*hegų*	*hąąp*	*hitanįhąįja*		*hegųgają*	*hegų*	*žige*
’eejaxjį	hegų	hąąp	hi-taanį-hą=hija		hegų=gają	hegų	žige
about.there	that.way	day	ORD-three-times=there		that.way=SEQ	that.way	again

hįšjųwąk,		*hegų*	*hegų*	*’eeja*	*hamįknąka,*		***žige***
hį-šjųwą=’ąk		hegų	hegų	’eeja	ha-mįįk-nąka		[[**žige**
1E.U-get.sleepy=POS.HOR		that.way	that.way	there	1E.A-lie.down-POS.NTL:DIST		**again**

hanąąňegi,	*’eeja*	*wažą*	*yaahąteną.*
ha-nąą=regi]	’eeja	wažą	hi<ha>hąte=ną]
1E.A-sleep=SIM/LOC	there	something	<1E.A>dream.of=DECL

'About on the third day I got sleepy again, lying there **I went to sleep again**, I dreamed again.'
(lit. 'About on the third day, I was getting sleepy again. After lying down, **when I slept again**, I dreamt something there')

The 'sleeping' event in (8) – given in bold and brackets – precedes the 'dreaming'-event in the main clause with some overlap. This adverbial clause fills the P$^{\text{I}}$ position of the main clause, which can be inferred from the fact that the undergoer argument of the main clause 'thing, something' is placed directly before the main clause predicate and after the adverbial clause. Note that the adverbial clause shows person indexing of the core arguments of the verb 'sleep'. The same semantic relation is expressed in MAP001 in (9).

(9)   MAP001

s'iireja	*hįxųnųįgregi*		*hi'ųnį*	*haara*	*taanįžu nąą 'eeja*
s'iireja	hį-xųųnų-įk=**regi**		hi'ųnį	haa-ra	taanįžu nąą 'eeja
long.time.ago	1E.U-be.small-DIM=**SIM/LOC**		mother	have.kin\1E.A-DEF	sugar tree there

ruusšųnųregi	*hagijitešųnų*
ruus-šųnų=**regi**	ha-gijite=šųnų
take(SBJ.3SG)-HAB=**SIM/LOC**	1E.A-help\1E.A=HAB

'A long time ago, **when I was small**, **when my mother used to take the sugar tree there**, I helped her.'

There are two temporal adverbial clauses marked by the same enclitic =*regi*. With regard to the discourse, they have different functions. The first one sets the stage of the following events. The entire episode is placed in the childhood of the speaker. The second subordinate clause gives the background of the activity with regard to which the child/speaker is acting.

That =*regi* (SIM/LOC) also may indicate the simultaneity of two events is illustrated in PM (X:6), an elicited example. This usage often comes with the progressive aspect in the adverbial clause marked here by means of the 'be' auxiliary *nįhé* 'be'. The adverbial clause is in PI position followed by the core arguments of the main clause.

(10)   PM (X:6)

Johnga	*nįįkjąnkra*	*wakišgac*	*nįheregi,*	*Maryga*	*waruc 'ųųną*
John=ga	nįįkjąnk=ra	wa-ki-šgac	nįhe=**regi**,	Mary=ga	waruc 'ųų=ną
J.=PROP	child=DEF	OBJ.3PL-REFL-play	be=**SIM/LOC**	M.=PROP	food do/make=DECL

'While John played with the children, Mary prepared the food.'

The gloss for =*regi* (SIM/LOC) signals that there is a temporal and a local/locative meaning associated with this form. The local/locative function never shows up with adverbial clauses. It can be found frequently with adverbs and local/locative adverbials, though.

5.2.   =*ga* (CONT)

The enclitic =*ga* (CONT) designates very similar temporal relations between a subordinate (adverbial) clause and its main clause. These relations can be translated in English as 'when, after, once, and then' and the like. A very typical use of =*ga* is illustrated in ED3018 in (11).

(11)   ED3018

hanį	*hegų*	*wažą*	*honįňega*	*hegų*	*wanį wanįňą*	*roohąšge*
hanį	hegų	waža	**honį-ire=ga**	hegų	wanį wanį=ra	roohą=šge
have.NTL	that.way	something	**hunt-SBJ.3PL=CONT**	that.way	meat meat=DEF	a.lot=also

hanįąkirire
hanį ha-kiri-ire
have.NTL COLL-arrive.back.here-SBJ.3PL

'**When they went hunting**, they brought back a lot of meat'

The =*ga* (CONT) marked clause presents an event that precedes temporally the main clause event 'hunting'. As is often the case, this adverbial clause could also receive a conditional interpretation. The =*ga* clause is placed in PI position before the lexical core argument of the main clause 'a lot of meat'.

That the enclitic =*ga* often occurs with independent clauses simply indicating a temporal succession or continuation without any subordinating function is illustrated in the following examples from the text corpus.

(12) WIC002

Wichąwąra	*kiisak*	***wamącanąkga,***		*rookra,*	*suura*	***hanąąc***
wicąwą=ra	kiisak	**wa-mąące=nąk=ga**		rook=ra	suu=ra	**hanąąc**
squash=DEF	half	**OBJ.3PL-cut=POS.NTL=CONT**		inside=DEF	seed=DEF	**all**

waigopnąkga,		*k'orok'oros*		*jiinąkiregi*
wa-gigop=nąk=ga		k'orok'oros		jiinąk-ire=gi
OBJ.3PL-hollow.out=POS.NTL=CONT		be.hollowed.out(OBJ.3SG)		become-SBJ.3PL=TOP

'eegi	*haruce*	*waamąxaranąąną.*
'eegi	haruce	wa-hamąxara=nąą=ną
and.then	cross(SBJ.3SG)	OBJ.3PL-slice=POT=DECL

'Cut the squash in half, scoop out the inside, and when it is hollowed out, it may be sliced crosswise.'

The translation of this utterance, that is given in White Eagle (1988), is to some extent misleading. There is no imperative form in the Hoocąk text as it is used in English recipes. A more literal translation would give 'and then one cuts the squash in half, and then one scoops out all the seeds inside, and if it is hollowed out, it can be sliced crosswise'. Here, =*ga* expresses a temporal continuation of actions that that are necessary for the preparation of squash, better translated as 'and then'. Both =*ga* clauses are certainly not subordinated, rather almost independent adjoined clauses that are ordered iconically.

The following example presents an utterance that consists of two independent but subordinate clauses. The first and semantically prominent clause designates the arrival of the brave man. This clause is marked by the definite article indicating that the fact that a man is coming is already mentioned in the previous clause (BOF033) in the text. BOF034 makes the claim more specific, it is a 'brave man' that is coming. The definite article is often used as a kind of indicator for subordination (marking giveness and thus backgrounding the event). The second clause in BOF034 has =*ga* indicating simultaneity here in this context.

(13) BOF034

Wąąk wašoše	*hiżą*	*'eeja*	***huhera***		*hegų*	*šųųk*	***hamįnąkga.***
wąąk wašoše	hiżą	'eeja	**huhe=ra**		hegų	šųųk_**hamįnąk=ga**	
man be.brave	one	there	**be.coming.here=DEF**		that.way	**ride.horseback(SBJ.3SG)=CONT**	

'A brave man came here riding a horse.'

The next utterance WIL054 contains likewise a clause that is marked with =ga and does not show any dependency to another clause in the immediate discourse context. The enclitic simply marks the continuation of the narration.

(14) WIL054

Wokáragixetexjįre		*meežegų*	*hiire**ga.***
woo<kara>gixete-xjį-ire		meežegų	hii-ire=**ga**
<POSS.RFL>love-INTS-SBJ.3PL		this.way	make/CAUS-SBJ.3PL=**CONT**

'They really loved their own.'

Etymologically, =*ga* (CONT) is derived from the distal demonstrative pronoun *ga'a* 'that' that does not occur once in the entire corpus, but was mentioned in older descriptions of Hoocąk (see Susman 1943, Lipkind 1945).

5.3. =*gają* (SEQ)

There is a third temporal marker of adverbial clauses =*gają* (SEQ), which can be translated often with English 'when, after, and then'. This form is mostly used with adverbial clauses that express time or weather conditions; see the utterances in (15) and (16).

(15) BOF019 **Hegų   hąąhe hakirigają   hegų   'eeja nįge   hamįįkanąga**
          hegų   hąąhe hakiri=gają   hegų   'eeja nįge   ha-mįįk='anąga
          that.way night start.coming=SEQ that.way there somewhere 1E.A-lie.down=and

   hanąą   nąą'įšge,   hegų   hąąkešge   nąą   tuuxuruknį.
   ha-nąą   nąą<ha>'į=šge hegų   hąąke=šge   nąą   tuuxuruk=nį
   1E.A-sleep <1E.A>try=also that.way NEG.IN=also sleep accomplish\1E.A=NEG.FIN
   '**When nightfall came**, I'd lie down and try to sleep, but I couldn't go to sleep.'

(16) NWB009 **Hokawasgają   'eegi   Jesusga   haja hiiže**
          hokawas=gają   'eegi   Jesus=ga   haja hii=že
          be.dark(OBJ.3SG)=SEQ and.then Jesus=PROP see   arrive.there(SBJ.3SG)=QUOT

   'aire.
   'ee-ire
   say-SBJ.3PL
   '**When it got dark**, and they say he went to see Jesus.'

Likewise, =*gają* (SEQ) marks an anterior relation between two events; compare the utterance BOF072 in (17). Note that the =*gają* (SEQ) clause is surrounded by two hesitation markers *hegų* that often serve as lexical clause boundaries. There is also an intonation break between adverbial clause and main clause.

(17) BOF072
   Hegų   hįš'agįk   taahera,   hegų   hakiri,   žige
   hegų   hį-š'aak=įk   taahe=ra   hegų   ha-kiri   [žige
   that.way 1E.U-be.old=DIM be.going.there\1E.A=DEF that.way 1E.A-arrive.back.here [again
   hegų   hakirigająšge,   hegų   žige hopį
   hegų   **ha-kiri=gają=šge**]   hegų   žige ho-pįį
   that.way **1E.A-arrive.back.here=SEQ=also**] that.way again APPL.INESS-be.good
   waagiwe.
   ho<ha>giwe
   <1E.A>take.path
   'Now that I was getting older, I came back here, again when I got home, I came to some good times.'

(18) ONE002

Hagoreižą (1971)	*hi'ąc*	*haara*	*haakaraikižu*		*Mąąnįco Horus*
hagoreižą 1971	hi'ąc	haa=ra	ha<ha-kara-kii>kižu		Mąąnįco_Horus
sometime 1971	father	have.kin\1E.A=DEF	<1E.A-POSS.RFL-RFL>be.together		St. Paul

'eeja	***hahiiwigają,***	*'eeja*	*wąąkšikra*	*stoohirekjąne*
'eeja	**ha-hii-wi=gają**	'eeja	wąąkšik=ra	stoohi-ire-kjane
there	**1E.A-arrive.there-PL=SEQ**	there	Indian/person=DEF	gather-SBJ.3PL-FUT

'aanąąke		*hija*	*hahiwiną.*
'ee=nąąk=ge		hija	ha-hii-wi=ną
say=POS.NTL.PL=CAUSAL		there	1E.A-arrive.there-PL=DECL

'Once my father and I, **when we went to St. Paul, Minnesota**, we heard that there was going to be a gathering of the local Indian people, and so we went there.'
(lit. 'Once, my father and I, **when we went to St. Paul**, and then because they said the local Indians would gather there, we went there')

Like the adverbial clause constructions with the other temporal enclitics, temporal clauses with =*gają* (SEQ) may easily be moved to a position after the main clause predicate; cf. the utterance NWB014 in (19).

(19) NWB014

Nicodemusga	*koore*		*mee*	***žee***	***heesge***	***higairegają.***
Nicodemus=ga	koore		mee	**žee**	**heesge**	**hige-ire=gają**
Nicodemus=PROP	be.surprised(OBJ.3SG)		this	**that**	**that's.why**	**say.to-SBJ.3PL=SEQ**

'Nicodemus was surprised when they told him this.'

Like the other already discussed temporal enclitics, =*gają* (SEQ) is polyfunctional and cannot only mark subordinate clauses, but can also be used with main clauses; cf. the utterances BOF074 in (20).

(20) BOF074

Hegų	*jaagu raagųňą,*	***hanąąc***	***haanįąjegają.***
hegų	jaagu roo<ha>gų=ra	**hanąąc**	**ha<ha>nį=ha-jee=gają**
that.way	what <1E.A>want=DEF	**all**	**<1E.A>have.NTL=1E.A-POS.VERT=SEQ**

'Whatever I want, I have it all.'
(lit. 'Whatever I wanted, I am having it all')

It seems that =*gają* (SEQ) is only weakly grammaticalized; it occurs as independent word in our corpus even in clause initial position; see ONE012 in (21) (and also HOR035, RL1016, which are not presented here).

(21) ONE012

Gają,	*wąąkšik*	*hinųknąągre*	*hižą*	*teegi*	*hapahi*
gają	wąąkšik	hinųk=nąągre	hižą	teegi	hapahi
SEQ	Indian/person	woman=POS.NTL.PL:PROX	one	right.here	go.toward

jiinąknąkga		*weeną,*	*"Jaagu 'ee?".*
jiinąk=nąk=ga		wee=ną	jaagu 'ee
run.into(SBJ.3SG)=POS.NTL=CONT		talk(SBJ.3SG)=DECL	what say(SBJ.3SG)

'**And so**, one of these ladies turned to us and asked, "What did he say?".'

The =*gają* (SEQ) is mostly attached to the verbal predicate of the subordinate clause (or independent clause), but it appears also with hesitation markers like *hegų* (BOF023) and *heesge* (WIL067), and can be translated in these cases as 'and then' like *'eegi.* Surprisingly, =*gają* (SEQ) also appears on nouns, for instance with soul=*gają* (e.g. in NWB017), and more frequently with temporal adverbs (e.g. TWI016).

5.4.   *keenį ... =nį* (ANT.IN ... ANT.FIN)

Hoocąk has a special construction that expresses a posterior temporal relationship. That is, the event in the adverbial clause happens after the event in the main clause. This relation is marked in English with 'before'. The corresponding construction in Hoocąk resembles the double negation construction used for clausal negation. The 'before' meaning is expressed by the negating word *keenį* plus the standard negative suffix =*nį* for verbs. That adverbial 'before' clauses contain some kind of negation is not unusual from a cross-linguistic point of view. The logic behind this construction is that the event in the adverbial 'before' clause did not happen, when the event in the main clause happend. Compare the example ED7004 in (22).

(22) ED7004

heesge	*heesge*	**keenįšge**	*jiikaranį*		*hegų*
heesge	heesge	**keenį=šge**	jiikere=nį		hegų
that's.why	that's.why	**ANT.IN=also**	**be.started(SBJ.3SG)=ANT.FIN**		that.way

wažąňą		*roohą*	*hųgiraknąkają*		*hegų*	*hanąąc*
wažą=ra		roohą	ho<hį-gi>rak=nąk=gają		hegų	hanąąc
something=DEF		a.lot	<1E.U-APPL.BEN>tell(SBJ.3SG)=POS.NTL=SEQ		that.way	all

wąąkšik	*nąągre*	*hinųknąągrešge*	*jaasge*
wąąkšik	nąągre	hinųk=nąągre=šge	jaasge
Indian/person	POS.NTL.PL:PROX	woman=POS.NTL.PL:PROX=also	how

hikorohohires'agi		*heesge*	*hiišųnų*
hikoroho-ire=s'a=gi		heesge	hii=šųnų
get.ready-SBJ.3PL=ITER=TOP		that's.why	make/CAUS(SBJ.3SG)=HAB

'**Before she left**, there were a lot of things she told me about all these Indians, how the women used to dress, that's what she used to do.'

The *keenį ... =nį* clause here appears like the other adverbial time clauses in P$^{\text{I}}$ position. Further textual examples of this construction can be found in WIL011, ED2008, RIC011, and CAW048.

5.5.   Other constructions with time relations

As has been mentioned several times, Hoocąk has only very few grammatical means to mark subordination. The enclitics discussed in the previous sections are used typically to indicate temporal relations between two clauses. However, their distribution is much wider. They form adverbs and mark adverbials and they do not always mark subordination. In this section, I would like to give a brief overview of other constructions that are employed to express temporal relations between two clauses. Sometimes, these meanings are not really grammaticalized, but have to be inferred from the context, sometimes we are dealing with secondary uses of other adverbial enclitics.

5.5.1. The definite article =*ra* (DEF)

One general subordinating device is the definite article =*ra* (DEF). There are many instances in the corpus, where subordinate clauses with =*ra* receive a temporal interpretation. These temporal interpretations are not grammatical, but have to be inferred from the context. Compare the following examples. In each case, the =*ra* marked clause receives a temporal interpretation 'after, when'.

(23) ED3035

nųnįge   **hahi**   **hįxetera**   *hoxjugnįįsge raže*
nųnįge   **ha-hii**   **hį-xete=ra**   hoxjuk=nįįsge=ra=že
nevertheless 1E.A-**arrive.there** 1E.U-**be.big=DEF** debris=VAGUE=DEF=QUOT

wayakišere   *ha'ųnąk'ų*   *watupį*
wa-hi<ha>kišere   ha-'ųų-nąk='ų   watupį
OBJ.3PL<1E.A>deal.with 1E.A-do/make-POS.NTL=SIM know.how.to(manually)\1E.A

'Nevertheless, **after I grew older**, I used her scraps to do the same she was doing, finally I got to know how to do it.'

(24) JOK015

hegų   *žee* **rušjąną**   *hegų*   *gisga* *hakiri*
hegų   žee **rušją=ra**   hegų   gisga hakirí
that.way that **end(SBJ.3SG)=DEF** that.way clear.up start(SBJ.3SG)

'**After that (=raining) stopped**, it started to clear up'

(25) BOF050

Hegų   *'eeja hakarawi,*   **cii**   *'eeja* **hagiwira**   *hegų*
hegų   'eeja ha-kere-wi   **cii**   'eeja **ha-gii-wi=ra**   hegų
that.way there 1E.A-go.back.there-PL **house there 1E.A-arrive.back.there-PL=DEF** that.way

nįįpąną hųųk'ųįňe.
nįįpąną ho<hį>k'ų-ire
soup   <1E.U>give-SBJ.3PL

'We went home, and **when we got home**, they gave me soup.'

The following example shows that =*ra* (DEF) marks subordinate clauses that express the time when the event in the main clause happens. Note that the word *hąąp* 'day', which is categorized as noun in the HLD is personally inflected for the first person undergoer.

(26) BOF028

Hegų   *žige* **hįįhąpra,**   *hegų*   *hąąp hijobahąną*
hegų   žige **ha<hį>hąp=ra**   hegų   hąąp hi-joop-ahą=ra
that.way again <1E.U>**day.comes.upon=DEF** that.way day ORD-four-times=DEF

hįįhąąpra,   *hegų*   *mįąnakanąga...*
ha<hį>hąp=ra   hegų   mįį<ha>nąk='anąga
<1E.U>day.comes.upon=DEF that.way <1E.A>sit=and

'Then day came upon me again, the fourth day came upon me, I was sitting up.'

5.5.2. Adnominal demonstrative ("new" paradigm)

A subordinate clause with a temporal relation to the main clause may also be formed by means of an adnominal demonstrative of the "new" paradigm based on a positional auxiliary. This construction, which is illustrated in BOF023, seems to be rare in the corpus. The subordinate verb with the demonstrative receives a temporal interpretation such as 'when, after' rather on the basis of the context than on the basis of the semantics of this construction. The positional auxiliaries that are used to express progressive aspect preserve this function also in this example.

(27)   BOF023

'Eejaxjį	*hegų*	*hąąp*	*hitanįhąįja*		*hegųgają*	*hegų*	*žige*
'eejaxjį	hegų	hąąp	hi-taanį-hą=hija		hegų=gają	hegų	žige
about.there	that.way	day	ORD-three-times=there		that.way=SEQ	that.way	again

hįšjųwąk,		*hegų*	*hegų*	*'eeja*	***hamįknąka,***		*žige*
hį-šjųwą='ąk		hegų	hegų	'eeja	**ha-mįįk=nąka**		žige
1E.U-get.sleepy=POS.HOR		that.way	that.way	there	**1E.A-lie.down=POS.NTL:DIST**		again

hanąąňegi,	*'eeja*	*wažą*	*yaahąte.*
ha-nąą=regi	'eeja	wažą	hi<ha>hąte
1E.A-sleep=SIM/LOC	there	something	<1E.A>dream.of

'About on the third day I got sleepy again, **lying there** I went to sleep again, I dreamed again.'

5.5.3. Enclitic *=gi* (TOP)

There is an enclitic form *=gi* (TOP) that is most typically used to form conditional clauses (see §6). Since conditional clauses are semantically close to temporal clauses 'when', it does not come as surprise that there are instances in the corpus, where *=gi* is used in a rather temporal way. Compare ED1035, where *=gi* is clearly not used in a conditional meaning.

(28)   ED1035

'eegi	*'eesge*	*hawa'ų*	*ceek*	*mąįxetera*		*mąą*	*'eegi*
'eegi	'eesge	hawa'ų	ceek	mąįxete=ra		mąą	'eegi
and.then	thus	reason	first/new	white.person=DEF		earth	and.then

hajiiregi		*raašge*	*wawok'ųįňe,*		*mąįxete*
ha-jii-ire=gi		raaš=šge	wa-wa-hok'ų-ire		mąįxete
COLL-arrive.here-SBJ.3PL=TOP		name=also	OBJ.3PL-OBJ.3PL-give-SBJ.3PL		white.person

hit'e	*raaš*	*wok'ųįňe.*
hit'e	raaš	wa-hok'ų-ire
speak	name	OBJ.3PL-give-SBJ.3PL

'**When the white people first came to this country**, they gave them English names.'

5.5.4. Coordination

A third strategy to express temporal succession of two events is by means of a simple coordination of two clauses. In ED3028, two clauses are coordinated by *'anąga* 'and', and in addition, the coordination is reinforced by the *=šge* 'also' coodinate conjunction. The temporal order of both events has to be inferred.

(29) ED3028

waružaire	*'anąga hegų*	*mąąx hagiciejašge*	*hoo wiiruwįňe* **šge**
wa-ruža-ire	**'anąga** hegų	mąąx_hagici='eeja=**šge**	hoo wiiruwį-ire **šge**
OBJ.3PL-wash-SBJ.3PL	**and** that.way	farmer=there=**also**	fish sell-SBJ.3PL **also**

'**After they'd washed them**, the farmers went to sell the fish.'
(lit. 'They wash them, and the farmers also went to sell the fish, also')

The same holds for the utterance ED3003. However, only the *=šge* 'also' conjunction is employed.

(30) ED3003

'eesge nįge	*howaraire*	*hegų*	*nąąpąą wiiruwį*
'eesge nįge	howare-ire	hegų	nąąpąą wiiruwį
thus somewhere	go.forward-SBJ.3PL	that.way	basket sell(SBJ.3SG&OBJ.3SG)

hairešge	*hegų*	*warucra roohąxjį hanį*
ha-ree-ire=**šge**	hegų	waruc=ra roohą=xjį hanį
COLL-go.there-SBJ.3PL=**also**	that.way	food=DEF a.lot=INTS have.NTL

hakirire
ha-kiri-ire
COLL-arrive.back.here-SBJ.3PL

'Whenever they went someplace to sell baskets, they brought back a lot of food.'
(lit. 'And/also they went somewhere to sell baskets, they brought back a lot of food')

The last point to make here is that there is a construction that is translated as 'until'. Such a construction is illustrated in (31).

(31) BO (X:1)

Peterga	*hįįcge kįį*	*hipa wareną*
Peter=ga	hįįcge kįį	**hipa** ware=ną
P.=PROP	tired make.oneself	**until** work=DECL

'Peter worked until he was tired'
(lit. 'Peter worked until he made himself tired')

The word *hipá* 'until' is categorized as adverb in the HLD with several meanings such as 'until, up to that far, near'. It is certainly not a subordinating conjunction even in this example. The clause 'until he made himself tired' is a subordinate clause, though. It is syntactically integrated in the main clause occupying the P^{F-1} position for adverbials. There is, however, no morphological sign of subordination at all.

6. Conditional clauses

In general, conditional clauses are complex clauses that express events that are not (yet) real. The first and dependent clause designates a condition, which—if met—has the consequence expressed in the main clause. Important formal distinctions, which can be found in English, have to do with the probability that the condition in the if-clause is fulfilled. Hoocąk conditional clauses do not show such variation.

The most important means to mark conditional clauses in Hoocąk are the so-called topic markers *=gi/=giži* (TOP). They mark the clauses that set the condition. They occur in the same structural slot, where all the other enclitics occur that have been discussed so far. Both forms are synonymous and freely interchangeably without any semantic effects.

A typical conditional clause is given in (32) (BOF015).

(32)   BOF015
*"Žee šuruxuru**ki***   *hija rah**į̨pgi***   *wą̨ą̨k rajijekjane,"*   *h**į̨ge.*
[žee šu-ruxuruk=**gi**]   [hija ra-hį̨ip=**gi**]   wą̨ą̨k ra-jije-kjane   hi<hį̨>ge
that 2A-ACCOMPLISH=**TOP** there 2.A-reach=**TOP** man   2.A-become-FUT <1E.U>say.to(SBJ.3SG)
'"If you can do that, if you can make it that far, you'll be a man," he said to me.'

There are two conditionals juxtaposed preceeding the main clause. These conditional clauses appear in the clause-initial P^I position of the main clause. Another example from the text corpus would be WIL035 in (33).

(33)   WIL035
Wažą́ňą   *h**į̨žą 'aire**gi*   *wanáňągixgų*   *šuruxúrukra*
[wažą=ra   hižą 'ee-ire=**gi**]   [wa-ną̨ą̨<ra-gi>xgų   šu-ruxuruk=ra]
[something=DEF one say-SBJ.3PL=**TOP**] [OBJ.3PL<2.A-APPL.BEN>hear 2.A-accomplish=DEF]
méžegų.
meežegų
this.way
'When they said something, you were able to hear (understand) them.'

The speaker in WIL035 is talking about the Ioways, who speak a language closely related to Hoocąk and which was, obviously, to some extent mutual intelligible. The conditional clause is formed by the enclitic *=gi* with the meaning 'if'. There are no other signs of subordination except the structural position. It is a finite clause in P^I position of the main clause. A similar conditional clause is presented in (34) (RIC042), but with *=giži* (TOP), which is an allomorph of *=gi* (TOP) and in free variation.

(34)   RIC042
*žige hac**įja hahiwi**giži***   *hac**įja 'eeja Hoocąkra***   *hostoiregiži*
žige hacį̨ja ha-hii-wi=**giži**   hacį̨ja 'eeja Hoocąk=ra   ho-sto-ire=**giži**
again where 1E.A-arrive-PL=**TOP** where there Hoocąk=DEF APPL.INESS-gather-SBJ.3PL=**TOP**
*'eeja heegu   wanąňąxgų**giži***   *hegų   Hocąkra   hit'et'e hegų   kiran**į̨isge.*
['eeja heegu   wa-ną<ra>xgų=giži]   hegų   Hoocąk=ra hit'et'e hegų   kira-nį̨isge
[there that.way OBJ.3PL-<2.A>hear=TOP] that.way Hoocąk=DEF talk   that.way only-VAGUE
'Wherever we went, wherever the Hocanks gathered, **if you listened to them there**, they'd speak Hocank only.'

Note that the first two occurences of *=giži* (TOP) in RIC042 are not conditional, but illustrate a different function of this form. The general function of *=gi/giži* (TOP) is to present the setting, strating point, or topic for the subsequent main clause, hence the gloss TOP. This function will be discussed below in more detail.

Generic conditional clauses that present the condition as a general rule do not show any marking differences. Compare the example in (35) (RIC052) of the same speaker.

(35) RIC052

hąke	*wagax hašja*	*wagax hajara*	*hąke*
hąke	wagax*h*a<š>ja	wagax_haja=ra	hąke
NEG.IN	<2.A>go.to.school	go.to.school=DEF	NEG.IN

pįįraanįgiži		*woocexi*	*hašurusikjane*
pįį-raa=nį=**giži**		woocexi	ha<šu>rus-i-**kjane**
be.good(OBJ.3SG)-make/CAUS\2.A=NEG.FIN=**TOP**		be.difficult	<2.A>go.through.sth-EP-**FUT**

'If you don't go to school, if you don't do good, it's not going to be very pleasant for you, if you don't do well at school, you're going to go through bad times.'
(lit. 'If you don't go to school, if you don't do good, you'll go through difficult times.')

The condition is marked by *=giži* (TOP), and the main clause has future (FUT) marking. A predictive conditional is formed in exactly a parallel fashion. Compare the example in (36), with the marker *=gi* (TOP) in the conditional clause, and the *=kjąne* (FUT) enclitic in the main clause.

(36) PM (X:1)

ware	*'ųgigiregi*		*hanąc hįwožąkjąnewįną*	
ware	'ųų gigi-ire=gi		hanąc hį-woožą-**kjąne**=wį=ną	
work	do/be cause-SBJ.3PL=TOP	all	1I.A-celebrate-**FUT**=PL=DECL	

'If he gets the job, we will all celebrate it.'

Common distinctions among conditional clauses are counterfactual conditionals, negative conditionals and concessive conditionals. All three types of conditional clauses will briefly be dealt with in the following sections. It will be shown that there are only relatively minor formal differences in Hoocąk between these different semantic types of conditionals. This fits in the overall picture that subordination is not deeply grammaticalized in the syntax of Hoocąk.

6.1.   Counterfactual conditionals

Counterfactual conditional clauses express conditions in the past that can by no means become real. Since Hoocąk has no past tense, the temporal situation of the event has to be inferred from the context, and consequently the necessarily unreal situation, too. There are two similar ways to express a counterfactual conditional. Both have in common that the main clause is marked by the *=nąą* (POT) 'potential' enclitic. The counterfactual conditional in (37) expresses the condition in the same way as all other conditions are expressed, by means of the *=gi* (TOP) marker. That this is a condition in the past has to be inferred. The only sign that the entire event remains unreal is given with the POT marker in the main clause.

(37) PM (X:8)

hostoeja	*ranišegi,*	*jagu*	*airera*	*hiraperesnąą*	
hosto 'eeja	ra-niše=**gi**,	jagu	'ee-ire=ra	hi<ra>peres=**ną**=ną	
meeting there	2A-be/2A=**TOP**	what	say-SBJ.3PL=DEF	<2A>know=**POT**=DECL	

'If you were at the meeting, you would know what they said.'

By contrast, I found also a clearly counterfactual condition without the *=gi/=giži* (TOP) marker, but with two POT markers, one in the conditional clause, the other in the main clause; see (38).

(38) ONE026

(He)gų   žige   hiruxųhi   hįnąžįkjawi   ’aajeną   hihanąišge
[hegų   žige   hiruxųhi   hį-nąąžį-kje-wi   ’ee=jee=ną   hihe=**nąą**=išge]
[that.way again be.lined.up 1PI.A-stand-FUT-PL say=POS.VERT=DECL say\1E.A=**POT**=also]

’ee   pįįnągają.
’ee   pįį=**nąą**=gają
this be.good(OBJ.3SG)=**POT**=SEQ

‘Or, if I said that we are to form a line, it would have been better.’

The square brackets in ONE026 mark the conditional clause, followed by the main clause. The two POT markers in the main verb of the conditional clause, and the verb of the main clause are given in bold. Note that there is an unusual way to express obligation in the conditional clause. Usually, it is the combination of =*kje* (FUT) + *heesge* that means ‘must’. Obviously, the FUT marker =*kje* may express an obligation meaning also in isolation.

6.2.   Negative conditionals

Negative conditionals express a condition that is negated. English has a special word for this meaning ‘unless’. Nothing comparable exists in Hoocąk. Negative conditionals are simply expressed by negating a normal positive conditional, as is examplified in (39) and (40).

(39) PM (X:1)

ke   *taanį   hįį   šurušjąnįgi,*   *honįwažakjeneną*
ke   taanį   hįį   šu-rušją=**nį**=**gi**,   ho<nį>waža-kjene=ną
NEG.IN tobacco smoke 2A-stop=**NEG.FIN**=**TOP** <2U>sick-FUT=DECL

‘If you don’t quit smoking, you will be sick’
‘Unless you quit smoking, you will be sick’

(40) PM (X:1)

ke   *nįįžunįgi,*   *cąąkeja   hįwarucwikjenawiną*
ke   nįįžu-**nį**=**gi**,   cąąk ’eeja   hį-waruc-wi-kjena-wi=ną
NEG.IN rain=**NEG.FIN**=**TOP** outside there 1I.A-eat-PL-FUT-PL-DECL

‘Unless it rains, we will have our picnic.’
(lit. ‘we will eat in the outside there’)

6.3.   Concessive conditionals

Concessive conditionals are conditionals that express that the condition itself is quite unexpected. Some languages have special markers for this. In English, for instance, the unexpected conditional is expressed by ‘even if’ or ‘even though’. Hoocąk has no lexical equivalent for that. However, I found that concessive conditionals in Hoocąk often employ in addition to the =*gi*/=*giži* (TOP) marker the =*šge* ‘also’ enclitic. Compare the examples in (41), (42), and (43).

(41) PM (X:1)

nįįžugišge,   *cąąkeja   hįwarucwinąną*
[nįįžu=**gi**=**šge**]   cąąk ’eeja   hį-waruc-wi=ną=ną
[rain=**TOP**=**also**] outside there 1I.A-eat-PL=POT=DECL

‘Even if it rains, we can have our picnic.’

(42) WTR011

jaajanągiži *woocexi* *wažą* *woocexiižą* *horagiwe*
[**jaajaną**=**giži** woocexi wažą woocexi=ižą ho<ra>giwe
[**when**=**TOP** be.difficult something be.difficult=one <2.A>take.path

hašąnąkwišge *waną'į nįgipįkjanawi* *nįrukegikjanawi*
ha-ša-nąk-wi=**šge**] waną'į nį-gipį-kjane-wi nį-rukek-i-kjane-wi
COLL-2.A-POS.NTL-PL=**also**] mind 2.U-like-FUT-PL 2.U-comfort(SBJ.3SG)-EP-FUT

'Even if you're going through a bad time, you'll be be in good spirits, and he'll comfort you.'

(43) ALV017

Žee hegúgi *hąąkéšge* *wąąkšík* *nąąc hirasgíkjene* *hąąke*
žee hegų=gi hąąke=šge wąąkšik nąąc_hi<ra>sgi-kjene [hąąke
this that.way=TOP NEG.IN=also Indian/person <2A>scold-FUT [NEG.IN

heesgánį *wažąňą* *hižą hąąke pįį*
heesge=nį wažą=ra hižą hąąke pįį
that's.why=NEG.FIN something=DEF one NEG.IN be.good

hiiranį́gišge *hąąké nąąc wiirasgíkje* *heesgą́nį*
hii-ire-nį=gi=šge] hąąke nąąc_wa-hi<ra>sgi-kje heesge=nį
make/CAUS-SBJ.3PL-NEG.FIN=TOP=also] NEG.IN OBJ.3PL-<2.A>scold-FUT thus=NEG.FIN

hazohícąą *worák* *hišára* *'anąga žeegųgi* *nąxgúįňekjene* *žeegú hišge*
hazohí=cąą wa-horak hiše=ra 'anąga žeegų=gi nąąxgų-ire-kjene žeegų hišge
carefully=instead OBJ.3PL-tell say\2.A=DEF and thus=TOP hear-SBJ.3PL-FUT thus also

nąňáxgų *'aire.*
nąą<ra>xgų 'ee-ire
<2.A>hear say-SBJ

'That way you don't scold them, even if they don't do something good, you are not supposed to scold them, instead tell them nicely and they will hear, that's what you heard they said.'

In all three cases, =*šge* 'also' follows the predicate of the conditional clause and occurs in all but one example immediately after the TOP marker. It seems that this 'also' that frequently occurs in our texts puts emphasis on the condition marking in these cases.

6.4. Other functions of =*gi*/=*giži* (TOP)

The two enclitics =*gi*/=*giži* (TOP) do not only mark conditional clauses, but have other functions too.

6.4.1. Formation of temporal adverbials

First of all, =*gi* (TOP)—and =*giži* (TOP) only rarely—forms temporal adverbials with words that designate phases of the day. For instance, there is the intransitive inactive verb *hąįnį* 'be.morning' in the HLD. With =*gi* (TOP) it is *hąįnįgi* 'in the morning (to come, tomorrow)' (cf. e.g. CAW066 and for =*giži* FOX028). Likewise, there is the intransitive inactive verb hoxjąną 'be.evening', which will be an adverbial *hoxjąnągi* 'in the evening' (cf. e.g. BLU029); and similarly *hąąhé* 'be.night'

will become the adverbial *hǫǫhégi* 'in the night, tonight' (FOX025). With regard to the formation of adverbials, *=gi* contrasts paradigmatically with *=re* 'this' forming adverbials that refer to a phase of the day that already passed with respect to the time of speaking. For instance, there is the advebial *hǫįnįre* 'this morning (that just passed)' vs. *hǫįnįgi* 'this (coming) morning'.

6.4.2. Formation of anaphoric adverbials

Secondly, *=gi* (TOP) and *=giži* (TOP) frequently occur in texts with adverbs like *žeegų* 'thus', *žeežegų* 'thus', *meegų* 'this way', *hegų* 'that way', sometimes also *heesge* 'that's why, so', and a few others. These adverbs have in common that they refer back to mostly immediatly preceding parts of the discours like episodes, events, and propositions. These forms thus are employed to create textual cohesion. If these adverbs are marked by the two TOP forms *=gi*/ *=giži*, this is meant to indicate that the episodes, events and propositions are the setting and strating point for the proceeding discourse or narration.

6.4.3. Marking of complement clauses

Thirdly, both forms are frequently used to mark complement clauses mostly with CTVs of 'thinking' and 'speaking'. The following example WIL053 in (44) could illustrate this usage.

(44) WIL053
    Jáasge hiires'ági   *heesge*   *wakáragigųsire*   *meegų.*
    jaasge hii-ire=s'a=gi   heesge   wa-kara-gigųs-ire   meegų
    how   make/CAUS-SBJ.3PL=ITER=TOP that's.why OBJ.3PL-POSS.RFL-teach-SBJ.3PL this.way
    'They taught their own what to do.'
    (lit. 'How to do it, that's what they taught their own')

The object of the teaching is a clausal complement of the trivalent verb *gigųs* 'to teach sth. to so.' This clausal complement is marked by *=gi* indicating that the content of the teaching is topical in the actual discourse. A very similar example BOF057 is given in (45).

(45) BOF057
    "Jaagu wašjagi   *hųųgirakre!"*
    jaagu   wa-ha<š>ja=gi   ho<hį-gi>rak=re
    what   OBJ.3PL-<2.A>see=TOP <1E.U-APPL.BEN>tell=IMP
    "Tell me what you saw in your dream!"

The content of the dream in this narrated conversation is the topic of the actual discourse.

6.4.4. Presentational function: new topics and topic changes

A fourth and related function of *=gi*/*giži* (TOP) is to highlight new topics in discourse. In example WIL061 in (46), the grandmother is introduced for the first time and will be a discourse topic in the subsequent story.

(46) WIL061

Žeežegų́	*hegųgiži*	**hiž̜ą́**	**hikoróke**	**haawigiži**	*raašrášge*
žeežegų	hegų=giži	**hiž̜ą**	**hikoroke**	**haa-wi=giži**	raaš=ra=šge
that's.how	that.way=TOP	**one**	**grandmother**	**have.kin\1E.A-PL=TOP**	name=DEF=also

ną́ąxgų		*nųnįge*	*hihaną́gre*		*hą̜ąke*	*peewį*
nąą<ha>xgų		nųnįge	hihe=nągre		hą̜ąke	peewį
<1E.A>hear(OBJ.3SG)		nevertheless	say\1E.A=POS.NTL:PROX		NEG.IN	think.about\1E.A

tuuxúruknį		*žeesge*	*gigiireže.*
tuuxuruk=nį		žeesge	gigi-ire=že
accomplish\1E.A-NEG.FIN		thus	let/cause(OBJ.3SG.REC.3SG)-SBJ.3PL=QUOT

'In that way, one of our grandmothers, I heard her name, but I can't think of it, they did that to her.'

In order to mark newly introduced topics in discourse, both forms may occur with NPs as demonstrated in the preceding example. However, they may also be used to mark a topic change as is the case in DES054 in (47). The "old" demonstrative pronoun *te'e* 'this' received a new referent in this example that differs from the referent of the previous clause.

(47) DES054

Te'egi	*hiž̜ą*	*hawają*	*kąną̜kirega.*
te'e=gi	hiž̜ą	hawają	kąną̜k-ire=ga
this=TOP	one	push	place-SBJ.3PL=CONT

'They put this one down and pushed it in.'

A fifth and likewise related function is to mark clausal topics. A very typical way of information packaging in Hoocąk discourse is to start with the expression of an event in general terms and then to repeat the main predicate with a core argument of a more specific content. Compare WIL103 in (48).

(48) WIL103

Raaš'ų́įň̜egi		*hųųc*	*hikikárac*	*hiž̜ą*	*heesge*
raaš 'ųų-ire=gi		hųųc	hikikarac	hiž̜ą	heesge
name do/make(OBJ.3SG)-SBJ.3PL=TOP		bear	clan.member	one	that's.why

raaš'ų́įň̜e.
raaš 'ųų-ire
name do/make(OBJ.3SG)-SBJ.3PL

'They named him a bear clan name.'

The sentence starts with the general statement that they gave him a name. This statement is the starting point or setting for the more specific claim in the following clause that it is a bear clan name. One could also characterize this function as a presentational function of the TOP marker. This presentational function can be found also with independent main clauses as in WIL068 in (49).

(49)   WIL068
    'Eeja mąruhá   *wagigire**giži**.*
    'eeja mąruha   wa-gigi-ire=**giži**
    there move.cross.country OBJ.3PL-let/cause-SBJ.3PL=**TOP**
    'They made them move.'

The fact that the Ioway were deported to Oklahoma (Indian Territory) is introduced here in this clause for the first time in the story told. It is not a subordinate clause. And comments of other speakers (CL and CW) indicate that both forms are freely interchangeable in this context.

7.   Conclusions

Subordination is only weakly grammaticalized in Hoocąk; there are no infinite verbs forms, no alternative word orders, no special moods of the subordinate verb, and no complementizers that mark subordinate clauses.

Given these facts, I posed two question in the beginning of this paper: are there really adverbial clauses (from a morphosyntactic point of view), and how can they be distinguished from complement clauses?

Adverbial clauses have the following morphosyntactic properties:

   i. appear regularly before the verbal predicate in P^{F-1} and/or in P^{I} position;
  ii. can be moved also in a position after the verbal predicate of the main clause;
 iii. are always finite pronominally marked (even if the subject of the main clause is coreferent with the subject of the subordinate clause);
  iv. tense/mood/modality marking is independently marked in the subordinate clause;
   v. there are enclitics that mark certain semantic relationship between the adverbial clause and the main clause; these enclitics are NOT subordinating conjunctions;

Complement clauses, on the other hand, have partially different morphosyntactic properties:

   i. position always immediately before the matrix verb; only complement clauses of verbs of 'saying' may be moved in a position after the matrix verb;
  ii. no other lexical material is allowed between complement clause and matrix verb in most cases;
 iii. almost all complement clauses allow the suspension of pronominal marking of the A/S (=subject) under coreference with the A/S (=subject) of the matrix verb; however, it is never obligatory;
  iv. there are no complementizers;
   v. object complement clauses are sometimes marked by a definite article (as if the clause has to be nominalized), but this marking of subordination is in no way obligatory; subject complement clauses, on the other hand, always occur with the definite article.

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A comparison of four descriptions of the Osage sound system[*]

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Abstract: This paper examines and compares descriptions of the Osage sound system found in four different sources: La Flesche (1932), Quintero (2004), Quintero (2010), and Wolff (1952). While the sources largely agree about vowel quality, there are significant differences when it comes to the description of consonants. Given that there are no longer any L1 speakers of Osage (**?**), the purpose here is to highlight the similarities and differences found in the extant descriptions of Osage, and this information will be used to inform a larger project which aims to build a more complete description of the sound system that will be linked to recordings from the Carolyn Quintero Collection held at the Sam Noble Museum of Natural History's Native American Languages Collection. What is presented here represents a synthesis of what we know about the segmental inventory of Osage.

Keywords: Osage, Osage Phonetics, Osage Phonology, Revitalization

1.   Introduction and overview

Osage belongs to the Dhegiha branch of Siouan languages once spoken widely in the greater Mississippi valley (Quintero 2004, 2010), and although there are both L2 speakers and learners, there are no longer any L1 speakers (Quintero 2010). The goal of this paper is to examine and compare the phonetic descriptions of Osage found in La Flesche's Dictionary (La Flesche 1932), Wolff's *IJAL* article on Osage phonology (Wolff 1952), Quintero's Grammar (Quintero 2004), and Quintero's Dictionary (Quintero 2010). By highlighting the similarities and differences found in these sources, we can identify areas of disagreement and focus our future work with archived recordings on the sounds that are in most need of investigation. Since the focus of this paper is segmental phonetics, I have not included Altshuler's work on quantity-insensitive iambs (Altshuler 2009) which follows Quintero (2004) for its analysis of phonemes.

This paper examines the sources in their historical order of appearance both to provide a historical overview of our understanding and for ease of exposition.

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2.   The four sources

The four sources examined here vary in the degree to which they focus on the sound system of Osage. On the brief end, La Flesche (1932:2-3) uses two pages and a single paragraph to provide a phonetic key for his dictionary. All five pages of Wolff (1952) focus on the sounds of Osage. Quintero's (2004) dictionary has eight pages specifically focused on the pronunciation of Osage, and Quintero's (2010) grammar has a seventy-page chapter on Osage phonology (including detailed discussion of allophonic and dialectal variation), and ?'s (2010) dictionary has eight pages specifically focused on the pronunciation of Osage.

2.1.   La Flesche 1932

La Flesche's description of the sounds of Osage requires a bit of guess-work precisely because it is brief and because, for the most part, the sounds are almost all explained relative to English sounds; e.g. "*a* as in father, **b** as in bad" (La Flesche 1932:2).

There are four points where La Flesche's explanation veers away from English. First, La Flesche states that the "[...] continental vowel is used entirely [...]" (La Flesche 1932:2) and lists some of the vowels as exploded, e.g. '*'e* exploded e" (La Flesche 1932:2). Second, there is a set of stops that are listed with an under-dot, *p ṭ ḳ*, and described as "a different sound than the plain letters in English" (La Flesche 1932:2), e.g. "*ṭ* a medial *t* (between *t* and *d*)" (La Flesche 1932:3). Third, *x* is listed as "*x* rough German ch" (La Flesche 1932:3). And finally, La Flesche (1932:3) lists *hn* in his key and states "the sound of the initial letter is expelled from the nostrils and is scarcely audible."

Since *h* appears in combination with other consonants in his dictionary, it is unclear why La Flesche has singled out *hn* in his phonetic key. Perhaps it is intended as a single sound, but it could also be that he just wanted to give a more detailed phonetic description to the cluster. Though his intention is not clear, I include *hn* in Table 1 below as a single segment.

When it comes to *x*, it is safe to conclude that this sound is a voiceless velar fricative (as *ch* is in German), but the "medial" stops are harder to decipher. Because these sounds are not directly equated with English, it is safe to conclude that La Flesche intends for them to be interpreted as distinct from the voiced and voiceless stops of English, perhaps due to aspiration or a fortis-lenis contrast as suggested by later work (Wolff 1952; Quintero 2004, 2010).

The vowels are less tricky than the consonants. Presumably, by "continental vowel," La Flesche intends a pronunciation of / i, e, a, o, u / as is typical in many European languages, similar to the sounds of the International Phonetic Alphabet. To the extent that we frequently encounter languages containing precisely these five vowels, this would appear to be a safe assumption; however, later work gives /u/ as a central vowel (not a back vowel), and European 'a' is not the "*a* as in *father*" and since Quintero (2004:xv) also uses "*a* as in *father*" I persist with /ɑ/ rather than /a/ here. Finally, La Flesche (1932:2-3) only lists two nasalized vowels "iⁿ nasalized i" and "oⁿ nasalized o."

The term 'exploded vowels' is harder to pin down. However, when considering the inclusion of glottal stop (Wolff 1952) and glottalized consonants (Quintero 2004, 2010) in §2.2, §2.3, and §2.4 below, we can make some sense of the term "exploded vowels" by assuming that they are vowels that immediately follow glottal stops/glottalized consonants.

Table 1 presents an interpretation, using IPA where possible, of the sounds of Osage based on the pronunciation guide in La Flesche's (1932) dictionary.

Table 1: Osage phonemes in La Flesche (1932)

Vowels	IPA
Oral	/i e ɑ o u/ (/e/ as in *prey*)
Nasal	/ĩ õ/
"Exploded"	/ˈi ˈe ˈɑ ˈo ˈu ˈĩ ˈõ/
Consonants	
Stops	/p b t d k g/ & /p̣ ṭ ḳ/
Fricatives	/θ ð s ʃ ʒ x h/
Nasals	/m n/ & /hn/
Approximant	/w/

2.2. Wolff 1952

Wolff based his description of Osage primarily on fieldwork he carried out in 1951 with two speakers, Fred M. Lookout and Robert Bighorse (Wolff 1952:63). He was careful to note that he encountered two distinct styles of speech, a normal conversational style and a deliberate emphatic style (typical of elicitation work), and while he noted "long or overlong vowels" and "preaspirated or long stops" in the emphatic style, he chose to base his description primarily on the sounds he heard in the conversational context (Wolff 1952:63). In all, Wolff identifies 17 consonants and 5 vowels "plus a phoneme of nasality /ˌ/, stress /ˈ/, and syllabic juncture /#/" (Wolff 1952:63). While Wolff used APA symbols to represent Osage sounds, (e.g. *c* for /ts/), Table 2 presents a list of the IPA equivalents.

Table 2: Osage phonemes in Wolff (1952)

Vowels	IPA
Oral	/i ɛ ɑ o u/ (mid-front /e/ = [ɛ])
Nasal	/ĩ õ ã/
Consonants	
Stops/Affricate	/p br t k ʔ/ & /ts/
Fricatives	/ð s z ʃ ʒ x h/
Nasals	/m n/
Approximants	/l w/

A few things stand out about Wolff's list of phonemes. First, when Wolff introduces the mid-front vowel ⟨e⟩, he provides a phonetic symbol for a mid-low front vowel [ɛ]. Given the use of [ɛ], one might expect to see the equivalent mid-low back vowel symbol used, but ⟨o⟩ is matched with the phonetic symbol [o], a mid-high back vowel (Wolff 1952:65). Second, the sequence ⟨br⟩ is listed as a single phoneme among the stops, and Wolff notes that "the phoneme /br/ depends on the dialect. (L) has [bl] or [bəl] and [bəð] in one instance; (B) has [br] or [bər]." (Wolff 1952:64;

Wolff's ⟨r⟩ shoudl really be taken as /ɹ/). For the affricate ⟨c⟩ [ts], Wolff notes that there are three allophones [ts], [tʃ], and [ʃ], with some variation between speakers, and the sound /l/ has some occasional realizations as [dl] and [gl] inter-vocalically (Wolff 1952:64).

Finally, among the stops, Wolff noted that there were both pre-aspirated and long variants (of /p t k/ in particular); however, the analysis suggests that they only occur when uttered in "slow delivery and emphatic syllable division" and he speculates on whether some of these sounds might be "sonant-surds [...] consisting of a voiced on-glide and a voiceless off-glide" (Wolff 1952:65). Finally, when discussing syllable types, it is clear that Wolff allowed for glottal stop to serve as the second member of a two-consonant sequence (e.g. the ⟨cʔ⟩ of "*cʔé-a-ðe* I killed him"; ⟨c⟩ = IPA [ts]; Wolff 1952:65) where Quintero saw this as glottalization of a single consonant.

2.3. Quintero 2004

To the best of my knowledge, the phonology chapter of Quintero's *Osage Grammar* (2004:16-87) is the most detailed and thorough source we have for the sound system of Osage. Quintero describes 8 vowels (5 oral, 3 nasal; 2004:36-37) and 31 consonant phonemes (2004:16-35), and each sound is described in prose and instantiated with examples. The phonemes described in Quintero (2004) are listed in Table 3 below.

Table 3: Osage phonemes in Quintero (2004)

Vowels	IPA
Oral	/i e ɑ o u/ (/u/ often = [y] or [ʉ])
Nasal	/ĩ õ ɑ̃/
Consonants	
Voiceless Stops	/p t ts tʃ k/ ([ts], [tʃ] my be allophones of /t/)
Glottalized Stops	/p' ts' tʃ' k'/
Pre-Aspirated Stops	/hp ht hts htʃ hk/
Aspirated Stops	/pʰ tʰ kʰ/ (but these never surface)
Voiced Stop	/b/ (but /b/ only occurs with [ɹ])
Fricatives	/s z ʃ ʒ x ɣ h/
Nasals	/m n/
Approximants	/ð ɹ l w/ (/ɹ/ only occurs with /b/)

For the vowels, Quintero points out that the high rounded vowel *u* is often realized as [y] (which she describes as front or central vowel, implying that it could also be [ʉ], and which she says frequently unrounds to [i]; 2004:35-39), and she notes that /õ/ and /ɑ̃/ are often in variation with one another although there are a few minimal pairs for the two phonemes (Quintero 2004:36-37). In addition, she mentions vowel length, and provides minimal pairs illustrating the phonemic quality of length; however, she also states that "[o]ne fairly intractable issue in the data is long vowels" since long vowels often shorten and short vowels may also lengthen, though the exact conditions are not well understood (Quintero 2004:37).

The consonantal system is more complex than that found in Wolff (1952) or La Flesche (1932) because she includes five series of stops: 1) plain stops (and she describes [ts] as an

allophone of /t/; Quintero 2004:25), 2) glottalized stops (while /tʃ'/ is included in her table of phonemes, it is not discussed explicitly in the section on glottalized stops, and she is non-committal about the whether the glottal stop should have phonemic status or not; Quintero 2004:23-35), 3) pre-aspirated stops which "sometimes appear as geminates" and which include /hts/ and /htʃ/ even though these may be in complementary distribution with /ht/ (Quintero 2004:29-34), 4) aspirated stops which "never emerge on the surface" (Quintero 2004:31-33), and 5) the voiced bilabial stop /b/, included to better match speaker intuitions even though /b/ only occurs in combination with /r/ and can frequently be derived phonologically from underlying /wa + ð/ (Quintero 2004:23).

For the fricatives, Quintero lists four voiceless and three voiced sounds, but she notes that there is evidence "to suggest that perhaps voicing may not have been the distinctive feature differentiating *z* and *ž* [ʒ] from *s* and *š* [ʃ]" (Quintero 2004:17; bracketed IPA is mine). In addition, she notes that "the tenseness of s and [ʃ] is so pronounced that it can easily be mistaken for length" (Quintero 2004:17; bracketed IPA is mine). Finally, she includes both [x] and [ɣ] but states that "the two sounds, once distinct, are merging in modern, obsolescing Osage" (Quintero 2004:18).

The nasals and approximants fit together in an interesting way. Quintero notes that despite present-day minimal pairs, "the segments n, ð, and l are historically related" (Quintero 2004:19). And while the inclusion of *ð* as an approximant, rather than a fricative, may be surprising at first glance, Quintero provides a phonological argument for this. She points out that many instances of the approximant /ɹ/ can be shown to derive from *ð* and also that *ð* alternates frequently with the palatal approximant *j* (Quintero 2004:20), and, thus, *ð* seems to pattern similarly to and have close connections to other approximants.

2.4. Quintero 2010

In terms of the phoneme inventory, there are few differences between the *Osage Grammar* (Quintero 2004) and the *Osage Dictionary* (Quintero 2010). The vowel inventories are identical, though in the Osage Dictionary the vowels are described in terms of English, French, and German (Quintero 2010:xv). Most of the consonants are also the same; the voiceless, voiced, and pre-aspirated stops are identical as are the fricatives, nasals, and approximants.

The key differences are found in the glottalized and aspirated stop series. The *Dictionary* lists the glottal stop among the glottalized stops, albeit, the stop is listed within parentheses to indicate its tenuous status (Quintero 2010:xviii). For the aspirated series, the *Dictionary* drops the superscript [ʰ] and instead uses sequences of stops and fricatives / pʃ, px tsh, tx kʃ, kx /, labels the sounds as "(post)aspirated stops", and drops the claim that these sounds never surface (Quintero 2010:xviii). Instead, Quintero writes "[w]hat presumably were originally the aspirated (or postaspirated) stops *ph*, *th*, *kh* appear in Osage as *px*, *tx*, *kx* (before the back vowels *a* [ɑ], *ą* [ã], *o*, *ǫ* [õ]) or *pš* [pʃ], *ch* [tsh], *kš* [kʃ] (usually before other vowels)" (Quintero 2010:xix; IPA is mine). Table 4 presents the Osage phonemes as described in Quintero's *Osage Dictionary*.

3. Comparing the four descriptions

At a glance, the area of greatest agreement is the vowel system, and the area of greatest disagreement is the analysis of stop consonants, in particular, when it comes to glottalized and aspirated

Table 4: Osage phonemes in Quintero (2010)

Vowels	IPA
Oral	/i e ɑ o u/
Nasal	/ĩ õ ã/
Consonants	
Voiceless Stops	/p t ts tʃ k/
Glottalized Stops	/p' ts' k' (ʔ)/
Pre-Aspirated Stops	/hp ht hts htʃ hk/
Aspirated Stops	/pʃ px tsh tx kʃ kx/
Voiced Stop	/b/
Fricatives	/s z ʃ ʒ x ɣ h/
Nasals	/m n/
Approximants	/ð ɹ l w/

stops. In this section, we will examine the vowels first and then look at each manner of articulation in turn.

3.1.   Vowels /i e ɑ o u ĩ õ ã/

All four sources agree list five oral vowels /i e ɑ o u/ and include nasal vowels. The core differences are small: the number of nasal vowels, inclusion of vowel length, the exact quality of /u/ and /e/, and La Flesche's exploded vowels.

For the nasal vowels, La Flesche only includes /ĩ õ/ while Wolff and Quintero include three /ĩ õ ã/. It may be that La Flesche conflated /õ/ and /ã/, and this suggestion is at least plausible given that Quintero describes considerable variation between /õ/ and /ã/.

Wolff and Quintero both explicitly discuss vowel length while La Flesche does not. Both Wolff and Quintero explicitly state that length is not straight-forward. Wolff (1952:65) states, "[v]owel length varies according to the style employed by the speaker and according to the consonantal environment." Quintero (2004:37) adds to the idea that phonological context can cause vowel length to vary, stating, "[a]t other times, the otherwise indisputably long vowel seems to be short, or at least shorter, especially when the long vowel is not accented due to its new position in a word". Quintero (2010:xvi) continues, "[a]lthough vowel length is certainly significant in Osage, it nonetheless can be tricky to perceive and is subject to a good deal of variation." It seems that vowel length is important to Osage, but there is a great deal of variation, some due to phonological phenomena and some, perhaps, due to individual speakers or speech styles/registers.

When it comes to vowel quality, La Flesche (1932) and Quintero (2010) describe the vowels in terms of English and other languages (e.g. "*e* as in *prey*" in La Flesche (1932:2) and "English *e* in *pet*" in Quintero (2010:xv), while Wolff (1952) and Quintero (2004) use phonetic descriptions (e.g. "mid-front *e* [ɛ]" in Wolff (1952:65) and "mid front unrounded vowel" in Quintero (2004:36). This leads to variation in how to interpret a vowel like *e*; is it [eɪ] like *prey*? [ɛ] like *pet*? IPA or cardinal [e]? Does it vary between all three? A future acoustic analysis of archived recordings can help provide a more precise picture of /e/ and the vowel system in general.

In the case of the vowel u though, Quintero and Wolff both agree that the vowel is not

purely a back vowel. Wolff (1952) lists it as [u]∼[ʉ], and Quintero (2004, 2010) describes it as varying from the central rounded vowel to a front version that sometimes is even unrounded and conflated with [i].

La Flesche's inclusion of *exploded vowels* appears to be a radical distinction from Wolff and Quintero, but if we assume that he perceived the glottalization of consonants as pertaining to the vowel rather than the preceding consonant, we might have an explanation for his description. A quick comparison of lexical items in La Flesche (1932) and Quintero (2010) suggests that this idea might hold water; for the word 'sour', La Flesche (1932:322) lists *ṭs'a-the* with an exploded *'a* and Quintero (2010:27) lists *sour* as [tsʔáaðe] (IPA mind) with a glottalized consonant.

In summary, we can conclude that Osage has five oral vowels, three nasal vowels, and vowel length, but we cannot be sure of the quality of the vowels, and we need to acknowledge variation in vowel length and variation between nasal /õ/ and /ã/.

3.2. Stops

While the various sources seem to agree the most about the vowel system, the opposite can be said for the various stop series (which, for Wolff and Quintero, also include the affricates); La Flesche (1932:2-3) lists 9 stops with a three-way contrast (voiceless, voiced, and medial), Wolff (1952:63) lists 6 stops including a two-way contrast of voiced and voiceless sounds but also notes several combinations of stops and fricatives that could increase the count of contrasts available, Quintero's *Grammar* (2004:17) lists 18 stops, and Quintero's *Dictionary* (2010:xviii) lists 21 stops (expanding the list of aspirated stops and tentatively including glottal stop). The following sub-sections examine each series of stop contrasts in order.

3.2.1. Voiceless stops /p t ts k/ (maybe /tʃ/)

When it comes to stops, one area of consistency among all four sources is that they agree on a series of plain, voiceless stops including /p, t, k/. Wolff and Quintero both include an alveolar affricate /ts/ as a single phoneme (Wolff 1952:63-64; Quintero 2004:??; Quintero 2010:??), but for La Flesche, this sound appears to have been encoded as a sequence of medial /ṭ/ and /s/ as shown in his dictionary entry for drum *ṭsé-xe-ni* (La Flesche 1932:259; c.f. *[ts]éɣenii* in Quintero's *Dictionary* 2010:24; IPA is mine). Wolff and Quintero both discuss the post-alveolar affricate /tʃ/ (La Flesche does not), but they differ about its phonemic status with Wolff not listing it among the phonemes of /ts/ (Wolff 1952:63) and Quintero discussing its distribution with /ts/ but still including it among the phonemes (Quintero 2004:17; Quintero 2010:xviii. Should we think of [tʃ] as a phoneme or an allophone? Quintero's rationale seems to be that the sound is attested in environments that /ts/ can appear in, so it must be included even though "[t]he affricates *č* [tʃ] and *hč* [htʃ] are quite rare" (Quintero 2004:34; IPA is mine).

3.2.2. Glottalized stops /p' ts' k'/ (maybe /ʔ/)

Arguably, all four sources recognize the set of sounds that Quintero (2004, 2010) labels as the glottalized series, /p' ts' k'/ (and arguably /ʔ/. The key difference is that La Flesche (1932) does not include a glottal stop or use the term *glottalized* in his descriptions; however, as mentioned in §3.1 above, combining his somewhat mysterious medial consonants with exploded vowels matches up

fairly well with the glottalized consonants in Quintero's work, so he seems to recognize this set of sounds as distinct from others, he just encoded them as a sequence of a consonant and an 'exploded' vowel instead of a single segment. Wolff's work, on the other hand, includes a glottal stop and discussion of how the consonants can combine indicating that, for him, he saw this series as a set of consonant combinations and not as single segments (Wolff 1952:63-65).

This leaves us with the question of whether or not to include the glottal stop /ʔ/ as a phoneme, and this requires two remarks. First, and most importantly, Quintero mentions that /ʔ/ can only "occasionally be directly detected" in a small set of verbs (Quintero 2004:35), and that when it occurs elsewhere its appearance is usually predictable (not phonemic) and "is best considered a phonetic device used occasionally at utterance level" (Quintero 2010:xvii). Second, one could argue that glottal stop, if it were to be included the way Wolff uses it (as a segment that combines with others to create the glottalized series), it should be included among the plain stops, and there should be no distinct series of phonemes.

Distinguishing between Quintero's and Wolff's analyses is a theoretical question that, in principle, could be resolved with both phonetic and phonological evidence that, in the absence of L1 speakers, it may prove difficult to resolve the question. From the point of view of language teaching and revitalization though, it may be easier to treat these sounds as single units rather than a combination of abstract phonemes that comes with context-specific pronunciation rules.

3.2.3.   Pre-Aspirated stops /hp ht hts htʃ hk/

The discussion of pre-aspirated stops is similar to that of the glottalized stops. La Flesche (1932) and Wolff (1952) do not include symbols for pre-aspirated sounds, but they do include an /h/ phoneme that can combine with other sounds to create the effect of a pre-aspirated series, and Wolff discusses this possibility explicitly noting that "only voiceless consonants form clusters", that h can be the first member of a CC cluster, and that "[i]n the sequence V + # + *p*, *t*, *k* the stops are pre-aspirated" (Wolff 1952:64-65).

Quintero on the other hand, includes the following pre-aspirated sounds explicitly in her list of phonemes: /hp ht hts htʃ hk/ and notes that they are often realized as geminate stops (Quintero 2004:29; Quintero 2010:xvix) and that /htʃ/ is extremely rare (Quintero 2004:37). Assuming that /hp ht hts htʃ hk/ are single segments allows for a simpler syllable structure, but that, alone, does not necessarily mean that they are single segments. Like with the glottalized consonants, the reasoning for whether to treat these sounds as a single unit or as a sequence of two segments may depend on our phonological theory as much as it does on the phonotactics of Osage. As a reviewer points out, future phonetic analyses of recordings of these segments may also aid in determining if they are 'true' pre-aspirates or not.

3.2.4.   (Post-)aspirated stops /px tx kx/

Neither La Flesche nor Wolff mention post-aspirated stops explicitly, but Quintero does in both her *Grammar* and her *Dictionary*.

In her Grammar, Quintero (2004:31) provides a phonological and historical rationale for including post-aspirated stops by writing, "[a]ll Dhegiha languages except Osage have a set of post-aspirated stops...I assume here that Osage has underlying post-aspirated stop phonemes (ph,

th, kh), but that they never emerge on the surface." At a glance, these sounds are purely abstract and, seemingly, not motivated synchronically or empirically.

Quintero's *Dictionary*, however, provides a different analysis that allows her account to be linked more closely to that of Wolff, to actual pronunciations of Osage, and to historical accounts of Dhegiha languages. Instead of assuming that there are combinations of consonants, Quintero suggests that the sequences in which a stop is followed by a fricative, /pʃ, px, tsh, tx, kʃ, kx/, are the reflexes of Dhegiha post-aspirated stops; "[w]hat presumably were originally the aspirated (or post-aspirated) stops ph, th, kh appear in Osage as px, tx, kx (before back vowels) or *pš* [pʃ], *ch* [tsh], *kš* [kʃ] (usually before other vowels)" (Quintero 2010:xix; IPA is mine). To me, this suggests three phonemes with six allophones, but Quintero lists all six combinations in the phoneme chart (Quintero 2010:xvii).

This is also interesting because, if we allow Wolff's *h* to take the place of Quintero's *x* (admittedly a stretch, but not an excessive one), Wolff includes words that instantiate five of the six post-aspirated contrasts mentioned in Quintero's *Dictionary*, the sequences *ph*, *pʃ*, *th*, *kʃ*, *kh* (*a-ǫ́pha* [ɑˈõphɑ] 'I believe,' *pší-ta* [ˈpʃitɑ] 'I'll come,' *áthą* [ˈɑthã] 'he kicked it,' *kší* [ˈkʃi] 'he reached home,' *áðikha ʒą* [ˈɑðikhɑ ʒã] 'he lay down'; Wolff 1952:65; IPA is mine). So, despite the smaller inventory of phonemes, Wolff's system uses combinations to account for 5 of Quintero's 6 post-aspirated phonemes.

3.2.5.   Voiced stop /b/

It is clear that Osage has a voiced bilabial sound, but it is not clear that /b/ should hold phonemic status. All four sources include a voiced bilabial stop, and both Wolff and Quintero point out that *b* appears with ɹ (Quintero 2004:23; Quintero 2010:xviii; Wolff 1952:64). In addition, Quintero points out that many, though not all, instances of *br* can be derived phonologically from the combination of *wa* + *ð* (Quintero 2004:23; Quintero 2010:xviii), and this suggests that a phonological analysis of Osage that lacks /b/ as a phoneme is possible.

3.3.   Fricatives /ð s z ʃ ʒ x ɣ h/

The fricatives, again, present a somewhat complex picture; all four sources include seven fricatives, but they disagree on which fricatives to include. La Flesche (1932:2-3) is the only source to include the voiceless dental fricative /θ/, while Quintero (2004:17-19; 2010:xviii) is the only one to include the voiced velar fricative /ɣ/. Quintero is also unique in listing the voiced dental fricative as an approximant rather than a fricative. Though not stated explicitly, her reasons are phonological; /ð/ alternates with both the palatal approximant [j] and the rhotic [ɹ] and it has a historical connection to the nasal /n/ and the lateral approximant /l/ (Quintero 2004:19-21). For his part, Wolff includes /ð/ with the fricatives and does not include /ɣ/. If we take a more standard view of /ð/ as a fricative, it would appear that there are eight fricatives in Osage, /ð s z ʃ ʒ x ɣ h/.

3.4.   Nasals /m n/

The nasal series is another place where the four sources are largely in agreement; all four list both /m/ and /n/ (La Flesche 1932:2-3; Wolff 1952:63; Quintero 2004:17; Quintero 2010:xviii). The outlier is that La Flesche lists /hn/ stating only "the sound of the initial letter is expelled from

the nostrils and is scarcely heard" (La Flesche 1932:3), but as stated in §2.1, it is not clear that La Flesche intended *hn* as a single segment.

3.5.   Approximants /ɹ l w/

Quintero (2004) notes that there is a historical connection between /ð, n, l, ɹ/, and she includes /ð/ with the approximants for phonological reasons (mentioned in §3.3,). If we set /ð/ aside, there are three approximants mentioned in the four sources, /ɹ l w/.

La Flesche (1932:2-3) includes only /w/. Wolff (1952:63) lists only /w/ and /l/ as approximants and includes /ɹ/ as part of a digraph /bɹ/. Quintero (2004:17; 2010:xviii) lists /ð ɹ l w/.

4.   Conclusion and growing edge

This paper provides a comparison of four sources descriptions of the Osage phoneme inventory, and it suggests that there is much agreement about the vowels, but that there is little agreement on the stops or the basic syllable structure of Osage.

Recent work has clearly benefited from the work that preceded it, and Quintero's *Grammar* is particularly noteworthy for the detailed prose descriptions and numerous examples that illustrate each sound. The careful and complete descriptions make Quintero's (2004,2010) work both easier to follow and more complete than the other sources. Although no two sources (even Quintero's *Grammar* and her *Dictionary*) agree entirely with each other, the image that emerges is that, despite clear initial differences, many of the contrasts that Quintero notes are present in at least some form in the earlier works of Wolff and La Flesche. Where Quintero was willing to expand the list of phonemes while maintaining a simplified syllable structure, Wolff and La Flesche allowed glottal stop and *h* to combine with other consonants and, in that way, account for several of Quintero's additional phonemes. The lack of consensus with respect to consonants, particularly the pre- and post-aspirated stop series, makes that a logical candidate for future research.

While the phonological analysis of the phoneme inventory may still be up for debate, when it comes to language revitalization work, a more concrete phonetic view which includes a greater number of phonemes but fewer abstract rules of allophony (akin to Quintero's analysis) might lend itself better to teaching, and it would certainly match up better with the existing resources such as Quintero's *Dictionary* and *Grammar*.

This paper is the first step in a larger project. The next step will link recordings in the Carolyn Quintero Collection held at the Sam Noble Museum of Natural History's Native American Languages Collection to the sounds described above. This will allow for more precise, acoustic descriptions of the sounds (using acoustic tools such as Praat), and the hope is that, in the absence of L1 speakers, we will be able to provide an enriched, accessible, and helpful resource to linguists and language learners who are interested in the sounds of Osage. Given how many languages are losing their last L1 speakers, this larger project has the potential to serve as a model for future phonetic work on languages that have at least limited archived recordings but which lack L1 speakers.

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Glottalized consonants in Mississippi Valley Siouan

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Abstract: Glottalized stops and fricatives form a class of consonants in Mississippi Valley Siouan that is commonly present but moderately rare. An attempt is made here to analyze these special sets, and to trace their phonological origins. Few word sets have more than three or four that extend across MVS language groups, and many of the glottalized consonants we find in the daughter languages may have arisen locally through syncopation in the later history of the languages. Hence, the historical reconstructions proposed here are tentative. It appears that there existed four or five glottalized stops, given here as *p', *t', *k', *č', and perhaps *ts', as well as three fricatives, given as *s', *š', and *x'. It also appears that syncopated *x-k and *k-x merged with *x' in MVS, yielding a neo-glottal in all daughter groups except Hoocąk.

1. Introduction

Glottalized consonants in Mississippi Valley Siouan are well known to linguists approaching these languages. Their origins and relationships, in my recollection at least, seem not to have attracted the degree of attention and historical linguistic ordering received by the more common consonants. In fact, the project of researching them for this paper has brought home to me the cross-linguistic complexity of glottalized consonants, and the difficulty of discovering regular historical-phonological laws to explain them. Glottalized stops and fricatives are indeed somewhat rare, but the surprising problem is that trustworthy correspondences between language branches are significantly rarer. This leaves the sound-shift laws that may be derived resting on perilously few concrete examples. Nevertheless, some patterns do seem to emerge, which offer us at least a reasonable hypothetical framework. Data presented here is drawn from the following sources: Cumberland & Rankin 2012 (Kansa), Dorsey & Swanton 1912 (Biloxi), Goodtracks 2014 (Ioway-Otoe-Missouria), Helmbrecht & Lehmann 2010 (Hoocąk), Kaufman 2015 (Biloxi), Quintero 2009 (Osage), Rankin et al. 2006 (Proto-Siouan and Proto-Mississippi Valley), Riggs 1992 (Dakota), Ullrich 2011 (Lakota), and Williamson 1992 (Dakota).

2.   Labial stop: $*p'$

All the MVS languages have cases of glottalized /p'/, as seen in Table 1. These sounds are rare, however. I found a root tracible to MVS *p'o*, 'fog, steam', in all languages but Hoocąk. All languages, including Hoocąk, have $*(wa\text{-})na^np'i^n$ for 'wear around the neck' or 'necklace'. This would seem to be a good match, except that it could easily be an international word for a prestige item among MVS languages, and thus more of a common loan word than an independent genetic derivative from proto-MVS. Biloxi has a similar word for 'necklace', *napani*. Hoocąk has a word for 'soft and spongy' that should trace to MVS $*p'a^nte$, and which may or may not find a match in Omaha, depending on the questionable reliability of my memory of Dorsey. These three cases tentatively support the view that MVS $*p'$ has been preserved as such in all MVS languages.

Table 1: PS $*p'$ in MVS

	'fog, steam'	'elm'	'(wear a) necklace'	'soft, spongy'
Da.	$p'o$	$p'e$	$na^np'i^n$	
La.	$p'o$	$p'e$		
Os.	$o\text{-}p'o\text{-}ra^n$		$no^np'i^n$	
Ka.	$p'o$	$e\text{-}hu$	$wa\text{-}na^np'i^n$	
Om.	$p'u\text{-}ro^n$	$ee\text{-}žo^n$	$wa\text{-}no^np'i^n$	$no^n\text{-}p'o^nde$ (? needs to be checked)
IOM	$ra\text{-}p'o$	$e\text{-}hu$	$wa\text{-}na^np'i^n$	
Ho.			$naa^np'i^n$	$p'aa^n\text{-}p'a^n\check{c}$
MVS	$*p'o$		$*(wa\text{-})na^np'i^n$	$*p'a^nte$

The word for 'elm', however, gives us pause. Here, Dakotan has a handsome p-glottal word *p'e*, while Dhegiha and IOM have simply *e*, or perhaps *'e*. Hoocąk seems to have switched to a different word. This looks like the difference between Dakotan and the other three in the case of funny-r *bl-* clusters, where we find *bl-* in Dakotan, but funny-r $*R\text{-}$ in the others. In this case, either the initial *p-* is an optional *wa-* or *wi-* prefix syncopated against a glottal stop, used in Dakotan but not in the other MVS languages, or else the *p-* in Dakotan 'elm' may be coming from a different phonetic source than the *p-* in 'fog'.

3.   Alveolar stop: $*t'$

As seen in Table 2, all the MVS languages have cases of glottalized /t'/ too, but there seems to be only one such word they share. This is the ubiquitous $*t'e$, meaning 'die' or 'dead', which is found much farther afield than MVS. They also seem to share a generalized derivative word, $*t'e\text{-}ka$, or 'dead-ish', but what this word actually signifies varies wildly.

Table 2: PS *t' in MVS

	'die, dead'	'feckless, lazy, crazy, rotten'
Da.	t'e	t'e-ča
La.	t'e	t'e-ča
Os.	ts'e	ts'e-ka
Ka.	ts'e	ts'e-ga
Om.	t'e	t'e-ga
IOM	č'e	
Ho.	t'ee	t'eek
MVS	*t'e	*t'e-ka

4. Velar stop: *k'

The glottalized /k'/ actually has several good words for comparison across MVS, shown below in Table 3. It should be noted though that most of these words are probably derivatives of the 'self' prefix *ki, tacked onto a following root morpheme that may have begun with a simple glottal stop. Since such words would be poly-morphemic, there is fair room to question whether they actually go back to Proto-MVS, rather than being later constructions. Their regularity and simplicity of conception makes it seem most likely that they do, however. Note that /*k'/ is retained across MVS, except for Omaha and Ponca, where the leading /*k/ is regularly dropped, leaving only the plain glottal stop. (In Dakotan, /*k/ regularly turns to /č/ after a front vowel such as /i/.)

Table 3: PS *k' in MVS

	'carry on back'	'dig'	'give'	'br-in-law-w'	'swift'
Da.	k'i^n	k'e	k'u	šič'e	
La.	k'i^n	k'e	k'u	šič'e	
Os.	k'i^n	k'e	k'u	šik'e	k'a^{n}saaki
Ka.	k'i^n	k'e	k'u	šik'e	k'a^{n}sagi
Om.	'i^n	'e	'i	ši'e	'o^{n}sagi
IOM	k'i^n	k'e	k'u^n	šik'e	k'a^{n}þa(-ge)
Ho.	k'ii^n	k'ee	ho-k'u^n	šik'e	saak(-re)
MVS	*k'i^n	*k'e	*k'u(^{n})	*šik'e	

So far, the glottalized stops seem to be fairly regular, with *p', *t', and *k' each retained pretty much as such throughout the daughter languages. We next turn to the fricatives.

5. Alveolar fricative: *s'

The first three items of these series below in Table 4 presumably trace back to MVS /*s'/. The 'shave, trim' *=s'o and the 'snake, snake-hiss' *s'a reconstructions are questionable. The only trustworthy *s' set we have is that for *s'i^n, 'crane the head or neck forward', as in peeping in, or

falling head-first, or standing on one's head, and this one seems pretty solid. The notable change here is that in Osage and Kaw, /*s'/ becomes the affricate /*ts'/. (In IOM, /*s/ regularly shifts forward to be a voiceless 'th', /þ/. Regular /*s/ stays /s/ in Osage and Kaw.)

Table 4: PV *s' in MVS

	'crane neck forward'	'shave, trim'	'snake, snake-hiss'	'sour, bitter'
Da.	*ka-s'i^n*		*s'a*	
La.	*s'i^n*	*=s'o*	*s'a*	*s'a-mna*
Os.	*o-ka-ts'i^n*	*ka-ts'o*	*we-ts'a*	*ts'aa-re*
Ka.	*o-ga-ts'i^n*	*ga-ts'u*	*we-ts'a*	*ts'a-ye*
Om.	*u-ga-s'i^n, ba-s'i^n*		*we-s'a*	*s'a-re*
IOM	*o-þ'i^n*	*=þ'o*		*t'a, wa-t'a-bra^n*
Ho.	*ho-i-s'i^n*			
MVS	**s'i^n*	**=s'o*	**(we-)s'a*	**ts'a*

The fourth series is the same except for IOM, where the reflex is apparently /t'/ rather than expected /þ'/. Perhaps the IOM word is not actually related. Otherwise, we may have another series based on something like /*ts'/.

6.   Palatal fricative: **š'*

Again, there is only one word found, **š'e*, 'drip' or 'drop', that is trustworthy across MVS, seen in Table 5 below. The suggested 'curved, bent' word **š'i^n* is too sparsely attested to inspire confidence. The other three columns are puzzling. They appear to derive from the same Proto-MVS sound sequence **š'ake*, but their respective meanings are hard to reconcile. Dakotan has just one root of this form, meaning 'strong'. The other languages have two roots of the form, one meaning 'weak' or 'fail', and the other meaning 'old man'.

Table 5: PS *š' in MVS

	'drip, drop'	'fail, unable'	'strong'	'old man'	'curved, bent'
Da.			*wa-š'aka*		
La.	*š'e*		*š'ake*		*š'i^n*
Os.		*=ts'ake*		*ts'ake*	*ts'i^n-ša*
Ka.	*ts'e*	*=ts'age*		*ts'age*	
Om.	*'e*	*='a(-ge)*		*i^n-š'age*	
IOM	*s'e / š'e*	*=s'age / =š'age*		*š'age*	
Ho.	*š'ee*	*=š'ak*		*š'aak*	
MVS	**š'e*	**=š'a(-ke)*	**š'a(-ke)*		

Osage and Kaw convert /*š'/ to /ts'/ as they do with /*s'/, meaning that they have regularly merged MVS /*s'/ and /*š'/. Omaha seems inconsistent here. According to the 'drip/drop' root and the 'fail' root, Omaha and Ponca dropped the initial /š/ to convert MVS /*š'/ into a plain glottal stop. Thus, MVS /*š'/ and /*k'/ are merged as /'/. This is probably the standard development, but

the 'old man' term clashes with this law. In fact, *i^{n}š'age*, 'old man', is the only word in Omaha I am aware of that contains /š'/. I think it is most likely that the Omaha and Ponca *i^{n}š'age* term is an early borrowing from IOM, perhaps from before the time that simple /š/ in Otoe moved forward to become /s/.

7.   Velar fricative: *$^*x'$*

The first three sets in Table 6 are restricted to Dhegiha and IOM, and the last set is dubious. Although all MVS language groups except Dhegiha have /x'/-cluster words, there seem to be no good /*x'/ words in Hoocąk that also span MVS. What we have, however, indicates that where IOM or Dakotan have /x'/, Dhegiha originally has /*k'/. As far as I have been able to determine (Quapaw not yet checked), there are no /x'/ clusters in Dhegiha. Apparently, MVS /*x'/ regularly became /*k'/ in Dhegiha, which then regularly became /'/ in Omaha and Ponca. There is thus no need to assume that /*x'/ changed to glottal stop separately in Omaha.

Table 6: PS *$^*x'$* in MVS

	'notched'	'scraping'	'itch, tickle'	'hanging, ragged, leak'
La.				*x'e* ('hanging ragged')
Os.			*k'u-e*	
Ka.	*k'abe*	*k'aɣe*	*k'ü-ya*	
Om.	*'abe*	*'aɣe*	*'i*	*'e* ('hanging, dangling')
IOM	*x'awe*	*x'aɣe*	*x'i*	*x'e* ('leak')
Ho.				*hi-x'e-žu* ('ragged, worn out')
MVS	*$^*x'ape$*	*$^*x'aɣe$*	*$^*x'u$*	*$^*x'e$*

However, we do seem to have at least three good sets spanning MVS where IOM and Dakotan have /x'/ and Dhegiha has /*k'/, but Hoocąk has either /xg/ or /šg/ rather than /x'/. These three are apparently polymorphemic, and two of them show the *$^*x$* cluster appearing at the boundary between two morphemes. Consider the words for 'hear', 'cottonwood', and 'star' in Table 7, which are common to all four MVS language groups:

Table 7: Unexpected alternations between *$^*x'$* and /xg∼šg/

	'hear'	'cottonwood'	'star'
Da.		*waɣa-č^{h}a^n*	*wi-č^{h}a-xpi(-x'a)*
La.	*na^{n}x'u^n*	*waɣa-č^{h}a^n*	*wi-č^{h}a-xpi*
Os.	*na^{n}k'o^n*	*paak'a*	*mi-hka-k'e*
Ka.	*na^{n}k'o^n*	*blak'a*	*mi-kka-k'e*
Om.	*no^n'o^n*	*ma'a*	*mi-kka-'e*
IOM	*na^{n}x'u^n*	*bax'e*	*bi-ka-x'e*
Ho.	*naa^{n}xgu^n*	*waašge*	*wii-ragu^n-šge*
MVS	*$^*no$^n$ɣ-'u^n*	*$^*Waɣ(-kE)$*	*$^*Wi-kka-( )-x'e$*

The 'star' set is long and complicated, and the morphemic sequence is not exactly the same in all branches of MVS. In all cases, the word starts with the word for 'sun, heavenly body', *Wi*. In all but Hoocąk, the second element is something reconstructible as **kka* (**hka* in CSD orthography). To this, Dakotan adds a **xpi*, but the other languages do not. The final element, which may or may not be absent in Dakotan, is normally **x'e*, which turns to /*k'e/ in Dhegiha and /*šge/ in Hoocąk.

In the 'cottonwood' set, the Kaw reflex is odd, because we would expect a simple /b/ ***bak'a*, rather than the /bl-/ cluster we find. Otherwise, the set is based on what must be an underlying **Waɣ*, where /*W/ is Siouan 'funny-W'. In Dakotan, the breakdown is clear, with the species name waɣa restricting the more generic 'tree/wood' head noun *čʰaⁿ*. But in the other three language groups, there is something else appended, which merges phonologically with the final /ɣ/ of *Waɣ*. This seems most likely to be the common Siouan generalizing suffix *-kE*, which can ablaut between *-ke* and *-ka*. If so, then Hoocąk and IOM used *-ke* here, while Dhegiha used *-ka*. The fusion turned Hoocąk **x-ke* to *šge*, IOM **x-ke* to *x'e*, and Dhegiha **x-k*a to *k'a*. (Before a simple stop consonant, the voiced velar fricative /*ɣ-k/ presumably would be devoiced to /*x-k/.)

8.   Glottalized **k'* from **x-k*

If this analysis is correct, then glottalized consonants /*x'/ and /*k'/ have arisen secondarily in IOM and Dhegiha from early morpheme boundaries of the form /*x-k/, where no prior glottal stop ever existed. Several other words in Dhegiha likely arose the same way in Table 8:

Table 8: Dhegihan *k'* from **x-k*

	'flat'	'little, young'	'paper'	'frog'	'decayed, rotten'
Os.	*brak'a*	*wa-hok'a*	*hta-naⁿk'a*	*htse-o-k'a*	*htsuk'a*
Ka.	*blak'a*		*tta-naⁿk'a*	*ttse-bu-k'a*	*ttsuk'a*
Om.				*tte-bi'-a*	*tti'a*
MVS	**brax-ka*	**wa-hox-ka*	**tta-naⁿx-ka*	**tte-pux-ka*	**ttux-ka*

The generalizing Siouan **kE* suffix is particularly common for adjectives (stative verbs) and for the names of animals. Four of these five fit those criteria. The remaining one, 'paper', is a compound, presumably recent, of which the second element is of unknown meaning, and quite possibly a stative verb. If this analysis is correct, then we find ourselves with five new Siouan lexical roots in MVS, the precise meanings of which are hinted at by context, yet are still not entirely clear.

This set in Table 9 follows the same outcome pattern as the others above, but it likely arose in the opposite way. Instead of being based upon a postfixed generalizing suffix /*-kE/, it probably comes from a prefixed 'self' particle /*ki-/. Relaxing or resting is something one does to oneself, as suggested by the Osage form, which prefixes the **ki-* again to the derived word. But if the suggested Hoocąk equivalent is correct, then the root verb should not have started with a glottal stop, as is often the case with the regular /*k'/ sets above, else it too should have yielded /k'/. Instead, it probably started with **x*, i.e. **xaⁿze*, 'rest', which would give **ki-xaⁿze*, or **k-xaⁿze* upon syncopation of the first, unstressed, syllable. A /*kx/ segment would have to be

Table 9: MVS *k'* from *k-x*

	'rest, relax, take a break'
Os.	*hki-k'a^{n}ze*
Ka.	*k'a^{n}ze-gire*
Om.	*'o^{n}ze-gire*
Ho.	*xgaa^{n}zi*
MVS	**k-xa^{n}ze*

handled somehow, and apparently it was treated the same as /*xk/, probably with metathesis in pronunciation. The result was same again as /*x'/.

The alternation in Hoocąk between /xg/ and /šg/ is a puzzle here. I would tentatively suggest that the difference may depend on what the following vowel is. Before front vowels like /-e/ we seem to get /š/ (/šge/), and otherwise /x/, (/xgu^n/ and /xga^n/).

Thus, putative /*x'/, /*xk/, and /*kx/ seem to show the same reflexes across MVS, and presumably were levelled to one in the original language.

9.   Palatal (?) stop: *č'*

In four series seen in Table 10, a /*t'/ or its reflex appears for IOM and Hoocąk only, and shows nothing at all in that location in any of the other languages. In a paper presented to this conference in 2015, I proposed that reconstructed Siouan *y was actually polyphonemic, and that one of its members was actually a palatal stop series /*č/. As a stop, this phoneme should potentially take the range of modifications in MVS that other stops undergo, including simple, tense/pre-aspirated, post-aspirated, and glottalized. I would suggest that the pattern illustrated above shows the outcome for glottalized /*č'/, where this phoneme merges with /*t'/ in IOM and Hoocąk, but disappears entirely in all other MVS languages.

Table 10: Possible PS *č'* in MVS

	'fly'	'speak'	'throw away'	'burn'
Da.			*u^{n}ya^n*	
La.	*ki^n-ya^n*	*i-yA*	*u^{n}ya^n*	
Os.		*i-e*	*oo^{n}re*	
Ka.		*i-e*	*o^{n}ye*	
Om.	*gi-o^n*	*i-e*	*o^{n}re*	*u-o^n*
IOM	*gi-t'a^n*	*i-č'e / i-t'a*		
Ho.	*t'aa^n*	*hi-t'e*	*t'uu^{n}nyee*	*ho-t'u^n*
MVS	**(ki-)č'a^n*	**i-č'e*	**č'u^{n}re*	**o-č'u^n*

10.   Conclusion

Glottalized consonants in proto-MVS seem to include *p', *t', *č', *k', *s', *š', *x',* and perhaps *ts'.*
Most *k'* sounds probably developed from syncopated *ki-'* combinations, using the 'self' prefix
ki-. Syncopated /*k-x/ and /*x-k/, as from /*ki-x/ and /*-x-kE/, merged with /*x'/ to produce new
glottals in all MVS languages but Hoocąk. Dakotan and IOM seem to be relatively conservative
in retention of the original forms, while Dhegiha and Hoocąk have been more inclined to change
them.

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Hook-swinging giants and other fantastic themes in Jiwere-Baxoje folktales*

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Abstract: This paper will examine fantastic themes within a corpus of traditional Jiwere-Baxoje narratives collected in the late 19th and 20th centuries, by linguists and folklorists such as James Owen Dorsey, Alanson Skinner, Gordon Marsh, and William Whitman. The first step will be developing an inventory of the many different beings, some of whom can be seen as magical in the positive sense, while others are truly terrifying. Next, the link between narratives and material culture is demonstrated through specific examples of historic and pre-contact artifacts. I will search for similar themes in other Siouan-speaking peoples' narratives, especially in Hochunk and Dhegiha traditions, then briefly consider how the Jiwere-Baxoje elements relate to the North American Motif Index within Stith Thompson's *Tales of the North American Indians* (1966).

Keywords: Baxoje-Jiwere, folklore, motif index, rock art

1.   Introduction

By picking this topic, let me confess that I was a child who was scared of the dark—of monsters, and other things that might go bump in the night! Thus, I was always fascinated by folktales from around the world, full of marvelous and terrible creatures. These beings are part of the oral traditions of the Siouan and Caddoan peoples also. Because as a scholar, I am most familiar with the Jiwere-speaking groups, the Otoe-Missouria and Ioway tribes, they will be the main focus for this paper.

   Because of time constraints, this preliminary inventory will omit positive supernatural beings, in part because, while they are very powerful, they generally tend to be benevolent to humans, so they do not fit with more ambiguous or downright frightening beings. Likewise, the general category of ghosts is excluded for time's sake.

2.   Strange humans and parts of humans that are dangerous

2.1.   Scalping survivor

Because scalping was not always fatal, there is the potential for someone to survive the trauma and heal. In the Ioway-Otoe-Missouria language (IOM) this person was known as a *ruwéthereje*

(Archaic) 'scalped man (who survived)'. The individual was believed to be malevolent because of what he had been through. He had to live alone in remote areas (because of the disfigurement), and had the special ability to talk with animals, as well as to exert ill powers (GoodTracks 2008).[1]

For example, in Alanson Skinner's collection recorded during the early 20th century, Ioway tale #12 "The Scalped Man" *Luwhê Therêdje*, a culture hero meets the survivor, who promises help against the horned underwater panthers if he will retrieve his scalp from the villagers across the river who still have it. (Whenever the village chief's son claims a headache, he is allowed to wear the Survivor's scalp for relief from pain!) So, our Hero flays the chief's son, using the skin covering to impersonate him, and thereby he is able to succeed in his quest to help Survivor. The Hero was instructed to wet the scalp and 'throw it' on Survivor's head. It works—Survivor's head is restored (Skinner 1925:475).

2.2.   (Decapitated) heads[2]

Please note that the only version of this motif collected by Skinner is in English, and there is no character name for "Rolling Heads" given.[3] They take the name or kinship term of their namesake in life, or simply are called 'the rolling head/skull'. Presumably the Baxoje original would have included a variant of one of these terms: *wanaxi pa* 'spirit head', *pa wahu* 'head bone'.[4]

In the IOM corpus, the body part is freshly separated from the rest of its whole, while the Omaha had a version in which it was a skull. In both instances, the head retains the ability to talk, hunt and kill game. Often it requests that a female relative carry it hidden under her belted skirt. While initially it may be helpful, the humans fear its power, and eventually try to escape from it. In anger, the skull pursues the human(s) by rolling very quickly, tracking them, and killing the humans in the end. The comparative folklore index includes this element as a common one in Native North America. Thompson Motif R261 *Pursuit by rolling head Note # 238a* occurs in the Omaha tale mentioned above, while a related preceding type-story entitled "The Rolling Head" differs slightly. In it, a wife caught committing adultery with a snake is decapitated, with versions found among the Assiniboine, Sioux [sic], and the Osage (Thompson 1966:343).

We can see numerous instances of Mississippian art depicting a warrior holding a decapitated skull, possibly performing a war dance, as in Figure 1. Between the narratives and the art, it appears that the taking of trophy heads was highly desired in Mississippian warfare. The Presbyterian missionary Rev. Hamilton also witnessed the display of an Omaha man's head upon a pole outside the lodge of an Ioway chief, during the years at the Highland Mission in the late 1840s and 1850s.[5]

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[1] Although Good Tracks does not cite Skinner in this particular entry, he clearly modernized Skinner's orthography and used the story to infer the negative traits.

[2] A common theme is that the dead can be resurrected if all parts of the body are put back together, so saving different pieces, even bones, is a necessity for rebirth, whether for humans or game animals. Cf. Beaver's granddaughter sacrificing herself for the girl, who ravenously bit into the meat, violating the taboo on disrespecting the bones of game animals (Skinner 1926; Tale #11). Even the scalp is needed for resurrection, as in the story of Red Horn's Sons, who bring him and the other village men back to life after defeating the giants (Radin 1948).

[3] For example, Skinner (1925) has "The Scalped Man" pp. 475-477; "Ishjinki and the Shell Spitter" pp. 493-494; Kerchival has an Omaha variant of a rolling skull (1893).

[4] Note that *pahi* (Dorsey n.d.) may possibly have meant a scalp instead.

[5] Hamilton was so offended at this practice that he stole the head to bury it in a hidden spot so it could not be re-mounted on its post. The Chief threatened him for this unthinkable disrespect, especially for loss of the teeth

Figure 1: Man Holding Human Head[6]

3. Fantastical creatures of mythical times

3.1. Sharp Elbows/Double-Face

Certain beings appear primarily in the stories of mythic time, when the early culture heroes vanquished them so that human beings could survive into 'modern' times. One of the most interesting (and fierce) of these kinds of beings are known as "Sharp Elbows" to the IOM peoples, because these human-like creatures have long bony protuberances coming out of their elbows; in other cultures they are described as "Double-Faces" because they also have a second face, on the back of their skull, enabling them to watch every direction. They have special abilities also, such as the capability of making fire without any tools. They appear among humans sometimes and they are always dangerous. Contemporary Ioway artist and archeologist Lance Foster included a Sharp Elbows in the drawing below, the dominant male figure on the left. (The person on the right is Grizzly Woman, another widespread transformation motif in Native North America.) Skinner (1926:232) transcribed this lexeme as *Itopahi* or *Iˣtopaíⁿyê*; the second form likely represents the Baxoje diminutive morpheme *íⁿñe/yiⁿñe*, but it can be used for descent or naming, not always in a literal sense of size.

For instance, it was a "Sharp Elbows" who visited the Hero Twins' mother while their father was away hunting (Marsh n.d.; Skinner 1925:427). She had been warned not to look at him, but at the end, finally peeked through the house cracks. Her failure to obey the tabu gave him the right to kill her with his awful sharp elbow-bones. The following is an excerpt from "The Twins" which gives his name, or really, the name of his kind of creature. It also is a classic example of the folktale motif *Looking Tabu Motif C300 (Note #217)* (Thompson 1966:338).

(1) a. LN4
     čhí-da   mįną   wáwaθųče nąhé-ske
     the.house-at (she)sits (she)sews it.is-if
     'If one is sitting in the house sewing'

---

which were to have been put inside a rattle (Hamilton n.d.).

[6]Original image from Engraved Shell Gorget, Castilian Springs Mound, Sumner County, Tennessee (Prentice 1986:245). Drawing after Dockstader (1960): Plate 64; originally published by Douglas & D'Harnoncourt (1941:66).

Figure 2: Baxoje Mythic Characters by Lance Foster (2012)

(Do not reproduce without permission of the artist.)

b. LN5

wą?šíge nągwanącče jí   ašką.
person fierce   (he)arrives it.seems
a fierce person arrives, it seems'

c. LN9

ihtó?-phàhį[7] *wiga-ñe khe.*   *Adáskąñi ho...*
Elbow-Sharp they.call-PL.INDEF-DECL(MASC) look-not (INJUNCTION)
'**Sharp-Elbows** they call them. Do NOT look at him!' (author's free translation)

These Fierce Creatures are mentioned by name three more times, when the Twins arrive at their village, and trick the dangerous beings into fighting amongst themselves, and thereby killing each other, while the Hero Twins are safely hidden. The boys then cut off all of the creatures' bony elbow points to give to their father to use as awls, 'to repair his moccasins' (Marsh: LN 203, 223, 227). Father is pleased for their avenging his wife/their mother, but he now is more frightened of the Twins than ever. He had sent them on this mission, perhaps hoping they would be killed, but it was culturally appropriate that they should attempt to take revenge on their mother's killer (and his people).

Tale #11 of Skinner's collection is titled "The Janus-Faced Man" (1925:472-475); he is the mystery suitor for four sisters. Their parents are so scared that they hide all the girls in a large grave, then cut their own hair, and blacken their faces. Thus 'in mourning', they inform the unwelcome suitor of the tragic illness that took all their daughters. He weeps at their grave! But they foolishly giggle at his sorrow, giving away the lie. After they go to sleep, he digs them out, throws them in his canoe, and then wakes them up. Each must answer a test question of

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[7]It must be the lenis/unaspirated dental stop in *ihto* 'elbow', because Marsh (n.d.) wrote it as /d/ later in LN 223 of this story.

what relation she will be to him. The first three focus on him as suitor, so each says 'Husband', whereupon he throws her out to drown. Cleverly, the youngest says 'sister' and is spared. Unfortunately, he steals a baby water panther for her to play with while he is away from their home. This action brings the wrath of the entire horned underwater panther village on him, eventually causing a terrible flood. His fortified canoe is capsized by the angry water panthers and he dies. But the girl throws the baby horned panther back in the water, and is saved as the flood recedes. (In this story, there is no specific mention of his elbows.)[8]

Another case of the unusual being is found in Lakota. Double Face *Anúŋg Ité* is listed as a proper noun in the *New Lakota Dictionary* (Ullrich 2008:862). Thompson (1966:364) has this motif with 'sharp elbowed women' (G341) as a subset of Ogres and Cannibals. In the comparative Notes section, #181, the motif summary is "Women with sharp elbows kill victims. At last they are deceived into stabbing one another"; he included the Dakota (Riggs 1893:140) and Assiniboine (Lowie 1910:183) as the only Siouan groups for this category (Thompson 1966:327).

Figure 3: Janus Figure Pipe Bowl with horse[9]
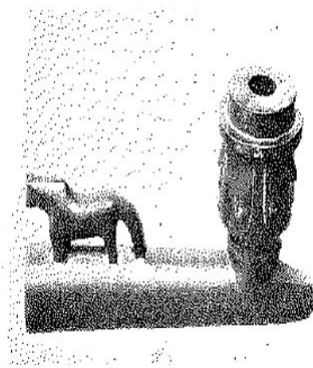
Figure 3 is a sacred clan pipe of the 'Double-Faced Man', whose head forms the Pipe Bowl of the Black Bear clan/gentes, with a horse also carved on the pipe (Skinner 1926:232). In their origin story, he is the Old Man who was heard hammering the pipe, then suddenly he disappeared. When the four Bear brothers came to the place where they had seen him, they found a pipe, and realized that the Old Man had turned himself into this pipe. In this instance, the Double-Face had made something very sacred, for the clan to use in keeping peace among their members (Skinner 1926:218-221).

Beyond this historic artifact, we also see evidence of these Sharp Elbows in the rock art of eastern Missouri dated A.D. 1010, more than eight centuries earlier (Figure 4 below). In the initial publication, Diaz-Granados et al. (2001) did not address the prominent elbow protuberance, focusing instead on the 'pelt' on the arm, and the bison-hand as evidence of possible shamanism. I became quite excited to have identified this obvious example of the "Sharp Elbow" creature within the Mississippian time and geographic sphere of influence. Notably, the just-released monograph devoted exclusively to Picture Cave itself has remedied that oversight, with clear

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[8]But it does not relate to Thompson tale Motif D733 *Loathly Bridegroom, Note #188*, where an ugly suitor becomes handsome. That one is another story of the poor orphan who is rejected by the 2nd sister, who regrets it after he is immersed in the river and emerges beautiful of face and richly dressed...

[9]Black Bear Gens, Ioway (Skinner 1926:304, Plate XXI).

recognition of this mythic being's identity (Diaz-Granados & Duncan 2015:182-182). I can at least attest to having discovered the identity independently, if not originally. However, I think that the second Ioway story could also explain the animal on the forearm. It has the rounded head and side 'bars'/fins and potentially long tail plus diminutive size, it could well be the stolen baby of the horned underwater panthers. It is quite tantalizing to note that the cave site where this image appears is very close in time and space to Cahokia, the premier Mississippian Ceremonial Center (Diaz-Granados et al. 2001). "Sharp Elbows" indeed! (See Figure 15, for similar rectangles at the side of the Horned Underwater Panther drawing near the entry of Picture cave.)

Figure 4: Arm with bison hand and pelt[10]

Figure 5: My proposed "Sharp Elbow/ Double-Face"[11]

I propose that another "shaman" figure at that site in fact also depicts "Sharp Elbows", reproduced in Figure 5 above. There are odd projections from the elbow area, but even more telling is the very oddly shaped head. It does not portray any ordinary human at all. It appears to have two profiles, with one face turned over the right shoulder, mouth open in a song or prayer, and the other face also in profile. This ear-front pose would clearly and instantly distinguish the Double-Faced being from an ordinary human.[12]

3.2.　Giants plus cannibals/ogres and ogresses

The next category of fantastic beings were mainly present in mythic times, but thankfully most were either killed off by Heroes to protect ordinary humans or vanquished to a distant home vaguely described as in the North but not a part of Earth, because there is some barrier separating them.

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[10]From Picture Cave, Eastern Missouri, dated ca. A.D. 1010 (Diaz-Granados et al. 2001).

[11]From Diaz-Granados et al. (2001). Note the protrusions on each elbow, plus the split profile, with the creature's right face speaking/singing.

[12]Diaz-Granados & Duncan (2015:180-187) put forward an feminine interpretation of this figure (First Woman), which is quite intriguing and ethnographically accurate, but I am not persuaded by the image itself. Note also that the actual photograph given in their Figure 14.1 is more difficult to interpret than the schematic drawing published earlier, which also makes my interpretation less clear.

I found two different stories with the curious detail of giants who swing sharp hooks to slice or grab onto humans as if they were prey—hence the original title of this paper. The following excerpts are from a Marsh text by the name "The Giants". In some cases the stories are named for the supernatural Antagonist rather than for the Human/Heroic Character. Marsh (n.d.) collected the tale in 1936 from Mrs. Robert Small, an Otoe-Missouria woman married to an Ioway man, living in the Perkins, Oklahoma area.

(2) Excerpts from Marsh's (n.d.) "The Giants"

    a. LN49
        wąlúške-xąče …
        Giant-(is)big
        'A large giant…'

    b. LN57
        wahík'o *gla-xąčįŋe*   *uhatá-glą-ŋ(a)-aškų.*
        hook   very-(is)big (he)hang.it.up-his.own-it.is.said
        'he hung up his huge hook, they say.'

    c. **wahík'o** *glúđe-ną*   *giwįxe.*   *mįn(a)-aškų,*
        hook   (he)take.it-and (he)swing.it (he)sit-it.is.said
        'That hook, he took it and swung it while seated, they say'

Right then, the crippled giant threw the sharp hook at the south side of the lodge where the men on the warpath were lying, but the hero was only pretending to sleep. He had quietly picked up a long pole, and used it to deflect the hook to the north side, where the other giant-brothers slept. So it was the giants who were cut up and killed instead, and the warriors escaped safely. Skinner (1925:465-467) also had Tale #9 *Maⁿto Íkîruhe*, Married To Grizzly Bear, featuring a similar incident, where it is the chief's son who rescues the war party.

Additional mentions of giants appear in "The Wanderer" tale from the Marsh collection:

(3) Excerpts from Marsh's (n.d.) "The Wanderer"

    a. LN81
        …**walúške** [?unclear mark] **xąč(a)**-*aškų.*
        giant   **is.big**-it.seems
        'There was a big Giant, it seems' [my free translation]

    b. LN90
        walúške *<géhąŋe>*[13]
        giant   <another/different one>
        '(Another) giant…'

    c. LN91
        šųkheñį gla-tógle-ną   **wą-šik'uče**-*é-aškų.*[14]
        dog   his.own-with.him-and **man**-**hunter**-he.say-it.seems
        'was hunted people with his dog, they say.'

        'There was another giant together with his dog and he was a Man-hunter, it seems.'
        or 'he was hunting men' [my free translation]

Note that giants were associated with equally big and dangerous dogs, not surprisingly. Aside from hunting and eating humans, the over-sized beings were in other ways much like human society. They also lived in similar-style longhouses, took scalps, played stickball and chunkey, and used ceremonies to care for their sacred war bundles!

Then, because the Giants' village is on both sides of the river the hero must pass through, he must wait until dark. He ties bundles of reeds on each side of his canoe as advised by the Wanderer. Despite the darkness, they have torches, and spot him. They shout, inviting him to stop and come eat with them. Of course he does not stop! Then they throw hooks at him, snagging the reed bundles and pulling them to shore. In the dark, they fight over the bundles, allowing him to get safely past. The same routine must be repeated on the hero's return trip. Again, the giants fail, and the family goes home safely.

One notable characteristic of giants was that they loved to compete in contests such as races, games of stickball or chunkey, battles of wit or assigning an impossible task. They would wager lives on the outcome. Giants appear in several additional stories in IOM traditions, as well as other Siouan groups. One episode of the Hero Twins includes a victory over a village of giants. Two different items of material culture may be related to that particular story. The first is another historic pipe bowl that features a large head of a man facing toward the smoker. The head is more than twice as large as the heads of two identical males seated opposite one another. See Figure 6.

Figure 6: Giant and Two Seated Males Pipe Bowl[15]

The second item is another Missouri rock art feature, reproduced in Figure 7 below. It is such a complex figure that it is difficult to determine exactly what is happening. However, it seems clear that the large figure lying on the ground is more than double the size of the rest of the anthropomorphs in the drawing, so it is safe to say he is a giant. Also, because of his position, and the actions of the men around him, it looks as if he has been injured or killed by two or three of those human figures, who are raising 'maces' or war clubs in their hands (Diaz-Granados et al. 2001, color emphasis added to giant figure).

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[13]The <> denotes something not in the original telling that was added during translation for clarification of the story line.

[14]Marsh used a dash here, probably to represent a syllable boundary. I think it should have been a glottal stop, as most compound words will contract *wąŋe* 'person' to a single syllable with the glottal marking a morpheme boundary, as noted in Whitman (1947), really written by Marsh (c.f. Schwartz 2014 "Who Wrote Whitman's Grammar?" SCLC 2014 in Madison, WI).

[15]Ioway Collection, National Museum of the American Indian: Washinton, DC. Photo by author, June 2017.

The authors of the original study interpret the smaller human figure to the right as possibly representing the culture hero known to the Hochunk (Winnebago) as Red Horn, based on the bi-lobed arrow hair ornament and the large long lock of hair or 'horn' for which he is known. The Ioway called him 'He-Who-Wears-Human-Heads-As-Earrings', an even more distinctive trait which was quite marvelous and charming to onlookers (Skinner 1926:456-458).

Figure 7: Sketch of Petroglyph[16]

Giants can also be rather disgusting and crude, as well as dangerous. In Tale #6, "*Waⁿkx!-istowi*, The Man With The Human Head Earrings", everyone who came to the world-wide race was upset, because "the giants with mucus hanging from their nose always won!" (Skinner 1925:457). The general term used in the tales for a giant are *walúške* 'giant' IOM, also written as *warúšge*. Maximillian gave *warúshka* (GoodTracks 2008). In Hochunk there are two distinct lexemes: *hit'enųke* (*wasé*) 'giants (large people who lived in caves of Minnesota)' (Miner n.d.) and *wąągrúcge* 'maneater, ancient giant' (Miner n.d.).

In the *New Lakota Dictionary*, there is an entry as follows: *Iyą́* 'Eater': "Proper noun, the giant eater" (on page 869, lists it as 'giant/big'); "character from Lakota myths **who ate people**" (Ullrich 2008:868, emphasis added).

Ogress Cannibals also were part of the tradition; for example, not long after White Plume (*Wagre Kagre*) outwitted that Male Giant on the hunting trip—Lo and behold, he sees a village where *Nashin Waxógre* had eaten all the adults, so the only people left were children. Giants like to have a contest first, in which they defeat their victims, before getting around to eating people.

Nashin Waxogre chose her victims by battle of art! They were told to make a likeness of an Underneath Horned Panther! If the Ogress' piece was best, then she'd kill them and eat them up.[17] So, White Plume took the children's sad little clay figure, and made it into a living "**SHINING Water Panther**!" (emphasis added) (Skinner 1925:460-461).

Their size is *not* specified, but there also was a powerful cannibal couple with power over weather in "Blood Clot Boy": *Ina'singê'katche'ruka* 'Wind Controller' (Woman-little Wind -rules?) and *Wansh'tadj'ruka* 'Old Man Wind Chief' (Man-Wind-rules?) (Skinner 1926:254).

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[16]From boulder at the Maddox Cave site, Missouri. Reproduced from Diaz-Granados et al. (2001:??).

[17]In the Ioway story "White Plume" *Wagre Kagre*, the hero must travel with a giant, who jokes this moon will 'crackle your clothes'; the Hero secretly switches Giant's moccasins/clothes with his own as a pillow. Giant later snatches bundle and throws it on the fire. Giant discovers his mistake when trying to dress in White Plume's clothing. Walking barefoot through deep snow, Giant dies from exposure Skinner (1925:460). Thompson (1966) has a motif for this plot twist; however, I will skip it for sake of time.

Cannibalistic Giants very commonly feature in tales around the world.[18] Think "Jack and the Beanstalk" for a familiar English version. "Fee, Fie, Fo, Fum, I smell the blood of an Englishman. Be he live or be he dead, I'll grind his bones to make my bread!"

4.   More fantastic creatures: dwarfs and little people[19]

Under the Miscellaneous category, 'Additional motifs... Dwarfs/Thompson motif F495, Thompson (1966) included a Crow story collected by Lowie (1918:165,169,171) *Comparative Note #287a* (Thompson 1966:356,364). The question is, were there more than one type within this category? I believe there are at least two distinct kinds of 'Little People' in the IOM tradition, and likely for all the Mississippi Valley Siouan peoples.

4.1.   Pointy-headed little ones who want to kill humans

For the Ioway, they were called "**Big Ears and Pointed Heads**" IOM *hunpóthroxje* (old Good-Tracks 2008)[20] or "Long Flat-heads" *Hompathrotci* (Skinner 1926:253).[21] For the Otoe (and Missouria), Whitman (1938) listed *humpathroxje*, *honpathroji*, *hompathroji* 'spirits with long heads that are sharp at the top, that live in the buttes of the Missouri and Mississippi Rivers.[22] This form has the tentative derivation of *hų/hõ* '?' plus *pha* 'head' plus *θroje* 'pointy?'. GoodTracks has *pothroxje* as an 'old' form (2008).

In one source the 'pointy heads' were mistakenly called giants, but it had exactly the same geographical area for their home, plus fondness for foot races with lives staked on the outcome/gambling; see the Ioway *Wanathuje* story (Skinner 1926:253). Therefore, I consider these to be a single creature type.

The Pointy-Headed ones are also found within the Dhegiha peoples' tradition. The Ponca called them *Mandhanuhandhe egan* 'like beautifully made arrowheads'; a Ponca story describes them as elves or dwarves that are dreaded, because they lead one away at night, leaving victim lost till daylight came (Howard's *The Ponca Tribe* in Cumberland & Rankin 2008:????). Among

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[18]If one really wanted to speculate, we could link the idea of giants with an ancient folk memory of *Homo erectus*, since our modern *Homo sapiens* ancestors traveled out of Africa then encountered these human predecessors all over Asia and parts of Europe. *Homo erectus* were heavier in skeletal framework and probably stronger, considering the size of the muscle attachment marks on the bones. There is even some evidence of cannibalism (see Peking Man-Zhoukoudien site).

[19]*Homo floresiensis* were essentially Little People also; the current location for extant finds have been limited to Indonesian islands such as Flores (type site for species name), but The Hobbit lived as recently as 18,000 years ago, so ancestral memories passed on for generations are not impossibly far-fetched. Their faces would have differed from ours, but no pointed heads.

[20]In the New World, 'cone-heads' are found in an ancient population of South America. The famous specimens appear in physical anthropology labs and pseudoscience TV shows. The skulls were intentionally deformed by wrapping infants' heads, not from a heritable genetic trait. The flattened foreheads of Mesoamericans are well known ethnographically, plus the sharpened canines of Aztecs would create terror in anyone who saw them. There would have been at least indirect contact between border regions and eastern North America. As maize spread north, why not rumors of monstrous cannibalistic men as well?

[21]See Motif N2, N2.1 *Lives wagered Comparative Note #277*, possibly found in Crow (Lowie 1918:200) and Wichita (Dorsey 1904:194) in Thompson (1966):354).

[22]See also Cliff Ogre motif G321, Note 163: Crow (Thompson 1966:322,364); "A monster kicks her victims over a cliff, where they are eaten by her brood".

the Kaw, I found no reference to an unusually shaped head, but note its size as being large in proportion to the human-like beings' small stature. Note this entry in the Kaw Lexicon: *Míaloshka* 'Hairy One/Monster with Big Head... Mythical people, water beings, or little people'. This lexeme was cross-referenced with an entry called 'the solitary dwellers' (Cumberland & Rankin 2012:128).

There is at least one illustration that I propose represents the small, pointy-headed anthropomorphs. It is an engraving from a small catlinite artifact called the New Albin tablet (see Figure 8 below). While not directly amenable to dating, since it was discovered at an Oneota site in Iowa, it should be roughly contemporaneous with Mississippian culture (A.D. 900-1300) or later, on up to A.D. 1700. The object on the Birdman's back is a pointy-headed small human-like figure. On the right, Robert Bray's sketch of the figure was isolated for clarity. The drawing is reproduced from Benn (1989). My interpretation differs from most archeologists, who have typically described the figure on the back as a sacred bundle, based in part upon various ethnographic accounts of war bundles being carried on the back of the leader of the war party. The image might represent a sacred hawk bundle, but no explanation is made of the sharp pointy head. A study of ethnological specimens found the preserved heads in bundles to be smaller than the species of hawk while living, but not uniquely angular (Ubelaker & Wedel 1975). Bray's sketch shows an object bearing only slight resemblance to photographs of actual Ioway sacred bundles. Both are vaguely cylindrical, but most bundles are bulky, and have cordage wrapping the object, not angular side elements suggestive of partial arms and legs. Pelts fashioned into medicine bags from otters, squirrels, and other animals have a closer resemblance, due to the head and limbs being retained in place (See Skinner 1926 appendix for Ioway bundles and medicine bags.)

Figure 8: New Albin Tablet[23]

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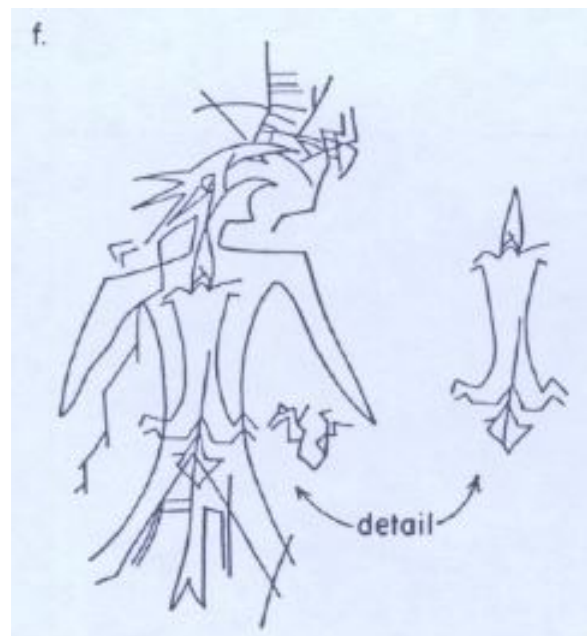
[23]Image incised on catlinite. Oneota site in Iowa from Benn (1989).

4.2.   Forest spirits: Little hairy men[24]

This type of creature may possibly have a tail, as well as being somehow associated with owls. Although of diminutive stature, and somewhat odd (they live alone in the forest, hermit-like), they are not to be taken lightly. One notable feature is an invisible column of power that extends above this creature's hollow tree home. Any birds that flew over it would drop dead from touching the 'force field' (my term), and become his prey. One source reported even the Thunderbirds were afraid of his/their power (??WHICH ONE?),[25] but see the following excerpt:

(4)   LN 137

Wakąda-noči-įŋe   (first mention of them)
spirit-tree-live.inside-DIM
'Sacred Little Tree-Dweller' [my gloss, c.f. GoodTracks (2008) entry 'elf/fairy']

A 'hidden name' or respect-avoidance term (i.e., euphemism) for this ambiguous set of beings is given in a different story. Name-avoidance occurs in many instances as a sign of respect. Close relatives tend to use family names and kin terms rather than personal names traditionally, which shows both affection and claim of kinship roles with all associated rights and obligations. Elder siblings and parents in particular are to be treated respectfully (Davidson 1997). Powerful supernatural beings and even dangerous prey animals are likewise respected, with a 'respect name' substituted before a hunt, during a ceremony, etc. This taboo is related to the widespread belief that living things are naturally attracted by the sound of their name (Consider the English idiom based on a similar folk belief "Speak of the devil... (and he shall appear)".[26]

So, in another Ioway story, the title and 'name' referring to the mysterious dwarf is "simply "The Wanderer", *mąyą - wàtahe* from *mąyą* 'land' plus *wàtahe* from Directional prefix 'this way' plus *a-* 'on' affixed to *dahe* 'standing position' (Marsh n.d.; "The Wanderer"). Initial *wa-* could also be the 3rd person plural prefix expressing object form, if it refers to those who stand (i.e., live) on the land (as opposed to 'sitting' in the village/house of ordinary humans). The mysterious dwarf befriends the lost Youth, and gifts him with a magic arrow that gets a deer every time it is shot. Skinner had a corresponding tale told in English, likewise titled *Maianwatahe* after the forest dwarf, but he translated it as 'World Man' or Everywhere Being'; Ioway youth seeking a vision were urged to pray for hunting power and 'plenty' from him (Skinner 1925:441). GoodTracks (2008) also lists the compound form for 'spirit; tree spirit; elf, fairy' as *wakanda nochiiñe*; *wakąda* 'god/holy.spirit' plus *nočįñe* from *na* 'wood/tree' plus *uči* 'in-house' plus *įñe* 'little', literally meaning 'Holy Spirit(s) (that) live-in little trees', based on Marsh.[27]

There is a feminine version for these creatures also. The popular tale 'Created-From-Feet'

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[24]In Hochunk I only found two relevant words so far: *suujá* 'be small in stature, stunted, dwarfed person or plant' (Miner n.d.) [cognate with IOM word for 'baby' *šuwe* (Davidson 1999)] and *hįįšék* 'be hairy (fuzzy, shaggy)' (Miner n.d.). Is it possible that these originally separate beings have been confused/merged over time? Among the Dakotan groups, they kept *Heyoka* separate from Tree-Spirit, according to Howard. For Lakota, Ullrich glosses *Heyókȟa* as 'Thunder dreamer' (2008).

[25]But Marsh's version of "The Twins" describes the Thunderers themselves as living inside a tree (n.d.).

[26]The Hochunk Medicine Lodge frequently used hidden language, i.e. 'creeping soldiers' for snake (Radin 1948). The custom kept sacred knowledge secret even from lower level Dance Society members.

[27]Oddly he also only lists four Thunderers here instead of six.

tale *Thiógrita'mį*[28] (also called 'Splinter Girl') ends with the powerful youngest sister defeating four giant brothers and their Sister, bringing her own brother's heads and bones back to life, then in the end going to the woods to live as *Núnwakanda* 'the Fairy of the Woods' (Skinner 1925:462-464). The form probably is *Nų:wakhąda* (1st syllable stressed, but also heavy, including two vowel mora there) from *ną* 'wood/tree' affixed to *u-* 'Inside' then adding *wakhąda* 'god/spirit'.

Among their northern Mississippi Valley relatives, we find the Dakota spoke of a similar short but powerful being they called 'Dwells in the Woods' or 'Tree Stump Spirit' (Howard 1955; Skinner 1919). Tree-Spirit bundles featured wooden icons that shamans could cause to 'dance' (See Figure 9).

Figure 9: Image of a medicine bundle for the worship of the Tree Stump Spirits[29]

There were also decorated masks representing Tree-Spirits among Dakota people, to wear while doing members' unique ceremonial dance. Even in Howard's day, no one practiced it, because only persons who had dreamed (or had a vision) of the Tree Stump Spirit had the right to do so. Yet a few elders remembered witnessing the ritual, saying it was similar to the *Heyoka* Dance Howard received an actual mask from a Dakota friend, as well as a drawing of such a mask

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[28]This is Skinner's transcription. Certainly the final feminine marker should be nasalized. There may be other errors also.

[29]Including male and female wooden figures laying on the right side of the bundle wrapper. Reproduced from Howard (1960).

(See Figure 10.) The giver told Howard he could try the Tree Dweller mask on 'for fun' if he liked (Howard 1955).[30]

Figure 10: Tree Dweller Mask of the Teton Dakota[31]

The Dhegiha groups also spoke of these special beings. Among the Kansa they were known as *Míaloshka* 'Hairy One/Monster with Big Head... Mythical people, water beings, or little people...' George Dorsey said they "dwell in solitary place, to which they entice unwary Indians. Their victims become crazy, and live as *minxoge*. Some dwell underground or in the water, sitting close to the bank of the stream." Dorsey also noted the Osage had a "camp near Pawhuska... [associated with the] Legend of the Hairy Man at Hairy Man's Bridge, east side of Indian Camp." (Cumberland & Rankin 2012:128).

5. Horned underwater monster/panther

This fearsome creature is a very, very ancient, important, and widespread symbol in the eastern portion of Native North America (Townsend 2005; Benn 1989). There are some differences from group to group on details, but the similarities outweigh the differences. These creatures are a mix of characteristics from many different species, and are primarily associated with rivers and lakes. Some type of horn is present, usually Deer antlers (some Algonkin pictures have bison horns instead). The head is feline (hence the word 'panther'), with smaller, usually rounded ears but large teeth. The body is rather undefined; it may be quite snake-like, e.g. without legs, but it always has a very LONG TAIL. This tail can be used to cause whirlpools.

Horned underwater panthers are very dangerous: they may steal human babies along the shore, and often drown adult humans. Sometimes they are depicted as spotted, and images may have power lines and/or offspring depicted inside (esp. Great Lakes Algonkin; Cf. Figure 13). I include these images because of the strong cultural influence these Algonkins had on the

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[30]Unlike the *Heyoka* mask he also sent, with warning for Howard (1955) NEVER to wear it, or lightning might strike him!

[31]Reproduced from Howard (1955).

Hochunk, plus the Ioway were very close historically with Sauk and Fox peoples, too, from the late 18th century on. Later the Ioway also associated with the neighboring Potawatomi while in Kansas (from the late 19th century up to today's Northern Ioway Reserve). Skinner (1926:286,340) had a small (five inch) woven bag with a Horned Water Monster motif on one side that I originally planned to include, but unfortunately the old black and white photograph did not scan well enough to see the design.[32]

The rock art of Harvey Rock Shelter in Iowa includes a full-face head sketch of an Underwater Panther alongside many Thunderbirds (See Figure 11.) Archaeologists have placed the IOM ancestors within roughly the same territory they inhabited at contact, associated with the material culture known traditionally in the archeological literature as Oneota (Map 1). Many Dhegiha and other Siouan people would prefer that those scholars used a name which reflected the known cultural continuity with their ancestors and tribal self-names, to prevent the all-too-common disconnect in the past between professional archeology and the native peoples affiliated with a particular region.

Figure 11: Harvey Rock Shelter art[33]
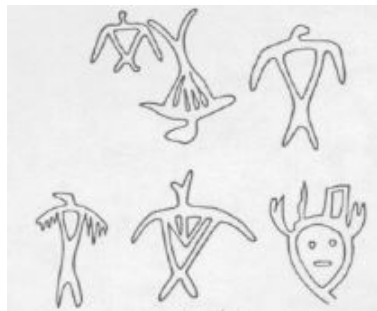
The belief in this creature occurs from the Texas region eastward to Florida, and up to the Great Lakes Region into what is now Canada. As creatures of the water, in that Eastern Woodland worldview, they are associated with the Underworld, caves, and snakes, all of which are dangerous to humans (and yet also associated with fertility, birth/death, and females) (Townsend 2005; Diaz-Granados et al. 2015). They greatly fear the Thunderbirds (also known as Thunder Beings/Thunderers), who prey upon them while they sun themselves on the rocks near the riverbanks/lakeshores. They disappear if any clouds appear, because storm clouds may hide the presence of the Thunderbirds.

There are several stories of Native person witnessing an aerial battle between them, when the Water Monster cries out for help, so the human (male) shoots the Thunderbird, whereupon the narrator generally says that choice was a mistake. A preliminary glance at the literature showed this story among the Ioway, Sauk, and the Great Lakes Algonkin.[34]

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[32]The original artifact is likely to be in the Milwaukee Public Museum collections, as it is the institution which sponsored Skinner's work, published his monograph, and other artifacts depicted in his illustration plates are known to be there. Catalog #30157 is also given (Skinner 1926:340).

[33]This art features the face of a horned underwater panther (bottom right) amidst Thunderbirds (Benn 1989:247).

[34]A fascinating extended account of a youth who was tricked into a Faustian deal by an Underwater Panther was written in the Meskwaki syllabary Dahlstrom (2003).

Map 1: Oneota area of American Midwest[35]
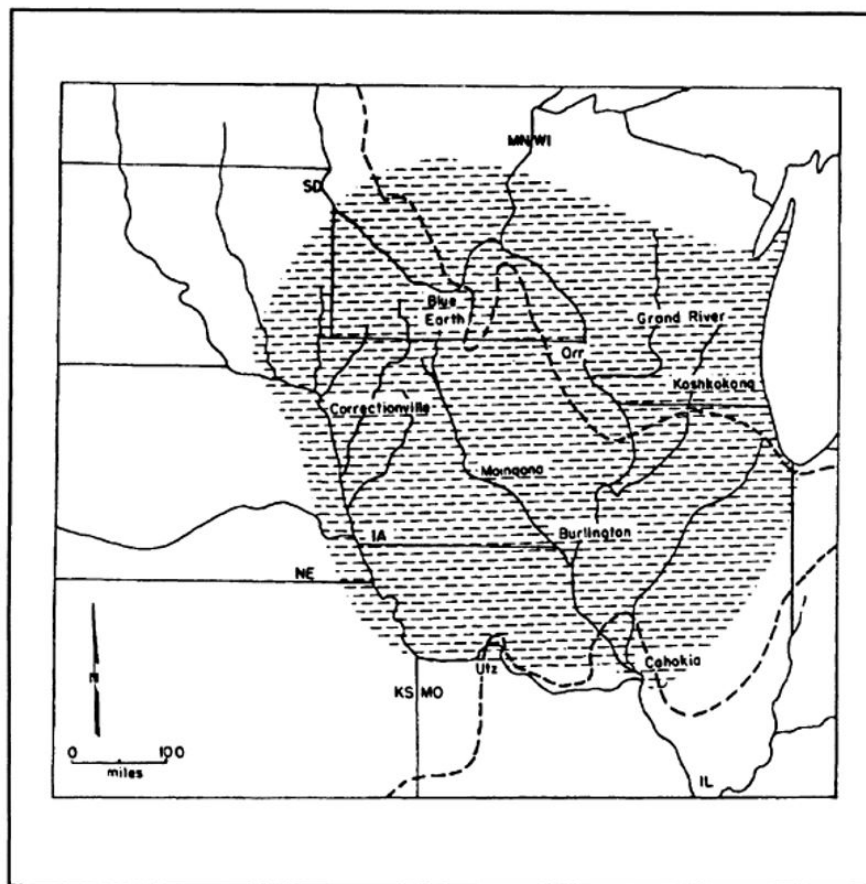
At this point, we should point out that 'jaguar' is actually a better translation than the most prevalent word 'panther', since jaguars were once in much of the wooded lower 48 states, and they do like to spend time in the water, where they hunt alligators and fish regularly (Daggett & Henning 1974). Jaguars are also known to attack humans without fear. They are significantly larger than the cougar, and last but definitely not least, their coat is golden or orange with black spots. Note the descriptions as 'glistening/shining' for the Horned Water Panthers, the inclusion of spots on the coat, even the famous Missouri jaguar gorget (Wood 1961). While archaeologists have often called it the *piasa*, the Cherokee called this mysterious creature *Unktemi* (Townsend 2005)/*Unktena* (Hudson 1976:131-168 in Benn 1989). A researcher working with another southeastern nation had the rather fascinating case where their Choctaw speaker chose a leopard picture to convey their idea of the animal, because of the golden-orange color and the black spots, while the same speaker would not accept a cougar photo (Daggett & Henning 1974).

To testify to the long time depth of this symbolic opposition of Sky World vs. Underwater World, there is a battle similar to the one described in that brief but widespread narrative, actually depicted on an engraved shell gorget that predates the Mississippian era (Figure 12). The original label conservatively describes it as Feline and Hawk.

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[35]Reproduced from (Benn 1989). Note the position of Cahokia, lower edge of cross-hatching region delineated.

Figure 12: Ancient roots of cosmological battle between Upper and Lower Worlds[36]

The conceptual link between these two ancient enemies is so strong, their motifs were often paired on opposite sides of woven bags. See Figure 13 for an example from a Great Lakes Algonkin group (the Anishanabe). The other side of the bag was covered with Thunderbirds (not shown).

Figure 13: Nettle fiber twined woven bag with images of horned Underwater Panthers[37]

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[36]Engraved shell gorget ca. A.D. 300-700, from Texas (Townsend 2005). The line behind the 'Feline'/Water Panther may be the tail, and the 'headdress' actually represents the antlers/horns of the monster. But it could also be feathers or a cedar branch, all prominent elements in native North American cultures.

[37]This bag features 'ribs' and 'infants' inside the Panthers in the upper row (reproduced from Whitford 1991).

5.1. Names for this fantastic creature

The Baxoje-Jiwere language has the following variants: *ishchéki, ishjéki* 'monster, water monster, horned water monster' (GoodTracks 2008); *Ixtcêxhe, Ixtci!xi,* 'Horned Water Panther' (Skinner 1926:253, 1915:741). The IOM's closest linguistic relatives, the Hochunk, did not seem to have an identical term, but two related lexemes include *waakcéxi* 'Water Spirit (clan)' (Helmbrecht & Lehmann 2010:416)[38] and *heecų* 'to be horned' [final syllable stressed] (Miner n.d.). The northernmost of the Mississippi Valley relations, the Dakota, use a word very similar to the Cherokee word (Iroquoian): *Unktehi* 'mythological Horned Water Panther' (Skinner 1919:174).

There are some similarities with general feline terms across the Siouan language family.[39] Especially noteworthy is the following term and its gloss from Biloxi: *taⁿtoⁿ* (archaic) 'wild cat'; *Ṭtątõ* 'Ancient of Panthers' (Rankin et.al. 2015, authors' source listed as (Dorsey & Swanton 1912:272b). See Figures 14 and 15 for variation in depicting the beings. The first image features the heart line (from mouth to heart) and 'ribs', plus legs. Presenting the creature with rounded eyes that gaze directly out from the frontal view of the face is a common way to portray this creature, as opposed to the falcon/birdman/Thunderbird beings, who are always in profile, with beak/nose emphasized.

Figure 14: Sketch of the Underwater Panther (Howard 1960:221)

Ethnographer James Howard drew this sketch based on the image he saw burned upon a Potowatomi drum reserved for the special ritual honoring the Underwater Panther, which he witnessed during the 1950s in Mayetta, Kansas (Howard 1960:221); the Potawatomi man who conducted the ritual remarked that the Wisconsin Winnebago also had a ceremony for the Underwater Panther, and he had visited them by invitation to compare each rite (Howard 1960:223). The Kansas Potowatomi are another Great Lakes Algonkin group, who have lived near the Ioway Reserve since the late 19th century.

Figure 15 demonstrates the more vague, legless body form for the same creature that can be seen in the prehistoric Missouri rock art tradition. This rendition is a reminder that the Horned Underwater Monster also is linked in ancient times with the Great Serpent, part of Mississippian (and other North American) cosmology in which a Great Snake is part of the foundation of the world, and husband to the Grand-mother of All/Mother Who Never Dies (Prentice 1986). These

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[38]Possibly cognate to IOM *wakąda* 'god/spirit' or alternatively, to *wąŋe* 'man' + *čexi* 'cruel, mean'?

[39]Ioway: *udwą'įñe* 'little cat, house cat' [Lightfoot/Greer notes]; Hoocąk: *wiicąwasįįcserèc* 'cougar' (Miner n.d.) (primary stress/2nd syllable); *wicqwą* 'big cat' variations for 'wildcat, lynx, cougar, tiger, jaguar' (last syllable stress) (Helmbrecht & Lehmann 2010:416); Lakota: *igmúthaŋka* 'cougar, panther' (Ullrich 2008:971); *igmúhota* 'lynx' (Ullrich 2008:944); Ofo: *atcánta, Ṭtathąta* 'wild cat' (Rankin et al. 2015, Wild cat [2]).

religious beliefs continued into historic times as documented in the 19th century by ethnographers and linguists. For example, the Osage had a Rite of Reincarnation for the Dead which invokes the 'Great Snake' who said "Even though the little ones pass into the realms of spirits, they shall, by clinging to me and using my strength, recover consciousness" (La Flesche 1975:368) quoted in Diaz-Granados et al. (2001:488).

Figure 15: Underwater monster[40]
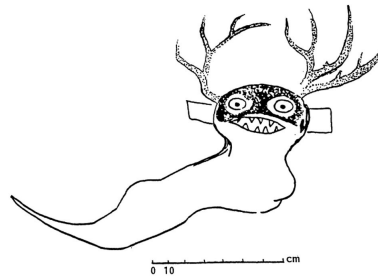
It may be unrelated, but it is interesting that the Kansa (Kaw) had a mythical flying snake *wéts'a tazhi lishka* whose power was so great, just looking at it meant the person must die. Their traditions also included an Old Woman who used to hold supernatural communication with them (Cumberland & Rankin 2012:214).

Finally, for an alternate depiction of the horns, Figure 16 is an historic drawing by a Meskwaki person as an illustration of a negative vision experience by 'The boy who did not fast' (Dahlstrom 2003). Note that the horns and head/neck hair are like a bison in this version, while the body is extremely elongated, and the face quite feline, complete with whiskers. It also features a kind of dorsal fin, a LONG serpentine tail, and is drawn partially facing the viewer.

Figure 16: Evil underwater being[41]
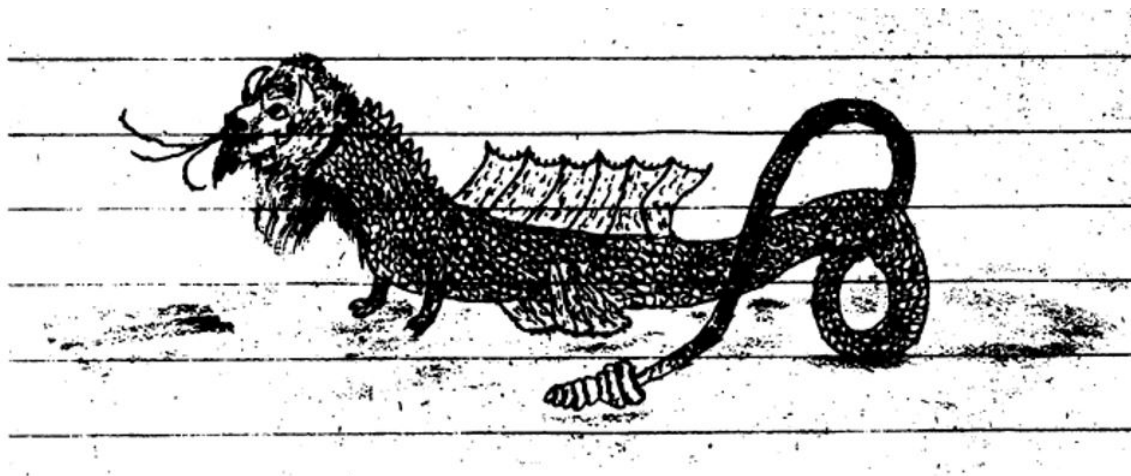
As mentioned earlier, one key point to remember is that the Mississippian site of Cahokia is quite close to the rock art sites in eastern Missouri of the same time period, and had clear

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[40]From Picture Cave, Missouri, ca. A.D. 1010 (Duncan & Diaz-Granados 2000).

[41]From a birchbark scroll in Meskwaki syllabary (Dahlstrom 2003).

influences on the Oneota peoples at its northern and western edges (Duncan & Diaz-Granados 2000; Benn 1989). The bird men figures, copper, use of catlinite for tablets and pipes, 'mace' weapons and unique war clubs, shell gorgets, and hawks all are linked to that Mississippian influence.

Map 2: Location of major Mississippian sites ca. 900-1400[42]

5.2. "Wolf's Cry" and the Horned Water Panthers

We can get a feel for the rather cruel nature of these beings through another Ioway tale, which features their enmity for humans, and their alliance with many other animals. In "Wolf's Cry" (*Haxuga*), Wolf's Cry had a brother who went to fetch water, but never came back. He discovers that the Horned Water Panthers drowned his brother and all the animals feasted on his body. They took the brother's skin, stretched it like an animal hide, hardened it, and used it as their door cover for their underwater lodge!

Naturally, he has to get revenge, but it is not so simple. First, he catches the Chief and His Wife sunning themselves on the river bank, as he transformed himself into an old stump. He shoots them, but they are merely wounded, managing to disappear back beneath water. Later, he sees Beaver chopping wood for the fire needed in doctoring the couple.

The Underwater Panther Village will have a curing ceremony for the wounded Chief and his wife, so many different animals come and go, helping them prepare. They also plan to kill

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[42]Reproduced from Townsend (2005).

Wolf's Cry. Eventually, he gets his chance to fulfill his original duty of vengeance. He meets Buzzard who was about to conduct a doctoring ceremony. So, Wolf's Cry kills Buzzard, skins him, and wears the skin as his disguise to safely enter the Underwater Monsters' Lodge.

As the "doctor" controlling the curing ritual, he is able to force everyone else out but the royal couple, then stabs them to death with a sharp heated pole. He snatches his poor Brother's skin from the door frame, and escapes. Wolf's Cry revives his brother by placing all his remains together, and shooting four magic arrows up into the air, shouting "Watch out!" The brother turns himself into an eagle to escape from earth, while Haxuga went up to the heavens, where he can help his people. Ever since that time, people use food as incense to reach Haxuga during the Medicine Dance ritual, and get assistance from beyond (Skinner 1925:468-472).

Themes found in this Ioway tale collected by Skinner includes the Sham Doctor Motif K1955, Note 271a, "*Hero masks as doctor and kills enemies*"; relevant tribes with tales containing this motif are Omaha, Assiniboine, Dakota, and also Pawnee (Thompson 1966:353).

6.   Conclusion

The folktales that a people tell over and over from each generation to the next may preserve ancient beliefs going back many centuries, even a thousand years or more, as we have evidence from rock art in Missouri that has been successfully dated at A.D. 1010, and even earlier for the shell gorget depicting jaguar and hawk (Townsend 2005).[43] Some narrative elements concern actual ethnographic practices such as the taking of scalps and trophy heads, whose physical presence in everyday village life appear in haunting tales as Scalping Survivor and Rolling Heads, who can take revenge upon the living for their damaged unhappy states. That set of cultural practices and beliefs also included the supernatural world, populated with amazing creatures that awe the listener, and inspired artists and artisans who created images on rock, shell, wood and fiber of "Sharp Elbows", Giants, Pointy-headed Little People, Tree-Dwelling Spirits, and perhaps most fantastic of all, the Horned Underwater Panthers.

This is merely a preliminary attempt to inventory the IOM peoples' 'scary' beings in folk-lore, and to interpret and recognize items of material culture that pertain to those categories. No doubt there is much more research linking language, folklore, and material culture representing the shared native worldview from the Mississippi Valley Siouan tribes with their Eastern Woodland and Prairie-Plains neighbors which has been omitted here. Certainly, there are many more stories left to tell.

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[43]The famous Missouri jaguar gorget, discovered in a proto-historic burial, is believed to have been an heirloom passed down for many generations, as its iconographic style is significantly older than the rest of the mounds' artifacts; some archeologists initially saw it as a Mesoamerican trade item because of the jaguar motif, but particularly for the feathered 'words' coming out of its mouth (Wood 1961; Daggett & Henning 1974).

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Incorporation in Crow?

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Abstract: While Crow has been described as an incorporating language (Graczyk 2007, Wallace 1993, Rankin et al. 2003), Golston, Boyle & Gebhardt (2018) argue that what looks like incorporation isn't. Rather what's happening is loss of word status, formation of a new prosodic word and deaccentuation. Focusing on noun incorporation, this paper reviews the facts and analyses, explicitly outlining the incorporationlike characteristics and weighing them against the phonological analysis. The conclusions are that the evidence favors a nonincorporating account and that even if incorporating features are acknowledged it's too simplistic to call Crow an incorporating language.

Keywords: Crow, incorporation, deaccentuation, prosody-syntax interface

1. Introduction

A variety of phenomena fall under the term 'incorporation', but the phenomenon does, perhaps canonically, involve the appearance of a word inside the verb when it would ordinarily appear in another position in the syntax and a tendency for generic rather than referential interpretation of the incorporated element (e.g. Massam 2009). How unified these phenomena are has been the focus of long debate, as have the kinds of phenomena that are necessary conditions for categorizing a language as incorporating. Before proceeding to examples of Crow, whose status as an incorporating language this paper questions, examples (1)-(3) illustrate some of the characteristics typically used to identify a language as incorporating. The a examples are nonincorporated while the b examples are incorporated structures. The tables below each data pair point to salient semantic and morphosyntactic contrasts between the nonincorporated and incorporated versions, with the element undergoing incorporation highlighted.

(1) Onondaga noun incorporation (Massam 2009:1077, citing Woodbury 1975, in Baker 1988)

    a. *pet waʔ-ha-htu-ʔt-aʔ*   *neʔ o-**hwist**-aʔ*
        Pat PST-3MS/3N-lost-CAUS-ASP the PRE-**money**-SUF
        'Pat lost the money'

    b. *pet waʔ-ha-**hwist**-ahtu-ʔt-aʔ*
        Pat PST-3MS/3N-**money**-lost-CAUS-ASP
        'Pat lost money'

Table 1: Salient evidence of nonincorporation and incorporation in (1a) and (1b)

Nonincorporated structure	Incorporated Structure
postverbal object	preverbal object
object with inflectional morphology	object without inflectional morphology
object a full DP	object a bare root
object referential	object nonreferential

(2)   Mohawk noun incorporation (Baker 1996:21)

    a. ***shako****-núhwe'-s*   *ne* **owira'a**
        M.SG.SUBJ/3.PL.OBJ-like-HAB the **baby**
        'He likes the baby'

    b. ***ra****-wir-a-núhwe'-s*
        M.SG.SUBJ-baby-like-HAB
        'He likes babies'

Table 2: Salient evidence of nonincorporation and incorporation in (2a) and (2b)

Nonincorporated structure	Incorporated Structure
postverbal object outside the verb	preverbal object inside the verb
object a full word	object a bare root
object a full DP	object a bare root
object referential	object nonreferential
transitive verb agrees with subject and object	intransitive verb agrees with subject

(3)   Yucatec Mayan noun incorporation (Mithun 2000:857, citing Bricker 1978)

    a. *t-in-č'ak-∅-ah*   *če'*
        COMP-I-chop-it-IMPF(transitive) **tree**
        'I chopped the tree'

    b. *č'ak-**če'**-n-ah-en*
        chop-**tree**-ANTIPAS-PERF-I.ABS
        'I wood-chopped'

Table 3: Salient evidence of nonincorporation and incorporation in (3a) and (3b)

Nonincorporated structure	Incorporated Structure
object outside the verb	object inside the verb
transitive verb	intransitive verb
active morphology	antipassive morphology (reduced valence)
object referential	object nonreferential

The incorporated examples in the three languages exhibit some of the characteristics typically, though not universally, associated with incorporation structures, here primarily those showing incorporation of the object noun. First, depending on canonical and incorporated order, the incorporated version places the object in a linear position other than that of the canonical non-incorporated structure. Second, the incorporated element lacks affixal morphology. Third, the incorporated noun lacks overt morphological evidence of full DP structure, whether the nonin-corporated noun has overt DP functional structure or not. Fourth, the incorporating verb de-transitivizes, sometimes via overt morphology. Fifth, the meaning of the incorporated element typically tends toward a nonreferential interpretation. It should be noted that while the three examples above involve incorporation of an object noun, indirect objects and adjuncts may also be incorporated, although subjects generally are not incorporated. Incorporation is a widespread phenomenon, notably common in North American, Australian, Oceanic, Austronesia and other languages. See Massam (2009) for an overview.

Having shown rather canonical examples of incorporation, I devote the rest of the paper to questioning claims that Crow incorporates. The main claim is presented and then countered with a purely phonological analysis of the phenomena. The argument against Crow incorporation is then tempered with a discussion of what constitutes incorporation and the conclusion that at least in the case of Crow, and likely in many languages, to say a language is incorporating is an overgeneralization and simplification.

2. Incorporation in Crow

2.1. Crow under an incorporation account

Crow, a Siouan language of the North American Great Plains, is a head-final language, with rich verb morphology that tends toward agglutinating and is said to incorporate nouns, verbs and other items (Graczyk 2007:5-7, Wallace 1993:3, Rankin et al. 2003:183). Example (4b) is an object-incorporated version of (4a) (from Graczyk 2007:280).[1]

(4)   a.   *iisáakshe*   **íiliia**   *daxxóxx-uu-k*
           young.men **tipi.pole** peel-PL-DECL
           'the young men peeled the tipi poles (e.g., the ones they cut in the mountains yester-day)'

       b.   *iisáakshe*   **íilii-***daxxoxx-uu-k*
           young.men **tipi.pole**-peel-PL-DECL
           'the young men were peeling tipi poles (engaging in the activity of peeling poles)'

The nonincorporated sentence, (4a), shows canonical SOV order with the object noun outside the verb in so-called citation form used for morphologically independent words (Graczyk 2007:32-33). Example (4b) has the same linear order of elements, SOV, but the noun appears with the final vowel deleted. Also phonologically, note that (4b) has three pitch accents, one on each word, while in (4b) the object-verb complex is reduced to a single accent. Semantically, according

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[1]For the Crow data, most of the glosses are transparent, but also note that A = agentive prefix, B = nonagentive prefix, DECL = declarative marker, PRO = pronominal.

to Graczyk, (4a) points to a reference of specific 'tipi poles' while the object noun in (4b) has a generic reference. Assuming incorporation has occurred in (4b) I assume that the incorporation is accounted for by something like Baker's (1988) analysis.

2.2. Crow under a nonincorporation account

Arguing that Crow does not have morphosyntactic incorporation,[2] Golston, Boyle & Gebhardt (2018) make the case that what is going on in sentences like (4b) is a purely phonological phenomenon of deaccentuation and loss of word status. Assuming that (4b) is derived from (4a), we have something like the derivation in (5).

(5)   *iisáakshe*$_\omega$ *íiliia*$_\omega$ *daxxóxx-uu-k*$_\omega$

                                       Loss of ω status

    iisáakshe$_\omega$ [*íilii∅-daxxóxx-uu-k*]$_\omega$

                                         Vowel loss

    iisáakshe$_\omega$ [*íilii∅-daxxoxx-uu-k*]$_\omega$

                                         Accent rule

The object noun *íiliia* 'tipi poles' loses its independent word status and the final vowel is lost by a general rule. With the noun and verb reduced to a single phonological word, an accent rule applies whereby, generally, the accent in the first word is kept and the accent in the second word is lost (Graczyk 2007:21-23). As an analogy, consider the English sentence in (6a), which is reduced in (6b).

(6)   a. [the men]$_\omega$ didn't$_\omega$ see$_\omega$ her$_\omega$
        b. [the men]$_\omega$ didn't$_\omega$ [siər]$_\omega$

Describing (6b) as derived from a representation of (6a), we have the two phonological words see her reduced to a single phonological word, with her deaccented and the /h/ deleted. The resulting form, [siər]$_\omega$, is simply a reduced and deaccented version of see her; we do not want to argue that her has been incorporated in any morphosyntactic or semantic way. The English phonological reduction, deaccentuation and one element losing its word status, is precisely what Golston, Boyle and Gebhardt argue is also occurring in the purported incorporation cases in Crow.

      However, there is no inconsistency between morphosyntactic incorporation and a phonological process that may be part of incorporation. After all, incorporation is a kind of wordformation and the result of wordformation, words, are subject to word-level phonology. To show that the phonology is the full account of the data and not simply the phonological effect of incorporation, Golston, Boyle and Gebhardt show problems with a morphosyntactic account which leave phonology alone as the explanation. The problems identified include the practical difficulty in determining whether incorporation has occurred due to the same SOV linear order in both the nonincorporated and incorporated versions. Further, the apparent incorporation of XPs as well as heads, incorporation of functional material, and the conclusion that purported movement violates island constraints are cited as evidence that incorporation is not occurring.

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[2]For the nonincorporating account of Crow, I use terms such as 'incorporating' and 'incorporated structure' to refer to those phenomena that have been alleged to involve incorporation.

First, in Crow it is usually impossible to discern a difference between nonincorporated and incorporated structures because both have SOV linear order. That is, roughly speaking we have something like S O V ⇒ S O-V, as in the examples in (4) where we cannot tell whether the purportedly incorporated object is independent of or attached to the verb. There is a difference in the form of the object due to the loss of the final vowel when it's incorporated, but the loss of the vowel is no indication that incorporation via Baker-like (1988) movement has occurred. Second, according to Graczyk (2007), Wallace (1993), Boyle (2002), and Rankin et al. (2003), Crow is able to incorporate phrases, against typical accounts which call for incorporation of heads. Besides heads that include nouns, quantifying determiners, verbs and postpositions, Crow is also argued to incorporate phrases such as postpositional phrases, as in (7). Further, Rankin et al. (2003:183) claim about incorporation that "in Crow, it is so productive that it is not surprising to find entire RCs incorporated into the verb complex." Incorporation of a CP relative clause appears in (8).

(7) PP incorporation (adapted from Graczyk 2007:382)
[$_{PP}$ ***ammalapáshkuua**-ss*]-*da-lee-ʔ*
   Billings-GOAL-2A-go-Q
'Are you going to Billings?'

(8) RC incorporation (adapted from Graczyk 2007:200)
[$_{CP}$ ***ak-dii-ammalapáashkuua**-ss-**aa-lee***]-*waa-chiin-moo-k*
   REL-2B-**Billings**-GOAL-**PORT**-**go**-1A-look.for-INCL-DECL
'We'll look for someone to take you to Billings'

Third, as the contrasts in examples (1) to (3) illustrate, incorporated material is typically single words or roots of words, without affixal or other functional material. This generally holds true in Crow, although Graczyk notes cases of incorporation of a noun along with its possessor (Graczyk 2007:281).

(9) ***d**-áasuu-lai-waa-(a)k*   ...
   2.POSS-house-make-1A-SS
'I will make a house for you ...'

As for verbs, it is not at all clear that what is going on in verb incorporation as claimed by Graczyk in examples like (10).

(10) *b-eeláx-b-**isshi**-k*
   1A-urinate-1A-**need.to**-DECL
'I need to urinate' (Graczyk 2007:300-309)

Nearly all cases of alleged verb incorporation involve one main verb and another of modal or aspectual quality such as 'will', 'try', 'want to', 'would', 'be ready', 'begin to'. That is, such examples involve a single predicate rather than the multiple predication that is generally the case in verb-incorporation (see Baker 1988: chapter 4). In addition, each of the verbs in (10) is independently marked for person with the *b(a)-* morpheme for agentive first person, in contrast to the typical case with incorporated verbs or serial verb constructions which result in agreement on only one of the verbs.[3] As a more extreme example, (11) show triple agreement.

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[3]I refer to inflectional agreement markers, while Graczyk (2007), for example, regards them as arguments. I leave investigation of these markers' status for further research.

(11) *April-sh* **baa**-*waláx*-**ba**-*k*-**b**-*ii-luu-k*
      April-DEF **1A**-sing-**1A**-give-**1A**-FUT-PL-DECL
      'We'll sing for April' (Wallace 1993:123)

Importantly from a theoretical point of view, Golston et al. (2018) hold that incorporation via movement into the verb from elsewhere in the syntactic structure sometimes requires violating island constraints. In a Baker-like (1988) syntactic treatment of incorporation, a direct object or other constituent undergoes movement as in (12), with English lexical items used in a simplified version of the Mohawk sentences in (2), based on Baker (1988:83, ex. 19a).

(12) a. baby likes house ⇒ baby house-likes
      b. $[_{TP}$ *baby* $[_{VP}$ *likes* $[_{DP}$ *house* $]]] ⇒ [_{TP}$ *baby* $[_{VP}$ *house-likes* $[_{DP}$ ~~*house*~~ $]]]$

In (12b) the object moves from the complement of V to left-adjoin to the verb. What is noted by Goldston, Boyle and Gebhardt is that under this account the movement sometimes entails extraction from a syntactic island. For example, in (13) there is a violation of Ross's (1967) Left Branch Condition, more precisely a Right Branch Condition in Crow.

(13) Left (Right) Branch Conditions (Graczyk 2007:287)
      a. *baláxii-uuwate kúh shoop-dútchi-k*
         weapon-metal PRO four-take-DECL
         'He also took four guns'
      b. *$[_{DP}$ *baláxii-uuwate* ~~*shoopa*~~$_i$] *kúh shoop$_i$-dútchi-k*

In (13a) the quantifying determiner *shoop-* 'four' appears as part of the verb, clearly separated from the DP by the pronominal form *kúh* (one of the few cases where linear order does change between nonincorporated and incorporated sentences). However, in order to achieve the movement as indicated in (13b) *shoop(a)* must be illicitly extracted from its position in the right branch of the DP. This movement is analogous to the illegal extraction of *whose* from the left branch of the DP in (13c).

(13) c. *whose$_i$ did you buy $[_{DP}$ ___$_i$ book]

      As one other example, the incorporation in (14) entails violation of the Coordinate Structure Constraint.

(14) Coordinate Structure Constraint (adapted from Graczyk 2007:296)
      a. *iisashpíta-lak baaík-dappee-t isahkáale-lak   duus-aat-ák*
         rabbit-and   stuff-kill-TEMP his.grandmother-and eat-APRX-SS
         'When he would kill rabbits and other small game he and his grandmother would eat them'
      b. *$[_{DP}$ *iisashpíta-lak* ~~*baaík*~~$_i$] *baaík$_i$-dappee-t isahkáale-lak*

While the purported movement is linearly vacuous as shown in (14b), it requires extracting the right conjunct out of the conjoined phrase. The illegal movement in (14b) is akin to the ungrammaticality of wh-moving the right conjunct of the DP in (14c).

(14) c. *what$_i$ did y ou eat $[_{DP}$ the sandwich and ___$_i$]

In the vast island literature since Ross (1967) much has been discussed about how universal islands are and under what conditions they can be violated, etc., but it is important note relevant to example (14) that the coordinate structure constraint is still considered one of the most robust constraints (see for example Boeckx 2012 and Hofmeister & Sag 2010).

To recapitulate to this point, in Crow it is usually impossible to tell if something has moved under incorporation since the order is SOV in both nonincorporated and incorporated versions. Also, in order to achieve morphosyntactic incorporation, in some cases the noun root must be extracted from an island. These empirical and theoretical problems leave the phonological account of Golston, Boyle & Gebhardt (2018) as the preferred interpretation of what's happening in Crow "incorporation", i.e. deaccentuation and loss of word status as the object noun and verb make up a single prosodic word.

2.3. A problematic case for the nonincorporation account

Wallace (1993) presents an example, (15) below, that looks like a genuine case of incorporation, where the adverb *kan* 'now' and the noun *nakáak* 'bird' clearly intervene between the verb *oosshe* 'cook' and the nonagentive prefix *bii-* 'me' (adapted from Wallace 1993:54).[4]

(15) a. *ba-sahké*   *bii=**kan**=**nakáak**=oosshe-hche-wia-k*
          1.POSS-mother 1B=**now**=**bird**=cook=CAUS=want-DECL
          'My mom wants me to cook the turkey now'

Unlike in many examples, if the *bii-* prefix in (15a) is part of the verb then the object sits unambiguously inside the verb, a counterexample to Golston et al.'s (2018) contention that purported cases of incorporation are string vacuous. However, there are two facts about cases like that in (15a) that mitigate the conclusion of its being a case of incorporation. First, Wallace (1993), claiming a typological oddity, presents data showing that the three preverbal elements in (15a) can be freely ordered in all six possible ways (English translations, for convenience):

(15) b. me-now-bird-   me-bird-now-   bird-me-now-
          bird-now-me-   now-bird-me-   now-me-bird-

This would seem to argue that whatever is happening to generate the six versions of (15b) it is not incorporation, since affixation and noun incorporation are typically rigid in terms of morpheme order. Second, while the permutations involve the nonagentive B prefix they do not involve the agentive A prefix. If (15a) is the result of incorporation, the incorporation is evidently qualified, a point discussed more in the following sections.

3. What is incorporation, and does Crow have it?

Massam (2009:1078) presents a definition:

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[4]Although *bii-* represents the apparent cooker, since this subject is embedded in a causative construction the subject of 'cook' gets the nonagentive prefix instead of the agentive prefix.

a grammatical construction where a nominal that would canonically (either in the given language, or in languages in general) be expressed as an independent argument or adjunct is instead in some way incorporated into the verbal element of the sentence, forming part of the predicate.

Despite some circularity, this definition is general enough to group many of the phenomena held to be or to be related to incorporation. Some characteristics of incorporation were illustrated in examples (1)-(3) above: appearance of a word or root inside a predicate, change in word order (where relevant), tendency toward nonreferentiality of the incorporated root, changes in morphology of both the incorporating and incorporated elements, reduction in valence of the verb. Various categories can be incorporated into other categories. Perhaps the most prominent cases involve incorporation of object nouns into the verb, though other categories such as prepositions and adverbs can be incorporated; both arguments and adjuncts are incorporatable. While Baker (1988:76-81) rules out English-type compound nouns as true incorporating structures, there clearly is some overlap between the properties of incorporation in languages like Onondaga and compound nouns in English (16a) and, to the degree that they are acceptable, structures like that in (16b).

(16) a. duck hunter

  b. Wayne hunts ducks   ⇒   Wayne duck-hunts
       S   V   O   S   O-V
       transitive *hunts*   intransitive *duck-hunts*

Evidence that *duck-hunts* is an incorporation, or at least a compound, lies in stress modification (17) and detransitivization (18).

(17) stress: Wáyne$_\omega$ húnts$_\omega$ dúcks$_\omega$ ⇒   Wáyne$_\omega$ [dúcks-hunts]$_\omega$
             3 main word stresses   2 main word stresses

(18) detransitivization: Wayne duck-hunts
                  ?Wayne   duck-hunts ducks/ducklings/mallards/mergansers

Sapir (1911:254-257) called noun incorporation the process of compounding a noun stem with a verb. Baker integrated theory to define noun incorporation as syntactic movement of a head, which adjoins to the verb, for which see example (12) above; Sadock (1991), in an autolexical approach, pointed to syntactic properties of noun incorporation in Greenlandic. In contrast, Mithun (1984:847-848) characterized noun incorporation as "a solidly morphological device" but she also claimed it to be "perhaps the most nearly syntactic of all morphological processes". The several variant approaches mentioned here only scratch the surface of ways to analyze noun incorporation in particular, let alone incorporation more generally. Mithun, in fact, classified incorporation into four basic types that includes features of morphology, syntax, semantics and pragmatics, although the characteristics overlap much more than she suggests in her categorization.

    Massam (2009), rightly I think, comes to the conclusion that incorporation as a unified phenomenon does not exist; rather, "incorporation" is a cover term for a family of related phenomena. That should not be a surprising conclusion, as it accords with what we often find in linguistics: the lack of clean categories. Consider ergativity as an example. Many languages are called ergative but the characteristics and degree of ergativity in a language vary greatly,

with regard to case, agreement, morphology, syntax (deep ergativity), which tenses and aspects it appears with, which persons, etc. Coons et al. (2017:1) suggest that scholarship is reaching a consensus that ergativity "is not a single unitary phenomenon, and is not realized in the same way across different languages". They cite on the same page specific comments from ergativity specialists such as Johns (2000:67) that there is "little value in studying ergativity as a thing in itself" and Deal (2015) that "ergativity is not one but many phenomena". Therefore, rather than claim that a certain language is ergative, one should be careful to say that language has such and such characteristics of ergativity. Similarly, since incorporation may involve any of a number of features (e.g. compounding, pseudoincorporation, semantic incorporation, distribution of bare nominals, complex predicates motivated by backgrounding of information, genericness, etc.), one should specify what particular aspects of incorporation are present.

So, where does that leave us with Crow, particularly with noun incorporation. In favor of incorporation, in certain restricted circumstances the linear order of the noun with regard to other items in the sentence differs between structures, and that noun in its noncanonical position usually lacks all functional material. Also, to the degree that the noun prefers a generic or habitual interpretation we have behavior that accords with incorporated status. Against incorporation is the fact that it is usually impossible to tell if a noun has moved linearly, and thus structurally; that phrases rather than simply heads are alleged to incorporate, that some functional material–possessors–can appear on the noun in noncanonical position. Theoretically, the strongest argument against incorporation is that in some cases it entails violation of island constraints. The examples in (15) constitute a wash: it looks like an object noun is appearing amid inflectional material but, on the other hand, the flexibility of word order suggests what is happening is not incorporation. This aspect must be further studied, at least to determine whether one or both of the person prefixes is more cliticlike or more agreementlike.

What happens in Crow does seem to have certain incorporationlike characteristics, but the evidence seems to weigh against incorporation based on the island violations. The most one can muster in favor of incorporation in Crow is that it exhibits certain features of incorporation. But without adducing incorporation, all the structures purported to be incorporation can be accounted for by positing deaccentuation and loss of word status.

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Nakoda "intensifier" -ȟ*

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Abstract: The present article analyses the distribution and semantics of -ȟ in Nakoda (a Dakotan language of the Mississippi Valley Siouan branch). I show that -ȟ has distinct semantic and pragmatic meanings depending on the type of words it attaches to. More precisely, the suffix -ȟ can express intensification (with gradable expressions like adverbs and stative verbs), as well as focus (with non-gradable expressions like active verbs, pronouns and nouns), two notions that are often ill-defined in the literature on intensification. Moreover, -ȟ also encodes epistemic specificity (speaker's knowledge) with indefinite pronouns, a function also occurring in Lakota. Lastly, -ȟ also has a purely adverbializing function from which stems quantitative meanings (multiplication, pluralization).

Keywords: intensification, focus, epistemic specificity, Nakoda, Siouan languages

1. Introduction

Siouan languages have morphemes called "intensifiers" or "augmentatives" which have been reconstructed for Proto-Siouan (hereafter PS) as *-xti and *-xtE. Although the morphology of these elements poses no real problem, their semantics is blurred in many daughter languages that keep reflexes of both PS forms like Nakoda -ȟ and -ȟtįyą and Lakota -ȟča and -ȟčiŋ. A major issue is that the concepts of "intensification" and "augmentation" are complex notions that have not been properly studied and defined in Siouan linguistics, and, consequently, their usefulness as descriptive concepts does not fully reveal the complexity of their semantic and pragmatic meanings. The present article aims to bridge this gap by analyzing the distribution, semantics and pragmatics of -ȟ in Nakoda (a Dakotan dialect of the Mississippi Valley Siouan branch). In this article I show that -ȟ has distinct meanings depending on the type of words it attaches to. More precisely -ȟ and -ȟtįyą have complementary distribution, the latter occurring mostly on verbs and the former on all other word classes, but especially on NP and adverbs. Drawing on the work of Farkas (2009), Haspelmath (1997), and especially Guesquière (2017) and Athanasiadou (2007), I demonstrate that -ȟ can express intensification with gradable expressions (e.g. adverbs and stative verbs), as well as focus with non-gradable expressions (e.g. active verbs, pronouns and nouns), two notions that were often ill-defined in older literature on intensification. Moreover, -ȟ encodes epistemic specificity with indefinite pronouns, but has also a purely adverbializing function from which stems innovative quantitative meanings (multiplication, pluralization) peculiar to Nakoda.

The paper unfolds as follows: in section 2, I define the catch-all concepts of *intensification*, *emphasis* and *focus*. Section 3 deals with Siouan comparative data and the development of PS intensifiers *-xti and *-xtE in the Dakotan dialects: the aim is to illustrate the fact that Nakoda has innovated in distinctive ways not found in other Dakotan dialects. Section 4 provides a thorough description and analysis of the distribution and semantic and pragmatic functions of -ȟ.

2. Intensification, emphasis and focus

Intensification is a well-known linguistic phenomenon that has been thoroughly studied by Bolinger (1972) for English, and more recently by Napoli & Ravetto (2017) for a selection of European and non-European languages. Although the term intensifier as been applied to various types of words in the linguistic literature (e.g. reflexive pronouns; see for example König & Siemund (2000), there is a need to clearly delineate between the related but distinct notions of intensification and focus. Bolinger (1972) defines intensification as any linguistic device that scales the quality of an entity upward, downward or somewhere between the two. Quirk et al. (1985), building on Bolinger's work, state that degree modifiers scale the degree of a gradable expression upward (i.e. amplifier) or downward (i.e. downtoner) from an assumed norm or standard. The traditional view of intensification (Quirk et al. 1985; Athanasiadou 2007) follows roughly the following distinctions (taken from Waksler 2012:28; see also Bolinger 1972:93) (Note the lack of isomorphy—one form for one meaning—with some of the so-called intensifiers):

AMPLIFIERS

- **boosters** increase the degree of target property on a scale (e.g., it is *very* hot; it is *so* cool; it is *very much* needed);
- **maximizers** increase the degree of target property up to the limit of the scale (e.g. it is *much* needed; it is *completely* covered in snow; it is *absolutely* awful);
- **emphasizers** reinforce the truth value of a proposition (e.g. I would *absolutely* not do that; You're *totally* getting hacked by someone; I am *so* getting my hair done by him).

DOWNTONERS

- **approximators** (e.g. it is *almost* dark);
- **compromisers** (e.g. he is *more or less* aware of this);
- **diminishers** (e.g. it was *partly* written);
- **minimizers** (e.g. I can *hardly* see it).

As seen in the preceding lists intensification is the process of modifying or scaling the degree of gradable properties expressed by adverbs, adjectives, and verbs (see Guesquière 2017:34), however, since adverbs belong to an eclectic word class, another important distinction is made between *degree modifiers* (i.e. intensifiers) and *focus modifiers* since these two types of modifiers are governed by different semantic and pragmatic parameters. While intensifiers enable the speaker to project a positive or negative scaling of the quality of a gradable expression (*very* big,

totally lost), this is not the case with focus modifiers (?*exactly* big, ?*only* lost, Bill *even* came). We follow here the definition given by Guesquière (2017:34) who states that "focus modifiers do not change the element or quality they scope over, but rather single it out in relation to alternative values, typically countering expectations and presuppositions in the discourse context." In sum focus markers have a clear discourse function, enabling the speaker to highlight some parts of the message and to guide the addressee/hearer in his/her understanding of the intended message. Researchers usually classify adverbs like *only*, *even* and *just* into distinct pragmatic types of focus. For instance, Nevelainen (1991) makes the following distinctions (see also Traugott 2009; Athanasiadou 2007 for an overview):

FOCUS MARKERS

- **inclusives** single out a value but imply other alternatives (e.g. He *also* came along; I want some *too*; John *even* came!)
- **restrictives** split into:
    - **exclusives** evoke a value and exclude all other alternatives (e.g. It is *only* a matter of time; I *just* finished eating pizza);
    - **particularizers** demarcate the focus value more emphatically or precisely without evoking alternative values (e.g. I want the *exact* same one; He did *precisely/exactly* as he was told; Jill *just* stared at him; other particularizers include particularly, *particular*, *specific*, *specifically*).

Athanasiadou (2007:556) notes that some focus modifiers pragmatically evoke scalarity since they activate a scale of property when used with non-gradable expressions (I need *only* three; I need a *specific* pen to do that; John *even* came). In other words, while *three* and *pen* are not gradable but only imply a set of alternatives (i.e. three compared to two or four; a specific pen compared to any odd pen), *even* in John even came evokes a scale (the coming or not of John), and ranks its focus on a scale of evaluation — even ranks John coming's as actual albeit surprising. In sum focus modifier can (but do not have to) express the speaker's subjectivity as with *I just finished eating pizza*. Although I use English examples to delineate my working notions and assumptions, the lack of isomorphic relation between form and meaning (one form like *so* can have more than one meaning, depending on the context) seen with so-called "intensifiers" is also found in Washo (isolate; Beltrama & Bochnak 2015, and Bundeli (Indo-Aryan; Jaiswal 1962:166) and many others.

Unsurprisingly Nakoda intensifiers also show the same kind of semantic flexibility. In Nakoda, intensification can be expressed morphologically (with affixes and morphological processes) or with particles. First, the suffixes -*ȟ* and -*ȟtįyą* can be added on almost any parts of speech to express: a) amplification/boosters in (1a) and (1b), or emphasis (1c); or b) specification or focus in (2a) and (2b).

(1)   a.   *Owáštena-**ȟ**   ma-∅-ní.*
          carefully-**INT** DS-3s-walk
          'He is walking really carefully.'

      b.   *Zitkána žé   nína ∅-júsina-**ȟtįyą**.*
          bird   DEM very 3s-small-**INT**
          'This bird is the smallest.'

    c. *O-wá-gihį-šį-**ħtįyą**!*
       DS-1A-able.to-NEG-**EMP**
       'I absolutely cannot do it!'

(2) a. *Dagú-**ħ***   *yawá-bi* ∅-*wa-cįga.*
       something-**SPEC** read-SUB 3s-1s-want
       'I want to read something specific (about it).'

    b. *Duktédu-**ħtįyą**?*
       be.somewhere-**FOC**
       'Where did it happen exactly?'

Downtoners scale negatively the property of gradable expressions. In Nakoda some of the downtoners are *ginįja* 'almost' (ADV) (approximator) and *štéħ* 'partly, -ish' (ENCL) (compromiser). Second, reduplication can also scale upward the quality degree of state verbs.

(3) a. *Šųktógeja nų́ba **tąk**tágabi*
       wolf   two **REDUP**.be.big-3PL
       'The two wolves were very big.

    b. ***Wa**-má-wašte*   *cén,*   *wįyą* *óda* *wįcá-mn-uha.*
       REDUP-1s-be.nice because woman many 3PL.P-1A-have
       'Because I was good looking, I had many girlfriends.'

    c. *Wįcášta žé*   *háska**ska**-bi.*
       men   those be.tall.**REDUP**-3PL
       'The men are very tall.'

The particle *kó* is used to convey emphasis and more precisely the speaker's strong emotion, irony, surprise, joking, teasing which in many cases reinforces the truth value of a sentence ([Cumberland 2005](#):326).

(4) a. *Hįįį*   *a-∅-hámna*   ***kó**!*
       exclamation.FEMALE DS-3s-be.moldy **INT**
       'Oh! They are all moldy too!'

    b. ***Kó*** *he?*
       INT QST
       'What then?'

    c. *Žé'įš*   ***kó**!*
       DEM.too **INT**
       'That one too!'

In the next section, I will cast the problem touch upon with examples (1) and (2) within historical and dialectal perspectives. More precisely, I claim that even though the notions of intensification and focus may seem similar at first site — as testified by the simple fact that Nakoda "intensifiers" *-ħ* and *-ħtįyą* can encode both notions—they are governed by different semantic and pragmatic parameters.

3.   Proto-Siouan *-xti and *-xtE

As a point of departure for my description and analysis of Nakoda *-ȟ* and *-ȟtįyą* (labelled "intensifiers" or "augmentatives" in the Siouan linguistic literature), let us examine Siouan comparative data. Two augmentatives *-xtE and *-xti have been reconstructed for PS ([Rankin et al. 2015](#)), although the semantics of these form is not straightforward. No meaning, except the label "augmentative", has been reconstructed for *-xtE: Crow *-šta* 'very' ([Rankin et al. 2015](#)); Mandan *xtéʔš* 'it's big'; in compounds *céxte* 'hurricane'; *cixtéc* 'it is very good' [Rankin et al.](#) ([2015](#)), and Lakota *-xčA* 'very, very much, really, particularly, in particular, especially, most; at all' (enclitic). On the other hand in PS *-xti yields a bewildering set of forms in daughter languages: Biloxi *-xti* 'augmentative, intensifier and superlative degree; real, true'; *pixtí* 'very good, best' ([Kaufman 2011](#)); Hoocąk *-xjį* 'verily, very, superlative'; *cooxjįną* 'it is very blue'; *céexjį* 'buffalo'; *Šųųkxete nįňąra ʾeewasaagre(xjį)?* 'Is your horse the fastest?' ([Helmbrecht & Lehmann 2006](#)); Kaw *-xci* 'real, very'; *hóxci* 'catfish'; *súsexci* 's/he/it is very fast' ([Rankin & Cumberland 2007](#)); Osage *-xci~-xcį* 'real, really, exactly, very, full, indeed, precisely'; *Wažaže xci brįe.* 'I'm a real Osage'; *xúða-xci* 'real eagle' ([Quintero 2009](#)); Lakota *-ȟčiŋ* (suffix) 'very, very much, really, real, particularly, especially, most; at all'; *Osní ȟče* 'it is very/really cold'; *é ȟča* 'she/he/it is the real/very one'; *Iháŋkeya wašté ȟče kiŋ ičú* 'He took the very best one' ([Ullrich 2011](#); [Ullrich & Black Bear 2016](#)); Nakoda *-ȟtįyą* 'very, exactly'; Hidatsa *-hdi* 'desiderative, urge'; *cagíhdi* 'be pretty, cute'; *eeríhdi* 'need to defecate' ([Park 2012](#)).

By examining the Dakotan comparative data it is evident that in Lakota and Dakota the reflexes of *-xtE (Lak. enclitic *-ȟča~-ȟče* and Nak. suffix *-ȟ*) and *-xti (Lak. suffix *-ȟčiŋ* and Nak. suffix *-ȟtįyą*[1]) have a language-specific distribution. Lakota *-ȟča~-ȟče* occur with main verbs (predicative use) while *-ȟčiŋ* occurs before verbs and attaches on adverbs (subordinate). In Nakoda, *-ȟtįyą* attaches mainly on verbs, while *-ȟ* occurs on all other parts of speech (nouns, pronouns, adverbs, some stative verbs). In both dialects the semantics of these elements is nearly identical since both can be translated by 'very, very much, really, real, particularly, especially, most; at all'. Let us examine some Lakota (from [Ullrich 2011](#)) and Nakoda examples.

Lᴀᴋᴏᴛᴀ

   (5)   a.   *Wašté ȟče.*
             'It is really good (it is the best).'

         b.   *Hokšíla ȟče.*
             'He was really (just) a boy.'

   (6)   a.   *Hé iyotáŋ ȟčiŋ waŋkátuya.*
             'This is the most important thing.'

         b.   *Líla ȟčiŋ owákaȟniğe šni.*
             'I didn't understand it at all.'

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[1]The final *-yą* of *-ȟtįyą* (with progressive nasalization) is an innovation of Nakoda. Since *-ȟtįyą* occurs mainly on verbs, the final *-yą* could well be the causative suffix which is often used to derive nouns into transitive verbs.

(7) a. *Owáštenaȟ maní.*
         'He is walking very carefully.

     b. *Dagúȟ opémijitų!*
         'Buy me something!'

(8) a. *Ǧíȟtįyą.*
         'it is deep yellow.'

     b. *Duktéduȟtįyą?*
         'Where did it happen exactly?'

These examples are crucial for a deeper understanding of the semantics of these cognates. Even though grammarians and lexicographers of the Dakotan dialects often give a single unifying meaning or translate both forms with a series of English adverbial equivalents, I claim that in Nakoda (but my analysis could apply to Lakota as well) *-ȟ* and *-ȟtįyą* have similar but distinct semantic and pragmatic functions in synchrony. Of course, on a very general level, the semantics of (7) and (8) may appear similar to the laymen, since, after all, they all invoke a departure or augmentation from a given norm (*a very cool guy*, *a real friend*), and are able to encode the speaker's subjectivity and perspective on the extra-linguistic reality. As can be seen with (7a) and (8a) above intensification is often translated with degree modifiers such as 'very, much, really (superlative adj.)' and both *-ȟ* and *-ȟtįyą* can act as positive scale boosters of the quality of gradable expressions like stative verbs and adverbs; this also applies to Lakota examples (5a) and (6a). Focus, on the other hand, singles out an entity or an event against a set of alternatives (5b), (6b), (7b), and (8b), but most importantly, when *-ȟ* and *-ȟtįyą* express focus they can only occur with non-gradable expressions like pronouns, nouns, and active verbs. The next section expands on these observations by providing a thorough description and analysis of these forms in Nakoda. Unfortunately due to space restrictions I concentrate only on *-ȟ*.

4. Distribution and semantics of *-ȟ* and *-ȟtįyą*

In this section I document the distribution and semantics of -ȟ and -ȟtįyą. As noted in the previous section, while both -ȟ and -ȟtįyą can express intensity and focus, depending on the type of words they attach to,[2] they can also occur on the same stem as the following examples illustrate.

(9) a. *aháge* 'it is the last' (vs);
         ahágeȟ 'the last' (n); 'lastly, finally' (adv);
         ahágeȟtįyą 'it is the very last one' (vs); 'really last, very last one' (adv)

     b. Aháge-**ȟ**   ti-máni   wa-hí.
         finally-**adv** house-walk 1s-come.here
         'I finally came to visit.'

---

[2]A similar versatility is seen in Bundeli (Indo-Aryan) where one the emphatic suffix *-ai* can attach to different parts of speech and express: (i) restrictive/exclusivity on nouns (e.g., *mōṛā* 'boy' > *mōṛāi* 'only the boy'); and (ii) emphasis on verbs (e.g., *bō jaihai* 'he will go') (Jaiswal 1962:166 et seq.).

    c. Aháge-**ȟtį̢yą** nén wací.
       be.last-**INT** here dance
       'Here is the very last dance.'

(10) a. *omá* 'the other one' (PRO);
       omáȟ 'either one' (PRO);
       omáȟtį̢yą 'she/he/it is the very first' (vs)

    b. *Omá-**ȟ***   *ma-k'ú!*
       either.one-**spec** 1P-give.IMP
       'Give me either one!'

    c. *Omá-**ȟtį̢yą***   *žé*   *cįga-bi.*
       other.one-**SPEC** that want-3PL
       'They want the other one specifically.'

(11) a. *waktá* 'she/he is expectant, aware of something' (VI);
       waktáȟ 'expectantly, on guard' (ADV);
       waktáȟtį̢yą 'she/he is truly expectant, on his/her guard' (VI)

    b. *Waktá-**ȟ***   *m-ą̢gá.*
       on.guard-ADV 1s-sit
       'I'm (sit) on my guard.'

    c. *Waktá-**ȟtį̢yą**!*
       be.on.guard-**int**.IMP
       'Be really on your guard!'

      In terms of distribution and semantics we can make the following observations. First, the two elements are in a near complementary distribution: *-ȟtį̢yą* is attached mainly to verbs (and some pronouns), while *-ȟ̌* is found on other types of words (nouns, pronouns, adverbs, and demonstratives). Second, *-ȟ̌* can derive a verb into an adverb and loose its intensifying/focusing meanings; this is an innovation found in Nakoda that is not fully representative of its original semantics. Third, there is a semantic opposition between *-ȟ̌* and *-ȟtį̢yą* when they function as intensifiers, as with the stems *-saba-* 'to be black' (*sapsábaȟ̌* 'it is very black' vs *sabáȟtį̢yą* 'it is pitch black') and *-wįca-* (*wįcáȟ̌ca* 'old man, husband (for a female speaker)' vs *wįcáȟtį̢yąną* 'very old man' (with progressive nasal assimilation). However, this semantic opposition of degrees is found only with a handful of stems and textual examples are extremely rare. The distribution and functions of *-ȟ̌* and *-ȟtį̢yą* is captured in Table 1.

      In the rest of this section I describe and analyze the semantics and pragmatics of *-ȟ̌*. The analysis highlights the fact that Nakoda has inherited the semantics of its forms from Proto-Siouan but innovated in ways not found in closely related dialects like Dakota and Lakota. The derivational suffix *-ȟ̌* is flexible semantically, since it has descriptive/quantitative properties (intensification, focusing, specification) as well as purely quantitative extensions (multiplication, pluralization). It can occur on almost all parts of speech, that is, on adverbs (time, space, and manner), interrogative and focus pronouns, ordinal numbers, demonstratives, nouns, and verbs. It also has an adverbializing function and is semantically bleached in that it does not express intensity or focusing as with *ahágeȟ̌* 'lastly, finally' (ADV) or *nųbáȟ̌* 'twice'.

Table 1: Distribution and functions of *-ȟ* and *-ȟtįyą*

	intensification	**focus**	**adverbializer**
-ȟ	*adverbs (some stative verbs)	*pronouns (expresses epistemic specificity) *nouns *demonstratives	yes (derives verbs into adverbs)
-ȟtįyą	*stative verbs (superlative degree) *emphatic enclitic on stative verbs	*active verbs (some pronouns)	no

4.1. *-ȟ* as an adverb, verb intensifier and pronoun emphasizer

The suffix *-ȟ* can function as an unbounded degree intensifier (INT) of gradable expressions and occurs on manner as in (12) and time adverbs[3] as in (13), but also on stative and auxiliary verbs like in (14). It expresses the speaker's subjectivity by increasing the degree of a target property on a scale.

(12)   a. *Owáštena-ȟ   ma-∅-ní.*
            carefully-**INT** DS-3s-walk
            'He is walking very carefully.'

       b. *Ótąna-ȟ   má-∅-ni   wo!*
            straight.way-**INT** DS-3s-walk IMP.SG.MALE
            'Walk in a very straight way!' (i.e. be a good, respectable person)

       c. *Pté tą́ga wa-páda   cén, dąyą́-ȟ   į-má-pį   no!*
            cow be.big 1A-butcher after really-**INT** DS-1s-be.full DECL.MALE
            'After I butchered a big cow, I'm really full!'

(13)   *(...) waná éstena-ȟ   t'á-bi   jé.*
            then soon-**INT** die.3-PL always
       '(...) they always died very soon.'

(14)   a. *(...) wé-ga   sapsábe-ȟ!*
            blood-gush be.black.REDUP-**INT**
            '(...) blood was gushing out' ([Parks & DeMallie 2012]:100)

       b. *Ma-stústa áya-ȟ!*
            1s-tired   become-**INT**
            'I'm getting really tired!'

---

[3]It is worth noticing that *-ȟ* appears on some adverbs which do not have the simple counterpart without *-ȟ* making it difficult to decide if we are dealing with an intensifying suffix or not: *įdúȟ* 'unexpectedly, contrary to hope, really, certainly', *naháȟ* 'still, yet', *wanúȟ* 'maybe'. Other examples of intensified time, manner and space adverbs include: *hąyáke* 'morning' > *hąyą́kena* 'early in the morning' (with diminutive *-na*) > *hąyákenaȟ* 'very early in the morning'; *nągáhą∼nahą́* 'now' > *nągáhąȟ∼nągáȟ* 'right now, right away'; *įwáštena* 'slowly, carefully, gently' > *įwáštenaȟ* 'really slowly'; *wągą́duwa* 'up above, high up' > *wągą́duwaȟ* 'way up there, really high up'.

The suffix -*ȟ* occurs obligatory with the degree adverb *nína* 'very' in negative clauses, but adds no semantic content to the sentence.

(15) a. *Nína-**ȟ**   ∅-ktá-šį.*
          very-**INT** 3s-be.heavy-**NEG**
          'It's not very heavy.'

  b. *Nína-**ȟ**   osní-šį.*
      very-**INT** be.cold-**NEG**
      'It is not very cold.'

  c. *Nína-**ȟ**   koná-∅-wa-ye-šį*
      very-**INT** friend-3P-1A-DS-NEG
      'He is not my true friend.'

In Nakoda independent focus pronouns are formed on the stem -*iye*- and can function as the predicate of a clause *iyé* 'she/he is the one', *miyé* 'I am the one', *niyé* 'you are the one', and *ųgíye* 'we are the ones'. It can also occur in comparative constructions to indicate the MARK 'than X' (Cumberland 2005:130-131). When -*ȟ* is attached to an independent focus pronouns it emphasizes the identity of the person already coded by the independent pronoun and the person markers on the verb (namely -*wa*- and -*mn*- '1sg.').

(16) *Tíbi   né   ∅-wa-gáǧa   m-iyé-**ȟ**.*
      house this 3P-1A-make 1-self-**EMP**
      'I'm building this house myself specifically.'

(17) *Sąksája   né   wa'á-∅-mn-aza   m-iyé-**ȟ**.*
      silk.dress this DS-3P-1A-bead   1-self-**EMP**
      'I beaded this dress myself specifically.'

Cumberland (2005:131-132) analyses the occurrence of -*ȟ* on independent focus pronouns like *miyéȟ* 'my very self' as an instance of intensification. I object this analysis since the focus pronoun 'myself' is not gradable. In (16) and (17) -*ȟ* does not contribute to the identification of a referent by the speaker (focus marking), nor does it scale the degree of the quality of a gradable expression (intensification). I claim instead that -*ȟ* functions as an emphasizer only with this type of pronoun; it simply reinforces the truth value of the proposition by indicating that the speaker alone is responsible for building the house or beading the dress. Of course, the fact that speakers often translate *miyéȟ* as 'my very self' only proves the claim that so-called intensifiers can be used to express intensification and focus.

4.2.   -*ȟ* as a focus marker and epistemic specifier

Focus modification relates to the process of singling an entity against a set of alternatives. With noun phrases -*ȟ* contributes to the identification of a given entity (a particular road, thing or pail) against a set of alternatives (FOC).

Noun phrases

(18) a. *Ocágu-ȟ žé.*
          road-**foc** that
          'That's [known to me] the road.'

      b. *Céǧa žé-ȟ   a-wá-hi.*
          pot   that-**spec** inst-1s-came
          'I came with a pot [known to me].'

In the rest of this section, I show that when *-ȟ* functions as a focus marker it expresses epistemic specificity (i.e. sensitivity to the speaker's knowledge). This occurs specifically with indefinite pronouns and the indefinite article *wąží* 'one, a'. Table 2 contains some of the Nakoda pronouns and the nouns from which they are derived.

Table 2: Some Nakoda pronouns

ONTOLOGICAL CATEGORIES	NOUN	INTERROGATIVE PRONOUN	INDEFINITE PRONOUN	NEGATIVE PRONOUNS
THING	*dágu* 'thing, something'	*dágu* 'what'	*dáguȟ* 'something, anything' *dágu* 'something'	*dáguni* 'nothing'
PERSON	*duwé* 'person, someone'	*duwé* 'who'	*duwéȟ* 'someone, anyone' *duwé* 'someone'	*duwéni* 'nobody'
PLACE	—	*duktén* 'where (static)'	*duktéȟ* 'somewhere, anywhere'	*dukténi* 'nowhere'

Two important observations can be made here. First, since Siouan languages have a weak noun/verb distinction, one is not surprised to find that some of the generic nouns can also function as stative verbs (*duwé* 'she/he is someone' as in *Madúwe he?* 'Who am I?'), as interrogative pronouns (*duwé* 'who'), or even as indefinite pronouns (*duwé* 'someone') with no change in the surface form. Second, there are two sets of indefinite pronouns; one stemming from the conversion of bare generic nouns into indefinite pronouns, and another one where generic nouns are derived with *-ȟ*.

(19) a. *Dágu   síj-ec-∅-ų-'.*   (indefinite pronoun)
          something bad-do-3A-DS-DECL.F
          'She did something bad.'

      b. *Dágu opé-ya-tų-kta   žehą́?*   (interrogative pronoun)
          what buy-2A-ds-pot then
          'What did you buy then?'

(20) a. *Dagú-ȟ   yawá-bi ∅-wa-cįga.*   (indefinite pronoun)
          something-**spec** read-sub 3s-1s-want.to
          'I want to read something specific (about it).'

b. *Dagú-**ȟ**   wįcá-∅-k'u-kta   he į-∅-m-úǧa.*   (indefinite pronoun)
   anything-SPEC 3PL.P-3A-give-POT QST DS-3P-1A-ask
   'I asked him if he will give people anything.'

Because of this fluidity in parts of speech membership -*ȟ* cannot be a marker of indefiniteness or intensification, and this is why I propose, following Haspelmath (1997:45-46), to analyze -*ȟ* as a marker of epistemic specificity.

The concept of specificity entered linguistics via philosophy of language, side-by-side with that of referentiality (see Farkas 2009; Enç 1991; Haspelmath 1997:22-23). While Payne (1997:264) thinks of specificity as essentially a matter of extra-linguistic referentiality when he states that "an entity is specific if the speaker assumes the existence of its referent in the extra-linguistic world", I believe this view cannot capture many of the phenomena described here. As proposed by Farkas (2009:909), the main function of specificity is to provide fine-grain distinctions within the semantics of NP, especially when formal devices such as indefinite/definite articles or pronouns are insufficient to capture the rich array of semantic, pragmatic phenomena that are associated with NP semantics. Although there are different types of specificity (see Farkas 2009), I will be concerned here solely with *epistemic specificity* since it is expressed with the suffix -*ȟ* in Nakoda. For Farkas (2009:910) epistemic specificity relates to the concept of intended referentiality or "whether the speaker has an intended referent in mind (specific) or not (non-specific)." For instance, the following avatar of a classical example which allows two readings illustrates the semantic specificity of NP:

(21)   a. *Mary wants to marry **a Nakoda man**.*

      b. SPECIFIC READING: "... but he does not want to."

      c. NON-SPECIFIC READING: "... and I hope she'll find one."

If we take sentences (21b) and (21c) as possible continuation of (21a), then, we can say that (21b) forces a specific interpretation of the NP *a Nakoda man*, while (21c) is unable to do that. Thus, we will say that in (21a) and (21b) the referent of the specific NP *a Nakoda man* is constant across the speaker's and addressee's epistemic alternatives (Farkas 2009:911): for both of them the referent of the NP *a Nakoda man* is the same. Whether or not an NP receives a specific or unspecific epistemic reading in English is intimately related to the context of utterance since English does not have constant formal means to express this idea. However, as shown by Haspelmath (1997:38), some languages like Russian, Greek, and Lithuanian have two series of indefinite pronouns that are used whether the referent of an indefinite NP is specific or non-specific. The choice between these two series of indefinite pronouns is pragmatically governed by (i) the context of utterance (indefinites usually introduce new information in the discourse), and (ii) by the speaker's knowledge which relates to its ability to identify (or not), and to disclose (or not) the identity of a new referent to his/her addressee/hearer. In other words when the speaker does not have a referent in mind, then the non-specific indefinite pronouns are chosen. However, Nakoda displays a subtle distinction between known referents (indefinite pronouns with specifically known referents) and presupposed ones (indefinite pronouns with specific but presupposed referents). However, while Lakota expresses the distinction of epistemic knowledge morphologically—e.g. *takúȟčiŋ* 's/t hypothetical' vs. *tákuȟča* 's/t real' (taken from Ullrich 2011)—this distinction stems solely from the context of use in Nakoda.

In what follows I show that the speaker's knowledge (or epistemic knowledge) governs the selection of bare indefinite pronouns vs. derived indefinite pronouns in -*ȟ* in Nakoda. The derived pronouns can be +/− speaker's knowledge. The articulation between morphological specificity and speaker's epistemic knowledge for Nakoda indefinite pronouns is captured in Table 3.

Table 3: Specificity and speaker's knowledge with indefinite pronouns

INDEFINITE PRONOUNS		
non-specific *dágu*	**specific** *dagúȟ*	
referent is unknown to the speaker	referent is presupposed by the speaker	referent is known to the speaker only
***Dágu** síjecų'* 'She did s/t bad.'	***Dagúȟ** k'ú!* 'Give anything!'	***Dagúȟ** mnawá.* 'Give anything!'

(A) + Specific; speaker's knowledge only (i.e. the speaker identifies the referent but does not disclose its identity to his/her addressee/hearer). In Nakoda the derived indefinite series in -*ȟ* is not restricted to certain types of constructions and occurs in declarative and imperative sentences as well as in irrealis contexts.

(22) a. *Dagú-**ȟ** opé-mi-ji-tų!*
          something-SPEC DS-1P-BENEF-buy
          'Buy me something [known to me]!'

   b. *Dagú-**ȟ** kikmá opé-mi-ji-tų!*
          something-SPEC alike buy-1P-BENEF-DS.IMP
          'Buy me something [known to me] like that!'

   c. *Dagú-**ȟ** opé-ya-tų céyaga.*
          something-SPEC buy-2A-DS should
          'You should buy something significant [know to me].'

   d. *Duká žé'įš dagú-**ȟ** awą́-∅-∅-yaga (...)*
          but that.too something-SPEC DS-3O-3A-watch.over
          'But something [known to me] must have been watching over him (...)' (Parks & DeMallie 2012:120)

   e. *Dagú-**ȟ** síja-bi-c otí'įga.*
          something-SPEC be.bad-DECL I.think
          'I think it was a bad thing [known to me]!'

(B) + Specific; presupposed knowledge (i.e. the speaker does not identify the referent but presupposes its existence). Speakers often translates this use of the derived indefinite pronouns with elective indefinites *anything, anywhere*[4] and *anybody* or other pronouns.

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[4]Note that there is distinct set of indefinite elective pronouns which are build on the generic nouns: *duktégakošta* 'any which one' (PRO); *duwégakošta* 'anybody' (PRO).

(23) a. *(...) dágu ųspé-'ų-∅-kiya-bi   ená, dagú-ȟ   snok-∅-ų́-yą-bi.*
           thing teach-1PL.P-3A-DS-PL here something-SPEC learn-3P-1PL-DS-PL
           (...) we didn't learn any [specific but presupposed] of what they taught us.' (Parks & DeMallie 2012:129; *dagúȟ* translated as 'nothing')

    b. *(...) dagú-ȟ   yuhá-bi   štén, én cądé e-gį́-knąge-šį!*
           something-SPEC have-3PL if   in heart DS-POS-carry-NEG.IMP
           '(...) whatever [specific but presupposed] they have, don't set your heart on it.' (Parks & DeMallie 2012:139)

    c. *Dagú-ȟ   wįcá-∅-k'u-kta   he į-∅-m-úğa.*
           something-SPEC 3O.PL-3S-give-POT QST DS-3P-1A-ask
           'I asked him if he will give people anything/something [specific but presupposed].'

Example (23d) illustrates well the pragmatics of -*ȟ*; here the speaker is talking about traditional laws and how Nakoda knowledge keepers are important in the dissemination of these tribal laws. Since these knowledgeable persons are few but well-known in their communities and beyond, the speaker presupposes such a person exists (*duwéȟ*), but does not disclose his/her identity to his/her addressee and indicates that the dissemination of these actual laws, whichever one (*dagúȟ*), is likely to occur in the future.

    d. *Žécen "duwé-ȟ,   dagú-ȟ   wó'ope, žé-∅-ca   o-nį́-∅-ji-yaga*
           then someone-SPEC something-SPEC law   be.that.kind-3S-DS DS-2P-3A-BENEF-tell
           štén, dąyą́ giksúya   wo!"
           if   well remember.IMP IMP.SG.MALE
           'Then [he said] "If someone [specific but presupposed] tells you about one of these laws [specific but presupposed], really remember it!"' (Parks & DeMallie 2012:145)

(24) a. *Duwé-ȟ   nécen   į-má-Ø-wųğa các, e-p-cé-šį*
           anyone-SPEC be.this.way DS-1O-3A-ask such? DS-1S-think-NEG
           'I never thought anyone [specific but presupposed] would ask me (...)' (Parks & DeMallie 2012:105)

    b. *(...) duwé-ȟ   dágu žé adų́we'-∅-i-kta.*
           someone-SPEC thing that scout-3S-go.there-POT
           '(...) someone [specific but presupposed] should go scout it out.' (Parks & DeMallie 2012:74)

    c. *Duwé-ȟ   toką́   ∅-hí.*
           someone-SPEC different 3S-arrive.here
           'Somebody [specific but presupposed] different came.'

    d. *Duwé-ȟ   kišné-∅-ya-ya?*
           someone-SPEC love-3P-2A-DS
           'Do you love someone [specific but presupposed]?'

(25) a. *Dukté-ȟ   iyódąga.*
           somewhere-SPEC sit.IMP
           'Sit anywhere/somewhere [specific but presupposed]!'

b. *"Né tóga-bi   néca   dukté-ȟ,   aná-wįca-Ø-tą   (...)"*
   this enemy-PL be.this.kind somewhere-SPEC attack-3O.PL-3A-DS
   '"Some enemies attacked them somewhere [specific but presupposed] (...)"' ([Parks & DeMallie 2012](#):14)

(C) – **Specific; – Speaker's knowledge** (i.e. the speaker does not identify the referent). I include here an example with *dóki* 'where to (dynamic)', altogether this last set of forms is harder to find in the literature.

(26)   a. *Gá, né tokákihąbi,   **dágu**   wąyáka-bi, duká snokyá-bi-šį   cén.*
          then this those.in.the.lead **something.UNSPEC** see-3PL   but   know-3PL-NEG thus
          'Then those in the lead saw something [unspecific], but they didn't know what it was.'
          ([Parks & DeMallie 2012](#):79)

       b. *Įknúhanaȟ, **dágu**   a-∅-pá-bi.*
          suddenly   **something.SPEC** DS-3P-hit-PASSIVE
          'Suddenly, something [unspecific] was hit.'

       c. ***Dágu***   *ó-∅-mna.*
          something.SPEC DS-3A-smell
          'He smells something [unspecific].'

       d. ***Dóki***   *ya'-í-šį   he?*
          somewhere.UNSPEC 2S-go-NEG QST
          'Didn't you go somewhere [unspecific]?'

The derived words *dáguni* 'nothing, none (inanimate referent)' and *duwéni* 'nobody, none (animate referent)' are formed from generic nouns by adding the negative suffix *-ni*. They function either as indefinite pronouns, and occur in positive or negative clauses or as negative partitives to indicate the absence of any representative of a given genre or set, and co-occur obligatorily with a negated verb ([Cumberland 2005](#):360-362). The derivational suffix *-ȟ* also attaches to both negative pronouns and negative partitive to emphasize the negative scope of these function words. Note that *-ȟ* does not express epistemic specificity, focus, or intensification here since it has scope over the negative suffix only, hence its analysis as an emphatic element (EMP) which reinforces the truth value of the sentence.[5]

(27)   a. *dágu-ni* 'nothing'
          thing-NEG

       b. *dágu-ni-**ȟ*** 'nothing at all'
          thing-NEG-**EMP**

(28)   a. *duwé-ni* 'nobody'
          person-NEG

       b. *duwé-ni-**ȟ***
          person-NEG-**EMP**

---

[5]Examples ([27b](#)) and ([28b](#)) have also two near-synonymous stative verbs *dágunišį* 'there is nothing' and *duwénišį* 'there is nobody' that are built on the negative stems *daguni-* and *duweni-* on which is added the negative suffix *-šį*. This element has a predicative function which enables the concatenation of *-ȟtįyą* to derive the emphatic versions of these stative verbs: *dágunišįȟtįyą* 'there is nothing at all' and *duwénišįȟtįyą* 'there is nobody at all'.

(29) *Mi-súga-bi   né   duwé-ni-**ȟ**   ∅-háske-šị.*
1-y.brother-PL DEM someone-NEG-**EMP** 3S-tall-NEG
'None of my younger brothers is tall.'

(30) *Wịcá-bi né   wąží-ni-**ȟ**   snok-∅-yá-bi-šị.*
man-PL DEM one-NEG-**EMP** know.it-3-DS-PL-NEG
'Neither of the men knew it.'

The numeral *wąží* 'one' functions as a numeral and an indefinite article which approximates the English a. The partitive *wąžíȟ* is formed by adding -*ȟ* on *wąži* and means either 'any' (elective existential) or 'a single one, a specific one' (specific with speaker's knowledge). Since wąží functioning as an indefinite article relates to the speaker's ability to identify (or not) the referent, and to disclose (or not) its identity to the addressee/hearer, we find the same pragmatic effects as with indefinite pronouns seen above.

(31) a. *Ą́ba waką́ **wąží** dágu ec-∅-ų́bi?*   (NUMERAL)
[week] **one**   what do-3S-DS-PL
'What happened in one week?'

b. *Iyécịgayena **wąží**   ų-cị́ga-bi.*   (INDEFINITE ARTICLE)
car   **INDEF.ART** 1PL-want-PL
'We want a car.'

SPECIFIC WITH SPEAKER'S KNOWLEDGE ONLY

(32) *Mína wąží-**ȟ**   ma-∅-k'ú-'.*
knife one-**SPEC** 1O-3A-give.it-DECL.F
'He gave me a specific knife.'

SPECIFIC BUT PRESUPPOSED

(33) a. *Ịknúhąnaȟ wagágana wąží-**ȟ**   wócị   ∅-hí   štén (...)*
suddenly   old.woman one-**SPEC** begging 3s-arrive.here if
'If suddenly an old woman comes begging (...)' ([Parks & DeMallie 2012](#):135)

b. *Žé n-ị́š   žécen   wịcóȟ'ąge wąží-ȟ,   én nị-∅-tị́-kta,   snok-∅-yá-ya štén (...)*
that 2-self there.is.that thing.habit one-**SPEC** to 2P-3A-kill-POT know-3P-2A   if
'But if you know something specific will kill you (...)' ([Parks & DeMallie 2012](#):146)

c. *Wąží-**ȟ**   n-iyé yužápa-m.*
one-**SPEC** 2-self uncover.it-IMP.SG
'One of you uncover it.' ([Parks & DeMallie 2012](#):12)

d. *Ą́ba wąží-**ȟ**   én ∅-hí-kta.*
day one-**SPEC** in 3s-arrive-POT
'He will show up one day.'

e. *Wịcášta ∅-háska wąží-**ȟ**   wą-wịca-n-aga   he?*
man   3S-be.tall one-**SPEC** DS-3PL.O-2A-see.it QST
'Did you see any tall men?' ([Cumberland 2005](#):363)

4.3.   *-ȟ* as an adverbializer

The derivational suffix *-ȟ* has also developed an adverbializing function as it derives manner adverbs from stative verbs, adverbs and numerals as in *ų́šiya* 'pitifully' > *ų́šiyaȟ* 'pitifully, in a pitiful manner'. Often times the underived stem does not exist in synchrony and the intensifying or focus meanings of *-ȟ* are bleached since it does not scale the degree of a gradable expression nor does it single out an entity against a set of alternatives as shown in (34) and (35).

(34)   a.   *wašté* 'it is good' (vs) >
          owášteȟ 'slowly, gently' (ADV) (*owášte)

   b.   *Owášteȟ ∅-máni.*
        gently   3s-walk
        'He walks gently.'

(35)   *Gá   wįcį́jana žé   ∅-giktá,   hį́kna pamą́knena-ȟ,   dág-eye-šį̇-ȟ   ∅-yąká.*
       then girl   that 3s-get.up and   head.bowed-ADV thing-say.it-NEG-ADV 3s-sit
       'Then this girl got up and with her head bowed she sat silently.' (Parks & DeMallie 2012:52)

In some cases however the adverbializing function seems to express focus marking.

(36)   a.   *ecédu* 'it is as such' (vs) >
          ecéduȟ 'the same as another' (ADV)

   b.   *M-į̇š   ecédu-ȟ   mi-jáǧa!*
        1-self the.same-ADV 1P-BENEF.make.it.IMP
        'Make me one exactly like this!'

The suffix *-ȟ* also derives manner adverbs of multiplication (e.g. I did it four times) from ordinal numbers: *nų́ba* > *nų́baȟ* 'two times'; *šákpe* (NUM) > *šákpeȟ* 'six times' (ADV). This way of forming multiplicatives is peculiar to Nakoda and does not occur in Dakota and Lakota which use the bare numerals: e.g. Lakota *Nų́pa-hí* 'He came twice'; *Tópa-ečúŋ* 'He did it four times' (Ullrich & Black Bear 2016:406). This type of adverb could be thought of as being akin to intensification since multiplication is an augmentation of an objective quantity while intensification is a boost of a subjective quality.

(37)   a.   *Yámni-ȟ   dágunišį̇ aké   dóba.*
          three-ADV zero   again four
          'Three times zero and four (0004)' (last part of a telephone number)

   b.   *Nų́ba-ȟ   wa-básisa.*
        two-ADV 1s-sew
        'I'm double stitching.'

   c.   *Žéci nųbá-ȟ   wa'-í.*
        there two-ADV 1s-arrive.there
        'I went there twice.'

The adverbial *-ȟ* also has a predicative function in a verbless clauses expressing multiplication of two numerals.

(38) *Dóba-ȟ̇ nų́ba štén šaknóğą.*
      four-**ADV** two   then eight
      'Four times two equals eight.'

Some partially fluent speakers have extended the adverbial use of *-ȟ̇* with numerals to indicate plurality with animate reference. This use of *-ȟ̇* is not reported for the Lakota and Dakota cognates, and doesn't occur, to the best of my knowledge in the published Nakoda literature. This extended meaning is awkward since there is already an animate plural suffix *-bi* that occurs on nouns, verbs, and pronouns although demonstrative and nominal plural markers are often dropped in fast/informal speech: *Wįcá né nową́bi* 'the men are singing' (expected *wįcábi nená nową́bi*). Since the examples in (52) were produced by a partially fluent speaker in his early seventies, it might suggest that the pluralizing function of *-ȟ̇* is idiolectal. Since the marking of grammatical number is asymmetrically in Nakoda (*-bi* on verbs and animate nouns, and reduplication and demonstratives on inanimate nouns), this could be a form of regularization of plurality marking, one that conforms more closely to English, as indicated by the place name *Wazíȟeȟ̇* 'Cypress Hills' (from the traditional noun *Wazíȟe* 'Cypress Hills' (lit., pine mountain)). Note that the use of *-ȟ̇* on nouns to express plurality of animates were rejected by fluent speakers.

(39) a. *Ecá   cén   waną́gaš tatą́ga-ȟ̇   ∅-yúda-bi jé.*
         it.is.as.such because long.ago buffalo-**PL** 3s-eat.it-pl always
         'Because it was like that long ago, they always ate bisons.'

      b. *Jim ta-šų́ga-ȟ̇   táwa.*
         Jim 3-horse-**PL** 3s.owns.it
         'Jim's horses.'

5. Conclusion

The present article analyses the distribution, semantics and pragmatic extensions of *-ȟ̇* in Nakoda (a Dakotan language of the Mississippi Valley Siouan branch). Like other means of intensification that are mentioned in cross-linguistic studies, Nakoda "intensifiers" have more than one function, depending on the type of words they attach to. The suffix *-ȟ̇* can express intensification (with gradable expressions like adverbs and stative verbs), as well as focus (with non-gradable expressions like active verbs, pronouns and nouns). One of the pragmatic extensions of *-ȟ̇* when occurring within noun phrases enables the speaker to expresses epistemic specificity or his/her ability to identify (or not), and to disclose (or not) the identity of a new referent to his/her addressee/hearer. In an example like *dagúȟ̇ opéyatų céyaga* 'You should buy something significant' the very possibility of ordering one's addressee for something specific to be bought (without any further details) runs against the Gricean Maxim of Quantity (i.e. be as informative as possible) and shows that such assumptions are of doubtful utility for the description of lesser known languages. Lastly, *-ȟ̇* also has a purely adverbializing function from which stems quantitative meanings (multiplication, pluralization). This innovation is not found in other Dakotan languages.

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Nasal harmony in Hoocąk and Mandan[*]

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Abstract: This paper lays out the conditions in which nasal harmony occurs in both languages. Hoocąk and Mandan share a common set of natural impediments to the spread of nasal harmony: supralaryngeal stops and mid vowels. Nasal harmony spreads unidirectionally until it meets one of these two blocking elements. The major distinction between these two languages is that nasal harmony is progressive in Hoocąk and regressive in Mandan. The difference between how Hoocąk and Mandan handle nasal harmony is not restricted to merely in which direction nasal harmony moves, but also onto which kinds of sonorants it may move. Previous research on Hoocąk, including Garvin & Hartmann (n.d.), Helmbrecht & Lehmann (2006), and Lipkind (1945) among others, has touched on the boundaries of nasal harmony, but has not detailed the specific morphophonological environments in which it occurs. Likewise, Hollow's (1970) account of regressive nasal harmony in Mandan is insufficient to account for the many instances where nasal harmony is expected to occur, but is absent.

Keywords: Hoocąk, Mandan, morphology-phonology interface, nasal assimilation, nasal harmony

1.   Introduction

Rankin et al. (1998:366) reconstruct a phonological system of Proto-Siouan that features nasal vowels but no nasal consonants. All modern Siouan languages have surface nasal consonants due to the assimilation of nasal features from a following nasal vowel, as seen in Table 1.

Table 1: Reconstruction of Proto-Siouan *awąą(-re) 'bird > game bird, turkey'

Proto-Siouan	*awąą(-re)	'bird > game bird, turkey'
Hidatsa	wáaraa (idáakubee)	'dove' ['dove' + 'owl']
Mandan	máąre(k)	'large bird'
Chiwere	(waayįk'úų)mą	'bird's nest'
Hoocąk	mąą	'nest'
Quapaw	mą	'crow'
Biloxi	máąni	'turkey'
Ofo	amą́	'turkey'
Tutelo	mąné (asą́)	'duck, goose'

Across the board, the underlying nasal vowel *ą in the stem above causes nasal assimilation of the preceding *w in all modern languages, except for Missouri Valley languages like Hidatsa, where nasal vowels merged with oral vowels and all nasalization is absent on vowels. However, in some languages, like Biloxi and Tutelo, the reflex of the *r in the stem augment *-re also assimilates the nasal feature of the adjacent nasal vowel. That is to say, it seems that the historical nasal harmony we observe in Proto-Siouan may not be as clearly delineated as described in Rankin et al. (1998:370).

What is not clear in the literature is whether the emergence of surface nasal consonants happened once over the development of various daughter languages from Proto-Siouan or whether there are have been multiple instances where nasal consonants have become reanalyzed as an underlying phoneme rather than a nasalized allophone. Furthermore, research into how languages synchronically handle nasal assimilation is quite limited. This paper offers a remedy to this by looking at nasal assimilation in two Siouan languages: Hoocąk and Mandan.

In §2, we examine some typological characteristics of nasal harmony in other languages. This overview helps to contextualize the kinds of nasal harmony we witness in Hoocąk and Mandan in §3. Section §4 describes the conditions under which nasal harmony occurs in both languages and some differences between them. In §5, we discuss the data and show that both share a common feature in Siouan to universally turn *r into [n] before a nasal vowel but that Mandan extends this process to universally converting *w to [m] while Hoocąk does not. We then conclude with some general observations about nasal harmony in Siouan in general and potential avenues of future research.

2.   Typological characteristics of nasal harmony

Nasal harmony involves vowel-consonant harmony where one segment assimilates nasal features from another, either from vowel to consonant or from consonant to vowel (Rose & Walker 2011:245). We can divide harmonies into two categories. If the [+nasal] feature is spread from left to right, it is referred to as **progressive** harmony, while spreading the [+nasal] feature from right to left is **regressive** harmony.

This consonant to vowel harmony is a productive feature in the South American language Warao. In this instance of progressive nasal harmony, a nasal consonant will spread [+nasal] across superlaryngeal voiced segments (i.e., vowels and glides but also including /h/). We can see this behavior in (1a) through (1d).

(1)   Progressive nasal harmony in Warao (Osborn 1966:111-112)

a.	/moau/	→ [mõãũ]	'give it to him!'
b.	/nao/	→ [nãõ]	'come!'
c.	/inawaha/	→ [inãw̃ãh̃ã]	'summer'
d.	/mojo/	→ [mõj̃õ]	'cormorant'
e.	/naote/	→ [nãõte]	'he will come'
f.	/mehokohi/	→ [mẽh̃õkohi]	'shadow'
g.	/panapana hae/	→ [panãpanã h̃ãẽ]	'it is a porpoise'

This **long-distance** (or **non-local**) nasal harmony takes place across syllable and word boundaries, so long as the phonetic conditions exist to permit its spread in Warao. This progres-

sive nasal harmony can take place beyond what is immediately adjacent to the original nasal, permitting the [+nasal] feature to be spread rightward until coming into contact with a voiceless superlaryngeal obstruent. This pattern appears in (1e) through (1g), where nasal harmony moves rightward until abutting against a voiceless stop. In (1g), we see nasality spread across a word boundary from /panapana/ 'porpoise' onto the following word, the copular /hae/, creating nasalized segments on the verb despite its own lack of underlying nasal segments.

While English does not have phonemic nasal vowels, we do have a kind of regressive nasal harmony in the form of anticipatory nasal assimilation. In the English examples below in (2), an underlying nasal consonant triggers nasal harmony with a preceding vowel. This process is **strictly local**: i.e., its effects are restricted to immediately adjacent segments. This behavior is evidence in (2a) through (2f). This nasal harmony likewise is blocked by any intervening non-vocalic segments between the vowel and nasal, as we see in (2g), where the /ɹ/ blocks the spread of nasal harmony onto the preceding vowel, even though there is a nasal element present in the coda of that syllable. Nasality is also localized to the domain of the syllable, as (2h) shows two individual nasal segments, /m n/, where only the /n/ triggers nasal harmony because it is tautosyllabic with the vowel /ɑ/ and has no intervening segments. Even though the /ə/ precedes a nasal consonant, it does not because nasalized because it does not share a syllable with /m/.

(2) Regressive nasal harmony in English (using General American English pronunciations)

a.	/dʒæm/	→	[dʒæ̃m]	'jam'
b.	/ɹum/	→	[ɹũm]	'room'
c.	/stɪnt/	→	[stɪ̃nt]	'stint'
d.	/sʌn/	→	[sʌ̃n]	'sun'
e.	/bɑnd/	→	[bɑ̃nd]	'bond'
f.	/sɔŋ/	→	[sɔ̃ŋ]	'song'
g.	/ɑɹm/	→	[ɑɹm], *[ɑ̃ɹ̃m]	'arm'
h.	/kəmɑn/	→	[kʰəˈmɑ̃n], *[kʰɔ̃ˈmɑ̃n]	'c'mon!'

Languages have a variety of ways to handle blocking mechanisms for nasal harmony (Walker 2011:1838). In addition to contrasting regressive and progressive nasal harmonies, there is another kind of nasal harmony. **Bidirectional** nasal harmony occurs when a language simultaneously has possessive and regressive harmony, causing the [+nasal] feature to spread both leftward and rightward in a word.

The Applecross variety of Scottish Gaelic is one example of a language that features simultaneous regressive and progressive nasal harmonies. In this variety, nasal harmony is blocked by oral stops but not oral fricatives. We can see this behavior below.

(3) Bidirectional nasal harmony in Applecross Scottish Gaelic (Ternes 1973:134-135)

a.	/frĩaˑv/	→	[f̃r̃ĩaˑṽ]	'roots'
b.	/ʃɛ̃nɛˑvar/	→	[ʃɛ̃nɛ̃ˑṽãr̃]	'grandmother'
c.	/ʟã:j/	→	[ɪ̃ã:j̃]	'hand'
d.	/ãhuç/	→	[ãħũç̃]	'neck'
e.	/sŋãˑnʲdʲan/	→	[s̃ŋãˑnʲdʲan]	'thread'
f.	/tʰãhusk/	→	[tʰãħũs̃k]	'fool'
g.	/strãiˑɣ/	→	[st̃r̃ãĩˑɣ̃]	'string'
h.	/kʰɔ̃ispaxk/	→	[kʰɔ̃ĩs̃paxk]	'wasp'

In (3a) through (3d), we can see that the bidirectional nasal harmony has spread from the underlying nasal vowel to both word edges. In (3e), we see the regressive harmony continue all the way to the left edge of the word, but rightward spread has been blocked by the /dʲ/. Likewise, the bidirectional spread in (3f) and (3h) is blocked at the edges of the word by voiceless stops, while (3g) sees its progressive nasal harmony make it to the right edge of the word, but is blocked in its regressive path by a voiceless oral stop.

In the languages heretofore discussed, each kind of nasal harmony has worked uniformly, even a language like Scottish Gaelic with bidirectional nasal harmony. Nasal harmony in both directions have the same blocking conditions and spreading conditions. This uniformity is not universally required of nasal harmony systems, however. The Tupian language Guaraní of South America features nasal harmony. This phenomenon in Guaraní has generated a large amount of descriptive literature (Gregores & Suárez 1967; Rivas 1975; Walker 1999, 2011; Rose & Walker 2011, Thomas 2014, *inter alios*).

In this literature two patterns emerge. First, Guaraní features iterative regressive nasal harmony before prenasalized consonants. Second, underlying nasal vowels spread the [+nasal] feature onto voiced segments (i.e., vowels, glides, and voiced obstruents) bidirectionally. The only blocking mechanism observed is an oral vowel bearing primary stress. A nasal vowel bearing primary stress still participates in nasal harmony. Secondary stress does not block nasal harmony.

The data below demonstrates the behavior of the first of these two types of nasal harmony: nasal harmony involving prenasalized consonants.

(4)   Guaraní regressive nasal triggered by prenasalized consonant

    a. /ᵐbeⁿdaˈre/ → [mẽⁿdaˈre] 'widow(er)' (G & S 1967:69)

    b. /ⁿdereˈᵐbe/ → [nẽr̃ẽˈᵐbe] 'your lips' (G & S 1967:69)

    c. /gʷeˈᵐbe/ → [ŋʷẽˈᵐbe] 'type of plant' (Thomas 2014:81)

    d. /tatae̍ⁿdɨ/ → [tãtãẽⁿdɨ] 'lamp' (Thomas 2014:81)

    e. /araˈⁿdu/ → [ʔãr̃ãˈⁿdu] 'knowledge' (Thomas 2014:81)

In each of the examples in (4) a prenasalized consonant triggers leftward nasal harmony, causing vowels and approximants to become nasalized and voiced consonants to acquire a nasal place of articulation. Nasality is restricted to phonological material to the left of the prenasalized consonant. Underlying prenasalized consonants involved in this nasal harmony become fully nasal, though the original prenasalized consonant does not.

The second type of nasal harmony, which is bidirectional, originates from an underlying nasal vowel and then spreads towards both edges of a word. Examples of this process appear below.

(5)   Guaraní bidirectional nasal harmony triggered by nasal vowel

    a. /iᵈjaˌkãraˈku/ → [ʔĩɲãˌkãr̃ãˈku] 'is hot-headed' (G & S 1967:69)

    b. /ɕeˌkʷãɣʷaˈsu/ → [ɕẽˌkʷãɣ̃ʷãˈsu] 'my thumb' (G & S 1967:69)

    c. /ⁿdo-roi-ⁿduˈpã-i/ → [nõr̃õĩnũˈpãĩ] 'I don't beat you' (Rivas 1975)

    d. /paɨˈrã/ → [pãɨ̃ˌr̃ã] 'to tinge' (Thomas 2014:78)

    e. /oro-maˈʔẽ/ → [õr̃õmãˈʔẽ] 'I watch you' (Thomas 2014:84)

In (5a) through (KL5c), we see a nasal vowel near the center of the word trigger the spread of nasality. In (5a) and (5b), specifically, we see the spread of the [+nasal] feature blocked by an

oral vowel bearing primary stress. In the remaining examples, the primary stress is on a nasal vowel, which them emanates to both edges of the word given the lack of blocking conditions.

Rose & Walker (2011) note in their discussion of the typology of harmony systems that bidirectional harmony can have different blocking conditions for different directions. Certainly, it appears that such systems might really be just separate nasal harmonies, similar to the two described above in (4) and (5): the prenasal consonant regressive nasal harmony is blocked from moving rightwards by the prenasalized consonat of origin; nasalization can move from right to left, but never left to right. The same is not true for the nasal harmony caused by underlying nasal vowels, where the only blocking mechanism is an oral vowel in a syllable bearing primary stress. Both nasal harmonies are non-local, and are able to spread very far from their original nasal-triggering segment, as seen in the example below. Nasal harmony is emphasized in bold.

(6) Long-distance nasal harmony in Guaraní
     [la ɕeraˈʔɨ   **ʔĩɲã̠kã̃xã̃ˈtã ĩtẽ**ˈrei   la eˈkʷela pe]
     /la ɕe-raʔɨ   iᵈj-akã-hatã iterei   la ekʷela pe/
     the 1-child(of.father) 3-head-a.lot just.too the school to
     'my child (father speaking) is just too stubborn at school' (Gregores & Suárez 1967:69)

The word 'be stubborn' is a compound that contains two underlying nasal vowels. Either of these vowels could be generating the bidirectional harmony, which envelops the whole word. To the right, the progressive nasal harmony continues until it encounters a blocking element: i.e., a syllable with an oral vowel that bears primary stress. No nasality spreads regressively from 'stubborn' due to the fact that 'my child' ends in a stressed oral vowel, thus preventing any nasalization. In Guaraní, not only does nasal harmony take place within the domain of a word, but it can move past word boundaries until some featural element impedes it.

The various systems of nasal harmony that appear above in Guaraní, Scottish Gaelic, English, and Warao all serve to highlight an important fact about nasal harmony: there is no singular kind of nasal harmony. Each language has a different approach, and some languages employ multiple approaches unto themselves. This section serves to provide an overview of the many ways nasal harmony can function in other languages, and to contextualize how nasal harmony in Hoocąk and Mandan fit within the typology.

3.   Nasal harmony in Hoocąk and Mandan

3.1.   Previous work on nasality in Siouan

With the exception of Missouri Valley languages (i.e., Hidatsa and Crow), all Siouan languages have nasal vowels (Parks & Rankin 2001:103). Repeatedly throughout Rankin et al. (2015), we can see that surface nasal consonants in modern languages can be reconstructed back to a *r and *w following nasal vowel. Diachronically, some kind of regressive local nasal harmony must have taken place in order for these sonorants to become nasals: e.g., PSi *wątho 'bear' > pre-Proto-Mississippi Valley |w̃ãtʰo| > Proto-Mississippi Valley **mątho > Lakota *matȟó* [maˈtˣo].

Michaud et al. (2012:209) note that several other Siouan languages have some form of nasal harmony. This observation points to the fact that nasal harmony is also a synchronic phenomenon in Siouan and is not just relegated to the historical development of these languages.

The vast majority of phonetic studies on nasality in a Siouan language has involved Lakota, as it has a large speaker pool from which to draw data. James (1983:6-7) gives the following examples of nasal spread in Lakota:

(7) Nasality in Lakota
    a. *lowáŋ* 'sing' /lɔwã/ → [lɔ̃.ˈw̃ə̃]
    b. *lená*[1] 'these' /lɛna/ → [lɛ̃.ˈnə̃]
    c. *akáŋl* 'on top' /akãl/ → [a.ˈkə̃l̃]
    d. *nážiŋ* 'stand' /ˈnaʒĩ/ → [ˈnə̃.ʒ̃ĩ]

All of the data in (7) involves nasality spreading bidirectionally from its source. Scarborough et al. (2015) do not find such a prolific pattern of nasal harmony, showing instead a pattern of coarticulation with carryover nasality being more noteworthy than anticipatory coarticulation.

To date, no comprehensive study of nasal harmony across the Siouan language family has been done. This paper represents the first look at nasality as a synchronic phenomenon in a Siouan language that is not Lakota. The content below describes the systems of nasal harmony for both Hoocąk and Mandan.

3.2. Hoocąk nasal harmony

Prior research on the phonology of Hoocąk, including Garvin & Hartmann (n.d.), Helmbrecht & Lehmann (2006, 2010), and Lipkind (1945), among others, has touched on the boundaries of nasal harmony. The harmony is progressive and affects vowels /a/, /i/, and /u/, as well as the consonant /r/. The vowels are nasalized when they occur after another nasal vowel or nasal consonant (/m/ or /n/), and the /r/ consonant becomes /n/ when following a nasal vowel. Whether that vowel is underlyingly nasal or nasalized by a proceeding vowel or consonant is inconsequential. This rule is summarized in (8) below:

(8) Progressive nasal assimilation rule in Hoocąk

$$\begin{Bmatrix} a \\ i \\ u \\ r \end{Bmatrix} \rightarrow [\text{+nasal}] \ / \ [\text{+nasal}]\_\_$$

Both examples in (9) demonstrate the results of the application of this rule:

(9) Nasal harmony in Hoocąk

    a. *nąąpąą ųįnera*
        nąąpąą ʼųų-ire=ra
        basket make-PL=DEF
        '[that] they made baskets' (Lipkind 1945:40)

---

[1]This word should have no underlying nasal vowels, but the description by James (1983) in working with younger speakers of Lakota suggests that either there is an underlying nasal vowel present or that there is some other source of the nasalization: i.e., the /n/. Another possibility is that this process is a newer phenomenon, given that it is sparsely attested. In addition, it is not clear if all nasalization is created equal in is example; it is possible that there is a distinction between weak nasalization due to anticipatory articulation versus a stronger nasalization conditioned by phonology. Additional research is needed to see how prevalent words without nasal vowels in Lakota participate in nasal harmony.

b. *nąą'ap*
   nąą-aap
   tree-leaf/sheet
   'leaf' ([Helmbrecht & Lehmann 2010](:158))

In ([9a](a)), the long /ą/ vowel following the /n/ in *nąąpąą* 'basket' is automatically nasalized due to its position following the nasal consonant. Meanwhile, the second long /ą/ in *nąąpąą* 'basket,' as well as the long /ų/ in *'ųų* 'make or do,' are underlyingly nasal. The /ų/ affects both the following nasalizable vowel /i/ and nasalizable consonant /r/ in the plural subject *-ire* suffix, producing [į] and /n/, respectively. The following vowel /e/ can not be nasalized in Hoocąk, and so the spread ends upon reaching it.

The example word *nąą'ap* 'leaf' in ([9b](b)) is composed of two morphemes: *nąą*, which has many translations in English, among them, 'tree,' and *'aap*, which is descriptive of the thin or sheet-like nature of a leaf. In this example, nasalization from the inherently nasal quality present in *nąą* does not carry over to the /a/ vowel in *'aap*. This spread is prevented by the glottal stop.

The above examples demonstrate that nasality may not spread past stop consonants or mid-vowels /e/ or /o/ (which are never nasalized in Hoocąk). These blocking elements will be further discussed in §[4.1](4.1). Nasality may spread across consonants /h/ and /w/, however, though there are discrepancies in previous descriptions of the nature of that spread. [Helmbrecht & Lehmann](2010:7) assert that nasality spreads across eligible vowels whether there is an /h/ between them or not, and that it may optionally spread through /w/. Conversely, [Garvin & Hartmann](n.d.:18) note that nasality spreads to subsequent vowels "sometimes" through /h/, and "usually" through /w/. Examples demonstrating nasal spread across /h/ and /w/ are provided in ([10](10)) and ([11](11)):

(10) a. Nasal harmony crossing /h/
         mįąnąk
         mįį<ha>nąk
         <1E.A>sit
         'I sit' ([Helmbrecht & Lehmann 2010](:7))

      b. *nąįžą*
         nąą-hižą
         tree-one
         'a tree' ([Helmbrecht & Lehmann 2010](:7))

      c. Nasal harmony not crossing /h/
         hiicąwą   *haara*
         hiicąwą   <ha>hii=ra
         brother.in.law <1E.A>be.related=DEF
         'my brother-in-law' ([DoBeS Archive 2016](2016))

      d. *pejąhu*
         pejąhu
         sandhill.crane
         'sandhill crane' ([DoBeS Archive 2016](2016))

(11)   a.   Nasal harmony crossing /w/
            Wažątire waanį̄wį̄ną̄   *coire*
            wažątire <ha>hanį-wi=ra   coo-ire
            car   <1E.A>have-PL=DEF blue/green-PL
            'the cars we have are blue/green' ([DoBeS Archive 2016](#))

       b.   *ha'ų̄wį̄*
            ha-'ų̄ų̄-wi
            1E.A-do-PL
            'we [exclusive] do' ([Helmbrecht & Lehmann 2010](#):8)

       c.   Nasal harmony not crossing /w/
            hį̄wus
            hį̄-wus
            1E.U-dry
            'I [my skin] am dry' ([Helmbrecht & Lehmann 2006](#):73)

We postulate that the reason for the nasality spreading across /h/, as in ([10a](#)) and ([10b](#)), or not, as in ([10c](#)), relates to word boundaries. Though examples ([10a](#)) and ([10c](#)) both contain the first person actor prefix *ha-*; in ([10a](#)), it is prefixed to the verb *mįįnąk* 'to sit' in primary derivation, and is therefore treated as word-internal. In contrast, ([10c](#)) consists of two prosodic words, with *ha-* in word-initial position. If nasalization consistently spread across /h/ as well as syllable or word boundaries, as claimed by [Helmbrecht & Lehmann](#) ([2010](#):7), we would expect nasalization to spread to all eligible consonants and vowels to form **hiicąwą hąąną* for 'my brother-in-law.' The word boundary likely prevents nasal spread onto the eligible vowels and consonant. Example ([10d](#)) shows an environment in which nasalization does not spread past /h/ to the nasalizable vowel /u/. This may be due to the same sensitivity to word boundaries, as *pejąhu* 'sandhill crane' is a rare compound word, composed of *peeją* 'crane' and *huu* 'leg.' Nasal spread across compound words is further discussed in §[4.3](#).

When it comes to nasality crossing or not crossing /w/ (as seen in ([11a](#)) through ([11c](#))), we support the generalizations made in previous research: that it is common, but not obligatory, for nasalization to spread in environments with /w/.

The only consonant which takes on a nasal quality through nasal spread in Hoocąk is /r/. The /r/ which becomes /n/ in environments in which it follows a nasal vowel. This nasalization frequently occurs when attaching the definite determiner =ra to a noun ending in a nasal vowel, as in ([12](#)):

(12)   Nasalization of determiner =*ra*

       wanį̄ną̄
       wanį=ra
       meat=DEF
       'the meat' ([Helmbrecht & Lehmann 2006](#):80)

In summary, given the proper conditions, the nasalization rule may apply to numerous nasalizable vowels and consonants until it reaches either a stop consonant, a mid-vowel /e/ or /o/, or the rightward edge of a word.

3.3. Mandan nasal harmony

The first description of the sound system of Mandan appears in Kennard (1936). Kennard's account of the phonology of Mandan does not address allophony, and he describes the voiced segments [ɾ n ⁿd] and [w m] as individual phonemes. However, throughout his glosses, he frequently remarks in footnotes that [ⁿd] becomes [ɾ] when word-internal, and that [w] can alternate with [m] when word-initial. There is no mention of nasal harmony in his analysis of Mandan grammar, but there are instances where nasal harmony is documented but not described.[2]

(13) Nasal harmony in Kennard (1936)
    máamakįmaaxaani   érehini [ˈmã:.mã.kĩ.mã:.xa.:nĩ ˈe.ɾe.hⁱnĩ]
    waa-wą-kiwąąxE=rį e-reh=rį
    UNSP-1S-ask=SS   PV-want=SS
    'she was just going to ask me something and...' (Kennard 1936:30)

    In the data above, we can see a long nasal vowel in *kįmáaxe* 'ask', which causes the underlying /i/ to become nasalized. Furthermore, the underlying /ã/ in the first person stative marker *ma-* causes the preceding /w/ to become [m], as well as continue spreading leftwards to the edge of the word. Hollow (1970:18) is the first to recognize that the coronal voiced consonants and the bilabial voiced consonants are actually allophones. In his analysis of Mandan phonology, Hollow posits that all surface nasal consonant occur when followed by a nasal vowel: e.g., [n] can only occur when an underlying /ɾ/ precedes a nasal vowel. Similarly, [ⁿd] only occurs in word-initial environments, and even then, it can still appear as [ɾ] when phrase-internal.[3]

(14) Hollow's (1970:22) Regressive Nasal Assimilation Rule
$$\left\{ \begin{array}{c} \text{Resonant consonants} \\ \text{Apex vowels} \end{array} \right\} \quad \rightarrow \quad [+\text{nasal}] \quad / \quad \_\_[+\text{nasal}]$$

    The rule above in (14) causes any non-vocalic voiced consonant (i.e., /w/ and /ɾ/) and non-mid vowels (i.e., /a i u/) to become nasalized when the following segment is nasalized. Kasak (2019) likewise supports this analysis of voiced consonants in Mandan. We can see this rule at work in the data below.

    In (15), we see that /w/ is [w] when word-initial or word-internal and is followed by an oral vowel. This behavior is clear in (15a) through (17c). We can contrast the behavior of /w/ in the first person active marker *wa-* with what we see in (15d) through (15f), where /wa/ becomes [mã] due to the presence of an underlying nasal vowel in the following syllable.

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    [2]Note that surface nasal vowels do not contain a nasal hook if preceded by a nasal consonant in the orthography used here: e.g., ⟨máahe⟩ 'bow and arrow' is really pronounced [ˈmã:he]. Nasal hooks are only marked when there is no preceding nasal consonant: e.g., ⟨xtą́ąte⟩ 'thunder' is still pronounced [ˈxtã:te].

    [3]Mandan exhibits sensitivity to prosodic domains (i.e., word-level versus phrase-level). After pauses or when there is an intonational break, /w ɾ/ appear as nasals [m n] without the presence of an underlying nasal vowel. The presence of a nasal consonant without a subsequent nasal vowel is one indicator of a change in topic or focus within a Mandan sentence. For addition discussion of phrase-sensitive allophony, see Chapter 2 of Kasak (2019), as the issue of prosodically sensitive allomorphy is beyond the scope of the present paper. It is possible that other Siouan languages possess similar sensitivities to prosodic environments with respect to nasal consonants, and this is a topic for future research.

(15)   Bilabial /w/: [w] versus [m]

    a. *warópxe'sh* [wa.ˈɾo.pxeʔʃ]
        wa-ropxE=o'sh
        1A-enter=IND.M
        'I entered' (Hollow 1970:247)

    b. *waréeho'sh* [wa.ˈɾeː.hoʔʃ]
        wa-rEEh=o'sh
        1A-go.there=IND.M
        'I went there' (Hollow 1970:175)

    c. *ówati* [ˈo.wa.ti]
        o-wa-ti
        PV.LOC-1A-dwell
        'my home' (Hollow 1970:251)

    d. *maná'ko'sh* [mãˈnãʔ.koʔʃ]
        wa-wą'k=o'sh
        1A-be.standing=IND.M
        'I stood up' (Hollow 1970:22)

    e. *maníiro'sh* [mãˈnĩː.ɾoʔʃ]
        wa-rįį=o'sh
        1A-walk=IND.M
        'I walked' (Hollow 1970:182)

    f. *ímaminixo'sh* [ˈi.mã.mⁱnĩ.xoʔʃ]
        i-wa-wrįx=o'sh
        PV.INS-1A-play
        'I am play' (Hollow 1970:305)

We can see the behavior of nasal harmony shown explicitly below, with an underline emanating from the origin of the nasality and spreading leftward.

(16)   Regressive nasal harmony in Mandan in (15d)
    <u>*maná'ko'sh*</u> [mãˈnãʔkoʔʃ]
    wa-wą'k=o'sh
    1A-be.standing=IND.M
    'I stood up' (Hollow 1970:22)

In the data in (15), the nasal harmony is purely regressive in nature; no nasal harmony moves rightward from a nasal vowel. We can see this same pattern repeated for the coronal voiced segments below.[4]

(17)   Coronal /ɾ/: [ɾ] versus [n] versus [ⁿd]

    a. *rópxe'sh* [ⁿdo.pxeʔʃ]
        ropxE=o'sh
        enter=IND.M
        'he/she entered' (Hollow 1970:247)

    b. *rarópxe'sh* [ⁿda.ˈɾo.pxeʔʃ]
        ra-ropxE=o'sh
        enter=IND.M
        'he/she entered' (Hollow 1970:247)

    c. *órati* [ˈo.ɾa.ti]
        o-ra-ti
        PV.LOC-1A-dwell
        'your home' (Hollow 1970:251)

    d. *naníiho'sh* [nãˈnĩː.hoʔʃ]
        ra-rįįh=o'sh
        2A-breathe=IND.M
        'you breathed' (Hollow 1970:181)

    e. *namáahąte'sh* [nãˈmãː.hã.teʔʃ]
        ra-wąąhątE=o'sh
        2A-groan=IND.M
        'you groaned' (Hollow 1970:267)

    f. *ónamiho'sh* [ˈo.nã.mĩ.hoʃ]
        o-ra-wįh=o'sh
        PV.LOC-2A-point.at=IND.M
        'you pointed at it' (Hollow 1970:286)

Using the second person active marker *ra-* to in a variety of environments in (17), we can see that /ɾ/ is only [ⁿd] when word initial before an oral vowel. Word-internally, /ɾ/ remains [ɾ]. However, if the following syllable contains a nasal vowel, nasality will spread leftward over each voiced element.

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[4]Note that in this orthography, unlike Kennard (1936), the word-initial allophone [ⁿd] is written ⟨r⟩.

In Mandan, this regressive nasal harmony is able to spread over great distances. Hollow (1970:22) himself notes an impressive example involving the spread of nasality leftward from the verb stem across three prefixes, though it is not alone in having long-distance harmony. This nasal spread is depicted with an underline.

(18)   Long-distance regressive nasal harmony in Mandan

    a.   *<u>máamananuunixinisto'sh</u>*   [ˈmã̃ː.mã̃.nã̃.nũ̃ː.nĩ.xⁱnĩ.stoʔʃ]
          waa-wa-ra-rųų=rįx=rįt=(k)t=o'sh
          NEG-UNSP-2A-abduct=NEG=2PL=POT=IND.M
          'thou shalt not commit adultery' Hollow (1970:22)

    b.   *<u>máamanaraxikanashinito'sh</u>*   [ˈmã̃ː.m̥ã̃nã̃.ra.xi.k̥ã̃nã̃.ʃⁱnĩ.toʔʃ]
          waa-w-rą-ra-xik=rąsh=rįt=o'sh
          UNSP-1S-2A-INS.MTH-be.bad=ATT=2PL=IND.M
          'you (pl.) ruined it all for me' (Trechter 2012:154)

This nasal harmony targets only voiced consonants and non-mid vowels. Thus, so long as all prefixes before a syllable bearing a nasal vowel has both of these prerequisites, there is no hard limit on the distance within a word that regressive harmony can travel.

3.4.   Comparison of both systems

Despite moving in different directions, both Mandan and Hoocąk have a few similarities in how vowel harmony works. For both languages, the /r/ universally participate in nasal harmony and become [n] when involved. Similarly, only non-mid vowels can participate in vowel harmony.

(19)   Nasal harmony for /r/

    a.   Hoocąk (→)
          h<u>įnąg</u>íkarahe   [hĩ.nã̃.ˈgi.kᵃra.he]
          hį-ra-gikarahe
          1S-2A-invite
          'you invite me' (Helmbrecht & Lehmann 2006:17)

    b.   Mandan (←)
          ó<u>nanap</u>o'na?   [ˈo.nã̃.nã̃.poʔ.nã̃]
          o-ra-rąp=o'rą
          PV.LOC-2A-find=INT.F
          'did you find it?' (Kennard 1936:20)

In (19a), the first person object marker *hį-* causes nasality to travel rightward, spreading the [+nasal] feature onto the /r/, making it [n] and carrying [+nasal] onward to the /a/. Similarly, in (19b), the nasality spreads leftwards from the /ã/ in the stem, onto the preceding /ɾ/, and then likewise continues spreading towards the left edge of the word onto each available segment (i.e., onto non-mid vowels and voiced consonants).

The other consonant that participates in nasal harmony in both languages is /w/. In Mandan, when /w/ is involved in nasal harmony, /w/ becomes [m]. However, in Hoocąk, /w/ allows nasal harmony to pass onto the following vowel without fortifying to [m]. We can see this behavior in the data below.

(20)   Nasal harmony for /w/

    a.   Hoocąk (→)
       nąąžįwįne [nã:.ˈʒĩ.wĩ.ne]
       nąąžį-wi-re
       stand-PL-IMP
       'stand (pl.)!' (Lipkind 1945:8)

    b.   Mandan (←)
       mamánape'sh [mã.ˈmã.nã.peʔʃ]
       wa-wa-rąpE=o'sh
       UNSP-1A-dance=IND.M
       'I danced' (Hollow 1970:167)

The data in (20a) is peculiar in that /w/ seemingly participates in nasal harmony in Hoocąk but does not become [m] in the same way /r/ becomes [n]. It is possible that the /w/ is actually [w̃], but no phonetic studies have been done on nasality in Hoocąk to date to confirm this nasal articulation. In the DOBES corpus, when /w/ is involved with nasal harmony, it is still transcribed as ⟨w⟩. This contrasts with the treatment of /r/ to [n], where such instances are depicted as ⟨ń⟩ in Lipkind (1945) and ⟨ň⟩ in Helmbrecht & Lehmann (2006) to distinguish this [n] from underlying /n/.

      The important finding of looking at nasal harmony in both Hoocąk and Mandan is that they are remarkably similar despite being part of disparate branches of the language family. Both languages allow for long-distance nasal harmony, and both languages involve the same segments in that harmony. The major difference between these two languages is the directionality of the nasal spread, with Hoocąk having only progressive harmony, while Mandan has only regressive. Hoocąk likewise is distinct from Mandan in that /w/ does not fully assimilate to a nasal stop, but it does permit nasal spreading to pass through onto following segments.

4.   Conditions for nasal harmony

The data presented in §3.2 serve to show the ways in which nasal harmony in both languages work. We know that both languages involve the sonorants /w/ and /r/ in nasal harmony, as well as the non-mid vowels /a i u/. The description that follows highlights the blocking conditions for nasal harmony in both languages, and it raises questions for what patterns might exist in nasal harmony across the language family.

4.1.   Blocking environments for Hoocąk

As demonstrated in §3.2, nasalization spreads across vowels /a/, /i/, /u/, and consonant /r/. The spread is blocked by stop consonants (including the glottal stop), mid-vowels, and right-edge word boundaries. Examples (21a)-(21c) showcase these blocking environments:

(21) Nasal harmony blocking in Hoocąk

    a. *nąą'ap*
       nąą-'aap
       tree-leaf/sheet
       'leaf' (Helmbrecht & Lehmann 2010:158)

    b. *waamįnąkra*
       waamįnąk=ra
       chair=DEF
       'the chair' (Helmbrecht & Lehmann 2010:254)

    c. *nąąpąą ųįnera*
       nąąpąą 'ųų-ire-ra
       basket make-PL-REL
       '[that] they made baskets' (Lipkind 1945:40)

    d. *mąą hijąhį*
       mąą hijąhį
       land different
       'different countries' (Helmbrecht & Lehmann 2010:87)

In (21a) (repeated from (9b)), nasal spread to the nasalizable vowel /a/ is blocked by the glottal stop. In (21b), spread to the nasalizable consonant /r/ is blocked by the stop consonant /k/. In (21c) (repeated from (9a)), the mid-vowel /e/ prevents spread to the /r/. Finally, in (21d), the word boundary prevents spread to the nasalizable vowel /i/. Because we have established that /h/ does not block spread across eligible vowels, we conclude that it is the word boundary that is preventing the spread in this case.

4.2. Blocking environments for Mandan

The description of nasal harmony in Mandan throughout §3.3 shows that Mandan robustly allows for long-distance regressive nasal harmony, so long as the following conditions are met:

(22) Nasal harmony spreads leftward in Mandan if...

    a. The nasal element is preceded by a voiced consonant (i.e., /w/ or /ɾ/), or
    b. The nasal element is preceded by a non-mid vowel (i.e., /a i u/).

This set of conditions conforms the description of nasal harmony that Hollow (1970) puts forth. We can see examples of blocking in the data below.

(23) Blocked nasal harmony in Mandan

    a. *ómıniḳ* [ˈo.mⁱnĩk], *[ˈõ.mⁱnĩk]
       o-wrįk
       PV.LOC-be.a.bean
       'bean' (Hollow 1970:132)

    b. *komíihąka* [ko.ˈmĩː.hã.ka], *[kõ.ˈmĩː.hã.ka]
       ko-wįįhą-ka
       3POSS.PERS-be.a.female.grandchild-HAB
       'her grandchild/sister-in-law' (Hollow 1970:287)

c. *émahekere're* [ˈe.mã.he.kᵉɾeʔ.ɾe], *[ẽ.mã.he.kᵉɾeʔ.ɾe]
e-wą-he=krE=o're
PV-1S-say=3PL=IND.F
'they said it to me' ([Hollow 1973a](#):189)

d. *wíiratąąre* [ˈwiː.ɾa.tã̃ː.ɾe], *[mĩ̃ː.nã.tã̃ː.ɾe]
wiiratąą=E
enemy=SV
'enemy' ([Hollow 1970](#):292)

In each of the examples above, regressive harmony has been blocked by a mid-vowel or a voiceless consonant. However, there are example in the Mandan corpus where nasal harmony is expected to occur but does not.

(24)   Unexpected blocking of nasal harmony in Mandan

a. *ímanapshe'sh* [ˈi.m̊ᵃnã.pʃeʔʃ], *[ˈĩ.m̊ᵃnã.pʃeʔʃ]
i-w-rą-pshE=o'sh
PV.INS-1S-2A-bother=IND.M
'you bother me' ([Hollow 1973b](#):133)

b. *káare   ótaamaharaata!* [ˈkaː.ɾe ˈo.taː.mã.hᵃɾaː.ta], *[ˈkaː.ɾe ˈo.tã̃ː.mã.hᵃɾaː.ta]
kaare   o-taa#wą-hrE=ta
NEG.IMP PV.LOC-be.facing#1S-CAUS=IMP.M
'don't point it at me!' ([Hollow 1973a](#):167)

c. *Núu'etaamiihseena* [ˈnũ̃ː.ʔe.taː.mĩ̃ː.hse̞ː.nã], *[ˈnũ̃ː.ʔe.tã̃ː.mĩ̃ː.hse̞ː.nã]
rųų'etaa#wįįh=s=ee=rą
Mandan#woman=DEF=DEM.DIST=TOP
'that Mandan woman there' ([Hollow 1973b](#):89)

d. *míihkanatka* [ˈmĩ̃ː.hka.nã.tka], *[ˈmĩ̃ː.hkã.nã.tka]
wįįh=ka#rąt=ka
woman=HAB#be.in.the.middle=HAB
'lizard [lit. 'female's heart']' ([Hollow 1970](#):286)

The data above illustrates one clear reason why nasal harmony does not continue moving leftward when there are not featural impediments: word boundaries. In the case of the causative construction in ([24b](#)) and the compound nouns in ([24c](#)) and ([24d](#)), there is a word boundary between a nasal element and a non-nasal element that should otherwise be able to participate in nasal harmony. Thus, we can see that word boundaries are a third blocking environment for nasal harmony. Unlike Guaraní, as seen in ([6](#)), nasal harmony in Mandan appears to be strictly word-internal.

With this third condition in mind, we can say that causative constructions like the on in ([24b](#)) involves an incorporated verb, thus explaining the word boundary and lack of nasal harmony onto the [aː] in *ótaa* 'be facing' near to the nasal [m]. However, this word boundary condition does not seem to apply to the data in ([24a](#)), where we do not see multiple words combined into a larger morphological word. The instrumental preverb *i-* is not its own word, so we should not expect to see word boundary-type blocking here.

A central argument in Kasak (2019) is that word boundary-type blocking is exactly what is happening in Mandan. Helmbrecht (2008:139) posits that preverbs in Siouan are diachronically the result of grammaticalized postpositional elements in Proto-Siouan or pre-Proto-Siouan that became reanalyzed as being integral parts of the verb. These elements lost their wordhood over time, leading these former free postpositions to become bound preverbs. Kasak (2019) builds upon Helmbrecht's (2008) hypothesis in how the structure of Siouan verbs came to be by employing Anderson's (1992) notion of a **composite** word: i.e., a word that has internal structure. In a composite, there is a word couched inside of a greater word, where there is additional morphological material outside the bounds of that head word. This evolution is illustrated step-by-step below.

(25)   Evolution of free postpositions into preverbs in composites

    a.   Stage 1: Free postpositions
        [[N][P]] [V]

    b.   Stage 2: Prosodic association of postposition with verb in SOV
        [N] [[P][V]]

    c.   Stage 3: Loss of wordhood for postposition and erasure of brackets
        [N] [P[V]]

Stage 1 in (25a) involves a typical postposition following its nominal complement to the left of a verb. This is a typical structure for a head-final language with SOV sentence order. There is nothing typologically marked about this stage. However, as we proceed to Stage 2, we can see in (25b) that the postposition has become reanalyzed as being associated with the verbal element rather than the nominal element. This postpositional element still has some degree of wordhood, perhaps similar to particle verbs in Germanic languages, which means that the postpositional element still has some prosodic and/or morpho-syntactic autonomy.

Stage 3 in (25c) represents the kind of structure that Kasak (2019) proposes for Mandan and other Siouan languages: where the postpositional element in previous stages has become fully reanalyzed as being a part of the same word as the verb, but not a word unto itself. It is part of the verb, but not integral to the verb in the same way as affixes are.[5]

Assuming this structure, we can account for the lack of nasal harmony onto preverbs by pointing out that there is actually a word boundary between the preverb and the verb complex. The caveat is that this word boundary is an internal word boundary, rather than the boundary between two words as seen in a compound. We can thus say that Mandan still only has three conditions for blocking nasal harmony. The conditions outlined in (22) are reiterated and updated in (26) below.

(26)   Nasal harmony spreads leftward in Mandan if...

    a.   The nasal element is preceded by a voiced consonant (i.e., /w/ or /ɾ/), or

    b.   The nasal element is preceded by a non-mid vowel (i.e., /a i u/), or

    c.   The nasal element is not preceded by a word boundary.

We can appeal to these three conditions account for all documented instances of so-called unexpected blocking of nasal harmony.

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[5]See chapter 4 of Kasak (2019) for additional discussion of the composite structure in Mandan and Siouan.

(27)   Word-boundary blocking of nasal harmony

    a.   *íminikihe'sh* 'I waited for you' ([Kasak 2019](#):344)
       [*í*   [*minikihe*   ]] *'sh*
       [i   [w-rį̄-kihE   ]] =o'sh
       [PV.INS [1A-2S-wait.for]] =IND.M

    b.   *áamanahuuro'sh* 'you came here with me' ([Kasak 2019](#):344)
       [*áa*   [*manahuu*   ]] *ro'sh*
       [aa   [w-rą̄-huu   ]] =o'sh
       [PV.TR [1S-2A-come.here]] =IND.M

In the data above, there is morphology containing underlying nasal vowels within the stem of the head of the composite word. In each of these cases, nasal harmony begins at the second person marker and travels leftward, nasalizing the /w-/ first person marker, but stopping before reaching the preverb. This lack of nasalization onto the preverb is now expected due to the fact there is an internal word boundary between the domain of the head of the composite word and the domain of the greater word where the preverb is. We can thus account for all the instances of unexpected blocking of nasal harmony in (24), which is repeated below with the internal structure of each word explicitly shown.

(28)   Expected nasal harmony blocking from word boundaries

    a.   *ímanapshe'sh* 'you bother me' ([Hollow 1973b](#):133)
       [*í*   [*manapshe*   ]] *='sh*
       [i   [w-rą̄-pshE   ]] =o'sh
       [PV.INS [1S-2A-bother]] =IND.M

    b.   *káare ótaamaharaata!* 'don't point it at me!' ([Hollow 1973a](#):167)
       [*káare*] [[*ó*   [*taa*   ]] [*maharaa*]] *=ta!*
       [kaare] [[o   [taa   ]] [wą̄-hrE   ]] =ta
       [NEG.IMP] [[PV.LOC [be.facing]] [1S-CAUS]] =IMP.M

    c.   *Núu'etaamiihseena* 'that Mandan woman there' ([Hollow 1973b](#):89)
       [[*Nuu'etaa*] [*miih*   ]] *=s*   *=ee*   *=na*
       [[rų̄ų̄'etaa] [wį̄į̄h   ]] =s   =ee   =rą̄
       [[Mandan] [woman]] =DEF =DEM.DIST =TOP

    d.   *míihkanatka* 'lizard [lit. 'female's heart']' ([Hollow 1970](#):286)
       [[*míihka*   ] [*natka*   ]]
       [[wį̄į̄h=ka   ] [rą̄t=ka   ]]
       [[woman=HAB] [be.in.the.middle=HAB]]

In each of the words above in (28), regressive nasal harmony should be permitted to keep moving leftward given that there is nothing featurally blocking harmony: i.e., the conditions in (26a) and (26b) are met. However, the condition in (26c) is preventing regressive nasal harmony from continuing toward the left edge of the overall word.

By positing word internal boundaries, we also can account for the unexpected lack of nasal harmony in the enclitic field.

(29)   Blocking of nasal harmony in the enclitic field

    a. *húuni* 'he came and...' ([Hollow 1973a](#):163)

      [*húu*   ] =*ni*
      [huu   ] =rį̄
      [come.here] =ss

    b. *kįnúuxik túnashoomako'sh* 'he got kind of scared' ([Hollow 1973b](#):71)

      [*kįnúuxik*] [*tú*   ] =*nash* =*oomak* =*o'sh*
      [ki-rųųxik] [tu   ] =rąsh =oowąk =o'sh
      [MID-fear] [be.some] =ATT =NARR =IND.M

    c. *wáarakų'karaanitinixanaate'sh* 'you (pl.) almost didn't give it to them' ([Hollow 1970](#):468)

      [*wáarakų'*   ] =*karaa* =*nit* =*inix* =*anaate* ='*sh*
      [waa-ra-kų'] =krE   =rį̄t =rį̄x =rą̄ą̄tE =o'sh
      [NEG-2A-give] =3PL   =2PL =NEG =PRSP   =IND.M

    d. *káare ka'ótaahkani* 'don't let him get hurt, and...' ([Hollow 1973a](#):63)

      [*káare*   ] [*ka'ót*   ] =*aahka* =*ni*
      [kaare   ] [ka-ot   ] =aahka =rį̄
      [NEG.IMP] [INS.FRCE-mix] =ABLE =ss

In ([29a](#)), nasal harmony should be permitted from the word-final nasal onto the /uː/ in the stem *húu* 'come here', but the word boundary prevents the spread of nasal harmony from the same-subject switch-reference enclitic =*ni*. Thus, we have [ˈhuːnĩ] instead of *[ˈhũːnĩ]. Similarly, the attitudinal =*nash* in ([29b](#)) does not spread nasality leftward onto the /u/ in *tú* 'be some' due to the intervening word boundary between the stem and the enclitic.

    Also noteworthy is the fact that nasal harmony cannot spread from one enclitic onto another. In ([29c](#)), the second person plural enclitic =*nit* should be able to spread nasality leftward onto the third person enclitic due to the fact that [aː] is featurally vidable for receiving the [+nasal] feature, phonologically. Yet instead of *[ˈwaː.kũʔ.kᵃnã̰ː.nĩtⁱnĩ.xᵃnã̰ː.teʔʃ] for 'you (pl.) almost didn't give it to them', we have [ˈwaː.kũʔ.kᵃɾaː.nĩ.tⁱnĩ.xᵃnã̰ː.teʔʃ]. We observe the same behavior in ([29d](#)), where the nasality from the same-subject switch-reference enclitic =*ni* does not spread leftward onto the /a/ in the modal enclitic =*aahka*. We can thus surmise that enclitic boundaries have the same effect on nasal harmony as word boundaries. This behavior suggests that enclitic boundaries are also a kind of word boundary, where additional boundaries appear as enclitics accrete at the right edge of the word. A more articulated structure for ([29c](#)) appears below.

(30)   Explicit encliticization-driven word boundaries in ([29c](#))

    [[[[[[*wáarakų'*   ] =*karaa*] =*nit*] =*inix*] =*anaate*] ='*sh*   ]
    [[[[[[waa-ra-kų'] =krE   ] =rį̄t] =rį̄x] =rą̄ą̄tE] =o'sh]
    [[[[[[NEG-2A-give] =3PL   ] =2PL] =NEG] =PRSP   ] =IND.M]

For the sake of ease of reading, the use of '=' as an enclitic marker shall serve as a shorthand for stating that there must be a word boundary placed around the stem and the enclitic. However, the lack of additional bracketing with the addition of enclitics should be assumed.

    Previous analyses of nasal harmony in Mandan (i.e., [Hollow 1970](#)) have only addressed general tendencies in nasal harmony, rather than looking at cases of exceptional blocking as done above. These data show that word boundaries play a critical role in blocking regressive nasal harmony in Mandan, both due to synchronic processes such as compounding and encliticization

and diachronic such as employing composite structures. Nasal harmony in Mandan is not merely relegated to the domain of phonology, but is sensitive to morphological structure as well.

4.3. Comparison of blocking environments

Hoocąk and Mandan share several identical featural blocking environments. Namely, voiceless obstruents and mid-vowels block nasal harmony, regardless of directionality. What no other sources to date have adequately addressed is whether nasal harmony is sensitive to word boundaries in these languages. To address this question, we look at compound words in each language. In Mandan, there is substantial evidence that nasality is blocked in compounds. However, because compounding is quite rare in Hoocąk, only a limited set of examples are available for study. Based on available documentation, we tentatively conclude that spread does not occur across the compound barrier (i.e., a word boundary).

(31)   Blocking nasal harmony in compounds

    a.   Hoocąk
       [[*wanį*][*ruxiri*]] 'ground meat' (*wanį* 'meat' + *ruxiri* 'ground [by hand]')
    b.   Mandan
       [[*Núu'etaa*][*miih*]] 'Mandan woman' (*Núu'etaa* 'Mandan' + *míih* 'woman')

In (31a), nasal harmony cannot spread rightward from *wanį* onto *ruxiri*: i.e., we have [wa.nĩ.ru.xi.ri] and not *[wa.nĩ.nũ.xi.ri]. Conversely, in (31b), nasal harmony cannot spread leftward onto *Núu'etaa* from *míih*: i.e., the word is ['nũː.ʔe.taː.mĩːh], not *['nũː.ʔe.tã̃ː.mĩːh]. While it is true that word boundaries can impede nasal harmony in these languages, all word boundaries are not equally impermeable.

    Hoocąk allows nasal harmony to pass a right word boundary provided that there is no intervening left word boundary. We can see this in DPs, where nasality from the left edge of a noun will progress onto the determiner.

(32)   Nasal spread across right word boundaries in Hoocąk

    a.   Single prosodic word
       [*wanį*] =*ną*
       [wanį] =ra
       [meat] =DEF
       'the meat'
    b.   Multiple prosodic words
       [*wanį*] =*ną*   [*waahą*   ]
       [wanį] =ra   [ho-ha-hą   ]
       [meat] =DEF [PV-1A-boil.something]
       'I boiled the meat' (Helmbrecht & Lehmann 2006:80)

    The definite article enclitic =*ra* must not have a left word boundary, else it should prevent nasal harmony from spreading onto it. This nasal harmony is able to pass the right word boundary of *wanį* 'meat', but is unable to pass the left word boundary of *waahą* 'I boil it.' The /w/ in

waahą should permit nasal harmony to continue spreading progressively, but that is not the observed behavior of the nasal harmony above: i.e., This behavior contrasts sharply with Mandan, where word boundaries are insurmountable barriers to nasal harmony, as shown earlier in (29) and (30).

5.   Discussion of nasal harmony in Siouan

What is surprising about these data is the similarity in how nasal harmony functions in both languages. Both languages are unremarkable in their lack of nasal mid-vowels, as this is a general rule among all Siouan languages. Those languages that have synchronic nasal mid-vowels, such as Kanza, have nasal mid-vowels due to the lowering of *ų to [õ] (Rankin 1990:4). This lowering of *ų to [õ] is common in Dhegihan languages, but also occurs in Virginian Siouan (Oliverio 1996:23). Catawban languages have nasal mid-vowels in addition to the expected [ã ĩ ũ] (Shea 1984), though correspondences between Proto-Siouan and Catawban is poorly understood (Rankin et al. 2015).[6]

For both Mandan and Hoocąk, mid-vowels are noteworthy in that they act as blocking agents for nasal harmony. This fact is robustly true in both languages. When looking across the Siouan language family to observe how other kinds of nasal harmonies work, we can look to Lakota for other examples of nasal harmony. Lakota appears to exhibit long-distance nasal harmony, we cannot necessarily make the generalizations regarding what the blocking environments for nasal harmoney are in Siouan languages, given the data from (7), repeated below.

(33)   Nasality in Lakota
a.	*lowáŋ*	'sing'	/lɔwã/	$\rightarrow$	[ĩɔ̃.ˈw̃ə̃]
b.	*lená*	'these'	/lɛna/	$\rightarrow$	[ĩɛ̃.ˈnə̃]
c.	*akáŋl*	'on top'	/akãl/	$\rightarrow$	[a.ˈkə̃ĩ̃]
d.	*nážiŋ*	'stand'	/ˈnaʒĩ/	$\rightarrow$	[ˈnə̃.ʒ̃ĩ]

Nasal harmony in (33a) appears to be regressive, as the underlying nasality in the /ã/ spreads leftward across each voiced segment, including the mid-vowel /o/. Not only is this nasality spreading leftward within its syllable of origin, it is able to cross the syllable boundary onto each [+voice] segment available. This behavior contrasts with the data in (33c), where nasal harmony appears to be progressive, originating on the /ã/ and spreading rightward onto the next available voiced segment, the /l/. Both of these examples seem to display unidirectional nasal harmony, but we can observe the datum in (33b) to see that bidirectional nasal harmony is observed. The /n/ is the only element that is underlyingly nasal in this word, and this nasality spreads regressively and progressively, given that this word is composed entirely of [+voice] segments. We see a similar situation in (33d), except there are two underlying nasal elements, the /n/ and the /ĩ/,

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[6]Catawba has been analyzed by previous scholars as having /ę/ (e.g., Speck 1913, Shea 1984, Rudes 2007). Often, this /ę/ corresponds to the Proto-Siouan ablaut vowel *E: e.g., PSi *ksE 'break off,' Lakota *-ksA*, Biloxi *ksĕdi* 'break by hand,' versus Catawba *sę* 'chop wood.' Catawba /ǫ/ also can arise from Proto-Siouan *ąhe sequences: e.g., Proto-Siouan *pąhe 'call, shout,' Crow *páa∼paá*, Osage *(ki-)pą́* 'call, invite,' versus Catawba *wǫǫ* 'cry out.' Additional work is needed to further investigate these correspondences between mid-vowel nasals in Catawba and the rest of Siouan, as well as look at whether there is any evidence of a synchronic system of nasal harmony in Catawba or diachronic evidence of one in the past. For these reasons, the Catawban branch is excluded from the discussion of nasal harmony across Siouan, though its inclusion may become more appropriate in the future when there is a better understanding how Proto-Siouan corresponds to Catawban languages.

causing two competing instances of nasal harmony which converge as they spread the [+nasal] feature to each voiced segment in the middle of the word. Thus, in these Lakota examples, we can say that nasal harmony spreads bidirectionally from some underlying nasal segment. However, the one instance of nasal harmony being blocked is a voiceless stop, as we see in (33c), where /k/ prevents the spread of the [+nasal] feature leftward: i.e., we have [a.ˈkə̃l̃] and not *[ə̃.ˈk̃ə̃l̃].

Scarborough et al. (2015) address the spreading of nasality onto other segments in Lakota, but their analysis holds that this process is purely phonetic (i.e., coarticulatory) in nature. However, the presence of the data from James (1983) suggest something more formalized and systematic than mere nasal carryover or anticipatory coarticulation. The presence of long-distance nasal harmony without the immediate presence of a nasal segment. Furthermore, nasality in (33) is only carried by voiced segments and is blocked by voiceless segments. This behavior is much more in line with the long-distance nasal harmony we have observed for Hoocąk in §3.2 and Mandan in §3.3.

Long-distance nasal harmony in Lakota is briefly discussed in Ingham (2003:6), where he states that nasalization can spread progressively. Examples demonstrating long-distance nasal harmony appear below, with the nasal spread depicted with an underline. In all the examples below, an underlying nasal segement (either a vowel or a consonant) spreads nasality rightward until it encounters either a voiceless obstruent, as in the case of (34a) through (34d), or a consonant cluster, as in the case of (34e) and (34f). No regressive harmony is described, even though a small set of his data are conducive to the regressive harmony akin to the kind observed in James's (1983) data. For example, in (34c), the /a/ before /m/ is a candidate for regressive nasal harmony, but Ingham (2003:6) transcribes it as [i.t͡ʃʰa.mã.ˌjã.pi], not *[i.t͡ʃʰã.mã.ˌjã.pi].

(34)   Nasal harmony in Lakota

     a. *yápi*
         yA=pi
         go.there=PL
         'they go' (Ullrich 2011:695)

     b. *uŋyáŋpi*
         uŋ-yA=pi
         1A.PL-go.there=PL
         'we go' (Ingham 2003:6)

     c. *ičháȟye*
         ičhağA#yA
         grow#CAUS
         'she raised her' (Ingham 2003:6)

     d. *ičhámayaŋpi*
         ičhağA#ma-yA=pi
         grow#1S-CAUS-PL
         'they brought me up' (Ingham 2003:6)

     e. *waŋyáŋke*
         waŋ-yaŋkA
         PV-see
         'he/she sees' (Ingham 2003:6)

f. *waŋbláke*
    waŋ-w-yaŋkA
    PV-1A-see
    'I see' (Ingham 2003:6)

It is unclear from Ingham's (2003) description whether only vowels become nasalized, or if consonants can also take on the [+nasal] feature: e.g., the data in (34c) might actually be [i.t͡ʃʰa.mã.j̃ã.pi], instead of the nasality skipping over the voiced semi-vowel /j/. What is clear is that there are several sources that attest to the existence of long-distance nasal harmony in Lakota. One issue with addressing the systematicity of this phonological process is whether there is a single system or if there are several. James (1983) notes that his consultants are exclusively from the Pine Ridge community, while Ingham (2003) draws upon transcribed data from various Lakota sources. In the closely-related language variety of Dakota, Boas & Deloria (1941:11) note that there is a strong tendency in Dakota to anticipate nasalization, which runs opposite the description for Lakota per Ingham (2003:8). Between James (1983), Ingham (2003), and Scarborough et al. (2015), three different systems are described for nasal harmony in Lakota, with James (1983) having the most prolific system of bidirectional harmony, and Ingham (2003) describing only progressive harmony. Scarborough et al. (2015) are more restrictive in their analysis, positing only a varying degree of anticipation and coarticulation in the environment of an underlying nasal segment.

What unifies all three of these descriptions is that there is at least some kind of progressive (i.e., carryover) nasalization in Lakota, and for James (1983) and Ingham (2003), nasal harmony is blocked by voiceless consonants and consonant clusters. Both Mandan and Hoocąk share voiceless consonants as a blocking environment for nasal harmony, so this behavior is expected. Data on nasal harmony across word boundaries in Lakota is not explicitly discussed in the literature, so it is not possible at this moment to conclusively compare how word-internal structure in Lakota compares with the conditions for nasal harmony in Mandan and Hoocąk discussed in §4. However, it is worth noting that there is evidence of nasal harmony in other Siouan languages beyond Mandan and Hoocąk.

The presence of nasal harmony in different branches of the language family raise the question of whether long-distance nasal harmony is prevalent across Siouan as a whole, or simply a parallel innovation shared between Mandan and Mississippi Valley Siouan. The data and analysis presented in this paper suggest that productive nasal harmony may synchronically exist across Siouan. Michaud et al. (2012:214) lay out six different stages of nasalization that have occurred between Proto-Siouan and its evolution into the various Siouan languages.

There is a complicated diachronic relationship between surface and underlying nasal segments throughout the language family, with nasality moving from underlying vowels onto consonants, and in some cases, moving from a consonant back onto a vowel in certain linguistic subgroups. This complex relationship is further rendered opaque by the phonetics-phonology interface in each of the Siouan language varieties, where certain articulatory phenomena may become phonologized or even cause certain phonological elements to become neutralized under phonetic pressures, as discussed in Scarborough et al. (2015). The fact that the Hoocąk and Mandan have a very productive and predictable phonological rule for nasal harmony, coupled with the evidence of some kind of nasal harmony (or at least nasal coarticulation) in Lakota support the hypothesis that nasality is not purely local within Siouan, and different languages may

have varying degress of long-distance harmony at work.

6.   Conclusion and future research

This paper has outlined the conditions for nasal harmony in Hoocąk and Mandan. Nasal spread is progressive in Hoocąk and regressive in Mandan. In both languages, nasalization is triggered by vowels /ą į ų/ as well as consonants /n m/. While nasalizable vowels and consonant /r/ are treated the same in each (with /a i u/ converting to /ą į ų/ and /r/ to /n/), treatment of consonants differs in that /w/ becomes /m/ only in Mandan. Hoocąk and Mandan share many of the same conditions which block nasal harmony, including interruption by a mid-vowel or a (non-nasal) stop consonant. We suggest that word boundaries affect nasal harmony in each language as well, a hypothesis which resolves apparent exceptions to the nasalization rules described in previous research.

This work is among the first of its kind in that we investigate how nasal harmony works in two Siouan languages, as well as investigate the possibility that nasal harmony is not confined to Mandan and Hoocąk. Additional work is needed in other languages to determine to what degree nasal harmony happens, or if Mandan and Hoocąk really are the only two modern languages with productive nasal harmony as part of their phonological systems. More attention is needed for Dhegihan languages and Ohio Valley languages to look for patterns of nasal spreading onto surrounding segments for a better idea of how nasality has evolved in Siouan over time. Not only is this relevant for understanding the development of Siouan languages from Proto-Siouan, such work would also contribute to the typology of nasalization and how phonetics and phonology interact in the environment of nasal segments.

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A phonetic analysis of obstruent series in Hidatsa*

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Abstract: This work represents a preliminary look at the obstruent series in Hidatsa. Various scholars have described a plain and aspirated series in Siouan (Boyle 2007, Park 2012), but there is a disagreement between scholars as to the status of "pre-aspirated" segments. Quintero (2004) notes that Siouanists have long had a debate over whether these so-called pre-aspirated stops are truly monosegmental or if they are a sequence of segments. This paper examines these previous claims and finds support for two underlying stop and affricate varieties: plain and aspirated. Furthermore, we find that there is no phonemic pre-aspiration in Hidatsa, though there is a distinction between underlying /hC/ clusters and a phonological operation of pre-aspiration of obstruents in the environment of heavy syllables bearing stress.

Keywords: aspiration, pre-aspiration, phonetics-phonology interface, Hidatsa, Proto-Siouan

1. Introduction

In this paper, we address the acoustic characteristics of the obstruent series in Hidatsa [ISO: HID; 47°45′N, 102°32′W], a Siouan language belonging to the Missouri River family. Existing descriptions of Hidatsa rarely contain phonetic analysis, and those that exist prior to the twenty-first century involve minimal sets of data with questionable interpretations of spectrographic information (Bowers 1996), or provide cursory descriptions of its sound system, focusing more on morpho-syntax than on the phonetics-phonology interface (Boyle 2007, Park 2012). Boyle et al. (2016) address the phonetic characteristics of word-level prominence in Hidatsa, but do not give a description of its obstruent series.

This paper is the first to examine the obstruent series of Hidatsa in depth, with a particular focus on plosives and affricates. One salient issue in the discussion of obstruents in Hidatsa is that various authors have commented on the status of frication in combination with certain obstruents in Hidatsa, but these works relied on personal perception (Boyle 2007, Park 2012), or uncertain interpretation of phonetic instrumentation (Bowers 1996). As such, the central question of this

work is how do previous analyses of the obstruent series in Hidatsa stand up to an examination of their phonetic characteristics using modern instrumentation?

To address this question, we employ Praat (Boesma & Weenik 2016) to conduct waveform and spectrographic analysis. The data that appear in this work have all been personally collected through fieldwork between 2015 and 2017 on the Fort Berthold Reservation in North Dakota or in the Phonetics Lab at the University of Colorado in Boulder, Colorado. The consultants who participated in these recordings are all L1 Hidatsa speakers who currently reside in Mandaree, North Dakota and have all been long-term educators.

The paper is structured in the following manner: in §2, we provide an overview of previous descriptions of the sound system of Hidatsa, including the vacillating depictions of so-called "pre-aspirated" segments. This description is followed by a typological survey of pre-aspiration in §3, and in §4, we look at the phonetic realization of ⟨hC⟩ elements in the data. In §5, we provide an analysis on whether pre-aspiration is an appropriate term for these particular sounds. We conclude that Hidatsa does not have a pre-aspirated series of obstruents in §6.

2.   Hidatsa sound system

The purpose of this section is to provide a synthesis of previous analyses of the sound system of Hidatsa, given special attention to its obstruents. For the sake of completeness, vowels and fricatives are briefly discussed here, but the primary focus of the following section is to detail the descriptions by other scholars on Hidatsa obstruents. In the introduction to vowels and consonants is a discussion of the sound changes from Proto-Siouan that have resulted in the current phonological inventories we see in modern Hidatsa. The overall goal of this section is to convey the sounds present in Hidatsa to contextualize the controversy over the phonemic status of non-plain stops in the language.

2.1.   Vowels

Rankin et al. (1998:366) reconstruct Proto-Siouan with long and short oral vowels for *a, *e, *i, *o, *u, as well as long and short counterparts for the nasal vowels *ą, *į, and *ų. Phonemic nasal vowels were lost in Missouri River Siouan, with each nasal vowel merging with its oral counterpart (Grimm 2012:19). The vowels of Hidatsa are given in Figure 1.

Figure 1: Hidatsa vowels (Boyle et al. 2016)
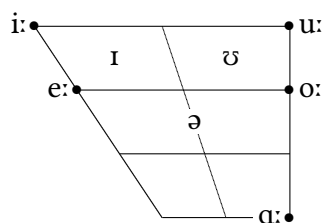
The vowels above in Figure 1 shows a relative symmetry between vowel lengths in Hidatsa, where non-mid long vowels have a short counterpart: /ɑː/::/ə/, /iː/::/ɪ/, and /uː/::/ʊ/. As

Boyle (2007:33) notes, short [e] and [o] are rare due to Proto-Siouan *e and *o merging with *i and *u in Proto-Missouri River, respectively. Park (2012:26) likewise analyzes Hidatsa as having only underlyingly long mid-vowels. Park (2012:397) additionally remarks that phonetically short mid-vowels may occur due to long vowels optionally contracting before fricatives, as well as when appearing word finally. The short vowels tend to be more centralized than their long counterparts, specially when unstressed. When stressed, short vowels are more likely to be produced as tense (Boyle et al. 2016).

In addition to the monophthongs above in Figure 1, there are also two falling diphthongs: /ia̰/ and /ua̰/. Historically, these diphthongs derive from Proto-Siouan *ihe and *uhe sequences, respectively (Rankin et al. 2015). These diphthongs pattern with long vowels with respect to duration and the tendency to attract primary stress (Boyle et al. 2016).[1]

2.2. Consonants

The purpose of this section is to describe the consonants present in Hidatsa. Both Boyle (2007) and Park (2012) have alternated between describing Hidatsa as having a single obstruent series, only to then describe certain elements as being pre-aspirated or post-aspirated. In the subsections that follow, we discuss previous descriptions of the consonant inventory of Hidatsa, first looking at what changes have occurred from Proto-Siouan, then examining the plosives, fricatives, afficates, and sonorants underlyingly present in modern Hidatsa.

Hidatsa has a drastically reduced consonant inventory when compared to the consonant inventory of Proto-Siouan as reconstructed by (Rankin et al. 1998:366). Most reconstructions of Proto-Siouan include four series of stops: plain, glottalized, pre-aspirated and post-aspirated. Fricatives likewise had multiple series, where there is a distinction between plain and glottalized. Consonants are reconstructed across five places of articulation: bilabial, coronal, palatal, velar, and glottal. The inventory below represents the most commonly cited one, which is used in the Comparative Siouan Dictionary (Rankin et al. 2015).[2]

Hidatsa has a drastically reduced consonant inventory when compared to the consonant inventory of the Proto-Siouan in Table 1 above (Rankin et al. 1998). Most of the stop series underwent mergers, with the pre-aspirated and post-aspirated merging with the plain series in Hidatsa. A formalized rule for this sound change appears in (1a), along with examples that to illustrate how this sound change took hold in modern Hidatsa in (1b) through (1d), where we can see that there is a general collapse of the non-glottalized stops. Each stop underwent a merger with its plain series analog, as we can see below.[3]

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[1]Boyle et al. (2016) use a phonetic study of over 500 tokens in Hidatsa, finding that primary stress is assigned through left-aligned, weight-sensitive iambs. Long vowels and syllables ending with a coda /h/ or /ʔ/ are considered heavy syllables. First syllable stress is possible with a heavy syllable, and third syllable stress appears when the first two syllables are light and the third is heavily. Elsewhere, second syllable stress is the default pattern. There are exceptions to this pattern, but unexpected stress is usually found in words that are compounds. Stress assignment in Hidatsa is beyond the scope of the present paper, but is a worthwhile subject of study for future work.

[2]Larson (this volume) argues for at least one additional consonant in Proto-Siouan, a glottalized palatal stop *čʔ, which is not reflected in the table above.

[3]The Proto-Siouan reconstructions that appear throughout this paper come from the online Comparative Siouan Dictionary in Rankin et al. (2015). All proposed Proto-Siouan forms appear as-is, though two changes are made for the sake of making the correspondence between the Proto-Siouan and Hidatsa forms more obvious. Firstly, the reconstructed Proto-Siouan accent is omitted, since accent is not examined in this work. Secondly, long vowels in

Table 1: Proto-Siouan consonant inventory ([Rankin et al. 1998](#):366)

		Bilabial	Dental	Palatal	Velar	Glottal
Plosive	Plain	*p	*t		*k	*ʔ
	Glottalized	*pʔ	*tʔ		*kʔ	
	Pre-Aspirated	*hp	*ht		*hk	
	Post-Aspirated	*ph	*th		*kh	
Fricative	Plain		*s	*š	*x	*h
	Glottalized		*sʔ	*šʔ	*xʔ	
Sonorant		*w	*r	*y		
Obstruent		*W	*R			

(1)   Merger of aspirated stops with plain stops

   a. Sound change

$$\left\{ \begin{array}{l} \text{*hC} \\ \text{*Ch} \\ \text{*C} \end{array} \right\} > \text{C}$$

   b. Post-aspirated to plain
      PSi *pho 'swell' > *bó(hshahi)* [ˈpohʃəhɪ] 'popping sound'

   c. Pre-aspirated to plain
      Psi *hpatE 'butcher' > *(ha)bádi* [həˈpɑtɪ] 'saw, file'

   d. Preservation of plain
      PSi *pųųšE 'spotted' > *búushi* [ˈpuːʃɪ] 'multi-colored, speckled, striped'

In addition to the collapse of the pre- and post-aspirated stop series from Proto-Siouan, the Proto-Siouan glottalized stop series also merged with the plain stops in Hidatsa. Glottalized obstruents, however, metathesized their glottalized element away from the consonant to an opposite position with the neighboring vowel, in effect taking some element from the onset of a syllable and moving it to the coda. This sound change is formalized as a rule below in ([2a](#)), which is then followed by examples of reflexes of this sound change in modern Hidatsa in ([2b](#)) and ([2c](#)). In ([2b](#)), the glottal element and the vowel trade positions, rendering what was originally a glottalized stop as a plain stop, and turning a formerly open syllable into a closed syllable.

Proto-Siouan had plain and glottalized fricatives in addition to its contrast between plain and glottalized plosives. This distinction likewise collapses for fricatives, where glottalized fricatives appear to merge with plain fricatives, as we can see in ([2c](#)).[4]

Proto-Siouan are represented here with a digraph: e.g., instead of the notation *u• that is used in the Comparative Siouan Dictionary, this long vowel appears as *uu in throughout this work. The purpose of this change is to increase the ease of comparison with modern Siouan forms, given that all Siouan languages with contrastive vowel length have orthographies that denote vowel length with a double vowel digraph: i.e., [aː] as ⟨aa⟩.

[4]Crow has traces of coda glottals with fricatives that were glottalized in Proto-Siouan: e.g., PSi *xʔehe 'drip' becomes Crow *xeé* 'leak' [xéː] and Hidatsa *xée* [ˈxeː] 'leak.' The high, flat pitch across the entire long vowel in Crow originates in syllables containing a coda glottal stop (i.e., as opposed to a high pitch that falls to a low pitch), as we can see from in Crow word *chií* [t͡ʃíː], which is a reflex of *kʔį 'carry on back.' We can, in turn, compare this Crow form to its Hidatsa cognate *gíʼ* [ˈkiʔ] as evidence that Hidatsa has preserved coda glottal stops that originate from

(2) Metathesis and mergers in glottalized consonants

    a. Sound change
       *CʔV > CVʔ

    b. Glottalized plosives to plain with glottal stop coda
       PSi *kʔį 'carry on back' > *gí* ['kiʔ] 'pack, carry on back'

    c. Glottalized fricatives to plain
       PSi *sʔįį 'peek' > *cíi(shi)* [ˈt͡siːʃɪ] 'scout'

    The remaining consonants posited in Rankin et al. (1998) show a similar tendency towards mergers. Proto-Siouan *y merges with *r in Missouri Valley Siouan and Mandan. So-called "funny" *W merges with /w/ in Hidatsa, and "funny" *R and *y merging with /r/ (Rankin et al. 2015).[5] The single non-merger sound change from Proto-Siouan to Hidatsa is that PSi *s affricated to *c* [t͡s]. A summary of these sound changes appear in (3) through (5).

(3) Merger of voiced obstruents with sonorants

    a. Sound change
$$\left\{ \begin{matrix} \text{*W} \\ \text{*R} \end{matrix} \right\} > \left\{ \begin{matrix} w \\ r \end{matrix} \right\}$$

    b. *W to *w*
       PSi *Waate 'boat' > *máahdii* /wɑːtiː/ 'boat'

    c. *R to *r*
       PSi *Rase 'behind, in back' > *(áa)raci* /ɑːɾət͡sɪ/ 'at one side'

(4) Merger of non-velar sonorants

    a. Sound change
       *y > r

    b. Palatal to coronal
       PSi *wiyą 'tree, wood' > *mirá* /wɪɾə/ 'tree, wood'

(5) Affrication of *s

    a. Sound change
       *s > c /t͡s/

    b. Fricative to affricate
       PSi *sii(-re) 'yellow' > *cíiri* /t͡siːɾɪ/ 'yellow'

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glottalized plosives, but not those that originate from glottalized fricatives. Boyle et al. (2016) find no pitch accent in Hidatsa, and as such, there are no direct reflexes of the glottal element Proto-Siouan glottalized fricatives.

    [5]The is no consensus on the phonetic values of "funny" *W and *R. These segments differ from *w and *r in that they often have reflexes that are sonorants in some daughter languages, but plosives in others. See Rankin et al. (1998:371) for additional discussion of these elements. There is some evidence that suggest that *R may have been *rʔ, as there are some examples of words in Hidatsa that involve /ɾ/ followed by a vowel and glottal stop, similar to the glottal metathesis described above: e.g., PSi *Re 'ache' > *aré* [əˈɾeʔ] 'hurt.' There are many other instances of *R being realized as /ɾ/ in Hidatsa and not /ɾVʔ/: e.g., PSi *Roksi 'armpit' > *nóhci* /ɾoht͡sɪ/ 'armpit.' The existence of two different reflexes with no obvious conditioning factors raises the question of whether *R represents a single proto-form in Proto-Siouan or whether there exists $*R_1$ and $*R_2$, where one proto-form is *rʔ and the other is some other element with obstruent-like qualities.

All of these mergers yield the consonant inventory below in Table 2. This table reflects the consonant inventory that is proposed in both Boyle (2007) and Park (2012). Compared to the inventory of Proto-Siouan consonants shown in Table 1, the sound inventory in Hidatsa is drastically reduced and has far fewer contrasting segments than its ancestor language.

Table 2: Hidatsa consonant inventory (Boyle 2007:27)

	Bilabial	Dental	Palatal	Velar	Glottal
Plosive	p	t		k	ʔ
Fricative			ʃ	x	h
Afficate		t͡s			
Sonorant	w	ɾ			

This section has provided an overview of how the sound system of Hidatsa evolved from Proto-Siouan. The data in Table 2 above is a consensus of most descriptions of the consonant inventory of Hidatsa from the twentieth and early twenty-first centuries (Stetson 1946, Boyle 2007, Park 2012, *inter alios*). The following subsections serve to describe the obstruents in Hidatsa. Given that this paper addresses the obstruent series in Hidatsa, there will be no discussion of the sonorants /w/ and /ɾ/ here.

2.2.1. Plosives

Modern accounts of the sound system of Hidatsa equivocate somewhat on whether Hidatsa has only one or multiple series of stops: plain, plain and post-aspirated, or plain with post- and pre-aspirated. Most descriptions state that stops may be partially or fully voiced when intervocalic. Boyle (2007:27) holds that there is only a single series of stops, where /h/ can appear as the final element in a consonant cluster. However, he refers to sequences of stops followed by /h/ as being aspirated throughout his description of Hidatsa. This treatment follows similar theoretical positions by Matthews (1965) and Jones (1984).

Park (2012:19) likewise lists only plain stops in his description of the plosive inventory of Hidatsa. Like Boyle (2007), whenever an /h/ follows a voiceless stop, Park (2012) describes this sequence as being post-aspiration.

(6) Post-aspiration in Park (2012)

     a. *beericgisdabeedhé* → [ˈpeːɾit͡skɪʃtəˌbeːtʰe] 'sleet' (lit. 'raven's eye secretion')

     b. *idawirúxibhi* → [ɪdəwɪˈɾuxɪˌpʰi] 'ice cream'

     c. *áàbhiru* → [ˈɑːpʰɪˌɾu] 'neck bone'

     d. *aˀghúù* → [ˈɑʔˌkʰuː] 'to bring it along'

According to Park (2012:66), aspirated stops are "always underlying clusters," which is the reasoning he provides for why his orthography does not have a unique grapheme for aspirated stops versus unaspirated stops: i.e., ⟨dh⟩ for [tʰ] and ⟨d⟩ for [t], instead of ⟨t⟩ for [tʰ] like other Hidatsa orthographies. The purpose of this paper is not to evaluate why one orthography is better suited for writing Hidatsa than another, but it is worth noting that most writing systems for Hidatsa take into account the fact that there is some distinction between a true voiceless stop and one with a glottal fricative element that follows it.

Despite the fact that both Boyle (2007) and Park (2012) agree that there are no true post-aspirated stops underlyingly in Hidatsa, these "aspirated clusters" do not behave like other consonant clusters phonotactically. Namely, Park (2012:30) remarks that there are no word-initial clusters in Hidatsa, with the exception of those who are underlyingly /Ch/. Furthermore, there is little discussion in the literature as to how syllabification works in Hidatsa, and there is nothing explicit pertaining to how word-internal "aspirated" stops are treated, either within words with no obvious morphological boundaries (e.g., *pí* [ˈpʰi] 'be blue' or *káa* [ˈkʰɑː] 'laugh') versus compounds (e.g., *áapiru* [ˈɑː.pʰɪ.ˌɾu] versus [ˈɑ.p.hɪ.ˌɾu] 'neck bone' from *áaba* 'neck' and *hirú* 'bone').

The other area where previous descriptions of Hidatsa stops varies is in whether there are pre-aspirated plosives. Boyle (2007:34) states that pre-aspiration is lost word initially, but that "word-intern pre-aspiration is always a coda: Vh-CV." Park (2012:150) likewise argues for the existence of a single stop series, but describes clusters beginning with /h/ as being "phonetically pre-aspirated." Boyle (2007:30) admits that he has difficulty discerning this so-called "pre-aspiration" in certain contexts, so we shall utilize data from Park (2012) to look at instances of alleged pre-aspiration in Hidatsa.[6]

(7) Pre-aspiration in Park (2012)

    a. *séhbi* → [ˈʃehpɪ] 'be dark'

    b. *núhdabi* → [ˈnuhtəˌbi] 'be tight-fitting'

    c. *sáhgi* → [ˈʃɑhkɪ] 'be open'

Throughout the literature on Hidatsa plosives, the description of these stops stand at odds with itself over the status of these elements: are they singleton stops that are pre-aspirated or are they truly a consonant cluster? If previous scholars are simply using the terms aspirated and pre-aspirated as a shorthand for these elements, then we should be more specific in how to describe them so as not to confound these phenomena in Hidatsa with terms that are more theoretically grounded in the typology. We evaluate the possibility that they truly are aspirated or pre-aspirated from a phonetic point of view. This issue is central to this paper, which is discussed in detail in §5.

The primary focus of this paper is to examine how many obstruent series exist in Hidatsa, and we pay special attention to plosives, given the four-way distinction that existed in Proto-Siouan. In addition to the plosives described above, Hidatsa also possess an affricate that often patterns with plosives phonologically. This affricate is described below.

2.2.2. Affricates

Hidatsa has a single affricate, ⟨c⟩ /t͡s/. This phoneme is often voiced intervocalically. Park (2012:20) observes that obstruents are most likely to remain voiceless "in morpheme-initial positions and when preceded by a prefix or a proclitic." As such, we should expect word-initial obstruents like /t͡s/ to remain voiceless when word initial. This pattern is indeed what we generally observe in the data for /t͡s/, which can be seen in the examples below.

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[6]The phonetic transcription of the data in this section assume Park's (2012) assumption that post-aspirated obstruents are phonetically post-aspirated as well as Boyle's (2007) description of pre-aspiration as being a coda /h/. We expound upon this matter and whether this is the most phonetically and phonologically accurate way to depict such data in §5.

(8) Voicing of /t͡s/ in Hidatsa

    a. *cacúgi* → [t͡sə'd͡zugɪ] 'flea'

    b. *cagíc* → [t͡sə'git͡s] 'it is good'

    c. *có'da* → ['t͡soʔtə] 'be gray'

    d. *cíidadagi* → ['t͡siːdədə'gi] 'white-tailed deer'

In addition to patterning like stops, the affricate /t͡s/ also has been described as having an "aspirated" counterpart, [t͡sʰ]. Boyle (2007) depicts this sound in his orthography with ⟨cc⟩, and Park (2012) uses ⟨ch⟩. We can see examples of this sound in the data below.

(9) Post-aspirated affricates in Hidatsa

    a. *mé'cci* → ['meʔt͡sʰɪ] 'knife'

    b. *naxbícci* → [nəx'pit͡sʰɪ] 'bear'

    c. *úuccee* → ['uːt͡sʰeː] 'make something dry'

    d. *máacciruwadu* → ['mɑːt͡sʰɪˌɾuwəˌdu] 'chokecherry'

In addition to the existence of these post-aspirated affricates, there are numerous instances of what both Boyle (2007) and Park (2012) would call pre-aspirated affricates. Examples of these supposedly pre-aspirated elements appear in the data below. These data demonstrate that there is no restriction on the quantity of instances of aspiration that can appear in a single word, as (10c) contains both what Boyle (2007) and Park (2012) would label as pre- and post-aspiration.

(10) Pre-aspiration in Park (2012)

    a. *híhci* → ['hiht͡sɪ] 'pink'

    b. *móohcaa* → ['moːht͡sɑː] 'coyote'

    c. *gháhcaac* → ['kʰɑht͡sɑːt͡s] 'he/she smiles'

Almost universally throughout previous descriptions of Hidatsa, the words in (9) have been described as having "aspirated" elements. This pattern is similar to the data in (6), where sounds are described as being aspirated or post-aspirated, but then there is some kind of back-tracking, where the authors deny that there is any underlying aspirated consonants in Hidatsa; all surface post-aspiration reportedly comes from underlying /Ch/ clusters. The affricate /t͡s/ in the data above also mirrors the behavior of plosives in that it is able to appear with sublaryngeal frication before an oral occlusion (i.e., a stop or the stop element of an affricate). We see this frication reflected in the transcriptions of (7) and (10).

2.3. Fricative

Hidatsa fricatives, unlike stops and affricates, typically resist intervocalic voicing (Boyle et al. 2016). Robinett (1955:1) analyzes some Hidatsa words as having fricative plus /h/ clusters, and Boyle (2007:30) goes so far as to suggest that there may be some post-aspirated fricatives in Hidatsa. These descriptions, however, all seem to stem from Stetson's (1946:136) observation that Hidatsa fricatives are much longer in duration than stops. Boyle (2007:30) notes that these

clusters are problematic, with various scholars transcribing certain segments as being sequences of a fricative plus /h/ or /h/ plus another fricative.[7]

Given that the focus of this paper is on stops and fricatives, the information above is the greatest extent to which fricatives shall be discussed in this paper. Park (2012:31) remarks that fricatives that co-occur with /h/ can methathesize and also can be produced as a geminate fricative in casual speech. The interaction between fricatives in clusters involving /h/ is topic that requires explanation beyond the scope of this paper, but is certainly an issue that is worthy of exploration in future work.

2.4. Summary

One fact that we repeatedly observe in the data is that there is glottal frication that interacts with plosives and affricates in Hidatsa. Scholars from the first half of the twentieth century have stated that there is a contrast between plain and post-aspirated (i.e., lenis and fortis) obstruents (e.g., Robinett (1955)), while most analyses in the second half of the twentieth century and those conducted during the twenty-first century are synoptic on the issue of there being a single obstruent series in Hidatsa (e.g., Boyle (2007) and Park (2012)). This concord between modern scholars on this single obstruent series belies the fact that these analyses simultaneously describe various elements as being pre-aspirated or post-aspirated at a phonetic level. The following section delves into the issue of what are the current notions of pre-aspiration so that we can examine whether Hidatsa truly does have pre-aspirated obstruents or if these elements are truly clusters.

3. Typology of pre-aspiration

Pre-aspiration is a rare phonological phenomenon occurring in only 1 percent of the world's languages (Clayton 2010:23; Helgason 2002:32). Pre-aspiration is the glottal friction that "intercedes after a vowel and precedes a consonant" (Clayton 2010:7). Thus, it is the expulsion of air before the release of consonants, much like an English h-sound after the consonants /p, t, k/. This aspirated phase, preceding the closing, has come to be identified as an h-sound or a "puff of air" (Bloomfield 1925:152; Helgason 1998:16, 2002:11). Hejná (2015:73) offers the following definition: "pre-aspiration is often accompanied by breathiness, which presumably serves as a transition from the modal voicing of the vowel to the voiceless pre-aspiration portion." For a geographical distribution of the languages claimed to include pre-aspiration, see Figure 2 below, in which Hidatsa is labeled in red.

The map below highlights that many of the languages that have been described as having pre-aspiration are found in the Americas. However, there are numerous European languages that include language varieties where pre-aspriatation is present. Pre-aspiration may appear to be an areal feature of indigenous languages of the Americas (North America with Mesoamerica

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[7]None of the previous accounts of the sound system of Hidatsa have used any kind of instrumentation to back up their analyses, though Bowers (1996:80) does try to argue in favor of the existence of laryngealized and glottalized fricatives, but the spectrographic data he employs does not lead us to the same conclusion. Further obscuring Bowers's (1996) case is that he relies on numerous non-standard diacritics in his transcriptions without defining what these diacritics mean. While his dissertation represented the first published phonetic work on Hidatsa, that work is largely not taken into account in this paper due to the points raised here.

in particular), but the fact remains that pre-aspiration is likely underdocumented, and additional work on languages of Africa and Asia may yield more instances of pre-aspiration.

Figure 2: Geographical distribution of languages claimed to have pre-aspiration[8]

This section has served to give a formal definition of pre-aspiration. This definition is somewhat vague, in that these definitions of pre-aspiration can be interpreted as being /h/ segments that occur before another consonant, or glottal frication that occurs with a consonant that renders that consonant phonologically distinct in that language. Thus, a consonant cluster like /ht/ could be called pre-aspiration, but so could the frication present that distinguishes /t/ from /ʰt/. Our question is whether Hidatsa possesses "true" pre-aspiration (i.e., [ʰC] segments), or if all the elements described in the literature on Hidatsa as being pre-aspirated are solely consonant clusters (i.e., [hC] sequences).

4.   Phonetic analysis of pre-aspiration in Hidatsa

To investigate the status of pre-aspiration in Hidatsa, we gathered audio recordings from L1 Hidatsa speakers and analyzed the recordings using instrumentation. This section serves to walk the reader through the process we used to test the question of whether Hidatsa has a single obstruent series or if there are phonemic pre-aspirated obstruents. We discuss the results, which lead to our discussion of pre-aspiration in Hidatsa in the following section.

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[8]This map is a compilation of the languages and language varieties discussed throughout Clayton (2017) and Silverman (2003) as having pre-aspiration. Its purpose is to show that Hidatsa is geographically proximate to a number of languages that exhibit pre-aspiration.

4.1. Participants

Study participants include four female L1 speakers of Hidatsa above the age of 60. All had been monolingual in Hidatsa until attending boarding school, and all continue to use the language regularly in their adult lives at home. Each participant currently resides in Mandaree, North Dakota and have all been long-term educators. All speakers currently live on the Fort Berthold Reservation in North Dakota, in Mandaree or New Town.

4.2. Stimuli

Stimuli included elicited words and careful reading of two children's stories ("Prarie Dog Goes to School" and "The Buffalo and the Bullboat").[9] The elicited word list came from a combination of the Hidatsa dictionary project that took place on Fort Berthold between 2014 and 2016, and from elicited word lists and sentences recorded at the University of Colorado Boulder through a CARTSS grant. These stimuli illustrate the Hidatsa clusters (h+C) in medial position. Cross-linguistically, pre-aspiration usually occurs in medial position (name source about initial position). Table 3 below is an example of the stimuli used in this study.

Table 3: Sample stimuli

Preceding vowel	Consonant cluster	IPA	Word	Gloss
í	⟨hb⟩	[ˈt͡sihpə]	*cíhba*	'prairie dog'
áa	⟨hd⟩	[ˈɑːhtʊ]	*áahdu*	'head'
í	⟨hg⟩	[ˈpuːʃihke]	*búushihge*	'cat'
óo	⟨hc⟩	[ˈpuːʃihke]	*moːht͡sɑː*	'coyote'
í	⟨hsh⟩	[ˈhihʃuə̯]	*híhshua*	'mint'
ó	⟨hsh⟩	[ˈohxɑːdɪ]	*óhxaadi*	'white'

We included stimuli where previous scholars have identified a glottal fricative preceding an obstruent. These sources include items present in Boyle & Gwin (2006), Boyle (2007), Park (2012), Boyle et al. (2016), as well as personal fieldwork conducted by the present authors.[10]

4.3. Recording and analysis

Recordings were made throughout several summers between 2015 and 2017 on the Fort Berthold Indian Reservation in North Dakota at Nueta Hidatsa Sahnish College or in the Phonetics Lab at the University of Colorado Boulder. The recordings were made using a Blue Shure microphone in a constructed sound-proof room and saved as waveform audio format (.wav) files. The data were

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[9]Videos that contain the visuals of these stories with a speaker reading along can be found at https://www.youtube.com/watch?v=RB5M1-1ZWQo and https://www.youtube.com/watch?v=EeYeywXvsPI.

[10]There were instances of data that were sought out that had to be discarded due to the fact that we could not corroborate the presence of any glottal frication or other phonetic elements aside from a vowel and a supralaryngeal obstruent where a previous scholar had transcribed a ⟨h⟩. The overtranscription of ⟨h⟩ scholars for Hidatsa could be due to the perception of breathiness on the part of the speaker that is non-linguistically salient (i.e., a speaker might just have a particularly breathy style of phonation across the board rather than trying to use breathy voice to indicate the presence of ⟨h⟩.

analyzed with Praat (Boesma & Weenik 2016) to conduct waveform and spectrographic analysis. The segmentation of pre-aspiration was made according to current practice, a narrow approach, labeling pre-aspiration as two components: segmenting both breathiness and pre-aspiration (Hejná 2015, 2016). Hejná (2015:43) believes that by applying the narrow approach, it provides a better understanding of how pre-aspiration develops historically. Each token, including an obstruent series, was segmented and labeled, as shown in Figure 3.

Figure 3: Example of the identification and segmentation of *máahdiiraxbihtaa* [maːʰtiːɾaxpiʰtaː] "in the boat" in word-medial position showing breathiness; br = breathiness; pre = pre-aspiration; closure = closure
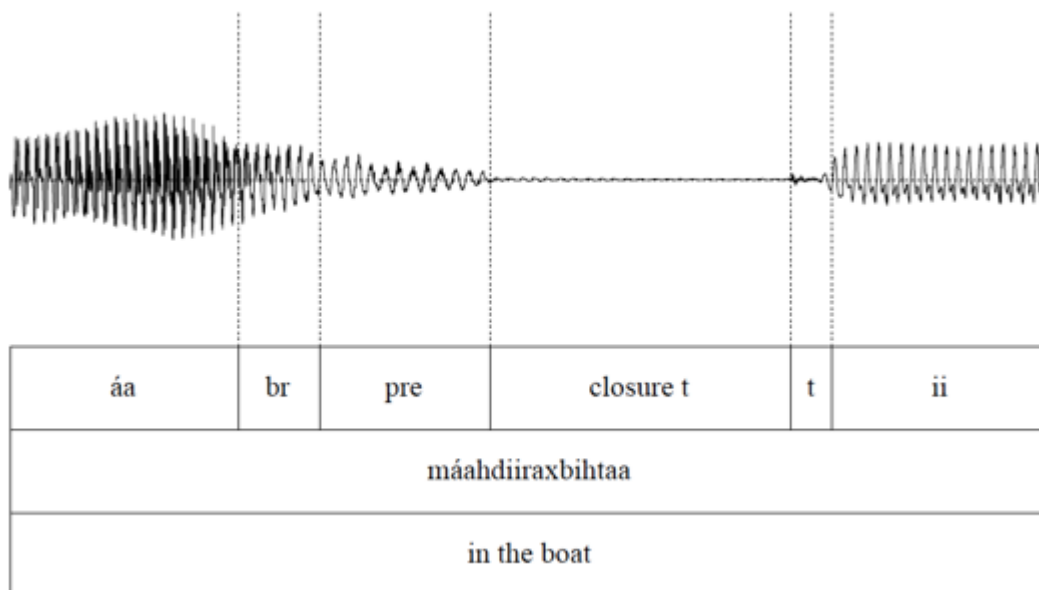
The beginning of the pre-aspiration segmentation was labeled similarly to the segmentation throughout Hejná (2015), where there is focus on segmenting the components of pre-aspiration narrowly. Boundary lines were labeled where there are increasingly less quasi-sinusoidal ripples in the waveform, this is the indicator of an articulatory gesture associated with voicing cessation. The breathy interval was segmented to end where these high quasi-sinusoidal ripples terminate (Hejná 2015:75).

4.4.   Results

The main goal of acoustically analyzing the Hidatsa obstruent series is to understand the status and manifestations of the series. We find that speakers either preserve, omit, or insert an alternative surfacing manifestation in replacement for the /h/ segment in h+C clusters. In this subsection, we provide a preliminary description of these occurrences.

Of the 127 analyzed clusters for this study, we find a division between the number of /h/ occurrences (n=92) and the number of instances when /h/ was not present in the cluster (n=35). Figure 4 presents this divide. These numbers represent a strong tendency in Hidatsa to preserve

underlying /h/ in the output. This strong tendency, however, still has a large number of tokens in which the /h/ is omitted.[11]

Figure 4: Number of of tokens when /h/ was either present or not in h+C sequences for speakers
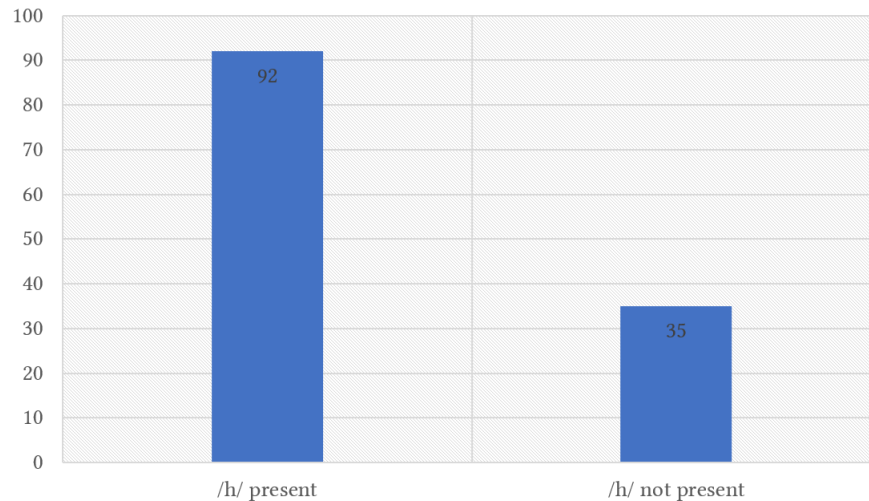
Below, additional acoustic evidence is provided in Figures 5 and 6 to support the preservation of /h/ and the omission of /h/ in h+C clusters. In Figure 5, an arrow is given to display the timing of the production of /h/ in the word *íihga* [í:hkə] 'chi.' (62.71ms). Figure 6 represents the word for 'eight,' *núubahbi* [nu:bapi] (107.24ms).

Figure 5: Preserved /h/ in *íihga*   Figure 6: Omitted /h/ in *núubahbi*
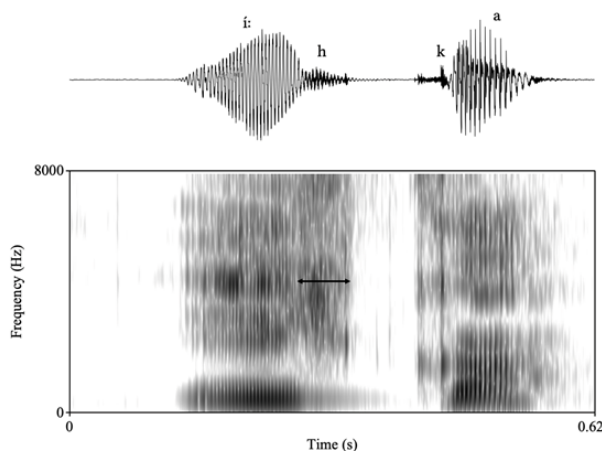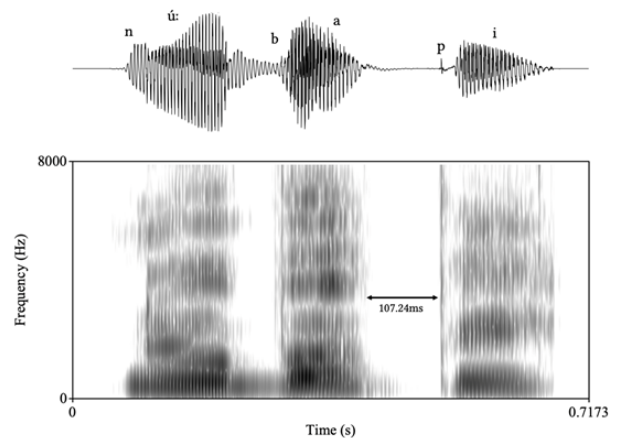
Notice in Figure 5, the given arrow is a selection of friction noise, with aperiodic noise, that represents aspiration. Here we see a preservation of the /h/ phoneme in the h+C cluster. Oppositely, in Figure 6, there is evidence of silence in the spectrogram. This is represented by

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[11]These omissions are never systematic: i.e., in certain productions of a token, the /h/ is present, while in others, it is not. Thus, we are not relying purely on the transcriptions of previous scholars, but investigating whether there is a /h/ there in the first place.

the arrow. The waveform displays a flat line which supportingly indicates a missing segment in the h+C cluster. For the occurrences where /h/ was not present, some were omitted (n=13) or surfaced with entirely different manifestation (n=22). Figure 7 displays this distribution.

Figure 7: Number of /h/ omissions or alternative surfacing manifestations of h+C
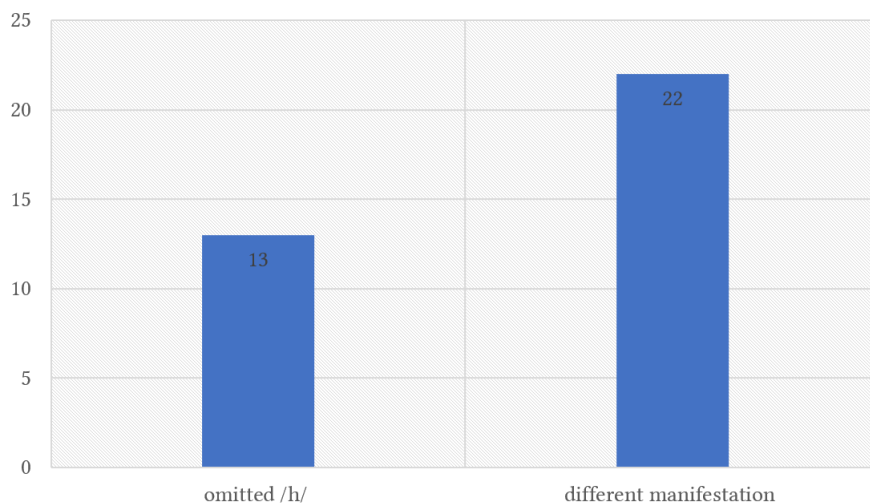
We find an outcome of three-way division for the tokens that presented with different surfacing outcomes other than /h/ in h+C cluster sequence. This three-way division is represented below in Figure 8. The alternative surfacing manifestations included glottal stop insertion (n=2), an extended closure duration (n=2), and evidence of /h/ assimilating to the following segment in the cluster (n=18).

Figure 8: Number of occurances for alternative surfacing manifestations
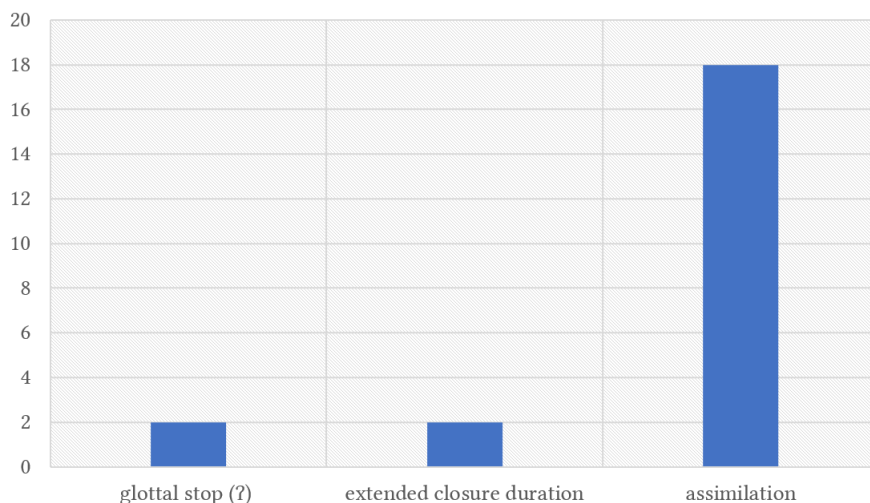
Figures 9-12 offer acoustic evidence for this three-way division. Figure 9 shows evidence of glottal stop insertion for /h/ in the word *áhgagoori* [ˈʔaʔkəgoːɾɪ] 'thousand.' Notice in the spectrogram of this figure, a quick transient burst indicated by a vertical line after the production

of the vowel. This indicates that the phoneme replaced here in this cluster is something other than a glottal fricative /h/. Figure 10 displays extended closure duration (173.60ms) in the word *xúhdi* [ˈxutɪ] 'gloves.' The period of this closure can be compared to that of Figure 6 where the closure duration measures less (107.24ms). Similarly to Figure 6, Figure 10 also omits the /h/ segment in the word *xúhdi*. Like our previous observation of Figure 6, Figure 10 shares the same characteristics of a flat line in its waveform, proving the omission of the /h/ segment.

Figure 9: /h/ as [ʔ] in *áhgagoori*   Figure 10: /h/ as extended closure in *xúhdi*
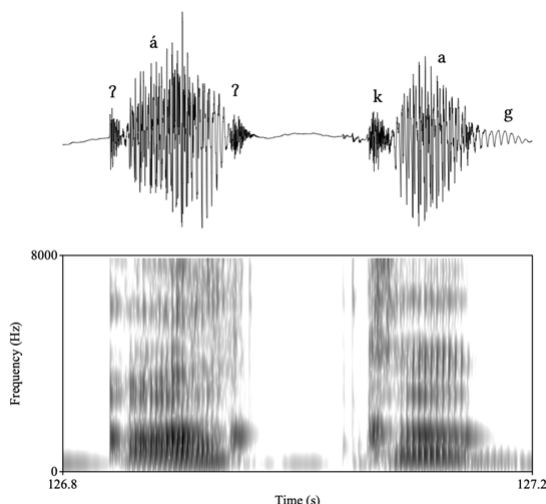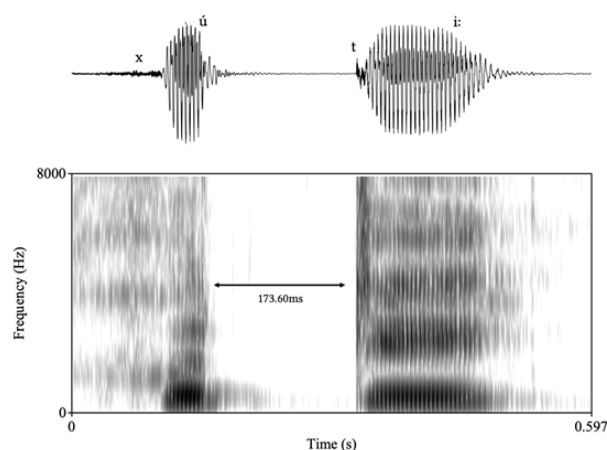
Figures 11 and 12 represent *híhshu* [ˈhiʃʊ] 'mint' and *híhci* [ˈhistsɪ] 'pink,' respectively. These tokens show evidence of the first component of the cluster (underlyingly /h/) assimilating to the second component of the group. Here in Figure 11, we see a lengthened aperiodic production of the /ʃ/ phoneme with slighlty lower frequency than the /s/ phoneme in Figure 12. Evidence for /s/ in the output for *híhci*, rather than an /h/ phoneme seen in Figure 5, is proven through the high frequency turbulent airflow.[12] The surfacing outcomes of this connected speech is that 1) the cluster becomes one long phoneme, evidencing a similar waveform structure to a geminate phoneme, and 2) the first component becomes more like one of the components from the affricate.

It should be noted that there were three occurrences in the data where *h+c* (/t͡s/) preserved the /h/ component in the cluster, though alternative realizations of /h/ were more common in the environment of the affricate. Another factor we examined was the interaction of stress and the manifestation of /h/ for h+C clusters. Figure 13 displays a breakdown of the distribution of the effect of stress upon the realization of /h/ in a h+C cluster. We find that preceding stress plays no no statistical significance role in /h/ deletion or assimilation.

One may argue for a geminate phoneme for the waveform structure of Figure 10, since a language is said to have a geminate contrast when the contrast affects the duration of the sound (Blevins 2008). However, it is not uncommon to find surface geminates derived by some phonological processes, most often by assimilation like we see happening in Figures 11 and 12 (Ridouane

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[12]An /h/ phoneme in a spectrogram appears with faint formant bands. A glottal frictive generates its turbulence in the same place where voicing originates so the turbulence of /h/ is subject to the same filter as a vowel (Freeman 2012:89).
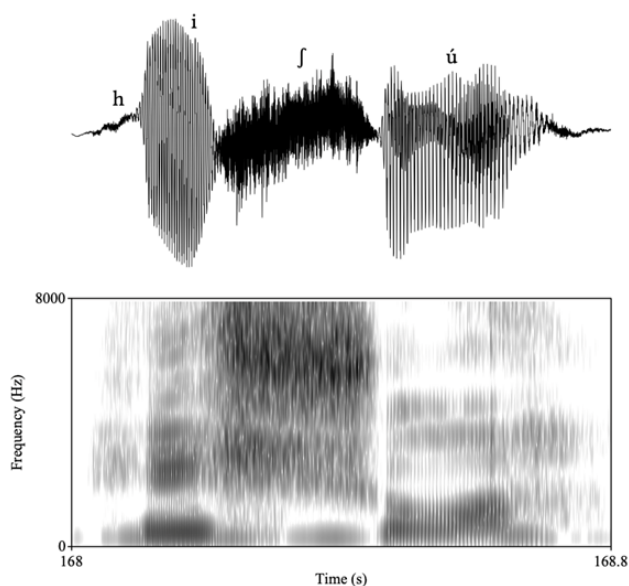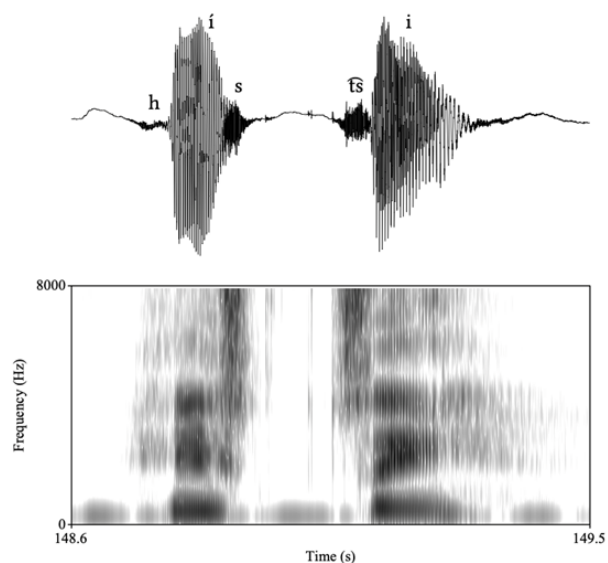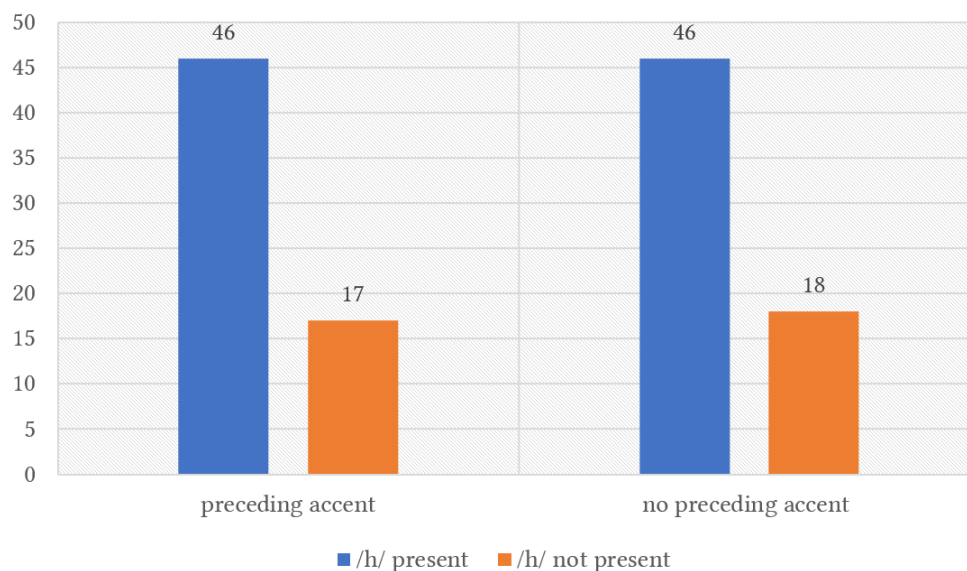
Figure 11: /h/ assimilating in *híhshu*   Figure 12: /h/ assimilating in *híhci*

Figure 13: Influence of preceding stress on the presence of /h/ in h+C cluster

2007). For this reason, we do not suggest that Hidatsa has geminate consonants, as well as because these false geminates represent a minority of the manifestations of /h/ in a cluster.[13] Of the 127 tokens used in this study, only 20 tokens exhibited an assimilation pattern. Additional work is needed to further corroborate this analysis, but an analysis that posits underlying geminates

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[13]Some scholars have proposed that Hidatsa has geminates, but those observations are not borne out in the data. Graczyk (2007) certainly describes Crow, Hidatsa's nearest relative, as having a contrast between singleton and geminate obstruents, but the phonetic data for Hidatsa here does not suggest that gemination is an inherited trait for both languages.

would need to somehow account for the fact that assimilatory processes (i.e., /h/ assimilating to either the place and/or manner of articulation of the following obstruent) make up approximately one-sixth of the observed data. The most parsimonious analysis is that Hidatsa has an underlying /h/ that has a higher degree of phonetic realization, and that assimilation represents only one possible manifestation of those glottal fricatives.

5. Discussion of pre-aspiration versus consonant clusters

Overall, the data examined for this paper found that there is a degree of variability with respect to the phonetic realization of consonants that have been described as "pre-aspirated" in Hidatsa. Given the consistency of how post-aspirated elements are described throughout the literature, we have not examined phonetic characteristics of said obstruents, though this is a topic that future work should focus on. The results of our analysis showed us that the status of /h/ that is part of consonant clusters is not easily explained. Furthermore, these data did not conclusively show that "pre-aspiration" occurs uniformly for all speakers.

5.1. Impact of study

This paper is a preliminary descriptive sketch of the obstruent series h+C in Hidatsa. The methodology pursued this analysis is discussed in this section. One possible objection a reader may have relies heavily on elicited text for acoustically describing the obstruent series h+C. Using elicited tokens that were collected for learning materials could have an impact on the production of the series i.e., hyper-articulation. As a result, one may claim that implications cannot be drawn on the description of these clusters based solely on this analysis. While we acknowledge here that this report is preliminary, it still provides insight to any unanswered questions regarding the status of pre-aspiration for any future studies of the series in Hidatsa.

5.2. Areas for future research

One major issue throughout this study is that the /h/ in h+C clusters had a wide range of realizations. One factor that was not controlled for was looking at individual speakers. It is possible that some of this variation is idiolectal or familylectal. While all the speakers we worked with were cousins and have shared close ties throughout their lives, different households could be influenced by other members that were not part of this study. Further work is needed to divide the data by speaker and see what patterns emerge.
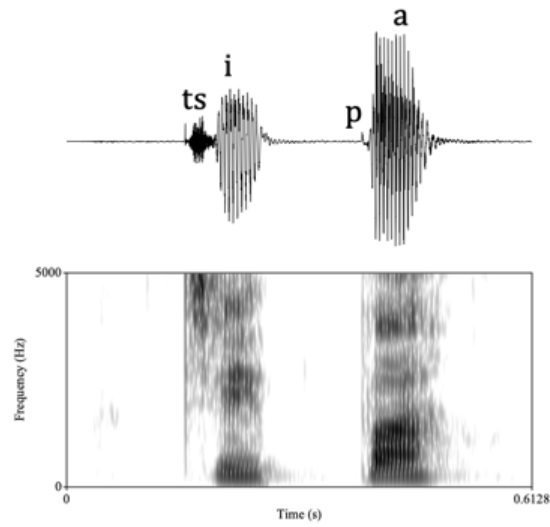
Another issue to be examined further is that of closure duration in h+C clusters. Extended closure duration measured for Figure 8 averaged 229.19ms. Although, on average closure duration appears to be long for speaker of Hidatsa or again it could be that the speakers were conscious that the elicited words would become the database to an online dictionary. All of the consultants involved in this work are also educators, which could be a confounding factor, as individuals may have tried to model words for future learners to discern their pronunciation. That is to say, there may be a question of how natural the speech we collected was. Follow-up work is needed to rule out any possibility of hypercorrection being a confound for closure duration.

Figure 14: Speaker 1's *máahci* 'pine'   Figure 15: Speaker 2's *máahci* 'pine'
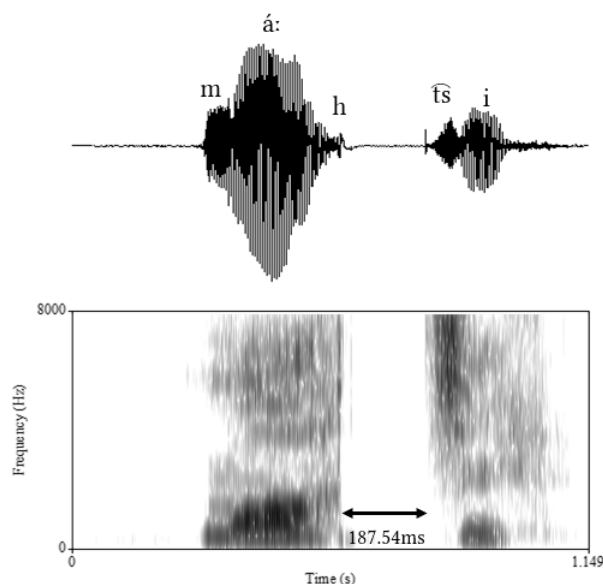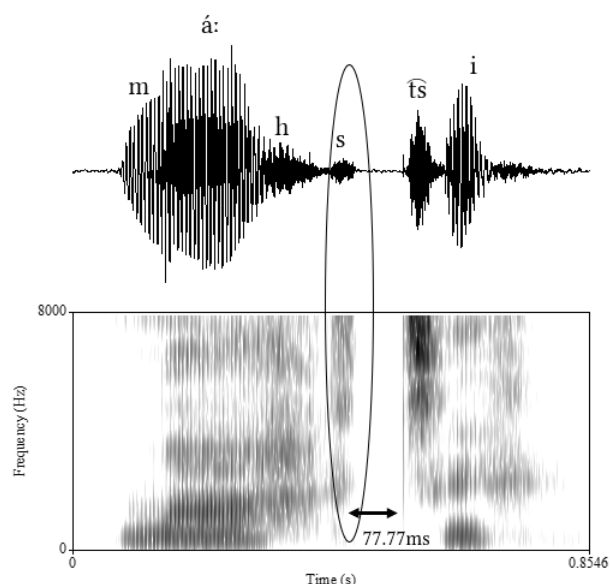
In particular, we can compare the difference in closure duration in Figure 14 above and compare it to Figure 15. Above, we see two examples of the same token from two different speakers for *máahci* [ˈmɑːht͡sɪ] 'pine.' In Figure 14, an arrow is provided to display the lengthened closure duration (187.54ms) in comparison to the speaker in Figure 15. In addition, Figure 15 displays a circle to show the production *h+c* [hst͡s]. We can see that Figure 14 has a slightly longer closure duration than all others in all examples shown in this paper, and Figure 15 mirrors Figure 12 in that there is some assimilation of the /h/ to the following obstruent, but the /h/ does not assimilate completely; there is a transition from [h] to [s], raising the question of gestural timing.

Ultimately, one factor that seems to be playing a decisive part in creating this variability is the many viable phonetic possibilities for how /h/ is realized when part of a cluster. Boyle et al. (2016) made the case that Hidatsa is a stress accent language where primary stress is assigned through weight-sensitive left-aligned iambs. Furthermore, coda glottal elements added to syllable weight, attracting stress. If these /h/ segments are really underlyingly present in the input, then it makes sense that there is a large range of possible gestures for /h/, as speakers are simply trying to fill a timing slot with some indicator that there is a mora present. We can see this process at work in the pronunciation of two different speakers for the word *cíhba* 'prairie dog' in the figures below.

Figure 16 shows ommision of the /h/ in the h+C cluster series. Recall from Figures 5 and 10, that a flat line and silence are indicators for an omitted segment. Here in Figure 16, we see identical acoustic evidence where the /h/ is omitted in the h+C cluster series. Oppositely, Figure 17 preserves the /h/ segment. Furthermore, Figure 17 displays the effects of breathiness moving leftward into the vowel and the preservation of /h/ in the cluster. In addition to the waveforms and spectrograms in Figures 16 and 17, a schematic representation is provided of the laryngeal opening gesture that is variably aligned relative to the oral articulators. The gestural figure is adapted from diagrams appearing throughout Beddor (2007).

Figure 16: Speaker 1's *cíhba* 'prairie dog'   Figure 17: Speaker 2's *cíhba* 'prairie dog'
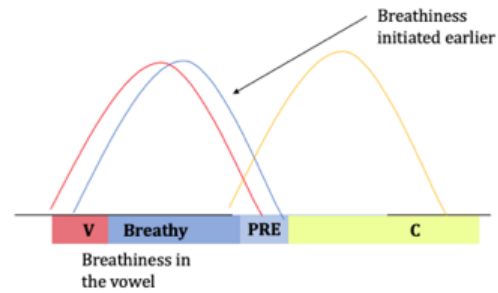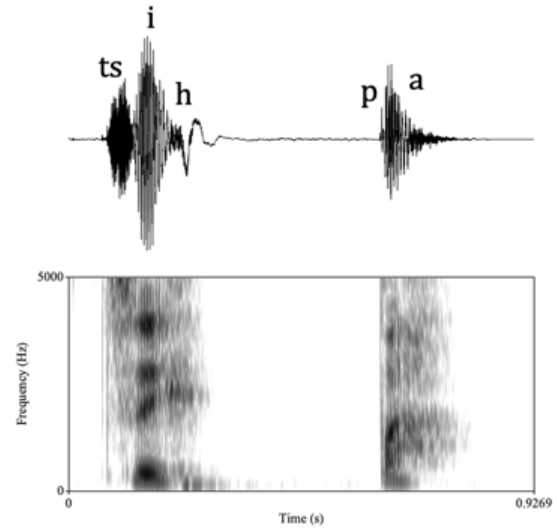
Figures 16 and 17 give supportive schematic representations of the re-alignment of the laryngeal opening gesture in pre-aspiration. The laryngeal opening gesture is evenly sized for both occurrences in Figure 16 and Figure 17, but the initiation of the onset of breathiness in Figure 17 occurs earlier in the vowel (anticipatory pre-aspiration). We see the gestural feature of aspiration become anticipatory for the speaker and move leftward into the vowel in Figure 17.

Figure 16 gives a schematic representation of the omission of /h/, showing the deleted laryngeal gesture. Additional work is needed with current speakers along with examining older recordings to determine the directionality of this variability. Namely, is one realization of /h/ becoming more common over time, or have these variable productions of /h/ in h+C clusters existed since the time of the earliest Hidatsa recordings in the first half of the twentieth century. If this variability is a newer phenomenon, then Hidatsa could be undergoing a sound change with respect to the realization of coda /h/.

6.   Conclusion

While other work has been done on areas of the sound system of Hidatsa, such as the work by Boyle et al. (2016) on primary stress and syllable weight, much more work needs to be done. This study represents an initial attempt to look at the obstruent series in Hidatsa. We cannot

conclude that Hidatsa has phonologically distinct pre-aspirated obstruents from these data. What our study adds to current understanding of Hidatsa is that we can now have a discussion on the ways that speakers differ in their use of Hidatsa without resorting to anecdotes or impressionistic generalizations. We can extrapolate from these data that Hidatsa has h+C clusters where speakers realize coda /h/ as something other than [h] more than 25 percent of the time. However, there is a limited number of ways in which non-[h] manifestations of /h/ can appear in the output.

Additional work is needed to examine where Hidatsa fits in the typology of coda glottal consonants and their behavior in consonant clusters, but for the time being, it appears we can rule out these elements being "true" pre-aspiration (i.e., phonologically distinct singleton obstruents that begin with glottal frication). Crow likewise has clusters that have been described as being pre-aspriation, so a comparative Hidatsa-Crow phonetic survey could shed light on whether this variation in the production of /h/ in h+C clusters is unique to Hidatsa or if it is a shared feature between the two languages.

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Prefix order and interpretation in Crow

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Abstract: In transitive verbs, Crow person prefixes generally line up in left-to-right order as nonactive prefix, active prefix, transitive verb. Some transitive verbs, however, call for two nonactive prefixes, and these can come in either order before the verb with either prefix indicating subject or object. Although the flexibility in order and interpretation could simply reflect a lexical oddity of the few verbs that behave like this, this article proposes that the phenomena can be easily handled under standard minimalist principles of lexical subcategorization, Merge, Agree and feature checking. The claim is that certain verbs subcategorize for two nonactive arguments and that nothing prevents the appearance of either nonactive prefix from appearing in either of two structural positions. Further, the precise semantic roles of both are open to interpretation as long as they are nonactive.

Keywords: Crow, prefix order, variable affix order, syntax-semantics interface

1.   A puzzle

As described by Graczyk (2007) Crow verbs are prefixed with person markers in an active-stative pattern. Transitive verbs typically have an active prefix adjacent to the verb indicating the subject (the so-called A-set prefix) and a nonactive prefix (the B-set prefix) that precedes the active prefix, resulting in B-A-verb. There are a few transitive verbs, however, that call for two B-set prefixes, as in (1). Note that *dii-* and *lii-* are allomorphs, as are *bii-* and *wii-*.

(1)   'I resemble you' / 'You resemble me' (Graczyk 2007:199)

    a.   *dii-wii-chichée-k*
       2B-1B-resemble-DECL

    b.   *bii-lii-chichée-k*
       1B-2B-resemble-DECL

Besides the verb using two B-set prefixes, the sentences in (1) are curious in that the person prefixes are order-reversible, as 2B-1B or 1B-2B, and that in both orders the semantic interpretation is ambiguous as to who is resembling who. It is unclear whether the markers are agreement prefixes or pronominal clitics, but in either case neither the order reversibility nor semantic ambiguity is expected.

In this paper, I argue that both the variable order of the prefixes and the semantic ambiguity follow from standard assumptions of syntax involving subcategorization of verbs, the operation Merge, Agree and feature checking. In short, for a small set of verbs, the verb subcategorizes for two nonactive prefixes which assign theta roles to the nominal arguments. However, while the verb specifies for two B prefixes there is nothing in the syntax that forces one to precede the other. This is in contrast to ordinary transitive sentences where the nonactive prefix

must precede the active prefix. As for interpreting which nonactive prefix corresponds to the subject and which to the object, this is left open because verb subcategorization only specifies as far as the active/nonactive contrast and has no effect on finer-grained semantic distinctions. Thus ambiguity follows.

Section 2 outlines details about Crow verbal person markers. In section 3 I lay out syntactic assumptions. Section 4 contains detailed derivations of Crow sentences with regard to verbal prefixes, with a goal of showing the derivation of the sentences in (1) in particular so as to explain the two B-prefix orders and the variable interpretation. Section 5 concludes and establishes topics for further research.

2.   Crow person markers

Verbs in Crow, a head-last polysynthetic Siouan language, access two sets of person prefixes in an active-stative pattern. One set corresponds to arguments that are subjects of active verbs, whether transitive or intransitive. Graczyk (2007:121-122) calls these A-set prefixes (set I, per Wallace 1993). The other set, comprising the B-set prefixes (set II in Wallace), is for subjects of stative verbs, direct objects of verbs and postpositional objects. Transitive verbs usually call for active subjects and nonactive objects while intransitive verbs are for the most part predictably active or stative based on semantics.[1] If the subject of an intransitive is intentional, causal, etc., the intransitive verb is active, calling for an A-set prefix; at least some experiencer verbs have A-set prefixes as well. B-prefixes are used when referring to an object or a subject that is less agentlike. Thus, A-prefixes are for active subjects and B prefixes occur in all other environments. Active verbs typically have agentive subjects, in the sense of Dowty (1991), although in Crow experiencers line up in the active class with causal subjects. The division between active and nonactive is not completely consistent as some verbs with seemingly nonagentive subjects behave like active verbs with A-set subjects. For example, *sáaxi* 'snore', takes an active prefix, while both 'remain voluntarily' and 'remain involuntarily' are both active verbs, as are *ilí* 'be alive' and *shée* 'die' (Graczyk 2007:133, 139). On the other hand, *biíshi* 'tell a lie' seems to indicate an intentional subject, yet it is a stative verb. Thus, the class of active verbs must be understood as a grammatical class which includes some verbs that are not necessarily semantically active or agentive. Likewise for the B-prefixes: the class as a whole contains some verbs that call for subjects tending toward the intentional and agentive.

Usually argument number appears as a suffix on verbs, not on nouns. However, for simplicity the data analyzed here considers singular subjects and objects. And since third person active and inactive are not marked with an overt prefix, the article focuses on first and second person. The A-set prefixes, which must be adjacent to the verb root, are more variable in form than the B-set prefixes and are "often somewhat fused with the stem" (Graczyk 2007:121). The paradigms appear in Table 1 (based on Graczyk 2007:121).[2]

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[1]Note that I will use the term "active" in referring to the verb or the subject and prefix. Similarly, "nonactive" will describe the verb or the argument/prefix.

[2]The surface forms of the person markers, argued to be underlyingly /m/ and /n/ by Graczyk, are more varied than suggested in the table, but the distribution indicated in Table 1 is sufficient for present purposes. Also, while it appears the prefixes are further decomposable, with, for example, *b-/w-* by itself indicating first person and the vowel alone marking the active/nonactive distinction, I follow Graczyk in treating the prefixes as single units.

Table 1: Singular person verbal prefixes

Person	A-set (active)	B-set (nonactive)
1	*baa-*, *waa-*	*bii-*, *wii-*
2	*dá(a)-*, *lá(a)-*	*dii-*, *lii-*
3	∅-	∅-

In most transitive verbs an A-set prefix is immediately left-adjacent to the verb but right of the B-set prefix if present, as in (2a). Active intransitive verbs use an A-set prefix for the single argument, as in (2b), while stative verbs use a B-set prefix for the single argument in (2c). Example (2d) shows that third person is unmarked.[3]

(2) a. *dii-waa-lichí-k*
       2B-1A-hate-DECL
       'I hate you' (based on Graczyk 2007:122, Table 6.2)

   b. *baa-lisshí-k*
       1A-dance-DECL
       'I dance' (based on Graczyk 2007:134, Table 6.18)

   c. *dii-háchka-k*
       2B-tall-DECL
       'You are tall' (based on Graczyk 2007:124, Table 6.4)

   d. *Joe-sh   Peter-sh   ∅-∅-dúupia-k*
       Joe-DET Peter-DET 3-3-hate-DECL
       'Joe hates Peter' (adapted from Graczyk 2007:123)

Transitive verbs, therefore, usually have B-A-verb morphology, while intransitive verbs can be B-verb or A-verb, depending on whether the subject is of an active or stative verb. I also remind that while the A-prefix immediately precedes the verb root, the B-prefix need not be adjacent to the A-prefix, as adverbial and other material can intervene. To focus on the issues of prefix order and interpretation I put aside cases of, for example, B-X-A-verb for further research.

        The goal of this paper is describe the syntax of verbs like *chichée* 'resemble' that take two B-set prefixes. A few other verbs that take two B-set prefixes are 'be touching' and 'be equal to' (Graczyk 1991:83), which suggests these verbs have a common feature of being somewhat reciprocal: if I resemble you then you must resemble me, for example. But other verbs with two B-set prefixes include 'belong to', 'be proud of', 'be there' and have no such reciprocal semantics. What all the B-B verbs do seem to share is the property of lacking a clear active subject.

3.   **Syntactic assumptions**

I assume basic morphosyntactic principles common to researchers working within the Minimalist Program (See Chomsky 1995, 2001, 2008; Hornstein et al. 2005; among many others). A concise formalization appears in Collins & Stabler (2016). Thus, among many things, I assume the

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[3]For (2a) and (2b) I've added the *-k* declarative suffix to Gracyzk's examples, since these sentences will be used in section 4 where the full sentences are derived.

existence of a numeration of feature bundles (morphemes) to be used in a derivation, a single operation of Merge where Move is a kind of Merge, Agree and feature checking. Though not crucial so the main point of the paper, I also assume some version of Distributed Morphology whereby morphology and syntax are essentially the same operation (Halle & Marantz 1993, 1994; Harley & Noyer 1999; among many others).

I will assume that theta roles are visible on the prefixes, as part of the prefixes' feature bundles. The nominal subjects and objects are assigned theta roles via the prefixes. Theta roles are thus assigned under Merge (Hornstein et al. 2005:54). However, since Crow is a *pro*-drop language the arguments are often *pro*s. The overt or nonovert nominals, then, act as probes seeking an interpretable theta feature.[4]

Generally I take no firm position on whether the prefixes are inflectional agreement markers or pronominal elements. Graczyk (1991, 2007) considers them argument clitics, but there is some evidence that the B-prefixes are not the same category as the A-prefixes. As mentioned above, the A-prefixes must be adjacent to the verb itself and are phonologically malleable while the B prefixes need not be adjacent to the bare verb or the A-prefix and are much more phonologically stable and uniform. Further, while both attach to verbal stems, the B prefixes may attach to elaborated verbal stems with adverbial and other material intervening between them and the A-verb complex. verb. That is, with regard to some properties of distinguishing clitics from affixes per Zwicky & Pullum (1983), the B-prefixes have at least some clitic properties where A-prefixes have affixal inflectional properties. In one instance, however, the distinction may be important. Since the A-prefix must be adjacent to the verb and the B-prefix occurs outside (left of) the A-prefix, there must be some property to determine the order nonstipulatively. If the nonactive B-prefixes are clitics and the active A-prefixes agreement markers, then the order of B-prefix outside the A-prefix would follow since clitics typically occur outside inflectional material.

In the Crow syntax to be proposed, the simplest way to get the prefixes in the right order requires a position for the B-prefix to be higher than the position for the A-prefix. This is counter to typical treatments where AgrSP is higher than AgrOP.[5] While the proposed relationship is thus somewhat stipulative, the stipulation is tempered by the fact that Crow is an active-stative language, at least with regard to its verbal person markers. In contrast to nominative-accusative and ergative-absolutive languages, where the distribution of case marking and agreement is based on the number of arguments, as mentioned above verbs in Crow as an active-stative language select prefixes based on semantics. The fact that languages with active-stative verbal morphology are rather rare, comprising about 7% of a sample in the World Atlas of Language Structures Online (Siewierska 2014), may be relevant as well. I assume these facts allow for some parametric variation in the hierarchical structure.

Thus, I assume the prefixes project phrases. An A-prefix projects at Active Prefix Phrase (APP) while a B-prefix projects a Nonactive Prefix Phrase (NPP). These must be separate phrases and not binary forms of the same phrase, since in the transitive structures under discussion they co-occur.

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[4]Whether the missing or deleted object in particular is *pro* is much debated. See Ruda (2017) for some background and the suggestion that missing objects, at least, are silent nominal heads *n*, possibly with higher functional material. I leave for further research determining the status of unexpressed nominal arguments in Crow.

[5]Agr phrases have generally been abandoned since Chomsky (1995) (also see Hornstein et al. 2005:161-169 for discussion). Positions to replace Agr heads and phrases are still, however, in the same structural relationship.

4. The syntax and semantics of Crow person prefixes

In this section I work through derivations for transitive and intransitive sentences to demonstrate the syntax. First will be shown the derivations for an active intransitive, a nonactive intransitive, and an active transitive; these are followed by the derivations for a nonactive intransitive, which is the goal of the paper. These four kinds of sentences have have verbal morphology, respectively, of A-verb, B-verb, B-A-verb, B-B-verb. The last of the derivations is that of sentences of the type in example (1), containing a verb with two B-set prefixes. It will be demonstrated that not only does the syntax allow the above discussed variable prefix order and interpretation but, if the syntax is on the right track, variable order and semantics necessarily follow for these types of sentences.

   The derivations are somewhat informal in order to make the main points clear.

4.1. Active intransitive

First is presented the derivation of the active intransitive sentence in (2a), repeated here as (3).

(3)   *baa-lisshí-k*
      1A-dance-DECL
      'I dance'

The verb subcategorizes for a single active argument. Hence the numeration is {*baa-*, *lisshí*, *-k*, *proS*, [Tense: nonfuture]}.[6] Tense is listed in feature format but of course all the items in the numeration represent feature bundles that are spelled out phonetically late. In particular baa- is a surface form listed as such for convenience. The feature bundle for the prefix includes include [1.A], as in the gloss, showing it is for first person and semantically active. The verb merges with the prefix and I assume that the verb raises to adjoin to the prefix. Recalling that Crow is a head-last language, the movement is necessary for getting the verb to the other side of the head.

(4)   [*lisshí* [*baa-*]]   ⇒   [~~*lisshí*~~ [*baa-lisshí*]]

The result in (4) merges with *proS*, resulting in APP, the equivalent of VoiceP.

(5)   [$_{APP}$ *proS* [~~*lisshí*~~ [*baa-lisshí*]]

In (5), *proS* probes for the first person active features in c-commanded *baa-*. Then, I assume, the verb raises to T, as in (6).

(6)   [$_{TP}$ [$_{APP}$ *proS* [~~*lisshí*~~ [~~*baa-lisshí*~~]] *baa-lisshí*]

   The *pro* subject, or an overt nominal, perhaps moves to SpecTP in (6) but I leave that issue open for now. Finally, the structure in (6) merges with the declarative marker, which I assume is in C.[7]

(7)   [$_{CP}$ [$_{TP}$ [$_{APP}$ proS [~~*lisshí*~~ [~~*baa-lisshí*~~]] *baa-lisshí*] -*k*]

The important thing in the above derivation is how the A-prefix ends up on the verb.

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[6]Crow does not distinguish past/present, neither with overt morphology, but does have future with a suffixed verbal form.

[7]Interrogative and imperative markers also occur in this verb-final position.

4.2. Nonactive intransitive

Here I show the derivation for the nonactive intransitive sentence (2c), here repeated as (8).[8]

(8)   *dii-háchka-k*
      2B-tall-DECL
      'You are tall'

We start with the numeration {*dii-*, *háchka*, *-k*, *proS*, [Tense: nonfuture]}. The verb merges with the prefix and the moves to right-adjoin to it.

(9)   [*háchka* [*dii-*]]   ⇒   [~~*háchka*~~ [*dii-háchka*]]

The result of (9) merges with *pro* and *pro* probes *dii-* for its [1.B] features.

(10)   [ₐₚₚ *proS* [~~*háchka*~~ [*dii-háchka*]]]

The verb raises to T and the result merges with *-k*. It's possible that the subject moves to SpecTP.

(11)   [CP [TP [ₐₚₚ *proS* [~~*háchka*~~ [~~*dii-háchka*~~]]] *dii-háchka*] *-k*]

4.3. Active transitive

In transitives there are two arguments and two prefixes, one for object and one for subject. As mentioned in section 3, it is possible that the two sets of prefixes may differ in category, in that the A-prefixes may be inflectional and B-prefixes clitics. So these prefixes' feature makeup will include the fact that A is an inflectional prefix and B a clitic. So the A-prefix must attach directly to the verb, inside the B-prefix. The derivation here is for the sentence in (2a), repeated here as (12).

(12)   *dii-waa-lichí-k*
       2B-1A-hate-DECL
       'I hate you'

We begin with the numeration {*dii-*, *waa-*, *lichí*, *proS*, *proO*, [Tense: nonfuture], *-k*}. Assuming that the object is inside VP, the first instance of merge involves the verb with the object *pro*.

(13)   [VP *proO lichí*]

The VP in (13) then merges with the active prefix *waa-* and the verb raises to right-adjoin to the prefix, as in (14).

(14)   [[VP *proO lichí*] *waa-*]   ⇒   [[VP *proO* ~~*lichí*~~] *waa-lichí*]

ProO does not c-command an appropriate prefix so cannot yet get assigned its theta role. The result in (14) merges with *proS*. Since *proS* in SpecAPP c-commands the A-prefix it can be assigned the appropriate theta role.

(15)   [ₐₚₚ *proS* [VP *proO* ~~*lichí*~~ [*waa-lichí*]]]

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[8]Graczyk (2007:5) considers adjectives to be stative verbs in Crow.

The syntactic object in (15) merges with the B-prefix, *dii-* (16) and the verb moves with the A-prefix to adjoin to *dii-*, resulting in (17). *ProO* then internally merges in SpecNPP, as in (18).

(16) [[_APP *proS* [_VP *proO* ~~lichí~~ [*waa-lichí*]]] *dii-*]

(17) [[_APP *proS* [_VP *proO* ~~lichí~~ [~~waa-lichí~~]]] *dii-waa-lichí*]

(18) [_NPP *proO* [[_APP *proS* [_VP ~~proO~~ ~~lichí~~ [~~waa-lichí~~]]] *dii-waa-lichí*]]

Following movement, *ProO* now c-commands the B-prefix and can get its theta role via Spec-head agreement. The verb, with its prefixes, internally merges in T (19), and TP merges with the declarative marker (20).

(19) [_TP [_NPP *proO* [[_APP *proS* [_VP ~~proO~~ ~~lichí~~ [~~waa-lichí~~]]] ~~dii-waa-lichí~~]] *dii-waa-lichí*]

(20) [_CP [_TP [_NPP *proO* [[_APP *proS* [_VP ~~proO~~ ~~lichí~~ [~~waa-lichí~~]]] ~~dii-waa-lichí~~]] *dii-waa-lichí*] *-k*]

4.4. Nonactive transitive

The derivations for active and nonactive intransitives and active transitives present no surprises. Following is the goal of showing the derivation for nonactive transitives with two B-prefixes. Recall that the interesting facts about such verbs include the fact that the B-prefixes can occur in either order and that both orders are ambiguous as to which correlates with the subject and which with the object. The derivation shows how to achieve these results and, further, makes the prediction that such results, in fact, follow.

The derivation is for sentence (1), here repeated as (21).

(21) 'I resemble you' / 'You resemble me' (Graczyk 2007:199)

   a. *dii-wii-chichée-k*
       2B-1B-resemble-DECL

   b. *bii-lii-chichée-k*
       1B-2B-resemble-DECL

The verb *chichée* is one of those verbs that subcategorize for two B-prefixes and hence for two nonactive arguments. Again, we start with the numeration of elements to enter the derivation. Since the first person and second person prefixes show up as alternate forms depending on whether they are in word-initial or intervocalic position, for convenience they are listed here as dii-/lii- and bii-/wii-. The numeration is {*dii-/lii-*, *bii-/wii-*, *proS*, *proO*, *chichée*, [Tense: nonfuture], *-k*}.

The first Merge operation involves the verb and its *pro* object to form the VP. Either *pro* can serve as the "object" since whatever the object is will not get its theta role checked until it raises to c-command the prefix. Meanwhile, the VP merges with a B-prefix, but since both *dii-/lii-* and *bii-/wii-* are of the B set the VP can merge with either. The result so far, equivalent to the bar-level of the Nonactive Person Phrase, has four possible forms before the verb raises to adjoin to the prefix:

(22) [[_VP *proS chichée*] *dii-/lii-*]

(23) [[_VP *proO chichée*] *dii-/lii-*]

(24) [[$_{VP}$ *proS chichée*] *bii-/wii-*]

(25) [[$_{VP}$ *proO chichée*] *bii-/wii-*]

In each case the verb will raise to the prefix and the *pro* element will raise to SpecNPP. In SpecNPP, *pro* c-commands the prefix and can be assigned its theta role and agree in person, either first or second. Thus, either *pro* can be the subject, the resembler, or the object, the resemblee. In (26) B$_i$ is a variable for either *dii-/lii-* or *bii-/wii-*. *Pro-x* is a variable indicating either of the pros from the numeration.

(26) [$_{NPP}$ *pro-x* [$_{VP}$ ~~*proS/O chichée*~~] B$_i$-*chichée*]

The syntactic object in (26) then merges with the unused prefix in the numeration, followed by merging with the unused pro from the numeration. The verb raises. The result, before final V-raising to T and the Merge with *-k*, is as in (27).

(27) [$_{NPP}$ *pro-y* [$_{NPP}$ *pro-x* [$_{VP}$ ~~*pro-x/y chichée*~~] B$_i$-*chichée*] B$_j$]
      where *pro-x* $\neq$ *pro-y* and B$_i$ $\neq$ B$_j$

What (27) is showing is that the two B-prefixes appear sequentially in either order and that the two pros can be selected for Merge in either order. In short, as the verb goes through successive instances of Merge, it can merge first with 1B or with 2B. If it merges with 1B first, then it merges with 2B second, and if it merges with 2B first, then it merges with 1B second. This accounts for the variant orders of the prefixes. Similarly with the pro elements, since either can merge in the lower SpecNPP, the remaining one will merge in the higher SpecNPP. This accounts for the subject/object ambiguity.

The proposed syntax not only allows for order variability and semantic interpretation, it in fact predicts both should occur.

5.   Conclusions

The preceding presented a morphosyntax for Crow simplex verbs consistent with basic common to the Minimalist Program. The syntax for intransitives and active transitives follows into non-active transitives to account for both B-prefix orders being grammatical and both interpretations predictable from checking in an active-stative language.

Stipulations were kept to a minimum. Nonetheless, further research should clarify whether unexpressed Crow subjects and objects are pro and whether or to what degree the prefixes are inflections of clitics, since the assumption of pros and how they receive theta roles was crucial to the ordering of steps of Merge. Also, while leaving open a determination about the status of the prefixes, it was convenient to assume that B-prefixes are more cliticlike and A-prefixes are more inflectionlike in that this allows the derivation the desired result of getting the B-prefixes outside the A-prefixes. Further research should integrate causative structures. As some simplex verbs take two B-prefixes, causatives end up with two B-prefixes as well, including one for the subject of the embedded (caused) event. Finally, this paper worked with verbs that only have agreement/clitic person markers. Crow verbs can become quite complex with a number of incorporated elements and a fuller account will place the additional elements in the right orders vis-a-vis the active and nonactive prefixes.

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The Ralph Pepper tapes: Overview of a lesser-known Kansa language audio resource

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Abstract: Rankin's analysis of Kansa grammar relies heavily upon his 1970s-era recordings of consultant Maude Rowe. Still, he recorded approximately 200 additional minutes of Kansa fieldwork with consultant Ralph Pepper after Rowe's death. It is unknown if Rankin ever transcribed these later recordings, and the tapes themselves were never professionally migrated to digital media along with Rankin's other Kansa materials. As such, the Ralph Pepper tapes remain among the least accessible of the available Kansa language materials. While work with the Ralph Pepper tapes remains ongoing, an overview of the initial findings is presented here. In spite of their comparative brevity, these recordings may shed new light on Kansa phonology (e.g., vowel length), lexicon (e.g., word choice), and discourse features (e.g., evidentials).

Keywords: Kansa, Rankin, fieldwork, transcription

1.   Introduction

This article is concerned with a collection of Kansa language resources undergoing its first systematic analysis. Owing to the paucity of extant Kansa materials, newly discovered items of any length have the potential to significantly impact what is known of the language. In this case, the materials are anything but new; they have been known and freely available for nearly four decades now. However, they have somehow managed to avoid close scrutiny throughout this time.

1.1.   Language background

Kansa, also known as Kanza or Kaw, is a member of the Dhegiha branch of Mississippi Valley Siouan languages. It belongs specifically to the Kansa-Osage subdivision, but is also closely related to Omaha-Ponca, and Quapaw ([Parks & Rankin 2001](#):109). There have been no L1 speakers of Kansa since approximately 1980, but the Kaw Nation has maintained active and fruitful language revitalization efforts for about two decades despite the lack of speakers through reliance upon documentary materials. The two most important of these sources include Dorsey's 1880s-era Bureau of Ethnology materials collected shortly after the Kaw tribe's forced removal from Kansas to a reservation in Indian Territory (present-day Kay County, Oklahoma) and Rankin's 1970s-era fieldwork with some of the last living L1 speakers of Kansa in and around this same

area ([McBride & Cumberland 2010](#):A21). Other available Kansa language materials are smaller in comparison and include work from Morehouse, Stubbs, Morgan, Turner, Bourassa, and La Flesche ([Cumberland & Rankin 2012](#):i) as well as Gatschet, Hewitt, Michelson, and Spencer.

1.2. Rankin's work on Kansa

Rankin's Kansa materials, which are of particular interest here, consist of approximately 64 hours of audio recordings with three different full-blood Kaw speaker consultants of advanced age, including two males and one female. They were, in chronological order, Walter Kekahbah, Maude Rowe, and Ralph Pepper. Present-day knowledge of Kansa relies heavily upon Rankin's work with Rowe owing to the fact that his two male consultants suffered from grave hearing loss at the time. This reliance can be seen in the fact that Rankin recorded dozens of hours of salvage interviews with Rowe compared to approximately 200 minutes with Pepper and just around 30 minutes with Kekahbah. It is important to note here that Rankin managed to transcribe and analyze most of these recordings ([McBride 2009](#):34), but not all. Careful consideration of Rankin's Kansa timeline reveals some materials that have managed to fall through the cracks for nearly 40 years

1.2.1. Kansa fieldwork: 1970s

From mid-1973 to mid-1979, Rankin collected Kansa language fieldwork materials in Kay, Osage, and Tulsa Counties in Oklahoma. Audio recordings of this fieldwork exist for his three primary consultants, as can be seen in Table 1.

Table 1: Rankin's recorded fieldwork with Kansa consultants

Consultant	Location	Date	App. length
Walter Kekahbah	Newkirk, OK	1973	0.5 hours
Maude Rowe	Shidler and Pawhuska, OK	1973-1977	60 hours
Ralph Pepper	Tulsa and rural Kay County, OK	1978-1979	3.5 hours

Note that, among the Pepper materials, there is also a field recording of moments from a 1979 Kaw powwow. It is of interest here primarily insofar as it contains a lengthy speech and prayer from Pepper, the latter of which is entirely in Kansa; the remainder of this recording is music. Pepper, the latter of which is entirely in Kansa; the remainder of this recording is music.

Table 1 clearly demonstrates that Rankin's field recordings skew dramatically in favor of Rowe. The primary reason for this is that the hearing loss of his two male consultants made for trying and time-consuming elicitation sessions, a fact that Rankin reflected on in an interview with Cumberland shortly before the former's death:

> ...[T]o record with Mr. Pepper, I had to basically write out my questions ahead of time so he could read them because he had trouble hearing my voice. He could always understand his daughter very easily but when I would try to talk to him, he had problems hearing, so he would respond to written questions and translate material... *I did some recording with Mr. Pepper, although his hearing loss made it difficult.* ([Cumberland 2016](#):121-122, emphasis mine)

Rankin made use of two media to document his Kansa fieldwork: audiotape and paper. He consistently used an inconvenient reel-to-reel audiotape recorder throughout his work with all three of his consultants. He was not as consistent with his paper-based methodology. About halfway through his work with Rowe, he apparently made an important change. He had originally begun his Kansa fieldwork with a series of notebooks for the purpose of guiding his elicitations and taking notes on the day of recording and transcribing the Kansa afterward. On a mid-1970s research trip to the National Anthropological Archives, however, he had obtained photocopies of the original Dorsey lexical slip files. From this point on, he abandoned the use of notebooks and began eliciting directly from these photocopies. He also transcribed sessions on them, but took minimal notes. This change is reflected in the names he gave his recordings of Kekahbah and Rowe, the former of which are brief enough to have been included at the beginning of a single tape that also features Rowe at the end. Rankin labeled his first 21 recordings as "Kansa" and his last 34 as "Dictionary." He labeled his five recordings with Pepper simply as "Ralph Pepper."

After sessions with his consultants, Rankin generally attempted to produce close transcriptions of the collected material. However, his professional commitments often conspired against this; he told Cumberland as much:

> Well, the first thing you need to do, of course, is transcribe all those tapes. Most of my recordings were on old tape recorders, reel-to-reel tape machines, so that had to be written down, and I got through most of it. *I may still have a little bit that still needs to be written down, even after all these years* because, you know, you get busy doing other things. I had a teaching position nine months out of the year and it's almost impossible to do a lot of tape transcription during that period. Things just get in the way... (Cumberland 2016:125, emphasis mine)

Rankin managed to produce close transcriptions for his "Kansa" recordings on the notebooks he used at the time. He did the same for his "Dictionary" recordings on his Dorsey slip photocopies.

Rankin's own health concerns at the time, the death of Rowe, and the difficulties in working with the hard-of-hearing male speakers put an end to his Kansa fieldwork in about 1980 (Cumberland 2016:122). Pepper and Kekahbah died shortly thereafter. Rankin was still left with an ample supply of analytical work that could be done on the language using his own materials and those of Dorsey and others, but he no longer had access to L1 consultants from that point on.

1.2.2.   Kansa analysis: 1980s

Rankin shifted his focus toward analysis of Kansa during this period. He managed to compile a Kansa grammar sketch (Rankin 1989), a series of lexical files that he would update from time to time (e.g., Rankin 2008), and various comparative Siouan materials making use of his own Kansa data and the findings of others, which he reanalyzed in light of his deepening understanding of the language. Sadly, however, he fell out of touch with his Kaw tribal contacts during this period.

1.2.3.   Return to Kansa: 1990s-2010s

At some point during the 1990s, Rankin had a surprise visit from a small delegation of Kaw tribal members who had come to his office at the University of Kansas to discuss his language materials.

This meeting renewed his connection to the tribe and also spurred the eventual establishment of the Kaw Nation's language revitalization efforts. One of the first acts was to hire an audio production company in Kansas to convert "at least fifty *hours*" of Rankin''s reel-to-reel field recordings with Kekahbah and Rowe to CD (Cumberland 2016:126-127), emphasis hers). For some reason, however, the Pepper tapes were not included in this conversion.

Rankin maintained a close relationship with the tribe after the establishment in the late 1990s of the Kaw Nation's Language Department, for which he served as Language Consultant. He met with department staff at least quarterly from this point until his death in 2014 and participated in a number of language revitalization projects. At some point during this time, he managed to convert his Pepper reel-to-reel tapes to audiocassette format; the language department staff converted these to a digital format at a later date in-office. In 2006, he also oversaw the conversion of his "Kansa" recordings-era field notebooks to MS Word format. This was a team effort involving Rankin, Quintero, Cumberland, and myself. In 2008, he also allowed the duplication of his collection of Dorsey slip file photocopies corresponding to his "Dictionary" recordings. Unfortunately, these resulted in poor quality duplicates, including some slips that are unreadable. Even now, these remain mostly unanalyzed. Still, no field notes from Rankin's Pepper sessions were converted at this time.

1.3.   Purpose

There is a lack of high quality audio for the Pepper tapes owing to the fact that they were not professionally digitized along with the others. Additionally, there are no known transcriptions of Rankin's time with Pepper; they were certainly not retyped with the others and any possible slip file notes may be unreadable given the poor quality of the available duplicates. As such, the Ralph Pepper tapes remain among the least accessible of available Kansa language materials. Nevertheless, while comparatively brief, they are potentially significant.

The purpose of this report is two-fold. In the short term, it is hoped that the overview provided herein will assist the Kaw Nation's current Kansa language revitalization efforts. Given that the Pepper materials have not heretofore been seriously described, this report may provide the Language Department a detailed snapshot of these materials. In the long term, it is hoped that the Pepper materials may lead to a fuller description of Kansa, particularly as a bridge between the older, Dorsey materials and the better-known Rankin materials. Keep in mind that Dorsey's consultants were all 19th century males, and Rankin's primary consultant was a 20th century female. Pepper, then—especially when taken with along with Kekahbah—could help to clarify the differences between Dorsey's data and Rankin's data.

2.   Ralph Pepper tapes

2.1.   Catalog

The Ralph Pepper tapes primarily consist of four cassettes of Kansa language elicitations, which were conducted at Pepper's home in Tulsa in December of 1978. These four tapes account for about 200 total minutes of salvage interviews yielding approximately 700 Kansa responses, including both words and sentences. Additionally, as was mentioned above, there is one cassette

of mixed recordings from the bleachers at a powwow in rural Kay County, possibly recorded in May of 1979. In roughly the middle of this tape, there are approximately two minutes of Pepper offering a speech in English followed by about an equal amount of time of Pepper praying in Kansa.

2.2. Methods

It is important to note here that work on the Ralph Pepper tapes has been an ongoing project for more than a decade. While serving as Kaw Nation Language Director in 2005, I digitized the cassettes that Rankin provided the tribe but conducted no further investigation into their contents. Research leading to my presentation at the 2017 Siouan and Caddoan Languages Conference (McBride 2017) renewed my interest in the analysis of the Pepper tapes. I began transcribing the audio the following spring. I suspect that a full analysis of the audio and transcriptions will take much time, but I hope to integrate my analysis into the available Kansa materials in the coming years.

3. Analysis and discussion

The findings are tentative at this beginning stage of the analytical process and serve mostly to confirm what is already known of Kansa. Still, there are some interesting early highlights, particularly in terms of phonology (e.g., vowel length), lexicon (e.g., word choice), and discourse features (e.g., evidentials).

3.1. Phonology

Before presenting how Pepper contributes to the larger understanding of Kansa phonology, it is worth noting that the proper documentation of vowel length is a constant source of consternation in Siouan scholarship (cf. Rankin 2005:465). The reasons for this are manifold, but it is largely a result of the fact that scholars have often tended to rely upon the work of early researchers, such as Dorsey, who failed to record vowel length at all or did so inconsistently. It may also be due to the fact that what nowadays can be shown via instrumentation to be long vowels are not absolutely long, but only relatively so. That is to say, a long vowel in one word in one context may actually be shorter than a short vowel in another word in another context so long as the short vowels in the former word and context are also proportionately shorter. The short vowel to long vowel ratio also appears to differ from context to context and from speaker to speaker. For example, for Kansa, Herd (2006:4) demonstrated that Maude Rowe's short vowel to long vowel ratio averaged approximately 1:1.5 for primarily stressed non-verbs. McBride (2017:13-15), on the other hand, demonstrated that, in contexts that include secondarily stressed words and verbs, Maude Rowe's short vowel to long vowel ratio averaged 1:1.16 while Walter Kekahbah's ratio averaged 1:1.23. Careful analysis of fluent speaker recordings can serve to set the record straight, but frequently has not done so owing to the reticence on the part of modern researchers to disregard material that does not take vowel length into account. This has the unintended effect of over-emphasizing individual speaker differences. For instance, Rankin's recent (2008) Kansa lexicon frequently lists Dorsey's ambiguously short vowel forms and his own consultants' consistently long vowel forms

side-by-side; he occasionally includes codes to demonstrate that Maude Rowe (noted as 'MR') used the long vowel, as in (1).

(1)   *gojí, goojí* (MR) 'far off, remote, long way off'

Such entries imply that Rowe may be an outlier as opposed to a contributor to the central tendency. Given the paucity of available data, it must be admitted that that may well be the case. Yet, the fact remains that the Dorsey consultant data is the less reliable in this particular phonological matter and so should not be considered normative by default.

Unfortunately, Pepper's elicitation responses frequently muddy the water rather than clarifying it. Pepper often lengthens forms that Rowe did not generally lengthen, as can be seen in Table 2.

Table 2: Pepper and Rowe vowel length comparisons

Example	Pepper	Rowe	Gloss
(2)	*waasábe*	*wasábe*	'black bear'
(3)	*móǫhį*	*mą́hį*	'knife'
(4)	*žą́ą*	*žą́*	'tree'

It is important to note, however, that these findings are impressionistic as opposed to instrumental. It is also unclear as to when he may be exaggerating certain sounds in order to be more easily understandable to Rankin. However, there are multiple instances of the lengthening patterns demonstrated in (2)-(4).

In addition to the lengthening of vowels, Pepper occasionally deletes syllable-final vowels leaving closed syllables. This is a violation of the general rule that syllabic codas in Kansa occur only in extremely restricted environments, i.e., some homorganic nasal codas between nasal vowel nuclei and stop onsets and some ambisyllabic geminate stops occurring word-medially (Herd 2006:2-3). Examples of Pepper's closed-syllables can be seen in (5) and (6).

(5)   *šǫ́*   *gáxb*   *éeyao*
       šǫ   ∅-∅-gáxe=abe   e=ao
       by.and.by   3P-3A-make=NCONT   DEM=DECL
       'he made it by and by'

(6)   *áayaha*   *ttakkóječh*[1]
       áa-∅-yahá-a   ttakkóje   čhe
       LOC-3P-wear-IMP   shoulder   DET
       'put something on your shoulders'

There are no examples of Kekahbah or Rowe omitting vowels in this manner, and Dorsey's consultants only do so in obvious loanwords, such as in (7).

(7)   *kháonzil bló* 'Council Grove' '

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[1]Pepper uses *ttakkóje* or some variant thereof (i.e., *ttákkoje* or *ttaakkóje*) throughout the tapes for both 'shoulder' and 'hip.' While unattested elsewhere in Kansa, this term bears a passing resemblance to t*táhü okkǘčhe*, 'neck joint,' which is semantically similar to 'shoulder.' At one point, Rankin even suggests 'joint' as a translation.

3.2. Lexicon

Pepper's word choices are occasionally unexpected or even unique. For instance, he frequently provides hyponyms or meronyms despite known Kansa alternatives, as in (8)-(11).

(8) a. *nąąjĕ* 'heart'
     b. used for 'heart,' 'stomach,' 'breast,' and 'chest'

(9) a. *sákkoĕe* 'melon'
     b. used for 'melon' and 'squash,' but not 'gourd'

(10) a. *ttakkóĕe* 'shoulder'
     b. used for both 'shoulder' and 'hip'

(11) a. *wažíga* 'bird'
     b. used for 'bird,' 'crow,' 'pigeon,' 'buzzard,' and 'bat,' but not 'owl'

While one cannot say so definitively, it is important to note that such examples are likely to be the result of attrition; owing to his hearing loss and the dearth of possible interlocutors, Pepper had not conversed in Kansa for some time prior to the recordings and may have forgotten numerous lexical items.

Pepper makes use of a larger set of subject markers than is found elsewhere in Kansa. For example, he frequent uses *góakhá*, perhaps a contraction of *gaa* (distal demonstrative) plus *akhá* (present, resting subject marker). This form appears neither in Dorsey's Kansa materials nor in Rankin's data for Kekahbah or Rowe. Examples can be seen in (12)-(13).

(12) *wakʔó góakhá   mǫǫščíǵe ǫǫhǫ́beo*
     wakʔó gaa-akhá   mǫǫščíǵe ǫǫ-Ø-Ø-hǫ́=abe=ao
     woman DEM-3A.SBJ rabbit   PREV-3P-3A-cook=NCONT=DECL
     'that woman cooked rabbit'

(13) *níkkašĭga góakhá   wakką́dagi akháu*
     níkkašĭga gaa-akhá   wakką́dagi akhá=ao
     person   DEM-3A.SBJ doctor   3A.CONT=DECL
     'that man is a doctor'

In a long and somewhat problematic sentence, he also makes use of what may be *akhé* as the subject marker and corresponding continuative auxiliary in a potentially oblique clause (this depends on how one brackets the construction). Note that Eschenberg (2005:31-33) describes the use of what she terms "nominative absolute" *akhé* in Omaha, where it appears to operate somewhat like a contraction of the subject marker *akhá* and the demonstrative *e*, but this is found nowhere else in the available Kansa materials.

(14) *níkkašĭŋakhá   waasábeǝkhe   hiiyákhé   nŭüžüĕekhéĕi níkkašĭŋakhá*
     níkkašĭga akhá wasábe akhá-e   Ø-hiyá akhá-e   nížüĕe khe=ĕi níkkašĭga akhá
     person 3A.SBJ   black.bear 3A.SBJ-DEM 3A-swim 3A.CONT-DEM river DET=LOC person 3A.SBJ
     íiyabadą́wasábeakhá   níkkašĭgakhá   waasábekhǝ
     íi-Ø-Ø-ye=abe=adą́ wasábe akhá   níkkašĭga akhá wasábe akhá
     LOC-3P-3A-see=NCONT=and black.bear 3A.SBJ   person 3A.SBJ   black.bear 3A.SBJ

íiyabéohá	*wasábeakhá*	*házabeu*
íi-Ø-Ø-ye=abe=ohá	wasábe akhá	Ø-háze=abe=ao
LOC-3P-3A-see=NCONT=when	black.bear 3A.SBJ	3A-flee=NCONT=DECL

'the man, the man saw the bear swimming in the river, and, the bear, when the man saw the bear, the bear ran away'

3.3. Discourse

As happens elsewhere in Dhegiha, Kansa makes use of evidential declarative markers that may be classified as gendered speech. However, Rankin noted that their use among the last Kansa speakers had become restricted to certain conditions:

> This is a feature of the language that has been nearly lost over the past 100 years. Most of my Kansa field work between 1973 and 1978 was with Mrs. Maude Rowe, a woman in her early 70s, and *she used the female speech marker only under certain circumstances. The particle took the form of -e and was used only (a) if the main verb was in the first person, that is if she were talking about herself and her own experiences, and (b) if Mrs. Rowe felt personally involved in what she was saying.* -*e* never appeared if I was eliciting verb lists or paradigms or reeliciting Dorsey's 1880s material sentence by sentence. If she was recounting something that she had done personally, however, she always used the female speech marker. (Rankin 1989:307, emphasis mine)

Examples of the Kansa female evidential can be difficult to spot because a great many verbs, verbal suffixes, and verbal enclitics already end in -*e*, the shape of the expected female evidential. Nevertheless, a quick survey of Rankin's 'Kansa' data shows that the female evidential -*e* appears about 25 times in nearly 3,500 utterances from Rowe, or less than 1% of her responses.

Pepper's evidential use is both more diverse and more frequent than Rowe's data suggest. His markers seem to take some form of both the male evidential par excellence -*ao* and the somewhat more expanded male speech form -*eyao*, 'indeed,' which consists of the demonstrative *e* together with -*ao*. However, in very many cases, instances of Pepper's evidential use appear to have been reduced, yielding such forms as -*əyau*, -*yao*, -*yau*, -*yəu*, -*yə*, -*e*, -*a*, -*o*, -*u*, -*ə*, etc. At this point, it is not clear if these forms represent phonological variations on one or two male evidentials or a much more vast and specialized set of context-dependent evidentials. At any rate, they appear approximately 50 times in just over 700 utterances, or more than 7% of Pepper's total responses. Pepper also uses these evidential forms in all persons—not just the first person—as can be seen in (15)-(17).

(15) *šį́į blį́iyáu*
       šį w-yį́=ao
       fat 1A-be=DECL
       'I'm fat'

(16) *yiiškí   hnáhnįao*
       yi=škí   Ø-y-ya-hnį́=ao
       2A=also 3P-2A-INS-swallow=DECL
       'you swallowed it, too'

(17) *šį́įmižįgakhá   waayǫ́beə*
      šį́mižįga akhá wa-Ø-yǫ́=abe=ao
      girl 3A.SBJ   PREV-3A-sing=NCONT=DECL
      'the little girl sang'

Note, however, that pointing out the difference between Rowe's less than 1% evidential use and Pepper's more than 7% evidential use is not the same as claiming that Rowe's evidentials are rare; Zipf's Law would not bear this out. Rather, I am merely stating that Pepper appears at least seven times more likely to make use of gendered evidentials.

4.   Conclusion

Again, it should be stated that the findings here are only preliminary highlights that are by necessity only tentative at this point. Much additional analysis is needed. In particular, Pepper's lengthy Kansa prayer in the powwow recording may provide a great deal of insight. This prayer is, in fact, the only example of connected, presumably extemporaneous Kansa male speech from the 20th century. However, the powwow recording offers the lowest quality of all the available Kansa audio given that it was obtained via an open-air loudspeaker. It also features many overlapping sounds and voices, including possible back-channeling from other Dhegiha language speakers in the audience. Still, the Pepper tapes when taken as a whole do seem to have the potential to expand our understanding of Kansa language—if only in raising more questions.

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