

A Prosodic Analysis of the Word in Kiowa

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1 Introduction

Native American languages, famous for particularly long grammatical words, offer an interesting opportunity to evaluate the relationship between syntax and phonology at the word level. Previous research (Rice 1993, Dyck 1994, Russell 1999) argues the long grammatical words in Slave, Cayuga, and Cree are not coextensive with phonological words but are actually phonological phrases consisting of several phonological words. Building on this previous research, I examine the verb complex in Kiowa, a Tanoan language spoken in Oklahoma. Kiowa is of particular interest as it is neither genetically related to nor spoken near the languages previously mentioned. In this paper, I will show that syllable-sensitive phenomena and other phonological processes suggest that the long grammatical words in Kiowa consist of up to four phonological words. The following analysis relies on my proposed definition for the phonological word in Kiowa.

This paper is structured as follows. In Section 2, I introduce the central construction of this paper: Kiowa's verb complex. In Section 3, I introduce evidence for multiple phonological domains within the Kiowa verb using native speaker intuitions (3.1) and syllable-sensitive phenomena (3.2). In Section 4, I propose an analysis of the Kiowa verb using the phonological word. In Section 5, I discuss the results of the analysis and conclude.

2 The Kiowa Verb Complex

2.1 Relevant Phonology

First, it is necessary to introduce the basic phonological facts of Kiowa that are necessary background for the arguments presented throughout the paper.

2.1.1 Phoneme Inventory

Kiowa's phoneme inventory has been established in earlier work (see Wonderly, Gibson and Kirk 1954, Sivertsen 1956, Merrifield 1959, Trager 1960, Watkins 1984). See Table 1 for the consonant inventory. It should be noted that the phonemic status of the glottal stop has been controversial. For the sake of this paper, I have adopted Watkins' (1984) view that the glottal stop is not phonemic. It remains included in Table 1, though, as this is an unresolved issue.

	Labial		Dental		Alveolar	Palatal	Velar	Laryngeal	
Stops	p	b	t	d			k	g	(?)
<i>Ejective</i>	pʼ		tʼ				kʼ		
<i>Aspirated</i>	p ^h		t ^h				k ^h		
Affricates					c				
<i>Ejective</i>					cʼ				
Fricatives					s	z			h
Nasals	m		n						
Liquids			l						
Glides						j			

Table 1: Consonants (adapted from Watkins 1984). Consonants in parentheses are nonphonemic.

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Kiowa's vowel inventory is small and may be found in Table 2. All vowels may be underlyingly short, long, oral, and nasal. Length is marked with the IPA symbol [:], and nasality is marked with the Polish hook (e.g. ą). The Polish hook is used extensively in the existing research on Kiowa, and that usage is continued here in place of the more modern tilde in order to avoid conflict with tonal diacritics

<i>Vowels</i>			<i>Diphthongs</i>		
	Front	Back		Front	Back
High	i	u	High		uj
Mid	e	o	Mid		oj
Low	a	ɔ	Low	aj	ɔj

Table 2: Vowels (adapted from Watkins 1984).

2.1.2 Syllable Structure

The basic syllable in Kiowa consists of a vocalic nucleus, optionally preceded by one consonant (or Cj cluster) and optionally followed by one consonant from the set /p, t, m, n, l, j/ (Watkins 1984). The syllable may be schematized as (C)V(C). Final VC sequences may be ambiguous in terms of syllabification. For example, a CVCV sequence may be syllabified as CV.CV as in the noun [mà:ji] 'woman' (Watkins 1984:13) or as CVC.V as in the verb [è.t'áp.è:bà:] 'We went deer hunting' (Watkins 1984:227).¹ This ambiguity in syllabification is central to following analysis of syllable-sensitive phenomena in the Kiowa verb complex, and it will be presented in greater detail in Section 3.2.

2.1.3 Tone

Pitch is contrastive in Kiowa (high, low, and falling). High tone (H) is marked with an acute accent (e.g. á), low tone (L) is marked with a grave accent (e.g. à), and falling tone (HL) is marked with a circumflex (e.g. â). Only H and L are permitted on short vowels, while all three tones are permitted on long vowels or VC sequences when C is from the set /m, n, l, j/ (Watkins 1984). Minimal pairs showing the three-way contrast are provided below in (1).

- (1) a. H-L minimal pair (Watkins 1984:29)
 án- '3rd person singular agent; 3rd person singular object'
 àn habitual particle
 b. H-F minimal pair (Watkins 1984:29)
 k'ô: 'cold'
 k'ô: 'knife; cut'
 c. L-F minimal pair (Sivertsen 1956:121)
 óydè hẹ:gja 'his toys'
 óydè hẹ:gja 'those toys'

2.2 Morphophonology of the Kiowa Verb

According to Watkins (1984), the verb is the most complex "word class" in Kiowa. With up to seven slots, the verb can form an independent clause through a) inflection for aspect, mood, and tense, b) verb agreement through pronominal prefixes, and c) the incorporation of verbs, nouns, and adverbs. The linear organization of the verb complex is provided in (2).

- (2) Ppfx – (Adv) – (N) – (V) – STEM – {Inflect, Modal} – (Synt)

Only three elements above are obligatory: the pronominal prefix, stem, and the inflectional/modal suffix. Therefore, a verb complex in Kiowa may be very short as in (3) or extremely long

¹ The majority of the data used in this paper is from Watkins (1984) unless otherwise specified. In addition, all underlying forms are attributed to Watkins (1984) unless otherwise specified.

as in (4):

- (3) Ø -ǎ: -Ø
 3SG- come -PF
 ‘She came.’ (Watkins 1984, p. 190)
- (4) é -étpáthéi-phòlà:hì: -khò: -tòt
 3SG:1SG -forced -rabbit -get.NV -send.PF
 ‘She forcibly sent me to get a rabbit.’ (Adger et. al 2009:26)

The first element, a PRONOMINAL PREFIX, is a complex element consisting of multiple morphemes that mark the semantic role of the primary animate participant (agent or patient), that participant’s person and number, and the number of any third person object. All of these pieces of information are encoded by sub-syllabic segments as schematized in (5) (Merrifield 1959, Watkins 1984). Consider (6) for an example.

- (5) C V V C
 Person – Person Number – Object – Object Number
- (6) /b -ǒ -ia -d/
 2SG -PL -3PL -PL

The underlying forms of the pronominal prefixes can be quite different from their corresponding surface forms, since they are subject to a series of phonological processes. For example, /b-ǒ-ia-d/ surfaces as [bát] as shown in (7).

- (7) Pronominal Prefixes (Watkins 1984:41–42)
- | | |
|-----------------------------|-----------------|
| <u>2PL:3PL</u> ² | |
| /b-ǒ-ia-d/ | |
| biád | V Truncation |
| bjád | Glide Formation |
| bád | Glide Deletion |
| bát | Final Devoicing |
| [bát] | |

The remaining obligatory elements are the STEM and an INFLECTIONAL/MODAL SUFFIX. The stem may consist of a simple root or a root combined with derivational/inflectional endings resulting in several different kinds of stems, including derived transitives and intransitives, thematic, and imperfective stems (Watkins 1984). For example, (8) shows stems becoming thematic (the action is now undergone by the verb’s theme) and transitive (the action now requires an object).

- (8) Root (Watkins 1984:155)
- | | | | | |
|-------------|---|--------|------------|-----------------|
| gú: ‘hit’ | → | gú:-pé | ‘get hit’ | Thematic Stem |
| há: ‘smoke’ | → | há:-bè | ‘smoke.TR’ | Transitive Stem |

Stems are then combined with inflectional or modal suffixes, such as imperfective, imperfective/hearsay, and future as in (9).

- (9) Inflectional/Modal Suffixes (Watkins 1984)
- | Root | IPFV | IPFV/HSY | FUT | Gloss |
|--------|---------|----------|---------|-------------|
| /gú:n/ | gú:n-ê: | gún-Ø | gún-tò | ‘dance’ |
| /â:j/ | â:j-ì: | âj-Ø | âj-tò: | ‘start off’ |
| /gú:l/ | gú:l-ê | gúl-Ø | gúl-tò: | ‘write’ |

Preceding the stem but following the pronominal prefix are optionally incorporated adverbs,

2 Note that pronominal prefixes are glossed as PARTICIPANT:OBJECT.

nouns, and verbs (10). Incorporated stems are bare (without affixes) and are phonologically identical to their unincorporated counterparts.

(10) Incorporation (Watkins 1984:225–227)

- a. adverb (/k^hó/ ‘now’)
 bà -k^hó -bà:
 2PL -now -go.PF
 ‘Let’s go right now.’
- b. verb (/dè-/ ‘sleep’)
 à -dè -hè:m -à
 1SG -sleep -die -IPFV
 ‘I’m sleepy.’
- c. noun (/cád/ ‘door’)
 bé -cát -hè:dè
 2SG.INV -door -remove.IPFV
 ‘Open the door.’

Finally, SYNTACTIC SUFFIXES mark clausal relationships such as relative clauses, subordinating conjunctions, and switch-reference markers (Watkins 1984). A complete list of Kiowa’s syntactic suffixes is provided in (11), and (12) shows the nominal basic suffix /-dè/ in the context of a verb complex.

(11) Syntactic Suffixes (Watkins 1984)

Nominal	/-dè/	‘basic’
	/-gò/	‘inverse’
Locative	/-èm/	‘here/away’
	/-òy/	‘at/generally’
	/-è/	‘here’
Switch-Ref	/-gò/	‘same’
	/-nò/	‘different’
	/-cè/	‘when/same’
	/-è/	‘when/different’
Others	/-àl/	‘although, even though’
	/-dò/	‘because’

(12) Relative Clause Nominalization (/ -dè/ ‘nominal basic’)

k’í:k’ódá:l	-ô:	Ø	-òl	-sól	-dè
wood.wagon	-on	3SG	-load	-be.in	- <u>NOM.BAS</u>
‘wood that was loaded in the wagon.’ (Watkins 1984:230)					

2.3 The Kiowa Verb as a Single Word

Previous research on the Kiowa language does not focus on the definition of the word, but analyses do refer to the unit “word” (Crowell 1949, Merrifield 1959, Sivertsen 1956, among others). Most of the earliest work unquestioningly assumes the verb complex is a single word, ignoring any difference that may be between syntax and phonology. Crowell (1949), however, attempts to define the word in phonological terms separate from the syntax. Specifically, she argues “phonologically, a word is a syllable or a sequence of syllables, one of which is accompanied by the loudest stress, between open [pauses]” (Crowell 1949:165). According to her definition, the verb complex forms a single word, though she concedes that all observations regarding stress and pausing are impressionistic and therefore not conclusive.

In more recent work, Watkins (1984) does not explicitly discuss the nature of the word in Kiowa or which domains play an active role in Kiowa phonology and morphology, but she makes assumptions throughout her analysis regarding the “word.” For example, Watkins calls the verb complex a “word class” and states that it acts as a phonological unit for word-level tonal modification.

Even though the above investigations of Kiowa are not concerned with the definition of the

word, the assumption that the Kiowa verb complex is a single word both syntactically and phonologically most likely makes a prediction. Namely, the Kiowa verb should act as a single phonological domain: the phonological word. As I will show in the following sections, the Kiowa verb does in fact form a single domain, though I propose it forms a phonological phrase and not a phonological word.

3 Evidence for Multiple Phonological Domains

3.1 Native Speaker Intuitions

Native speakers of Kiowa appear unconvinced that the Kiowa verb is a single unit. While two different orthographic systems present considerably different approaches to how to break down to the Kiowa verb, both notably break up the verb into more than one word.

Parker McKenzie, a self-trained Kiowa linguist, created a writing system in the early 20th century (Harrington 1946, McKenzie & Harrington 1948, Watkins & Harbour 2010). He writes most of the Kiowa verb as a long word uninterrupted by punctuation or spaces. He does, however, separate the pronominal prefix as seen below in (13).

- (13) gát cáuicùthàigàdaiuthaiu
 ‘We would know how to write Kiowa.’ (Watkins & Harbour 2010:331)

In contrast, a non-linguist Kiowa speaker Alecia Keahbone Gonzales created a Kiowa orthography writing verb constructions consisting of several words, separating every morpheme with spaces (Gonzales 2001).

- (14) daw-gyah, gyah aim day daw
 song 1SG:1SG go sing FUT
 ‘I am going to sing that song.’ (Gonzales 2001:71)³

Regardless of which orthography is used, native speakers of Kiowa do not treat the entire verb complex as a single word. Given the drastic differences between the orthographies, details as to how the verb should be broken down are not clear. The fact that native speakers do not treat the verb as a single word, however, suggests that an investigation into the phonology of the Kiowa verb is worthwhile.

3.2 Syllable-Sensitive Phenomena

Alongside native intuitions, phonological processes sensitive to syllable-structure provide evidence against treating the Kiowa verb as a single, uninterrupted phonological word. Specifically, consider Kiowa’s syllable-sensitive rules Final Devoicing and Closed-Syllable Shortening (Watkins 1984). These are illustrated in (15)-(16).

- (15) Final Devoicing (Watkins 1984)
 Devoice all syllable-final obstruents.
 [-sonorant] → [-voice] / ____]_{syllable}
 (16) Closed-Syllable Shortening (Watkins 1984)
 Long vowels become short in closed syllables.
 [+syllabic] → [-long] / ____ C]_{syllable}

In (17), the underlying long /*ú*:/ shortens in the imperfect and future forms when /n/ must form the coda. In the imperfective-hearsay form, however, /*ú*:/ surfaces unchanged because /n/ forms the onset of the next syllable showing that syllabification spans the Stem-{Inflect, Modal} morpheme boundary.

3 Morpheme-by-morpheme gloss is mine.

(17)	Root	Ip/hsy	Imperfect	Future	Gloss	(Watkins 1984)
	/gún:/	gún:.n-ê:	gún-Ø	gún.-tò:	‘dance’	

Syllabification does not span all morpheme boundaries in the verb, though. As seen in (18), Final Devoicing applies at the end of the pronominal prefix, changing the final /d/ to [t] (19). If syllabification spanned the morpheme boundary, /d/ would not devoice, as it would syllabify as the onset of stem’s syllable as in *[bá.d-ôm]. Therefore, the pronominal prefix and verb stem are members of separate syllabification domains.

(18)	dà	bát	-ôm	ppfx < /b-ó-ia-d/
	OBLIG	2SG:3PL	-do.IPFV	
	‘You must do it.’ (Adger et. al 2009:97)			
(19)	Pronominal Prefixes (Watkins 1984:41–42)			
	<u>2PL:3PL</u>			
	/b-ó-ia-d/			
	biád		V Truncation	
	bjád		Glide Formation	
	bád		Glide Deletion	
	bát		Final Devoicing	
	[bát]			

In addition, Final Devoicing and Closed-Syllable Shortening apply at the end of incorporated elements as in (20). The final /b/ in /t’á:b/ ‘deer’ does not syllabify as the onset of an adjacent vowel-initial incorporated element (*[t’á:.b-è:]). This shows that an incorporated noun [-t’áp] ‘deer’ and incorporated verb [-è:] ‘hunt’ form separate syllabification domains.

(20)	è	-t’áp	-è:	-bà:
	1PL	-deer	-hunt	-go.PF
	‘We went deer-hunting.’ (Watkins 1984:227)			

Therefore, incorporated elements form separate syllabification domains.

The above examples show that Kiowa’s verb is comprised of at least four smaller syllabification domains as bracketed in (20).

(21)	[Ppfx] – [(Adv)] – [(N)] – [(V)] – [STEM – {Inflect, Modal}] – (Synt)
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If the Kiowa verb is assumed to be a single word, there is no explanation for syllabification spanning from the verb stem through the suffixes but not between prefixes and incorporated elements. The Kiowa verb, therefore, must be reanalyzed in order to account for the above syllable-sensitive evidence.

4 The Phonological Word and the Kiowa Verb: a Proposal

4.1 Defining the Phonological Word

In the following analysis I adopt an approach that crucially relies on the model of Prosodic Phonology, which breaks down speech into a series of hierarchically organized units. These units form the domains for different phonological processes (Selkirk 1980, Nespor & Vogel 1986, Hayes 1989). In order to account for the Kiowa verb’s syllabification domains, I first propose the following definition of the phonological word (PW) in Kiowa.

(22)	<u>Phonological Word in Kiowa</u>
	The PW consists of a stem + suffixes

Previous work has defined the PW as consisting of minimally a stem (or root) with any affixes, functions words, or clitics that pattern together phonologically (cf. among others Nespor & Vogel

1986, Vogel 2008). Therefore the definition above is specific to Kiowa, though it may also be true of other languages (e.g., the PW in Turkish as defined in Kabak & Vogel 2001).

As seen in (23), this definition yields up to four PWs within the Kiowa verb. Each incorporated element forms a stem and therefore is an independent PW. The stem and suffixes PW is expected to include the Stem-{Inflect, Modal}-(Synt) sequence from (2), but the data so far does not include syntactic suffixes. Section 4.4.2 contains a discussion about the status of syntactic suffixes. For now, let us assume they form part of the stem and suffixes PW in agreement with (22).

- (23)

é	-[étpáthéi] _{PW}	-[phòlà:hì:] _{PW}	-[khò:] _{PW}	-[tòt] _{PW}
3SG:1SG	-forced	-rabbit	-get.NV	-send.PF
Ppfx	-(Adv)	-(N)	-(N)	-STEM. {Inflect, Modal}

‘She forcibly sent me to get a rabbit.’ (Adger et. al 2009:26)

According to the proposed definition, prefixes are also excluded from the PW, as they are neither stems nor suffixes following stems. The status of the pronominal prefixes in the Kiowa verb will be discussed in detail in Section 4.4.1.

4.2 Revisiting Syllable-Sensitive Phenomena

Given the proposed PW definition in (22), the domain for syllabification may be stated as in (24).

- (24) Syllabification in Kiowa
The PW is domain for syllabification.

The PW as the domain for syllabification provides an account for the observed syllabification domains within the Kiowa verb. Closed-Syllable Shortening applies across the Stem-{Inflect, Modal} morpheme boundary, supporting my proposal that they are members of the same PW (stem and suffixes). This is why [l] syllabifies as the onset of second syllable in the imperfect/hearsay form and /ú:/ surfaces as long.

- (25)

Root	Ipf/hsy	Imperfect	Future	Gloss	(Watkins 1984)
/gú:l/	gú:l-ê	gúl-ø	gúl-tò:	‘write’	

Moreover, syllabification does not span the proposed PW boundaries of incorporated elements. The incorporated noun /t’a:b/ ‘deer’ surfaces as its shortened and devoiced counterpart [t’ap] in (20), and the incorporated adverb /hê:n/ ‘dubitative’ shortens in (26). The /n/ cannot syllabify as the onset of the verb stem because of the PW boundary, and Closed-Syllable Shortening applies.

- (26)

há:têl	mô:	ø	-hên	-à:
someone	like	3SG	-dubitative	-come.PF

‘I’m not sure someone is coming.’ (Watkins 1984:225)

4.3 The PW and Other Phonological Rules

Prosodic domains are typically characterized by a clustering of phonological processes (Nespor & Vogel 1986, Shiering et al 2010). Therefore, it is expected that the PW in Kiowa will form the domain for more phonological processes than syllabification. In fact, three other phonological rules apply within the PW in Kiowa: Vowel Truncation (27), Glide Formation (28), and the Dental-Velar Switch (29). The Dental-Velar Switch is a particularly unusual phonological process described by Watkins (1984), in which [g] and [d] switch in certain sequences (e.g., /ge/ → [de] and /di/ → [gi]).

- (27) Vowel Truncation (Watkins 1984)
In a VV sequence, delete the first V.
[+syll] → ø / __ [+syll]

(28) Glide Formation (Watkins 1984)

/ia/ → [ja]

(29) Dental-Velar Switch (Watkins 1984)

Switch dental and velar place in case of the sequences [ge] or [di]

[+cons, -son, -α ant, -α cor, α high] → [α ant, α cor, -α high] / __ [+syll, -back, -α high]

To begin, consider (30). Glide Formation applies within the incorporated noun /ki̯á:hî/ ‘man’. As expected, Glide Formation applies within a proposed PW (incorporated element).

- (30) ó:hò: cólhò -kò kú:tò -gò -àl á -k’jâ:hî -dò: -mè:
 then thus -like bird -inv -too 3PL -man -be -hsy
 -dé -è
 -nom -when
 ‘at that time when those like him – birds too – were man like’ (Watkins 1984:227)

Moreover, all three processes apply across the Stem-{Inflect, Modal} boundary (31–32), as predicted by the proposed PW definition.

(31) /há:/ ‘shout’ (Watkins 1984:44)

Imperfect

/há:-dè-î:/

há:-dî: V Truncation

há:-gî: D-V Switch

– Glide Formation

[há:-gî:]

(32) /t^hém/ ‘break/itr’ (Watkins 1984:45)Perfect/t^hém-gé-ia/t^hém-giá V Truncation

– D-V Switch

t^hém-gjá Glide Formation[t^hém-gjá]

Crucially, the above-mentioned processes do not apply across a PW boundary. In (33), for example, a VV sequence is permitted when each vowel is on either side of a PW boundary.

- (33) à [-pó:]_{PW} [-á:]_{PW} *à-p-á:
 1SG -see -come.PF
 ‘I came to see you.’ (Watkins 1984:229)

Therefore, the PW as defined for Kiowa not only delimits the domain for syllabification but also for a series of three phonological rules.

4.4 Accounting for the Remaining Elements of the Kiowa Verb

4.4.1 Pronominal Prefixes

Since each element after a pronominal prefix forms its own PW, the prefix forms its own syllabification domain. As seen in (34), an underlying /d/ devoices and surfaces as [t] indicating that syllabification stops at the morpheme boundary.

- (34) bét -ô: ppfx < /b-é-ia-d/
 1SG:3PL.INV -gave
 ‘I gave them them.’ (Harbour 2003:516)

As mentioned in Section 4, prefixes are excluded according to the proposed definition of the PW

(22). Therefore, Kiowa's pronominal prefixes might be expected to act differently from a PW. In fact, pronominal prefixes differ from a PW in a prefix-specific Nasalization process (35).

(35) Nasalization (Watkins 1984)

Voiced stops become [+nasal] when before and/or after a [+nasal] segment. (Prefix-only.)

According to the rule, voiced stops become [+nasal] when before a [+nasal] segment as in /d-i̱-ə-/ → [n̩] '3SG:3SG' (Watkins 1984:49). Voiced stops also become [+nasal] after a [+nasal] segment as in /ə-ə̱-ə-b/ → [ɛ̱m] '3SG:3PL' (Watkins 1984:130). Additionally, the rule is bi-directional and nasalizes voiced stops in both directions as seen in (36).

(36) Nasalization in Pronominal Prefixes (Watkins 1984:48)

2PL:3SG

/b-ḡ-ia-d/

bi̱ad

V Truncation

bja̱d

Glide Formation

ḇad

Glide Deletion

m̱an

Nasalization

[m̱an]

Consider (37), which confirms that the nasalization process does not apply within a proposed PW. The incorporated verb /d̩:/ 'sleep' remains oral when it is incorporated into the verb complex.

- (37) à: -d̩: -h̩:m -à
 1SG -sleep -die -IPFV
 'I'm sleepy.' (Watkins 1984:225)

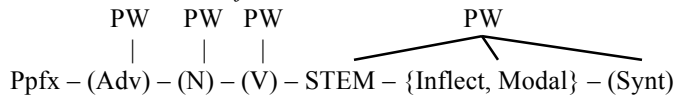
Therefore, pronominal prefixes demonstrate different characteristics from a PW in Kiowa and should not be considered a PW. I propose Kiowa's pronominal prefixes are excluded elements that join with the PWs at a higher level in the Prosodic Hierarchy, which I will discuss in detail in Section 6.

4.4.2 Syntactic Suffixes

The existing literature does not appear to contain evidence regarding the syllabification domain of syntactic suffixes. Namely, I have found no instances of a consonant-final verb stem and vowel-initial syntactic suffix in order to test whether or not Closed-Syllable Shortening or Final Devoicing applies. Watkins (1984) mentions in passing that Kiowa's syntactic suffixes may be considered clitics. Absent any evidence to the contrary, I propose that the syntactic suffixes form part of the stem and suffixes PW in agreement with the definition in (22). Whether or not the syntactic suffixes are affixes or clitics is left to future research.

To summarize, I propose the Kiowa verb consists of up to four PWs and an excluded prefix. This is shown in (38).

(38) *Prosodic Structure of Kiowa Verb*



5 Discussion

On the basis of syllable-sensitive processes and other phonological phenomena, I have demonstrated that the grammatical word and phonological word are not coextensive in Kiowa. In fact, Kiowa's verb is comprised of up to four PWs and an excluded element (the pronominal prefix). Whether or not Kiowa's syntactic suffixes are simply excluded suffixes or clitics, however, is left

to future research.

Moreover, future research should focus on whether or not the Kiowa verb complex corresponds to a higher prosodic constituent (e.g., the phonological phrase) as proposed in previous work on Native American languages (Rice 1993, Dyck 1994, Russell 1999). Recall that Watkins (1984) argues the Kiowa verb acts as a phonological unit for tonal modification. Tonal rules may then prove useful in delimiting upper-level prosodic constituents of the Kiowa verb.

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