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Abstract This article aims at investigating the linguistic criteria to determine what a word is in Wichi (Matacoan), a polysynthetic and agglutinative language spoken in the Gran Chaco Region, in South America. The main phonological criteria proposed are phonological rules and stress. We also apply some grammatical criteria that have been proposed cross linguistically, some of which are useful to determine the boundaries of grammatical words in Wichi. Finally, we explore the relationship between the phonological and grammatical word with the written word. We base our analysis of written words on a textbook (Tsalanawu) used in many bilingual schools in Northeastern Argentina.

Keywords Wichi · Matacoan · Wordhood · Phonology · Morphosyntax · Writing

Abbreviations
1   = first person
2   = second person
3   = third person
ADV = adverb
AUGM = augmentative
APPL = applicative

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CAUS = causative
CL = classifier
COLL = collective
DEM = demonstrative
DIM = diminutive
DIR = directional
DISTR = distributive
EXCL = exclamatory marker
FOC = focus marker
FREQ = frequentative
FUT = future
INCL = inclusive
INT = interrogative
ITER = iterative
IMP = imperfective
LOC = locative
NEG = negation
NMLZ = nominalizer
OBJ = object
PAT = patientive
PL = plural
POSS = possessive
PRO = pronoun
PROFint = interrogative preform
REFL = reflexive marker
SG = singular
SUB = subordinator
TNS = tense
VBLZ = verbalizer
( ) = deleted segments
+ = morpheme boundary
σ = syllabic edge

1 Introduction

The Wichí language belongs to the Matacoan family along with Chorote, Nivaclé and Maká. Wichí is spoken in northeastern Argentina and in southeastern Bolivia in parts of the Gran Chaco region. The Argentinian territory belonging to this phytogeographical region is home to the above mentioned Matacoan family, the Guaycuruan family (Toba, Mocoví and Pilagá), the Tupi-Guaraní family (Ava-Guarani, Mbya Guaraní, Tapiete, Guaraní), and the Lule-Vilela family.

According to the last census (2004–2005),[1] there are 40,036 speakers of Wichí in Argentina, most of them living in the provinces of Salta, Chaco and Formosa.

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[1] http://www.indec.gov.ar/webcenso/ECPI/index_ecpi.asp.

Wichí is the Matacoan language with the highest number of speakers and one of the indigenous languages of Argentina with the highest vitality level (Censabella 1999; Terraza 2002).

Since the Ley Federal de Educación (N° 24.195) was sanctioned in 1993, the Argentinian educational system has been progressively modified to develop into a more inclusive bicultural and bilingual system. During the 90s, Wichí began to be used as the language of instruction along with Spanish (from grade 1 to 3) in different Wichí communities in the context of a Bilingual Literacy Program (Zidarich 2004). The Wichí orthography is alphabetic and was developed by missionaries around 1910 (see for example Hunt 1913). It has been modified throughout the last 15 years under the influence of school and university members, native speakers, grass-roots non-profit organizations, and members of the Anglican Church (Buliubasich et al. 2004). Although the standardized Wichí orthography is still not accepted by every community, it is widely used in the school system.

This article has two objectives. First, we aim at defining the phonological and grammatical criteria that allow us to identify what a word is in Wichí. Secondly, our purpose is to explore if the writing tradition that is being developed in Wichí and that is now used in the context of school reflects those boundaries. The use of the written language at school has necessarily forced the teachers, the textbook writers and the speakers themselves to reflect on what a word is in Wichí. Following the writing tradition of most languages with alphabetic systems, the unit 'word' has been separated by spaces. But what are the criteria followed to put spaces between units? How consistent are these criteria?

We will base our analysis of written texts on the textbook called *Tsalanawu* (Zidarich et al. 1996 and 2006).[2] This textbook is used in grades one to three to develop literacy both in Spanish and Wichí. It includes two versions, one in Spanish (*Chalanero*), and one in Wichí (*Tsalanawu*) plus a booklet with activities. When equivalent data are available, we will compare the boundaries that we propose to identify a word in Wichí to the division between written words that has been proposed in the textbook. It is worth mentioning that Wichí speakers have played a major role in the production of this pedagogical material, and thus we expect to find a manifestation of speaker's intuitions on what a word is in Wichí. Our purpose is to illustrate the writing tradition in the school. The school plays a major role in the development of literacy in the Wichí communities and the new generations of literate Wichí are being trained by this institution in the context of bilingual education. This is the reason why we have not included other written materials such as the Bible or the publications by Laureano Segovia, a very well-known Wichí writer.

Our analysis of the phonological and grammatical word is based on data that the authors gathered themselves in three Wichí communities: one, Rivadavia Banda Sur (Salta); two, Tartagal (Salta); and three, Ingeniero Juárez, Barrio Viejo (Formosa).

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[2]The 2006 version is an adaptation of the 1996 into a different Wichi dialect. It also contains innovative pedagogical material. The 2006 version was published as part of the Documentation Program of Endangered languages (DOBES) sponsored by the Volkswagen Foundation and directed by Lucía Golluscio.

The examples provided in this paper are mainly from Ingeniero Juárez and Rivadavia[3] (hereafter IJ and R respectively).

The article is organized as follows. Section 2 presents a brief typological profile of the language. In Sect. 3 we propose some phonological criteria that delimit the boundaries of phonological words. Section 4 discusses some criteria to define a grammatical word. In Sect. 5 we discuss the orthographic word and how it relates to phonological and grammatical words. Section 6 is a summary.

2 A thumbnail typology

Wichí is an agglutinative, head-marking language with a strong tendency toward polysynthesis. It exhibits highly complex verbal structures that include information about grammatical relations of participants (prefixes for subjects and suffixes for objects), tense, aspect, negation, valency alternations, derivational suffixes, etc. (see Terraza 2009 for a description of verb morphology). There is no case marking on nominals and the language lacks adpositions. Most of the notions expressed by adpositions in other languages are expressed by applicatives in Wichí.

The preferred word order is SVO in bivalent clauses but both SV and VS are found in monovalent ones.[4] There are three open word classes in Wichí: nouns, verbs and adverbs. There is not a distinct adjective category: properties concepts are expressed as stative verbs. Closed word classes are subordinators, pronouns, the focus marker and conjunctions.

3 Defining the phonological word in Wichí

Phonological rules and stress are useful criteria for identifying a phonological word in Wichí. Tables 1 and 2 show the Wichí phonological system of Ingeniero Juárez dialect based on Cayré Baito (2013). Murmured and aspirated consonants are marked by an asterisk because they are losing their distinctive function. There are only a few examples registered with these consonants.

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[3]We decide to provide examples from these two dialects because they do not exhibit many dialectal differences. Their phonological inventories are quite similar except for the following segments: the palatalized phoneme /kʲ/ and the uvular /q/ from the dialect spoken in Rivadavia are realized as an affricate /tʃ/ and a velar /k/ in Ingeniero Juarez. Thus 'mountain' and 'head' in Rivadavia are *takʲenax* and *ɬeteq* while in Ingeniero Juárez, *tatʃenax* and *ɬetek*. There is also a morphological difference that the reader will notice in this article: in the dialect spoken in Rivadavia the 1st person possessive marker is a nasal, *n-* or *nj-*, while in Ingeniero Juárez it is a nasalized vowel: *ũ-* or *ũj*.

[4]In monovalent clauses the verb can precede or follow the noun with no change in meaning, only a different emphasis on the first element of the clause:

(i)	Ø-tamkʲoj n-wej	(R)	or	n-wej	Ø-tamkʲoj
	3-dry 1POS-clothes			1POS-clothes	3-dry
	'My clothes are dry'				

Table 1 Consonantal phonemes in Wichí

Consonants		Lab	Dento-alv	Palat	Velar		Glot
					Non-labial	Labial	
Plosive	Plain	p	t		k	k^w	
	*Asp.	p^h	t^h				
	Glott.	$p^ʔ$	$t^ʔ$		$k^ʔ$		
Affricate	Plain		ts	tʃ			
	Glott.		$ts^ʔ$				
Fricative		s			x	x^w	h
Lateral fricative			ɬ				
Nasal	Plain	m	n				
	*Murm.		ṇ				
Approx.	Plain	w		j			
	*Murm.	w̰		j̰			
	Lateral		l				

Table 2 Vocalic phonemes in Wichí

Vowels	Front	Central	Back
High	i		u
Mid	e		o
Low		a[a]	

[a] In some dialects such as the one spoken in Tartagal (Viñas Urquiza 1974; Fernández Garay and Spinelli 2006) or in Bolivia (Claesson 1994) there is a phonological distinction between a central vowel /a/ and a back vowel /ɒ/

3.1 Phonological rules

The following processes apply within the word; the first three are triggered by laryngeal /h/:

- Aspiration of the plosives /p/, /t/ and /k/
- Murmur phonation (or devoicing)[5] of the nasals /m/ and /n/
- Nasalization (and murmur phonation) of the approximants /l/ and /j/
- Palatalization of the velars /k/ and /x/

---

[5] In this paper we will refer either to murmuration or devoicing. In the literature on Wichi (Avram 2008; Terraza 2009; Nercesian 2011a, 2011b) the process triggered by /h/ on nasals is analyzed as "devoicing". In Rivadavia dialect nasals are devoiced by /h/ (Terraza 2009) but in Ingeniero Juárez and Tartagal dialects we registered that /h/ triggers murmur phonation rather than devoicing. Spectrograms show that in murmured sounds there is a weakening of acoustic energy but voicing is maintained in nasals (for more details see Cayré Baito 2013).

In the following sections we analyze these processes, first the ones triggered by /h/ (Sect. 3.1.1) and then velar palatalization (Sect. 3.1.2). In each case we describe the applying and non-applying contexts, and then in Sect. 3.1.3 we explain why phonological rules are a criterion to identify a phonological word in Wichí.

3.1.1 Processes triggered by the laryngeal /h/

Nasalization, aspiration and murmuration (or devoicing) are regressive processes triggered by /h/. They apply between morphemes when the target segment occupies the final coda (of the stem) and the following suffix (or enclitic) starts with /h/. As can be seen in (1a), /l/ loses its [lateral] feature and becomes [n]. In the literature there are two analyses of murmuration (or devoicing) and aspiration. Some scholars (Terraza 2009; Cayré Baito 2013; Nercesian 2011a, 2011b) consider that murmured or devoiced consonants are allophones of plain consonants /m/, /n/, /p/, /t/ and /k/. Other scholars such as Claesson (1994) analyze them as a sequence of $C + h$ which undergoes metathesis afterwards.[6]

(1)   Nasalization (and murmuration) of approximants /j/ and /l/:

    (a) ito′[**j̃**]at   (IJ)
          i-to**j-h**at
          3-lose-CAUS
          'He makes it disappear'

    (b) ixʷe′[**n̥**]u (IJ)
          i-xʷe**l-h**u
          3-tell-APPL
          'He tells [something to someone]'

    Aspiration of plosives /p/, /t/ and /k/

    (c) ji′[**pʰ**]en (R)
          Ø-ji**p-h**en
          3-sound-PL
          'They yell'

    (d) ũj′he[**tʰ**]u   (IJ)
          ũj-he**t-h**u
          1SG-push-APPL
          'I gather [the children]'

    (e) ja[**qʰ**]i′t′ʔe   (R)
          Ø-ja**q=h**itʔe
          3-come.back=NEG
          'He does not come back'

---

[6]See Terraza (2009: 26–27; 40–41) for arguments against the analysis of aspirated and devoiced nasals as a sequence of two segments.

Murmuration (or devoicing) of nasals /m/ and /n/

(f) niwen′a[m̥]u   (IJ)
ni-wen=a**m**-**h**u
1SG-have=OBJ2-APPL
'I give [something] to you'

(g) ilesaj′[n̥]ila   (R)
i-lesaj(e)**n**=**h**ila
3-drive=FUT
'He will write'   (lit: I will drive something)

Interesting, these processes do not apply when the inalienable noun -*hi* 'container'[7] is added to the stem even though it is an *h*-initial morpheme. The target segment does not syllabify as onset either:

(2)   (a) soto[**j′h**]i   *soto[**j̃**]i (IJ)
            soto**j**-**h**i
            animals-container
            'Farmyard'

       (b) ijo[**t′h**]i   *ijo[**tʰ**]i (R)
            ijo**t**-**h**i
            mud-container
            'Wheelbarrow'

       (c) pa[n′h]i   *pa[n̥]i (IJ)
            pa**n**-**h**i
            bread-container
            'Place for bread'

Another exception of the applicability of these phonological processes is found in the left edge of the word. Here again the phonetic context would be appropriate (h-initial) but, as we will see in section Sect. 3.1.3, the morphological context is not: the laryngeal /h/ is not the initial consonant of the suffix (or enclitic) but the initial consonant of the root:

(3)   (a) ũ[**j′h**]uje   *ũ[**j̃**]uje (IJ)
            ũ**j**-**h**u-je
            1SG-go-LOC
            'I go somewhere'

       (b) [**nh**]e′t′ʔat   *[n̥]etʔat (R)
            n-het=tʔat
            1-push=IMP
            'I push'

---

[7]In Terraza (2009)-*hi* is analyzed as an inalienable noun used in nominal compounding processes; while in Cayré Baito (2013)-*hi* is analyzed as a nominalizer suffix. For the purpose of this paper we follow Terraza, see Sect. 3.1.3.

(c) ɬa[**jh**]e′men   *ɬa[**j̃**̈]emen (R)
Ø-ɬa**j-h**emen
3-REFL-love
'He loves himself'

Finally, these processes do not apply between words, as the following examples
show:

(4) (a) niwe′ne[**j**]   ha′lo   *niwe′ne[**j̃**̈] (IJ)
ni-wen-(j)e**j** **h**alo
1SG-see-LOC tree/stick
'I see the tree'

(b) i′lo[**n**] ha′jox   *i′lo[**n̥**] (R)
i-lo**n**   **h**ajox
3-kill   tiger
'He kills the tiger'

(c) jak^j o′ha[**t**]   ha′lo   *jak^j o′ha[**tʰ**] (R)
ja-k^j o-ha**t**   **h**a'lo
1PL-breake-CAUS tree/stick
'We broke the stick'

3.1.2 Palatalization of velars

Palatalization is a progressive process triggered by a front vowel preceding a velar
consonant (this process occurs only in Ingeniero Juárez dialect). It applies between
morphemes when the velar of the final coda position (of the stem) is preceded by a
front vowel.

As can be seen in the following examples, /k/ is realized as the post-alveolar af-
fricate [tʃ] and /x/ as the post-alveolar fricative [ç]:[8]

(5) (a) niwe′le[**tʃ**]a   (b) ji[**tʃʰ**]i′la
ni-wel**ek**-a   j-**ik**=hila
NEG3-walk-NEG   3-go=FUT
'He does not walk'   'He will go'

(c) ni′le[**ç**]u   (d) ijoje′[**ç**]en
ni-l**ex**-hu   i-jo-(j)**ex**-hen
1SG-clean-APPL   3-drink-APPL-PL
'I clean [the pot]'   'They drink [it]'

Example (6) shows that when the velar occupies the onset position, palatalization
does not apply even if it is preceded by a front vowel. On the other hand, example (6b)

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[8]The gloss neg3 stands for a negative morpheme which subsumes negation and person, in this case 3rd
person. There are two ways of negating a clause in Wichi, with the suffix *-hit'e* or with a set of morphemes
(a prefix and a suffix) subsuming person and negation: nam-a (1st), qa-a (2nd person), ni-a (3rd person).
The second part of this negative morpheme, -a, has been analysed as the irrealis in Chorote (Carol 2014).
In previous work (Terraza 2009) we analyzed this two affixes as a discontinuous morpheme.

shows that the velar palatalizes only when it syllabifies as the onset of the following suffix:

(6)   (a)   i[**k**]a′na   *i[**tʃ**]a′na
               i-ka-na
               3-LOC-DEM
               'He is here'

    (b)   ile[**x**]′pe   *ile[**ç**]′pe
               i-l**ex**-pe
               3-clean-APPL
               'S/he washes [my face]'

There is no palatalization when the inalienable noun *-hi* 'container' is added to the stem (as was the case with the processes triggered by /h/), even though the phonetic context is suitable:

(7)   peje[**k′h**]i   *peje[**tʃʰ**]i
    pejek-hi
    image-container
    'Mirror'

Finally, palatalization does not occur between words:

(8)   ũ′ɬam   ni′le[**x**]   ũkus′tes   *ni′le[**ç**]
    uɬam   ni-lex   ũ-kus(e)t-Vs
    PRO1SG 1SG-wash 1POSS-pant-PL
    'I wash my pants'

3.1.3 Phonological rules as a criterion for defining a phonological word

Based on the description in Sects. 3.1.1 and 3.1.2 we can state that:

- These processes apply between morphemes, when the target segment occupies the final coda of the stem or suffix (see example (9)), and the following suffix (or enclitic) is vowel-initial (for palatalization) or *h*-initial (both for palatalization and the processes triggered by /h/). At the same time, these processes are subject to syllabification of the target segment as onset of the following suffix or enclitic.
- These processes apply only at the right edge of the word, that is, when a suffix or enclitic is added to the stem. These processes do not apply on the segments to the left of the stem (that is prefixes and root initial consonants).
- None of these processes applies between words.
- None of these processes apply when the inalienable noun *-hi* 'container' is added to the stem, although the phonetic context is suitable.

Thus, these phonological processes are criteria that allow us to identify a phonological word, since all of them apply within it. Whenever the phonetic context is suitable and the target segment syllabifies as an onset, the processes apply at the right edge of the stem. The following examples show that rules can apply across two boundaries morphemes: between a stem-final target and a suffix (such as /j/ in (9a)

Table 3 Two domains within the phonological word

	/iˈwen/	/iweˈna/	/iweˈnu/	/niweˈnahu/
	'He has'	'He does not have'	'He gives [sth to so]'	'He does not give [sth to so]'
First domain				
[Prefix + Root] + -a]	i-wen	ni-wen-a	i-wen	ni-wen
Output	[iˈwen]	[nĩweˈnã]	–	ni-wen-a
Second domain				
[[Prefix + Root] + -a] + Sufix./Enclit.]	–	–	i-wen-hu	ni-wen-a-hu
Murmuration and syllabification	NA	NA	Applies	NA
Output	[iˈwen]	[nĩweˈnã]	[iweˈn̥ũ]	[nĩweˈnãhũ]

and the first /x/ in (9b)) and between a suffix-final target and another suffix/enclitic (such as /t/ in (9a) and the second /x/ in (9b)):

(9) (a) ta[j̃]a[tʰ]itˀenuˈkʲo   (R)
          Ø-ta**j**-ha**t**-hitˀe-nu-(n)kʲo
          3-sit-CAUS-NEG-1OBJ-(?)DIR
          'He did not make me bend down'

     (b) ti[ç]eˈ[ç]en   (IJ)
          Ø-ti**x**-e**x**-hen
          3-hit-APPL-PL
          'She crashes [into something]'

Based on these data we put forward the following hypothesis: there are two domains within the phonological word in Wichí. The first domain is the stem, composed by a verbal or nominal root with prefixes which give information on person, voice and negation. As the negative prefixes always co-occur with the suffix -a, we include this suffix in this domain. The second domain is made up of stem plus suffixes and enclitics (plural morphemes, applicatives, causatives, negation with *-hitˈe* etc.). The phonological processes apply only at the second domain. (See Table 3.)

Since in Wichí there is only one primary stress per word weather complex or not (see Sect. 3.2), we consider that a prosodic word in this language could be either a stem (prefix + root) such as *iˈwen* 'He has' or a stem + suffixes/enclitics, such as *iweˈnu* 'He gives (something to someone)'. This is shown in Fig. 1.

Therefore we can state that phonological rules are active within the stem + suffixes/enclitics domain but not in the stem domain (prefix + root). This explains why phonological processes do not take place between the morpheme boundary prefix and root. It also explains why phonological rules take place when the locative =*hi* is added to a stem ((10a), and (11a)) but they do not when the inalienable noun *-hi* 'container, box' is combined with another word (10b), (11b) (see also examples (2) and (7):
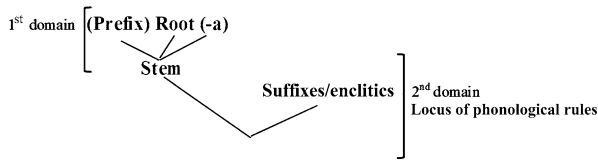
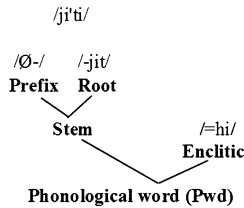**Fig. 1** Domains within the phonological word in Wichí

Fig. 2 One Phonological word *jiti* 'It shines'

Fig. 3 Complex Phonological word *lhamethi* 'book/notebook'
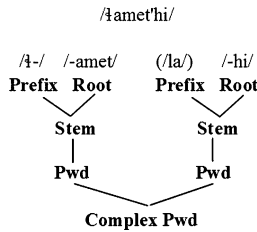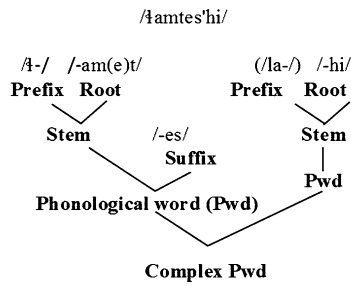
(10) (a) ko′[j̃]i   (IJ)   (b) ko[j′h]i   *ko′[j̃]i (IJ)
           koj=hi   koj-hi
           clothes=LOC   clothes-box
           'Pocket'   'Closet'

(11) (a) ji′[tʰ]i   (IJ)   (b) ɬ-ame[t′h]i   *ɬ-ame[tʰ]i (IJ)
           Ø-jit=hi   ɬ-amet-(la)hi
           3-shine=LOC   3POS-word-box
           'It shines'   'Book / notebook'

In (10a) and (11a) there is one Pword (composed of a stem + enclitic =*hi*) while in (10b) and (11b) there are two Pwords (composed each by a stem), therefore phonological rules cannot apply (see Figs. 2 and 3). In the (b) examples both stems create a new noun, hence we consider them as complex phonological words.

An argument to support this hypothesis is that in (12b) and (13b) the first noun can take the nominal plural suffix:

/ɬamtesˈhi/

/ɬ-/ /-am(e)t/   (/la-/) /-hi/
Prefix Root   **Prefix   Root**

Stem   /-es/   **Stem**
            Suffix

                          Pwd

Phonological word (Pwd)

Complex Pwd

Fig. 4 Complex Phonological word *lhamteshi* 'books'

(12) (a) ɬ-amˈtes   (b) ɬ-amte[sˈh]i *ɬ-amte[s]i (IJ)
           ɬ-am(e)t-es   ɬ-am(e)t-es-(la)hi
           3POS-word-PL   3POS-word-PL-box
           'words'   'books'

(13) (a) maˈjej   (b) maje[jˈh]i *maje'[j̃]i (IJ)
           maje(k)-ej   maje(k)-j-(la)hi
           thing-PL   thing-PL-box
           'things'   'boxes'

As Fig. 4 shows each stem is independent and takes its own affixes. The final con-
sonant /t/ in *ɬam(e)t* syllabifies as the onset of the next syllable: ɬamet.es → ɬam(e).tes
when plural suffix is added; syllabification takes place within the phonological word.
But final consonant /s/ in *ɬamteshi* cannot syllabify as onset *ɬamtesi because *ɬamtes*
and (*la*)*hi* belong to different Pwords.

3.2 Stress

The stress pattern of Wichí is quantity-insensitive; that is, primary stress falls on the
rightmost syllable of the word regardless of syllable weight (Cayré Baito 2013):

(14) (a) laˈkʲexʷ (R)   la-kʲexʷ-is
           la.kʲe.ˈxʷis   3POSS-wing-PL
           'bird wing'   'bird wings'

      (b) aˈɬe   a.ɬe.ˈtax (R)
           'lizard'   aɬe-tax
                                 lizard-AUGM
                                 'alligator'

      (c) ti.naˈjit   ti.na.jit.ˈnu (IJ)
           ti-najit   ti-najit=nu
           3-tie   3-tie= 1OBJ
           'They tie [something] up'   'They tie me up'

(d)	ta.taj.ˈ**pʰo**	ta.taj.tʃe.ˈ**pʰo**	(IJ)
	ta-taj-pʰo	ta-taj-tʃe=pʰo	
	3-sit-DIR	3-sit-DIST=DIR	
	'She is sitting'	'They are sitting'	

(e)	hi.pet.ˈ**xen**	hi.pet.xa.ˈ**hen**	(IJ)
	hi-pet(a)x-hen	ni-pet(a)x-a-hen	
	3-slip-PL	NEG.3-slip- NEG.3-PL	
	'They slip'	'They do not slip'	

As shown in examples (14), the stress pattern is not modified by the suffixes or enclitics that are added to the stem.[9] Moreover, none of the prefixes affect the stress pattern and they are themselves always unstressed: subject (4a) and possessive markers (8a), reflexive markers (3c), and the negative prefixes (5a). Likewise, it is not modified in compound words:

(15)	(a)	ł.eteq.łi.ˈ**lej**	(R)	(b)	ũ.xʷexʷ.ˈ**t²ox**	(IJ)
		ł-eteq-łile-j			ũ-xʷexʷ-t²ox	
		3POSS-head-bone-PL			1SG.POSS-finger-leather	
		'Skulls'			'My fingernail'	

But even when the stress pattern is modified as in verbal derivation[10] there still one primary stress per word:

(16)	(a)	jen.ˈ**kʲe**.me.ta	(R)	(b)	i.wu.ˈ**le**.sa	(IJ)
		Ø-kʲemet-a			i-wu-les-a	
		3-do-work-VBLZ			3-do-sons-VBLZ	
		'He works [sharpening knives]'			'She gave birth'	

---

[9]It is worth mentioning that **stress** in Wichí requires a thorough study, since it does not always appear to be regular. We have noticed that some suffixes present a double behavior depending on the bases or stems with which they co-occur. In some cases they follow the general stress pattern (they attract stress) but in others they do not (Terraza 2009; Cayré Baito 2013):

(i)	Affix *-hu*		
	ujˈ**he**.tu	vs.	ni.xʷe.ˈ**nu**
	uj-het-hu		ni-xʷel-hu
	1SG-push-APPL		1SG-tell-APPL
	'I gather [the children]'		'I tell [something to someone]'

(ii)	Affix *-a*		
	taˈ**tʃu**.ta	vs.	i.lo.ˈ**ta**
	ta-tʃut-a		i-lot-a
	3SG-help-APPL		3SG-hear-APPL
	'He helps [her]'		'He hears [the door]'

[10]According to Terraza (2009) verbal derivation in Wichi is possible with two verbal roots semantically similar: *wu* and *jen* that have the meaning 'to do'. Both roots require the verbalizer morpheme *-a* that is suffixed at the end of the derived verb. The same construction is analyzed as an instance of noun incorporation (see Nercesian, this volume). For more details and for the arguments against a noun incorporation analysis see Terraza (2009: 173–183).

3.2.1 Stress as a criterion for defining a phonological word

Stress is another criterion that helps identify a phonological word: there is one primary stress per word assigned to the rightmost syllable. Below we show how, in previous studies (Terraza 2009; Cayré Baito 2013) stress was one of the criteria taken into account in order to consider possessive classifiers as independent prosodic words. This is based on the following facts:

- In example (17), there are two primary stresses, viz. one for the classifier and another one for the noun.
- Like nouns, classifiers carry inflectional affixes: possessive markers, plural suffixes and diminutive suffix *-xʷa*. As example (17d) shows, the stress pattern applies regularly when affixes are added to the classifier, primary stress is applied to the rightmost syllable of the word just like in nouns.

(17) (a) ũ.′**loj**   e′le-s   (IJ)
          ũ-lo-j   ele-s
          1POSS-CL-PL parrot-PL
          'My parrots'

     (b) jen′ɬi   la′**ka**   wuna (IJ)
          Ø-jen-ɬi   la-**ka**   wuna
          3SG-do-ITER 3POSS/SG-CL hat
          'He makes his hat'

     (c) ha′tʔe   to la′**qoj**   la′pis   (R)
          ha-tʔe   to la-qo-j   lapi-s
          INT-PROFint SUB 3POSS-CL-PL pencil-PL
          'Whose are these pencils?'

     (d) ũlo′**xʷa**   mi′tsi (IJ)
          ũ-**lo**-xʷa   mitsi
          1POSS/SG-CL-DIM cat
          'My kitty'

Like nouns, the classifiers *lo* and *ko* (or qo) combine with the construction *jen. . .a* (see footnote 10) and derive the verbs 'take hold of' and 'adopt (an animal)' respectively. In the examples in which the general stress pattern do not apply such as (17), primary stress is assigned to the first syllable of the noun; likewise in the examples given below in (18) primary stress is assigned to the classifier:

(18) (a) jen′**ko**ja   me′sa (IJ)
          jen-ko-(j)a mesa
          do-CL-VBLZ table
          'He takes hold of the table'

     (b) jen′**lo**ja   mi′tsi (IJ)
          jen-lo-(j)a mitsi
          do-CL-VBLZ cat
          'He adopts the cat'

When combined with a possessive prefix, classifiers *ko* and *lo* can be translated as '(my, your, his, our, their) belonging(s)' and '(my, your, his, our, their) pet(s)' respectively.

4 Defining the grammatical word in Wichí

In this section we will describe the criteria that allow us to identify a nominal and verbal grammatical word.

4.1 Nouns

The grammatical nominal word in Wichí can be defined as centered on a nominal root. Roots can be either alienable or inalienable. A minimal nominal word can consist of just a prefix + root when it is inalienable (as *-wuley* 'leaf' in example (19)) or of a root when it is alienable (as *wuna* 'hat' in example (20)). When an alienable noun is possessed it needs to be categorized by a possessive classifier. Example (19) shows the inalienable noun specified both by a prefix (*la-*) and a possessor lexical noun (*haloj* 'trees'), and example (20) shows the alienable noun *wuna* 'hat' in a possessive construction with a classifier (*qa*).

(19)　halo-j　**la-**wule-j　　Ø-jaqatˀe　(R)
　　　tree-PL 3POSS-leaf-PL 3-be.yellow
　　　'The leaves of the trees are yellow'

(20)　naqwutaq-wu Ø-ihi **la-qa**　　wuna (R)
　　　honey-maker 3-be　3POSS-CL hat
　　　'There is a bee in his hat'

Nouns can also bear suffixes and enclitics, and compounding is quite productive in the language. The following table (adapted from Terraza 2009: 59) shows the structure of nouns.

Tense markers and demonstratives/directionals are clitics; possessive, derivational and number markers (i.e. plural and distributive/collective) are affixes. Following Dixon and Aikhenvald (2002: 19), we will first consider the following three main criteria to identify a grammatical word and in Sect. 4.3 we will discuss four other criteria and their applicability to the word in Wichí:

(a) Cohesiveness: grammatical elements occur together rather than scattered through the clause.
(b) Fixed order: the grammatical elements in the word occur in a fixed order.
(c) Conventionalized coherence and meaning: speakers clearly may talk about a word but not about a bound morpheme.

As for criterion (a), it applies to nouns since the morphemes in Table 4 only occur within the nominal structure and cannot be separated from the nominal root. They need either to be affixed to a nominal root or to be enclitized to it. Moreover, no correspondent full form exist. As they have no correspondent full form they are always part of the noun or the verb and are not scattered through the clause. Criterion (b)

Table 4 The nominal complex[a]

POSS	**ROOT**	DERIV.	NUMBER		TENSE	DEM/DIR
n/nt-1		*-jax* nom.	*-j*	*-lis*	*=mati*	*=na*
a/Ø/ha-2		actions	pl.	distrib.	past	Dem.
la/Ø/ta-3		*-et* patientive	*-Vs*	*-łajis*	*=ne*	*=ni*
to/tot-		*-hi* locative	pl.	collect.	past	dem
unspecified		*-xʷax* dim.	*-tsel*		*=naxi*	*=tsi*
ła- 1pl.incl		*-tax* aumen.	pl.		past	dem
					=te	*=li*
			-ł		past	dem
			pl.		*=hila*	*=tsu(j)*
			-haj		future	dir.
			pl.			*=xim*
						Dir

[a] The following morphemes appear in Table 3 from left to right: possessive prefixes and their allomorphs, different derivative morphemes, number suffixes and their allomorphs, temporal markers (past: *=mati*, *=ne*, *=naxi*, *=te* and future: *=hila*), demonstrative locatives *=na*, *=ni*, *=tsi*, *=li* and directionals *=tsu(j)* and *=xim*.

is a strong one in Wichí; at least in the nominal complex, the position of clitics and suffixes is fixed:

(21)   n-łoq-hi=hila=tsuj   n-qa   tju
         1POSS-food-inside=FUT=DEM 1POSS-CL uncle

         Ø-tehiloq Ø-texʷ=nu (R)
         3-want   3-eat=1OBJ
         'My uncle want(ed) to eat the food that will be on my plate'

Finally, criterion (c) also contributes to the definition of a nominal word in Wichí. If one asks speakers for the meaning of any noun plus affixes or clitics, they have no problem in offering a definition of the word or an explanation of its meaning with its translation. However, if one asks a speaker about the meaning of *la-*, *=na*, or *-lis*, they do not recognize it as a meaningful unit.

4.2 Verbs

Verbs in Wichí are actually minimal clauses as they generally occur with the personal markers in subject function, even in subordinate clauses (see also Nercesian, this issue). The minimal verb unit is a verbal root preceded by a personal marker.

There are 11 slots for suffixes and clitics. The following list shows some examples (for a more complete list of suffixes and clitics, see Terraza 2009: 118):

Causative: *-jen*, *-hat*
Negation: *=hitʔe*
Object: *=nu*, *=am*, *=nam*, *-Ø*
Locative: *-ej* ('long distance'), *-hi* ('inside')
Directional: *-po* ('up'), *-lo* ('in front')
Applicative: *-ex* (instrumental), *-pe* ('over')

Distributive/collective: *-kʲe, -kʷe*
Number: *-hen, -wito*
Tense: =*mati* (past), =*hila* (future).
Aspect I: =*pex*
Aspect II: =*tˀat*

Even if the order in which the suffixes and clitics were presented is not always fixed, variation occurs in a very restricted way and is usually accompanied by a change in meaning:

(22)   ta-kʲema=pex ta-kʷej   wit
         3-take=FREQ 3POSS-hand and

         j-ax=pex=lo   qˀata-s (R)
         3-hit=FREQ=LOC fly-PL
         'He would shake his hand and hit the flies'

One of our consultants accepted the following alternative order for the verbal construction in boldface in example (22): *j-ax=lo=pex*. Even though he was unable to explain the difference between the two versions, he asserted that there was a change in meaning. This is consistent with criterion (b). As for criteria (a) and (c), they also apply to the verbal word.

4.3 Further criteria to identify a grammatical word

The following criteria proposed by Dixon and Aikhenvald (2002) only apply to some languages. We will briefly discuss them and their applicability to Wichí:

(d) Non-recursiveness: morphological processes involved in the formation of words tend to be non-recursive, that is, one element will not appear twice in a word.
(e) Uniqueness:[11] there will be just one inflectional affix per word (in languages with an inflectional system).
(f) Uninterruptability: a speaker may pause between words but not within a word.
(g) Isolatability: a word may constitute a complete utterance, all by itself.

Criterion (d) does not apply to Wichí nouns but it does apply to verbs. Nouns can, in certain cases, be marked twice for plurality as in the following examples:[12]

(23)   (a) sinox-xʷax   (b) sinho-s-**a**-s   (R)
            dog-DIM   dog-PL-**DIM**-PL
            'Small dog'   'Small dogs'

       (c) wet-xʷax   (d) wet-es-**a**-s
            house-DIM   house- PL-**DIM**- PL
            'Small house'   'Small houses'

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[11] This term is not used by Dixon and Aikhenvald (2002).

[12] Here the diminutive suffix -xʷax is reduced to -a. The derivation of the plural form of *sinox* 'dog' is as follows: /*sinox-os*/ (vowel copying and insertion), then the velar /x/ becomes /h/ in onset position yielding /*sinohos*/. The first vowel drops as a consequence of a syncope yielding /*sinhos*/ and finally /h/ devoices the nasal /n/ yielding [siṇos].

As for criterion (e) it applies to languages with a single inflectional (obligatory) system on each class of words such as Latin (Dixon and Aikhenvald 2002: 22) and this is not the case of Wichí. In regard to the following criterion we have no information in our corpus to determine if a speaker may pause between words or within words. Finally, criterion (g) has limited applicability to *some* languages and *some* words (Dixon and Aikhenvald 2002: 25). Wichí is one of these languages for most clauses are actually one grammatical word (and sometimes one phonological word) with the arguments of the verbs indexed on the verbal root. In some cases, a nominal predication may also be one utterance by itself:

(24)   la-xuk^ja-**nu**   (R)
       3POSS-father-OB1
       '(He is) my father'

4.4 Clitics

Clitics are an intermediate category between full-fledged phonological words and affixes. There has been a great deal of publications devoted to this special category (for instance Anderson 2005; Zwicky 1977; Zwicky and Pullum 1983, etc.). From a typological perspective, there seems to be a great number of language specific parameters in terms of selectivity of the host, phonological cohesion, syntactic scope, etc. (see Aikhenvald, 2002: 43 for details).

From a phonological point of view, we are unable for the moment to propose criteria strong enough to distinguish between affixes and clitics. From a grammatical point of view, clitics and affixes can be distinguished in terms of host selectivity. Prefixes and suffixes are exclusively nominal or verbal and clitics can take both lexical categories as hosts.

Clitics in Wichí differ from full-fledged phonological words mainly in that they cannot stand alone without a (phonological) host, which can be a nominal, verbal or adverbial root, or another clitic. Even though they may be considered grammatical words, clitics also differ from them in that they do not convey a conventionalized and coherent meaning (criterion c). In terms of the direction in which they attach to a host, we find only enclitics in this language.

4.4.1 Enclitics

We mentioned in Sect. 3.2 that enclitics and suffixes do not modify the stress pattern of the word when they are added to a root or stem. In terms of phonological rules, these apply both to suffixes and to enclitics.

Enclitics such as tense markers (=*mati*, =*naxi*, =*ne*, =*te*) and demonstratives (the locatives =*na*, =*ni*, and the directionals =*tsu*, =*xim*) may take either a nominal (ex. (25a) and (25b)) or verbal host (ex. (25c) and (25d)):

(25)   (a)   halo=**mati**=**na** i-k^jo   (R)
             tree- TNS-DEM 3-break
             'This tree (recently mentioned) broke'

(b) xobenes to   Ø-i-hi   ribadabia=**na** (R)
    youngsters SUB 3-be-LOC Rivadavia=DEM
    'The youngsters who are here in Rivadavia'   (lit: in this Rivadavia)

(c) sinox Ø-jukʷax=**naxi** to   Ø-i-hi   tahi (R)
    dog   3-bite-TNS   SUB 3-be=LOC woods
    'The dog bit him when he was in the woods'

(d) (...) Ø-jaq   Ø-nom-ej=**na**   nekʲe namił
    (...) 3-return 3-come-LOC=DEM still   PRO1PL
    ja-wen   itox (R)
    1PL.INCL-have fire
    '(...) and it brought it back here (the fire) and now we still have fire'
                                            (legend about the origin of fire)

Some free forms, such as the adverb *p'ante* 'long time ago' may be enclitized and receive a clitic at its right as well. Compare (26) and (27).[13]

(26)   wit ha=tsu   to tsihna=tsu j-omej
       and EXCL=DEM SUB woman=DEM 3-speak
       'And this is how that woman used to speak'

(27)   wit ha=**pˀante**=tsu   hop caso pˀante
       and EXCL=ADV=DEM FOC story ADV
       'And this is how this story went'

5 Defining the orthographic word in Wichí

In many Wichí communities, the Wichí language is nowadays the language of instruction (in grades 1 to 3) along with Spanish. Being the language of school implies necessarily that it possesses a writing system and that some decisions have to be taken to decide where to put spaces to distinguish between words. The use of spaces to separate words is a convention shared by many languages, especially in languages with an alphabetic writing system. The use of Spanish is undoubtedly influencing Wichí in its lexicon (see Terraza 2003; Vidal and Nercesian 2009a, 2009b) and is certainly molding the methodology used to promote literacy. However it does not seem to be influencing the boundaries between the written words.

The spaces between words proposed in the textbook *Tsalanawu* correspond roughly to a phonological word. Both suffixes and clitics are usually written as part of the same orthographic word (Zidarich et al. 2006: 12 and 49):[14]

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[13]The morpheme *ha-* is glossed here as an exclamatory marker. However, in its more common use it functions as an interrogative marker.

[14]This is one of the words used for written word. It is formed on the verb root *tson* which means 'drive, inject, poke'.

(28) (a) *latsohnay*   (b) *n'ihiamej*
          la-tson-(ek)hay   n-i-hi-am-ex
          3POSS-drive-PAT-PL   1-be-LOC-2-APP
          'Written words'   'I marry you'

However, in some cases we may find a hyphen or a space between suffixes (Zidarich et al. 1996: 46 and 50):

(29) *kʰachalh*   ***itiche-pe***   *lawetes*
      kakya-ł   i-ti-kʸe-pe   la-wet-es
      medicine-PL 3-put-DIST-LOC 3POS-place-PL
      'The medicine is on the shelf'

(30) *yik mat toj **nakel lhi***
      3jik mat tox nakel -łi
      3go very   3hurry-ITER
      'And he left quicly   (lit: "very rushy")

An indication that these kinds of inconsistencies at the boundaries of the written word has been subject to discussion by the textbook authors is the fact that the hyphen and the space was eliminated in the 2006 version: these two words are now *itichepe* (29) and *nakellhi* (30). Another case in which there was a change in the orthography is in the construction resulting from the verbal derivation process illustrated in (31). In the 1996 (pp. 27 and 50) version it was written in two separate words but in the 2006 version, these two examples were changed to one orthographic word:

(31) (a) *yen t'isana*   (b) *łiwu tamsecha*
          jen -t'isan-a   łi-wu-tamsek-a
          do body-VBLZ   REFL-do-peace-VBLZ
          'To put the bait'   'To be peaceful'

As Dixon and Aikhenvald (2002: 8) point out 'writing conventions are unlikely to be absolutely consistent'. We can illustrate this statement in Wichí by the writing convention for the classifiers *ka*, *ko* and *lo*. Sometimes they are written as separate words, like in (32a), but sometimes as part of the noun like in (32b) (Zidarich et al. 1996):

(32) (a) *la ka itoj* (p. 50)   (b) *lakanotsas* (p. 21)
          3POSS-CL-fire   3POSS-CL-children
          'His/her fire'   'His/her children'

This inconsistency has been unified in the 2006 version by writing classifiers in the same orthographic word as the noun they classify. In this case the single orthographic word represents two phonological and grammatical words.

The verbal construction (the clause) is generally represented as one orthographic word (Zidarich et al. 1996: 30):

(33) (a) *hiwenche*   (b) *itetsanlhi*
          hi-wen-k^{y}e   i-tetsan-ɬi
          3-see-DIST   3-watch-ITER
          'S/he sees around'   S/he watches repeatedly'

      (c) *hifwen^{h}u*
          hi-x^{w}en-hu
          3-say-APPL
          'S/he says [something to someone]'

As to personal indexes, most of the time they are written together with the root (as one orthographic word) but in some cases we find them as separated from it. For example, in the following question, the first occurrence of the personal marker *la* (2nd person in *lahemen*[15]) is part of the same orthographic word, but in its second occurrence (*la t'ekwehen*) it is not (Zidarich et al. 1996: 30). The same situation is found in the 2006 version (p. 32):

(34) *ha lahemin   che la t'ekwehen*?
      ha la-hemen che la-tek^{w}e-hen
      INT 2-like   SUB 2-look.for-PL
      'Would you like to find them?'

The use of the written language at school creates awareness on the concept of 'word', the written word. As Wichí children grow up in an oral society and writing is not part of their everyday life, teachers need to insist on the importance of writing. In this context the basic unit is clearly the word *nañ^{h}il* or *totsonhay* (see example (28) and footnote 14), which is not necessarily the spoken word but the written one. School not only promotes the use of the written language but also defines its use. Importantly, the examples of the written form used in school and presented in this article show that the passage from oral to written has been done in accordance with the linguistic criteria that define a word.

Moreover, in the second edition, most of the inconsistencies found in the first one have been corrected to reflect even more the phonological word of Wichí. We have not found any example in which Spanish may have influenced the boundaries between words in the written language.

6 Summary

In this article we have proposed some linguistic criteria to determine what a word is in Wichí. On the one hand, we suggested two phonological criteria: phonological rules (aspiration, murmuration, nasalization and palatalization) and stress. Phonological rules apply within the stem + suffix domain. Whenever the phonetic context is suitable and the target segment has the possibility to syllabify as onset, the processes apply (see Sect. 3.1). According to these criteria we have been able to demonstrate

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[15]In the dialect of the first version the verb is -hemen (to like), and in the dialect used in the second version the same verb is -hemin.

that examples with the inalienable noun *-hi* 'container' are made of two nouns that behave independently since they take their own affixes (see Sect. 3.1.3). Stress is a useful criterion to identify a phonological word, since there is one primary stress per word assigned to the rightmost syllable of the word. Based on these criteria, we consider possessive classifiers as independent prosodic words (see Sect. 3.2).

We have also applied three main grammatical criteria (grammatical cohesiveness, fixed order and conventionalized coherence and meaning) to identify two kinds of grammatical words: nouns and verbs (see Sects. 4.1 and 4.2). We have also discussed some more language-specific criteria (non-recursiveness, uniqueness, uninterruptability, isolatability) of which we only could demonstrate the applicability of the later criterio (isolatability). In addition, we have made a distinction between clitics and affixes based on host selectivity, and between clitics and full-fledged phonological words based on criteria (a) and (c).

Finally, we compared some of our hypotheses with written words in the *Tsalanawu* textbook. This comparison allowed us to conclude that writing reflects pretty much the criteria proposed here since orthographic and phonological words match almost perfectly.

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