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Binary Stress in Winnebago?!

Abstract:

In this paper the stress pattern of the Siouan language Winnebago is analyzed and proposed to be based on ternary foot construction. This is at variance with most of the previous work on stress placement in Winnebago, however both the necessity of the ternary analysis, and the problems which have led to other analyses (binary or phonemic stress) are demonstrated and explained. The recognition of Winnebago as a language with ternary feet is then shown to open up several interesting areas for further research in metrical theory including the nature of extrametricallity, degenerate feet, and minimal word restrictions.

0. Introduction

In the past Winnebago has been treated variously as having either binary, ternary or, in the older literature, even phonemic stress. Miner (1979) treats stress placement as ternary and provides several examples of words of six or more morae (henceforth 6+words) as demonstration of the ternary nature of Winnebago stress. Later Hale and White Eagle (1980) published an article treating the stress placement as binary, however, they provide very few examples of 6+words, and some of those longer words are very problematic within their binary analysis. The purpose of this paper is to demonstrate that the stress pattern of Winnebago is best accounted for by the ternary analysis and that instances of apparently binary stress placement (as well as some instances of apparently ternary stress placement!) are due to the fact that one word may contain more than one metrical domain. Words of more than one metrical domain occur as the result of cliticization[1] or syntactic compounding. This paper will demonstrate which morphemes in the language are "clitics" and will give

[1] Throughout this paper the word "clitic" will be used to describe certain loosely bound suffixes which may constitute a separate metrical domain from the preceding word. This is in agreement with Siouanist usage, but it is quite different from the standard use of this term. See Shaw (1985) for discussion of "clitics" and stress in Dakota.

examples of the difference between lexical and syntactic compounds. Finally, the examples of 6+words in both the Miner (1979) and Hale and White Eagle (1980) papers will be subjected to a ternary analysis, taking into account the facts of cliticization and compounding presented in the earlier section.

1. History of Winnebago Stress Analyses.

The earlier researchers on Winnebago were fairly mystified by the stress system, assuming that stress was either phonemic or was governed by principles which had not yet been discovered.
Susman (1943) described Winnebago stress as phonemic.

> Winnebago employs length and stress phonemically, and each sets up contrasting pairs of words. (Susman 1943, p. 3)

And yet she recognized that the stress may occur only in a limited number of possible positions, and that stress occured on every third syllable in series of short syllables.

1)1. A long syllable must either carry stress, or be immediately followed by a stressed syllable.
2. The first syllable of a phrase or the first syllable after a stress is never normal length and stressed.
3. If two or **three** short (i.e. normal) syllables occur in sequence, the last is stressed.
4. A single unstressed short syllable occurs only at the end of a phrase.
5. The first (phonetically strongest) syllabic stress is on one of the first three syllables.

(Susman 1943, p. 12), emphasis mine.

Lipkind (1945) indicates that "no stems were found differentiated solely by accent." He appears to consider stress to be non-phonemic, but he does not attempt to account for its placement. He also considers vowel length to be a non-phonemic correlate of stress, stating that it is "largely a matter of accent, accented vowels being ordinarily about twice as long as others."
Paul Radin (1949) refutes Susman's claim that stress is phonemic, and reiterates the statement that stresses generally fall on every third syllable.

The problem of accent in Winnebago is extremely complex and still awaits authoritative study. It is definitely not phonemic. Stems, as such, seem to be divided into those with fixed and those with fluid or no accent. In flowing discourse, under rules that so far have not been worked out, stems with fixed accent may lose it and those with fluid or no accent acquire it. As a rule, all long vowels due to contraction are accented. In flowing discourse, **every third syllable** is generally stressed, bearing either a primary or a secondary accent.
(Radin 1949, pp. 6-7), emphasis mine.

Wolff (1950) in his article on comparative Siouan indicates that he believes that Winnebago stress may in fact be phonemic.

In Winnebago the question of length and stress seems to be extremely complicated. Susman [1943] ... describes both length and stress as phonemic. In one of his most recent publications Radin [1949] describes long vowels as allophones of short vowels and declares that stress is definitely not phonemic. Our own impression, gained from an examination of Radin's text materials, is that stress does not occur in any easily predictable patterns, while length may or may not be purely prosodic.
(Wolff 1950, p. 171)

Miner (1979) provides the first detailed account of Winnebago stress as a non-phonemic, metrical phenomenon. He states that regular words (i.e. non Dorsey's Law words) are stressed as follows:

2)1. "Accent **every third mora** as long as three are available;"
2. "otherwise, accent a second mora."
(Miner 1979), emphasis mine.

Miner's analysis offers a major departure from the previous works in that he considers the mora, rather the long or short syllable, to be the unit by which stress is assigned. Hale and White Eagle (1980) also analyze Winnebago stress as non-phonemic, however, they disagree with Miner (and Susman and Radin) as to where stress is placed. According to them stress is placed as follows:

3)1. In disyllables the primary stress falls on the final syllable.
2. In longer words the primary stress falls on the third syllable.
3. Secondary stresses fall on each even-numbered vowel counting from the vowel bearing primary stress.
(Hale & White Eagle 1980)

They proceed to demonstrate that Winnebago stress is assigned by iteratively building binary feet on the "vowel projection", starting with the second vowel.
Halle and Vergnaud (1987) take some of the data[2] from Hale and White Eagle and analyze it within their own system. They maintain Hale and White Eagle's binary stress assignment, but express it within their bracketed grid type system. They also go into detail about the mechanism by which Dorsey's Law application sometimes affects stress placement.

2. Metrical Structure

Winnebago words having at least six morae within one stress domain show stress on every third mora (or fourth in the case of some applications of Dorsey's Law). This is represented below with data from Susman[3], Radin[4] and also from Hale and White

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[2] Notably, they do not attempt to explain Hale and White Eagle's most problematic form: [hirat?át?ašanakšàna], you are talking. Their analysis is unable to account for the stress pattern of this word, as can be seen below.

```
line 1              *        *     +
line 0   < >(*   *)(*   *) (*)   -->   < >(*   *)(* x *   x *   -->
          hi rat?át?ašnákšna          hi rat?át?ašanakšana
```

```
line 1              *      *        *   +
line 0   < >(*   *)(* x)(*   x)(*)
          hi rat?át?aší nakší na
```

[3] Data from Susman are unique among the older sources for Winnebago in that both stress placement and vowel length are consistently correctly marked. Within her texts there are some instances of secondary stresses being left unmarked, but vowel length appears to always be marked correctly. She does not indicate apparently binary stresses in words containing multiple applications of Dorsey's Law.

[4] In Radin's texts stress, when marked, is consistent in placement with the stresses marked in Susman, however Radin leaves many instances of secondary stress unmarked. His marking of vowel length, however, is very inconsistent in that many long vowels are not marked as such. The opposite error, that of marking short vowels as long, does not seem to occur in his texts. Thus in Radin's texts the absence

Eagle.

4) Stress on words of one domain[5].

[haragíguziré], they are teaching him [S]
/ha-ra-gi-gus-hire/

[wairágišuruhíjwiirá], salute them (for me) [S]
/wa-hi-ra-gi-š-ru-hič--wi-hira/

[harakí-ɬurujíkšaná], you are pulling it taut [H&WE]
/ha-ra-ki-ɬ-ru-jik--ɬna/

[hirat?át?ašanakšána], you are talking [H&WE]
/hi-ra-t?et?e-š-nak-šna/

[hirakárašanakšgúniiná], you can take care of it (your own) [R]
/hi-ra-kara-š-nak-šguni-:na/

The ternary stress system of these words may be analyzed as follows within the Halle and Vergnaud system.

5) Halle and Vergnaud type ternary analysis

1. Mark an initial mora extrametrical.
2. Assign line 0 asterisks to every mora/vowel.
3. Line 0 parameter settings are [-HT, +BND, left to right].
4. Construct constituent boundaries on line 0.
5. Locate the heads of line 0 constituents on line 1.
6. Line 1 parameters are [+HT, -BND, left].[6]
7. Construct constituent boundaries on line 1.

---

of an accent or vowel length mark means nothing, but if a mark is present it is correct.
Words from Radin are only used when the vowel lengths can be determined with certainty.

[5] Or with a first domain of six or more morae.

[6] For the purposes of this study there is no need to demonstrate the construction of line 1 constituents and the subsequent steps leading to a distinction between primary and secondary stress. However, these steps are included here for the sake of completeness.

8. Locate the heads of line 1 constituents on line 2.

Using this analysis the stress patterns of the above words may be derived thus:

6) Sample derivations showing ternary stress

```
line 2         *
line 1        (*       *)
line 0   < >(* * *)  (* *)
         ha ragígus hiré

line 2        *
line 1       (*      *)      (*)
line 0  < >(* * x)(* *)  <x>(*)
        ha rakíšu rujík--ša ná        ˇ


line 2        *
line 1       (*         *      *)
line 0  < >(* x *)x(*   * *)(* *)
        hi rakárašanakšgùni  inà[7]

line 2         *
line 1        (*          *)
line 0  < >(*  *   *)x(*  x *)
        hi rat?át?ašanakšàna
```

[7] This form is quite unusual in the context of Halle & Vergnaud's statements about the interaction between Dorsey's Law, the Domino Condition and Boundary Construction. It would seem to indicate that the Domino Condition applies not after all applications of Dorsey's Law, but after each application. Thus:

```
line 1     *           *       DL          *        *     *    DL
line 0 < >(*   *  *) (* **)(*)  -->   < >(* x *)(*   * *)(* *)  -->
       hi rakrášnakšguníi na   SC    hi rakárašnakšgúni  iná   SC

line 1       *        *       *
line 0 < >(* * *)x(*   * *)(* *)
       hi rakárašanakšgúni  iná
```

```
line 2         *
line 1        (*         *       *)
line 0  < >(* * *)x(* *  *)(* *)
        wa hirágišuruhìjwi hirà      ˘
```

The failure of the binary analysis as presented in Halle & Vergnaud[8] is demonstrated by the sample derivations below.

7) Sample derivations showing failure of binary stress analysis

```
line 2       *
line 1      (*     *) +[9]
line 0  < >(* *)(*  *)(*)
       *ha ragí gushì re

line 2         *
line 1        (*     *)     (*)
line 0   < >(* *)x(* *)  <x>(*)
         ha rakíšurujìk--ša ná          ˘          [10]


line 2        *
line 1       (*    *     *    *) +
line 0  < >(* x)(* x)(*   *)(**)(*)
       *hi raká rašà nakšgù niì na

line 2         *
line 1        (*    *    *) +
line 0  < >(*  *)(* x)(*  x)(*)
       *hi rat?át?ašà nakšà na
```

[8] The differences between their binary analysis and the ternary analysis above are that their line 0 parameter settings are [+HT], and that there must either be a post-stress destressing rule, or we must assume that Winnebago observes the "strong prohibition" on degenerate feet (i.e. that they may never occur) (per Hayes 1991).

[9] The symbol "+" is here used to indicate an asterisk removed by the post-stress destressing rule, or the lack of a line 1 asterisk on a degenerate foot.

[10] This form represents a case in which either analysis results in the correct placement of stress.

```
line 2         *
line 1        (*    *    *    *) +
line 0   < >(* *)(* x)(* *)(* *)(*)
        *wa hirá gišùruhìčwihì ra
```

As certain of the above forms (6) demonstrate, the effect of Dorsey's Law application on constituent structure is the same within the ternary analysis. That is to say that a vowel inserted between constituents does not affect the previously constructed boundaries, but a vowel inserted into an already full constituent results in the destruction of that and all subsequent constituents (Halle & Vergnaud's Domino Condition), followed by a repetition of metrical constituent construction commencing with the first destroyed constituent.

8) Sample derivations demonstrating Domino Condition

```
UR            /harakišrujik--šna/    /wahiragišruhičwihira/

SC[11] line 2       *          *          *
   line 1         (*    *)    (*)       (*      *       *)
   line 0   < >(* *  *)(*)    (*)    < >(* * *)(* *  *)(* *)
            ha  rakišru jik--šna     wa  iragišruhičwi hira      ˇ

DL[12] line 2       *            *         *
   line 1         (*      *)    (*)       (*      *       *)
   line 0   < >(* *  x *)*)   x(*)   < >(* * *)x(* *  *)(* *)
            ha  rakišuru jik--šana   wa  iragišuruhičwi hira      ˇ

DC[13] line 2
   line 1
   line 0   < >(* * x  * *    x *
            ha rakišu rujik--šana            ____

SC  line 2       *             *
   line 1         (*      *)     (*)
   line 0   < >(* * x)(* *)  <x>(*)
            ha  rakišu rujik--ša na           ____
PR          [harakíšurujìkšaná]       [wairágišuruhìjwiirà]
```

[11] Stress Construction

[12] Dorsey's Law

[13] Domino Condition

3. Apparent Exceptions to Ternary Stress

a. "Clitics"

There exist in Winnebago many cases of apparently binary stress placement. Among non-compounds there are examples such as the following.

9) Apparent binary stress

[wiiráperéste], you will know something [S]
[waakšíkš?íikjanégižíʃ][14], if you will live [S] ˇ
[náires?áže], they sleep [S][15]
[yaapéreznákšaná], I know it (sitting) [S]
[?uurékjanégižíʃ], when he will be going to do it [S] ˇ
[maaníšjaánagá], you are strong and... [S] ˇ
[haakítujíkšaná], I pull it taut [H&WE] ˇ
[wiirágušgéra], the stars [H&WE]

What these forms share in common is the fact that they contain certain suffixes which in fact are "clitics" constituting separate stress domains from the rest of the word. The "clitics" constitute a finite and definable set of morphemes, although certain of them may also occur within the same stress domain as the rest of the word (presumably due to a faster speech tempo or different syntactic bracketing). Those morphemes of Winnebago which have been found to constitute separate stress domains are listed and illustrated below in 10). In some cases the "clitics" of Winnebago are cognate with "clitics" in other Siouan languages. In these cases the cognate forms are indicated.

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[14] When stress falls in a syllable of two or more morae the syllable always surfaces with a falling tone regardless of which mora is accented, unless the syllable contains a diphthong. In the case of diphthongs the syllable surfaces with either rising or falling depending on the type of diphthong. Thus /ée/ and /eé/ surface as [ée], /éa/ and /eá/ surface as [eá], and /éi/ and /eí/ surface as [éi] (Miner 1979, Susman 1943).

[15] Underlyingly the first syllable of this word is a contraction from two syllables containing a total of three morae: /naa-hire-s?azhe/. When three underlying morae end up in one syllable they shorten into two morae, either a long vowel or a diphthong. Stress assignment, however, occurs before this shortening and therefore these words surface with stress on that syllable. (i.e. /naa-híre.../ --> [náire...]).

10) "Clitics" of Winnebago:

/-anaga/, and...
(Dakota -na, and... post-verbal clitic)

Multiple domains.

[wajóbanagá], she ground something and... [S]
/wa-jóp--anagá/
[γáaganagá], he cried and... [S]
/γaák--anagá/

Single domain. (none yet found)

/-gižį/, when...

Multiple domains.

[kiikáwa?ágižį́], when it lifts itself up [S]
/ki-hi-káwa-?á--gižį́/

[wookáragixétexjígižį́], when he loves very much [S]
/wa-ho-kára-gi-xéte-xjí--gizhí/

Single domain.

[waakšíkš?iigížį], when you live [S]
/waak-šík-š?ii-gížį/

/-jee/, [standing, positional continuative]

Multiple domains.

[wašíjéena], he was dancing [S]
/wa-ší--jee-:na/

[híijaaré], one who does [S]

/hií--jee-ré/

/-kje/, [future intentive]
(Dakota -kte, [future] post-verbal clitic)

Multiple domains.

[wiiráperéste], you will know something [S]
/wa-hi-rá-perés--kje/

Single domain.

[ceekjé], I will die [S]
/h-t?ee-kjé/

/-kjnahe/ ([-kjanahe], [kjane(e)]), [future]
(Dakota -kte, [future] post-verbal clitic)

Multiple domains.

[waakšíkš?íikjanégiží], if you will live [S]
/waak-šík-š?ií--kjané--giží/

[waakšíkš?íikjané], you will live [S]
/waak-šik-š?ií--kjané/

[herékjanahégiží], if there were to be [R]
/he-ré--kjanahé--giží/

Single domain.

[waakšíkš?iikjáne], you will live [S]
/waak-šík-š?ii-kjánahe/

/-naak/, [sitting, plural positional continuative]

Multiple domains.

[hiránáakiží], if/when they think [S]
/hiré--naák--giží/

/-ra/, [definite article]

Multiple domains.

[wiirágušgéra], the stars [H&WE]
/wii-rá-guš-ké--ra/

[háapra], the day [S]
/haáp--ra/

Single domain.

[wiirágušgerá], the stars [M]
/wii-rá-guš-ke-rá/

[haaprá], the day [S]
/haap-rá/

/-šna/ ([-šana]), [declarative]

Multiple domains.

[wa?únáakšaná], they are sitting [S]
/wa-?ú-naák--šná/

[haakítujíkšaná], I pull it taut [H&WE]
/ha-ha-kí-h-ru-jík--šná/

Single domain.

[nitekšána], you are sore [S]
/ni-tek-šána/

/-že/, [quotative]

Multiple domains.

[náires?áže], they sleep (hearsay) [S]
/naa-híre-s?á--že/

[téekše], it is sore (hearsay) [S]
/teék--že/

Single domain. (none yet found)

Other possible "clitics": /-guni/, [dubitative]; /-šguni/, [dubitative]; /-wi/, [general plural] (Dakota -pi, [plural] post-verbal clitic); /-ni/, [negative] (Dakota -šni, [negative] post-verbal clitic)

All of these "clitics" occur either at the end of the word, or are followed by other "clitics", the declarative /-:na/, or articles and demonstratives serving to nominalize the word. One other possible set of "clitics" is the possessive markers for inanimates and non-kinship terms, however these are probably better treated as cases of syntactic compounding, as they are composed of a verb stem followed by possessive suffixes.

b. Compounds

There are other apparent exceptions to stress assignment involving some compounds. In certain compounds the first stress will occur on the second mora of the word, rather than on the third; in other compounds there may be a sequence of three (non-Dorsey's Law) unaccented morae between one stress and the next, rather than just two. This is due to the fact that there is a difference between lexical compounds and syntactic compounds in that lexical
compounds are joined into one word at some point fairly early in the lexical phonology, whereas syntactic compounds remain as separate words until some point later in the grammar. Thus lexical compounds may be differentiated from syntactic ones based on their behavior as regards stress. Lexical compounds comprise a single metrical domain, whereas syntactic compounds comprise multiple domains. There are several nice pairs indicating the distinction between the two types of compound.

11) Lexical vs. Syntactic compounds

[naarúžip], to shave wood for kindling (Lexical)
[/naa/, wood + /ru-žip/, to shave,whittle]

[náaružíp], to whittle wood (Syntactic)
[[/naa/, wood] + [/ru-žip/, to shave, whittle]]

[panapí], to be sweet-smelling (Lexical)
[/pna/, to smell,have odor + /pii/, to be good]

[panápíi], it ought to have an odor (Syntactic)
[[/pna/, to smell,have odor] + [/pii/, to be good]]

[hajapí], to be good-looking (Lexical)
[/ha-ja/, to see + /pii/, to be good]

[hajápíi], to be able to see ("to see good") (Syntactic)
[[/ha-ja/, to see] + [/pii/, to be good]]

4. Forms from Miner (1979) and Hale and White Eagle (1980).

Following are analyses of examples of 6+ words utilized in Miner (1979) to provide evidence for ternary stress, and in Hale and White Eagle (1980) as evidence for binary stress. It is found that in both works the data used as evidence for foot size is inadequate due to the fact that the words used are either compounds or contain "clitics", and thus are not one stress domain. Additionally, in the case of Miner's article he deliberately avoided just that class of words which do contain individual stress domains of six or more morae, that is inflected forms.

It is difficult to find longer sequences which do not contain
fast sequences [applications of Dorsey's Law] without using
inflected forms, which I would prefer to avoid; the latter do,
however, obey the same accent rule...
(Miner 1979, p.28)

12) Miner:

a. [hižakíičašguní], nine
/hižakí-hičaš--guní/

This form is a compound formed from the words /hižakí/, "one"; /hi-cáš/, "to break apart"; and the dubitative suffix[16] /-guni/. It seems to provide evidence both for ternary stress assignment and for Miner's assertion that "once a diphthong[17] is accented, its second member does not count as a mora in determining the further application of the rule." This rule does not appear to hold true when one examines the data in Susman and Radin; morae are assigned to metrical constituents regardless of whether or not they are co-syllabic with a stressed mora. In fact it appears that /-guni/ may be a "clitic" constituting a separate metrical domain, thus explaining its final stress. The same word occurs in Radin's texts with a penultimate stress: [hižakíičašgúni]. Following the assumption that /-guni/ is a "clitic", the two forms may be analyzed thus.

```
line 1        *             *            *      *
line 0  < >(* * *)(*) | (* *)    < >(* * *)(*  * *)
        hi  žakíhi čaš | guní     hi žakíhi čašgúni
```

b. [hižakíičašguniánagá], nine and...
/hižakíičašguní-anagá/

This form is the same as 1. except that it has additionally the "clitic" /-anaga/. It may be analyzed as follows.

```
line 1         *             *           *
line 0  < >(*  * *)(*) | < >(*) | < >(* *)
        hi  žakíhi čaš |  gu ní  |  a nagá
```

c. [waγiγígišgap?úižeré], baseball player
/waγiγí-gi-šgap-?ú-hiža-ré/

---

[16] This suffix is one of the forms which may in fact be a "clitic", but at present there is too little consistent evidence to tell.

[17] Presumably this also is meant to apply to long vowels.

This form is made up of the following words and morphemes /waγiγi/, ball; /gi-šgap/, to hit, bat an object; /?uu/, to do; /-hiža/, [indefinite article]; and /-re/, that which does x. It is a lexical compound of the words /waγiγi-gišgap/, "baseball" and /?uižere/, "one who does/makes x". It is nearly impossible to determine whether this is a lexical or a syntactic compound as there is no difference in the stressing of this form, except that were the compound syntactic we would expect no stress on the final syllable, which constitutes a defective foot. The form is analyzed as follows.

```
line 1        *       *      *
line 0  < >(* * *)(*  * *)(* *)
        wa γiγígišgap?úhi žeré

line 1         *                *
line 0   < >(* * *)(*) | < >(* * *)(*)
        *wa γiγígišgap | ?u  uhíže re
```

d. [waγiγígišgap?úižereánagá], baseball player and...
/waγiγígišgap?úižeré-anagá/

This form is composed of the previous form plus the "clitic" /-anaga/.

```
line 1        *       *     *           *
line 0  < >(* * *)(*  **)(* *) | < >(* *)
        wa γiγígišgap?úi žeré  |  a nagá
```

e. [hiižúgokirúsge], double-barreled shotgun
/hiižúg-hokirúsge/

This form is made up of the words /hiižuk/, "gun"; and the reflexive verb /ho-ki-ru-sge/, the meaning of which is not known to the author. Hale and White Eagle state that they consider this word to fit within their analysis, claiming that it is actually a sequence of two words. They are perhaps correct, as this is an example of a word which could be either a lexical or a syntactic compound.

```
line 1        *      *
line 0  < >(* * *)(* *  *)
        hi   ižúgo kirúsge

line 1         *          *
line 0  < >(*  *) | < >(* *  *)
        hi   ižúg  | ho kirúsge
```

f. [wiirágušgerá], the stars
/wii-rá-guš-ke-rá/

This form is composed of /wii-ra/, the moon/sun; /guš-ke/, skunk; and /-ra/, the definite article. It is not clear whether or not it is a lexical compound, but on semantic grounds it seems rather likely both to myself and to Susman. See Hale & White Eagle's version below in 13) a.

```
line 1        *      *
line 0  < >(* * *)(* *)
        wi   irágušgerá

line 1        *          *
line 0  < >(* *) | < >(* *)
        wi  ira  |  gušgera
```

g. [hakeweákšaná], he is entering (moving)
/ha-kwe-hák--šaná/

This is composed of /ha-kwe/, to enter; /-hak/, moving [positional continuative]; and the "clitic" /-šna/, [declarative]. Miner uses it as evidence for his proposal about diphthongs mentioned above (Miner: 1.), but in fact the stress is not assigned to the first vowel in the diphthong [ea], but to the second. The "clitic" in this case comprises a separate domain, otherwise there could be no stress on the final syllable.

```
line 1          *        *
line 0  < > x(* *) | <x>(*)
        ha kewehák | ša ná
```

13) Hale and White Eagle:

a. [wiirágušgéra], the stars
/wii-rá-guš-ké--ra/

This form is a composed of /wii-ra/, the moon/sun; /guš-ke/, skunk; and /-ra/, the definite article. It is not clear whether or not it is a lexical compound, but on semantic grounds it seems rather likely both to myself and to Susman. Hale and White Eagle disagree with Miner on the stress of this form, which makes perfect sense considering that the "clitic" /-ra/ varies rather freely between being in the same or a different domain from the rest of the word.

```
line 1        *     *      +
line 0  < >(* * *)(*)  |  (*)
        wi  iráguš ké  | ra

line 1        *         *      +
line 0  < >(* *)  | < >(*)  |  (*)
        wi   irá  | guške  |  ra
```

b. [haakítujíkšaná], I pull it taut
/ha-ha-kí-h-ru-jík--šaná/ˇ
[harakíšurujíkšaná], you pull it taut
/ha-ra-kí-šu-ru-jík--šaná/ ˇ

Most of the 6+words in Hale & White Eagle may be treated together, as they all contain the "clitic" /-šna/, which constitutes a separate domain.

```
line 1        *     *        *
line 0  < >(* * *)(*)  | <x>(*)
        ha  akítu jík | ša ná

line 1        *      *         *
line 0  < >(* * x)(* *)  | <x>(*)
        ha rakíšu rujík | ša ná
```

c. [hakirújikšána], he pulls it taut
/ha-ki-ru-jik-šaná/

This and the following form are both quite unusual in that the "clitic" /-šna/ is not normally within the same domain as the word preceding it unless that word is three or fewer morae in length. Of the two forms this one provides a problem for the ternary analysis, and the next provides a problem for the binary analysis. As is demonstrated below only the binary analysis generates the correct stress placement on this form.

Ternary

```
line 1         *           *
line 0   < >(* * *) | <x>(*)
        *ha kirújik | ša ná

line 1         *       *
line 0   < >(* * *) x(*)
        *ha kirújikšaná
```

Binary

```
line 1         *     *
line 0   < >(* *)(*  x)(*)
         ha kirú jikšá na     ˇ
```

d. [hirat?át?ašanakšána], you are talking
/hi-ra-t?ét?e-ša-nak-šaná/

Hale and White Eagle go to some lengths to attempt to account for this form within their binary analysis, but the form is quite readily explainable following the ternary analysis.

```
line 1         *          *
line 0  < >(*  *  *) x(*  x *)
        hi rat?át?a šanakšána
```

5. Conclusion

This paper has attempted to demonstrate conclusively that Winnebago stress is basically ternary in nature, and that examples of apparently binary stress are due to the presence of more than one stress domain in the word either due to "cliticization" or syntactic compounding. It has also pointed out that part of the reason for the existence of the two competing analyses in recent years has been based on the fact that most of the examples used in support of either ternary or binary stress have not contained single stress domains of six or more morae, the minimum number required to demonstrate ternary stress.

6. Directions for Future Research

The recognition of Winnebago as a language with a ternary stress system opens up a great new opportunity for research leading to a fuller understanding of both ternary and binary stress systems. In Winnebago, as opposed to the other languages with ternary stress, a number of later phonological rules (i.e. those which apply after initial metrical construction) have an effect on stress. Dorsey's Law inserts vowels within morphemes and between prefixes and roots or other prefixes, leading to reconstruction of constituent boundaries in some cases. At least two processes of consonant deletion, one involving intervocalic /h/ and the other intervocalic /g/, result in two underlying syllables becoming one, thus giving the impression that metrical construction may split syllables. Tri-moraic syllables shorten to two morae, leading to the appearance of second mora stress. And a late rule epenthesizes a short schwa between obstruent-final morphemes and sonorant-initial ones. This schwa never takes stress and has no effect on previously assigned stresses. In addition to the phonological complexity of the language another advantage of Winnebago in terms of understanding ternary stress systems is that the closest relative of Winnebago, Číwere also has ternary stress, but without extrametricality, thus providing a valuable chance for comparison and reconstruction.

The Winnebago stress system provides evidence regarding the nature of extrametricality, degenerate feet[18], the Domino Condition[19] of Halle and Vergnaud (1991) and the possibility of constituent boundaries splitting syllables. Analyzing

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[18] It appears likely that Winnebago obeys Hayes (1991) "strict prohibition" on degenerate syllables, but final degenerate syllables are sometimes written with stress even in Susman (1943) and Radin (1949, 1950). For the purpose of this paper I have used forms with all possible stresses marked, including final degenerate feet, for the sake of supposed completeness and in order to have all stresses conform to those given in Miner (1979) and Hale and White Eagle (1980).

[19] If degenerate feet are disallowed in Winnebago then some aspects of the Domino Condition and reconstruction of boundaries may be seen to follow naturally given a cyclic metrical construction rule.

Winnebago stress as ternary also helps to reinforce Hayes claim that the "general law of rhythm" manifests itself in stress systems, as it eliminates one of the five examples that he lists as having iambic but quantity-insensitive stress rules (Hayes 1985).

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