ABSTRACT

In this paper it will be shown that the concept of syllabification, i.e. the assignment of syllable structure, can account for the at first sight disparate vowel deletion phenomena in a much discussed American language, viz. Tonkawa. More specifically, it will be shown that the specification of the direction, the domain of application and the elements triggering the syllabification can account for the data in question. The Tonkawa case thus provides a good illustration for the view that certain phonological processes involving syllable structure, like vowel deletion, epenthesis and semi-vocalization, are typically the result of the assignment of syllabic structure, and need not be stated as independent rules.

INTRODUCTION

Consider the following set of Tonkawa forms:
(1) a. picno? < picena+o? 'he cuts it'
b. wepceno? < we+picena+o? 'he cuts them'
c. picnano? < we+picena+n+o? 'he is cutting it'
d. wepceno? < we+picena+n+o? 'he is cutting them'
e. picen < picena 'steer castrated one'

The following affixes can be identified:
(2) a. we- 3rd person plural, pronominal object
b. -o? 3rd person singular, declarative, present tense

c. -n- progressive (continuative)
d. (unmarked) 3rd person singular, pronominal object

The following phonetic variants are exhibited by the stems:
(3) c. picen-,-pcen-, peca-, -pca-, picen,
   /picena/ 'cut'

In order to account for these data, Kisséberth [4] posits the following rules:
(4) a. Word-Final Vowel Deletion
    V --> $\emptyset$ / $\emptyset$

b. Vowel Elision
    V --> $\emptyset$ / #CVC-C[$^*_{stem}$]

c. Vowel Truncation
    V --> $\emptyset$ / $\emptyset$

The derivations are given in (5):
(5) (a)  (b)  (c)
    UR  picena+o?  we+picena+o?  picena+n+o?
    Delete
    Elide  picena+o?  we+picena+o?  picena+n+o?
    Truncate  picena+o?  we+picena+o?  picena+n+o?
    SR  piceno?  wepceno?  picano?
    (d)  (e)
    UR  we+picena+n+o?  picena
    Delete
    Elide  we+picena+n+o?  picena
    Truncate  we+picena+n+o?
    SR  wepceno?  picen

The specification is [+stem] for the final vowel in the SD of Vowel Elision (4b) is needed in order to prevent Elision to take place in (6c):
(6) a. pilo? < pil+e+o? 'he rolls it'
    b. weplo? < we+pile+e+o? 'he rolls them'
    c. pileno? < pile+o+o? 'he is rolling it'
    d. weplo? < we+pile+e+o? 'he is rolling them'

In (6c) the second vowel of the word does not elide, although it is in the environment CVC_CV. The final vowel in these forms does not belong to the stem, but to the suffix -o? (see (2b)).

Kisseberth adduces additional paradigms in order to show that the vowel that is to be deleted by Vowel Elision must belong to the stem:
(7) a. yakpo? < yaka+p+o? 'he hits it'
    b. weykapa? < we+yaka+p+o? 'he hits them'
    c. weyakapo? < we+ya+yaka+p+o? 'he hits them with force'

In (7c) it is not the second vowel of the form that elides, (which is what rule (4b) would predict), but its third vowel, which is the first stem vowel. Therefore, Kisséberth restricts Vowel Elision further so that only a vowel that is specified as [+stem] is affected by the rule. He observes ([5]:117) that if there is a CV prefix, the first stem vowel deletes and that if there is no prefix, the second vowel of the stem deletes.

Kisseberth reformulates Vowel Elision as:
It is assumed that in these forms, the prefix and affixes adjacent to the stem are attached to the stem as

**Table 3**: This is not crucial. In (14a), the prefix or suffix triggers syllabilification, syllabilication, in accordance with the directriceness setting (11b), and the prefixed or suffixed c is not analyzed into the syllabic base, while a is ignored by the syllabification mechanism, because there is no constraint on the syllabic structure (cf. template (10)). It is thus true that the data for which Eisehert has formulated his rule of vowel truncation (6b) is borne out. In (14b), the w of the prefix also triggers syllabification. Because there are no elements to the left, the direction of syllabification is reversely virtue of (11b), cf. (12). Note also that on this first cycle, the mapping is given the second cycle is topic-like, let us now look at the second cycle:

(14a) **a. (vacuum) b. (vacuum)**

When postycyclic syllabification takes place in (14a), c and e are still un syllabified. Going from right to left (by virtue of (11a)), the syllabification algorithm creates a syllabic corresponding to the c, e, and s. Now, all consonants are incorporated into the syllabic structure. Hence there is no need to incorporate the and therefore the phonetic outcome is found and realized, respectively.

(14b) **a. pcicumen** b. wpcicumen**

Having outlined our analysis of Tokwawa syllabification of each of the type of cases mentioned in section 1. We will show that the cases, the correct deletion is forestalled by our syllabification algorithm. Let us now look at the cases (1a-3a-3d), repeated here as (15):

(15) **a. pcicumen** b. wpcicumen**

In this form, during the first cycle the morphemes which are adjacent to the stem will be syllabified:

(15) **a.**

(15) **b.**

(15) **c.**

(15) **d.**

(15) **e.**

(15) **f.**

(15) **g.**

(15) **h.**

(15) **i.**
ward manner. Since there are no morphemes attached to the stems, there is only one, postcyclic, application of syllabification. Syllabification starts form the right in accordance with (11a):

(15) \[ \sigma / \backslash \]
picena

Thus, the syllable cen is formed. Arriving at the p, no material can be found to the left of this element. Therefore, the direction is reversed by virtue of (11d.i) (cf. (12)):

(15)' \[ \sigma / \backslash / \backslash \]
picena

Now, all consonants, which are the syllabification triggering elements (cf. 11c), have been syllabified. The final n has been left unsyllabified, and hence is not realised, which is the correct prediction.

Let us now turn to the example given in (6c) where the second stem vowel is not elided.

first cycle: second cycle: postcyclic syll.:

(16) \[ \sigma \backslash \](16)' \[ \sigma \sigma \backslash \]
pile+n=a? pile+n=a? pile+n=a?

We thus see here that the nonrealisation of the e (the vowel which finds itself in the environment VC.CV) is the consequence of the setting of the cyclicity parameter (11a): the e had to be incorporated into syllable structure at the first cycle, at which syllabification was triggered by n (the progressive morpheme). This example also illustrates the working of (11d.ii): during the postcyclic syllabification, the n was extracted from the previous syllable and was incorporated into the final syllable (an instantiation of (13a)).

Finally, let us look at the form in (7c). Here it was the third V and not the second one that was deleted.

(17) First cycle: (17)' Second cycle: Postcyclic syllabification:

\[ \sigma \backslash \sigma \sigma \sigma \]
\[ wexda+yaka+pa+o? \]
\[ wexda+yaka+pa+o? \]

Here, the k was the only consonant that had not yet been syllabified during the cycle. Leftward syllabification will fail, because the preceding consonant y is already incorporated into a syllable. Therefore, by virtue of (11d.i) (cf. (12)), the direction of the application of syllabification is reversed and the following a is incorporated into the syllable structure. The first stem vowel is left unsyllabified, because all consonants are already syllabified, and there is no need for further syllabification. It is thus correctly predicted that wexda+yaka+pa? is the phonetic outcome.

We have thus seen that the phenomena for which Kisseberth's word-final vowel deletion rule (4a),

the truncation rule (4c) as well as his vowel elision rule (8) were formulated are all correctly predicted in our syllabification model. Hence, there is no need for formulating separate rules.

CONCLUSION

In this paper, we have provided an explanation for the different phenomena of vowel deletion taking place in Tonkawa. We have shown that it is possible to account for them by analysing them as a result of the assignment of syllable structure. It has also been shown that, for Tonkawa at least, a lexical and a postlexical stage of syllabification must be assumed. Furthermore, the theoretical relevance of a newly proposed parameter the obligatory incorporation parameter has been outlined. Its importance for the account of the Tonkawa fact has subsequently been shown. Finally, it was demonstrated that the concept of directional syllabification can not only explain the correct epenthesis sites in certain languages (as shown in Noske [6,7]) for Yavelmami and Tigrinya, but also the correct sites for vowel deletion in certain other languages, like Tonkawa.

NOTE

* I wish to thank Martha Wright for a valuable discussion on the Tonkawa data and especially for pointing out that the assumption that the order in which syllabification applies in the different morphological domains is of crucial importance. This paper is part of work in progress, where more data of Tonkawa will be treated. The main source on Tonkawa is Hoijer [2].

REFERENCES