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ABSTRACT
                Patterns of plural selection in Armenian suggest that
lexical representations of morphemes must include predictable syllabic
structure, contrary to most theories of phonology, and that some phonological
rules such as syllabification may precede morphological rules, contrary to
the theory of distributed morphology. Furthermore, certain segments at the
edges of morphological domains are not syllabified in lexical
representations, and are syllabified at a later stage in the derivation. The
findings are supported by analysis of, and accounts for, patterns in both
Standard Eastern and Standard Western Armenian. Contains 11 references. (MSE)

ED 408 835

Armenian Plural Selection and the Nature of Lexical Syllabification*

Bert Vaux, Harvard University May 1997

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Armenian Plural Selection and the Nature of Lexical Syllabification[*]

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1. Introduction

The morphological process responsible for selecting the correct plural suffix for Armenian nouns appears at first blush to be quite straightforward; monosyllables select -er (1a), and polysyllables select -ner (1b).

(1)	singular	plural	gloss
a.	kʰar	kʰar-er	stone
b.	morukʰ	morukʰ-ner	beard

However, in order to demonstrate that this is the correct generalization, we must first wade through a variety of subtle and not-so-subtle complications that have not been noticed in existing treatments of Armenian phonology and morphology. Dealing with these complications also reveals a number of interesting facts about syllable structure in Armenian, as well as what appear to be principles of syllabification and properties of lexical items in Universal Grammar.

Specifically, the Armenian facts suggest that lexical representations of morphemes must include predictable syllabic structure (contrary to most theories of phonology), and that some phonological rules such as syllabification may precede morphological rules (contrary to the theory of Distributed Morphology (Halle and Marantz 1993)). It furthermore appears to be the case that certain segments at the edges of morphological domains are not syllabified in lexical representations, and are syllabified at a later stage in the derivation.

2. Basic Properties of Armenian Syllable Structure

Before we turn to the problems of plural selection, I'd like to present a brief outline of the basic properties of Armenian syllable structure. As represented in (2), Armenian allows

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only simple and Consonant + j onsets. Nuclei invariably consist of a single simple vowel. Codas contain a maximum of two segments. As shown in (2c), it appears at first blush that the Coda can also consist of a geminate consonant, as in Western Armenian [*dar:*] 'element' (contrast this with [*dar*] 'take!'). However, certain facts suggest that this claim may be too strong. For example, though most if not all consonants can be geminated intervocalically, to the best of my knowledge the only geminate segment that can occur in word-final position is [*r:*]. Furthermore, no geminates are attested in preconsonantal position (***dar:ta*, etc.). These distributional facts lead me to hypothesize that the second element in word-final geminates is in fact syllabified as an Appendix.

(2)	**syllable canon**			**examples**	**gloss**
a.	Onset:	(C(j))	Ø	*at^{h}ʃ*	right (side)
			C	*χat^{h}ʃ*	cross
			Cj	*njut^h*	subject
b.	Nucleus:	V			
c.	Coda:	(C$_1$(C$_2$))	Ø	*lu*	louse
			C	*hin*	old
			CC	*χent^h*	crazy
			C:	*dar:*	'element' (cf. *dar* 'take!')

With one notable exception, the syllabic constituents in (2) conform to the Sonority Sequencing Principle (SSP): sonority decreases as one moves away from the syllable nucleus. Thus, for example, in complex codas C_2 is always less sonorous than C_1.

The exception to the Sonority Sequencing Principle is a class of what I will call Appendices, in accordance with common usage (cf. Halle and Vergnaud 1980). Appendices violate the Sonority Sequencing Principle, occur only at word boundaries, and are drawn from a restricted subset of the phonemic inventory. Armenian allows three types of Appendices: the k^h in (3a) is a bound morpheme of unclear function that occurs only in word-final position; the segments r, $ʁ$, and m in (3b) also occur only in final
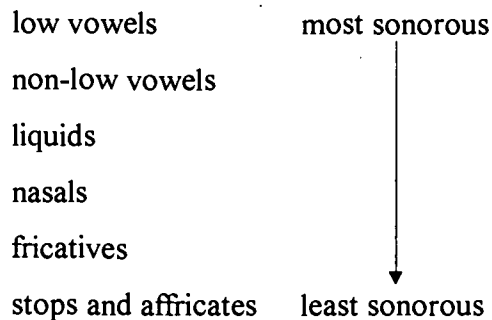
position, but are not independent morphemes; the *s* in (3c) occurs in both word-initial and word-final position in Eastern Armenian, but only in final position in Western Armenian.[1]

(3)	segment	example	gloss
a.	k^h	[*partk^h*] (SEA)	debt
b.	*r ʁ m*	[*dak^hr*] (SWA)	brother-in-law
		[*asdʁ*] (SWA)	star
		[*ṙazm*]	battle
c.	*s*	[*mak^hs*]	tax
		[*skizb*] (SEA)	beginning
		(SWA [*əsgizp^h*])	

These Appendices will play an important role in the discussion of plural selection, to which I will soon turn.

I have argued elsewhere (Vaux 1997) that the surface syllabifications assigned to Armenian words are best seen as the result of a nucleus-driven algorithm similar to the one proposed by Dell and Elmedlaoui 1985. This algorithm assigns syllabic structures to words in a series of passes based on the sonority hierarchy in (4); the first pass targets low vowels, the next pass targets non-low vowels, and so on.

(4) The sonority hierarchy

low vowels	most sonorous
non-low vowels	
liquids	
nasals	
fricatives	
stops and affricates	least sonorous

[1] The word-final consonant sequences I have found that appear to involve Appendices are as follows: *k^hr*, *zr, t^hr, χr, dzr, hr, ʁr, mr, nr, sr, tr, rr, dʒʁ, zm, ʁm, rdzr, nt͡sr, rt͡sr, ʁt͡sr*.

When the syllabification algorithm finds an unsyllabified segment of the appropriate level of sonority, it attaches that segment to a Nucleus, and immediately attaches as many adjacent segments as possible as Onset and Coda to the newly-created syllable. Note that this model differs slightly from the one proposed by Dell and Elmedlaoui in that Codas are assigned during each pass of nucleus assignment, rather than at the end of the derivation; this is required to account for the existence of complex Codas, as in the form [andz.rev] 'rain' in (5). If Coda assignment did not apply until the end of the derivation, the dz would be assigned to a Nucleus, since Armenian allows syllabic consonants, and the form would surface incorrectly as *[a.nədz.rev].

(5)   underlying form   /andzreu/ 'rain'

        surface form   [andz.rev] (not *[a.nədz.rev])

The fact that Codas are assigned during each pass of syllabification also requires what I call the Sonority Blocking Constraint, which prevents the syllabification of a segment followed by a more sonorous unsyllabified segment.

(6) The Sonority Blocking Constraint (SBC)

$$*\quad A$$

$$\downarrow$$

$$B_x \quad C_y$$
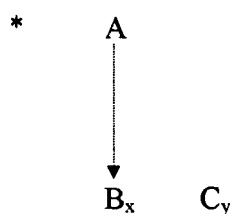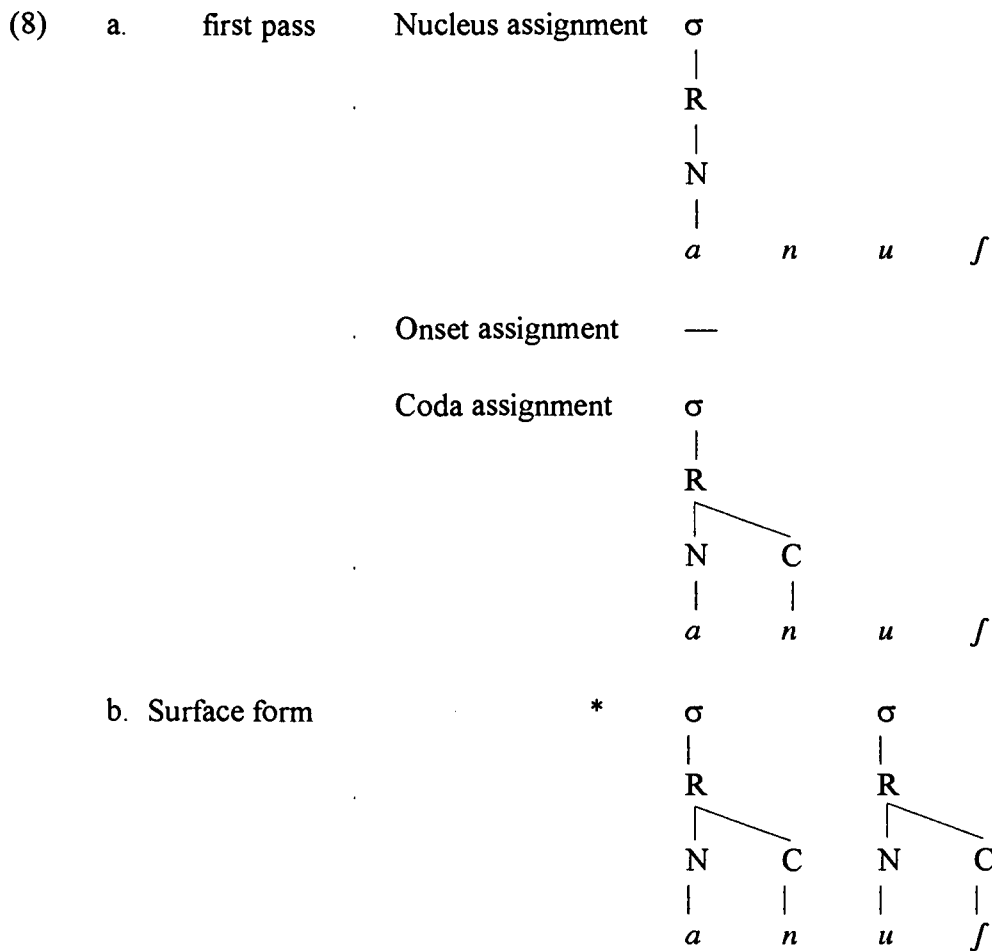
where: A   =   a syllable constituent

         B   =   a segment targeted for syllabification

         C   =   an unsyllabified segment

         x and y =   degrees of sonority, $x \leq y$

This constraint, which is formalized in (6), is needed to account for forms such as *anuʃ* 'sweet' in (7), where a vowel targeted for Nucleus assignment is followed by an unsyllabified segment and a less sonorous vowel.

(7)   *anuʃ* 'sweet'

If syllabification applied in the normal manner, without the Sonority Blocking Constraint, the first pass of syllabification (8a) would assign the *a* to a Nucleus, and then attach the *n* as its Coda, ultimately yielding the incorrect surface form in (8b).

(8)   a.   first pass   Nucleus assignment

```
σ
|
R
|
N
|
a       n       u       ʃ
```

Onset assignment   —

Coda assignment

```
σ
|
R
 ⌐‾‾‾⌐
N     C
|     |
a     n       u       ʃ
```

b. Surface form   *

```
σ                σ
|                |
R                R
 ⌐‾‾‾⌐          ⌐‾‾‾⌐
N     C          N     C
|     |          |     |
a     n          u     ʃ
```

The Sonority Blocking Constraint captures the intuition that segments like the *n* in *anuʃ* are left unsyllabified so that they can later attach as Onsets for the following segment.

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3. Type 1: Istanbul dialect

With these preliminaries in hand, let us now turn to the facts of plural selection. The simplest system is the one we find in the variety of Western Armenian spoken in Istanbul. In this dialect, words whose surface form is monosyllabic select the plural suffix *-er*, as in (9a), and all other words select the plural suffix *-ner*, as in (9b). Note that the set of monosyllables in (9a) includes words that have a final Appendix, such as *asdʁ* 'star' and *ṙazm* 'battle'.

(9)	singular	plural	gloss
a.	*t͡ʃʰi*	*t͡ʃʰi-er*	horse
	kʰar	*kʰar-er*	rock
	kʰir-kʰ	*kʰir-kʰ-er*	book
	asdʁ	*asdʁ-er*	star
	ṙazm	*ṙazm-er*	battle
	dakʰr	*dakʰr-er*	brothers-in-law
b.	*morukʰ*	*morukʰ-ner*	beard
	jereχa	*jereχa-ner*	child

Based on the generalization reflected in (9), we can postulate the rules of Vocabulary Insertion in (10), which are formulated within the framework of Distributed Morphology.

(10) Vocabulary Insertion rules governing the Plural in Istanbul Armenian

   In the context [+plural, __]:

σ	$\Leftrightarrow$	*-er*
elsewhere	$\Leftrightarrow$	*-ner*

For the moment, it is sufficient to assume that stems are fully syllabified by the point at which the rules in (10) apply; we'll explore the consequences of this assumption at the end

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of this paper. For now, though, I would like to focus on the assumption that stems are *fully* rather than *partially* syllabified.

A potential problem for the analysis developed thus far arises with words that end in a sequence of two consonants followed by an *r*, such as *tʰusdr* 'daughter' and *gardʒr* 'solid' in (11a), which according to my informants who speak this dialect have before the *r* a very short or "half" schwa, which is distinct from the longer, "full" schwa that occurs in other positions, as in *sədel* 'lie' in (11b).

(11)	**underlying form**	**surface form**	**gloss**
a.	*tʰusdr*	*tʰusdᵊr*	daughter
	gardʒr	*gardʒᵊr*	solid
b.	*sud-e-l*	*sədel*	lie (v)

One might think that the appearance of the schwa in forms like those in (10a) would trigger the selection of the polysyllabic plural suffix *-ner*, but this is not what actually happens; all forms of this type select the monosyllabic plural *-er*. This problem can be dealt with, though, by assuming that the "half" schwa in (11a) is what Levin 1987 calls an "excrescent" vowel, as opposed to the "epenthetic" vowel in (11b). In Levin's analysis, excrescent vowels are shorter than regular vowels, and do not participate in phonological processes; epenthetic vowels, on the other hand, are inserted by phonological rules and can therefore be targeted by subsequent phonological processes. Following Levin's suggestion, I assume that the half schwa in the forms in (11a) is excrescent, inserted for articulatory reasons at the end of the phonological derivation. Since this excrescent vowel is not yet present in the Morphological component, the stage in the derivation where plural selection applies, it plays no role in plural selection.

However, the problem raised by the forms in (11) leads us to our next case, Standard Western Armenian, which presents a similar but more difficult challenge for our working assumption that stems are fully syllabified at the point where plural selection applies.

4. Type 2: Standard Western Armenian

Standard Western Armenian, the dialect of most educated speakers of Armenian in the Middle East, appears at first glance to be identical to the Istanbul dialect with respect to plural selection, because each word that selects -*er* in Istanbul also selects -*er* in Standard Western Armenian, and each word that selects -*ner* in Istanbul also selects -*ner* in Standard Western Armenian. However, the situation is actually more complex, because many of the singular forms that are monosyllabic in the Istanbul dialect are in fact *polysyllabic* in Standard Western Armenian. According to the standard grammar of Standard Western Armenian by Bardakjian and Thomson (1977:244), for example, all words that end in a consonant followed by *n* or *r* insert an epenthetic schwa before the final consonant, as in (12).

(12)	underlying form	surface form	gloss
	omn	vomən	(a) certain (person)
	manr	manər	small
	pʰokʰr	pʰokʰər	small
	aiʒm	ajʒəm	now
	tʰusdr	tʰusdər	daughter
	pʰart͡sr	pʰart͡sər	high

Unlike in the Istanbul dialect, the schwas inserted in the Standard Western Armenian forms in (12) are epenthetic; in other words, they do not contrast with the epenthetic vowels that occur in other positions in words, and they constitute regular full syllables. Thus, for example, all of the surface forms in (12) are bisyllabic.

However, this poses a problem for our working analysis of plural selection, since all of the forms in (12) select the monosyllabic plural -*er*, as depicted in (13).

(13)

| singular	plural	gloss
manər	manrer	small thing
pʰokʰər	pʰokʰrer	small thing
tʰusdər	tʰusdrer	daughter
pʰartʃsər	pʰartʃsrer	high thing

Our challenge now is to explain why this class of polysyllabic words selects the monosyllabic plural, preferably without modifying our original hypothesis too extensively.

One possibility is to stipulate that the schwas in (12) are actually excrescent, and therefore, like the Istanbul forms in (11a), they are not present at the point in the derivation where plural selection applies. However, this analysis is unable to account for the above-mentioned fact that these schwas are identical to the schwas that occur in other positions, as in (14a). Crucially, the syllables containing the schwas in (14a) count for the purposes of plural selection, as shown in (14b).

(14)

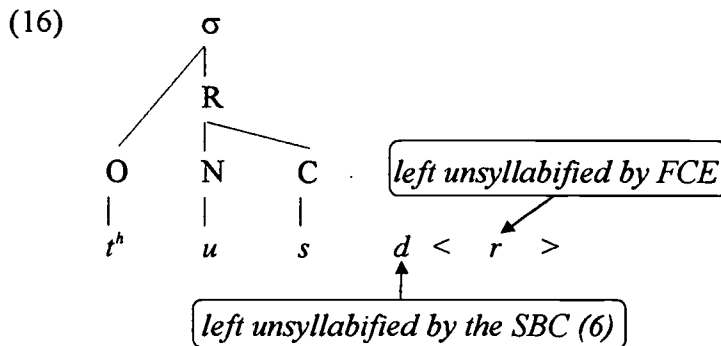| underlying form	a. singular	b. plural	gloss
kʰluχ	kʰəluχ	kʰəluχner	head
sduer	əsdver	əsdverner	shadow

Given that the epenthetic schwas in (14) count for plural selection, we should expect the schwas in (12) to trigger selection of the polysyllabic plural -ner; since they do not, we are left with our original dilemma.

I propose to account for the problematic facts in (13) by appealing to the principle of Final Consonant Extraprosodicity (FCE) proposed by Borowsky 1986 and Itô 1986 to account for a variety of phonological phenomena in English. The principle of Final Consonant Extraprosodicity, which I assume is a parameter provided by UG, states that a word-final consonant is left unsyllabified in its cycle. A word such as anuʃ 'sweet', for example, would receive the initial syllabification in (15), where the triangular brackets enclose extraprosodic material:

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(15)

```
    σ              σ
    |             /|
    R            / R
    |           /  |
    N     O    N
    |     |    |
    a     n    u   < ʃ >
```
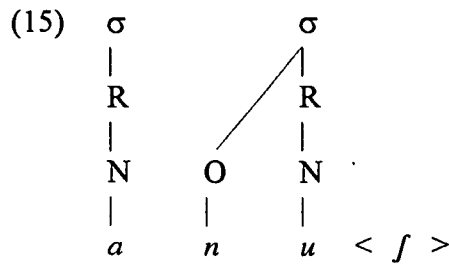
(The final ʃ is then assumed to be syllabified post-cyclically.)

Since Final Consonant Extraprosodicity has been proposed on independent grounds to be a principle of UG, we can incorporate it into our analysis of Armenian at no cost; however, it ends up doing a significant amount of work for our plural problem. Consider in (16) how a typical form from (12), *tʰusdr* 'daughter', would be syllabified:

(16)

```
              σ
             /|
            / R
           /  |‾‾‾‾‾‾‾‾‾
    O     N     C     [left unsyllabified by FCE]
    |     |     |
    tʰ    u     s     d  <  r  >
```

[left unsyllabified by the SBC (6)]

The key in (16) is that Final Consonant Extraprosodicity marks the *r* in *tʰusdr* as extraprosodic, and the *r* is therefore not syllabified. Since the *r* is not syllabified, the second syllable containing the *d* and the *r* does not exist at this stage. Consequently, *tʰusdr*—and by the same reasoning all of the forms in (12)—are monosyllabic at this point. If we assume that plural selection applies at this stage, before the unparsed consonants are syllabified, we account straightforwardly for the plural selection facts in (13). I take the fact that Final Consonant Extraprosodicity, which is motivated on entirely independent grounds, is able to account for the seemingly nonsensical Armenian plurals in (13) to be strong evidence for the cross-linguistic validity of this principle.

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At this point one wonders about the Istanbul system, which we had assumed to select the appropriate plural suffix on the basis of the fully syllabified stem. It would be undesirable to say that FCE holds over Standard Western Armenian forms, but not over Istanbul forms. Fortunately, it turns out that extending FCE to the Istanbul forms has no effect; marking each word-final consonant as extraprosodic makes no difference in the syllable counts of forms in the Istanbul dialect.

5. Type 3: Standard Eastern Armenian

Let us now turn to the last major system of plural selection found among the Armenian dialects. Standard Eastern Armenian, the dialect spoken by educated Armenians in Armenia and Iran, possesses the same plural system as the Western Armenian dialects, with one significant difference[2]: words whose singular form contains an Appendix invariably select the polysyllabic plural suffix *-ner* (Atʃaɾjan 1957:817-18, 1971:270-71), as in (17).

(17)	singular	plural	gloss
	skizb	*skizb-ner*	beginning
	spai	*spa-ner*	officer
	stak	*stak-ner*	money, coin
	skizb	*skizb-ner*	beginning
	stor	*stor-ner*	windowshade
	part-kʰ	*part-kʰ-ner*	debt
	kurts-kʰ	*kurts-kʰ-ner*	breast
	vag(ə)r	*vagər-ner*	tiger
	astʁ	*astəʁ-ner*	star

---

[2] I will not discuss here the idiolectal variations in the treatment of hiatus sequences arising from concatenation of the plural morpheme. For example, one of my SEA informants (DE) invariably selects *-ner* with vowel-final stems, even if they are monosyllabic; this is clearly intended to avoid creating a hiatus situation between the stem-final vowel and the intial *-e-* of the monosyllabic plural suffix *-er*. My Western informants deal with the same hiatus situations in two different ways: one informant (HM) selects the expected plural allomorphs, but invariably inserts *j* in hiatus configurations (*tsi-j-er* 'horses', *pʰu-j-er* 'owls'); another informant (HH) allows the hiatus configurations to surface undisturbed (e.g. *tsier* 'horses' not **tsijer*).

Note that it is not the case that all words containing the bound morpheme $-k^h$ select the polysyllabic plural; for example, in (18) you can see that the plural of $girk^h$ 'book', which contains the same $-k^h$ morpheme as $part-k^h$ 'debt' in (17), selects the monosyllabic plural.

(18) $gir-k^h$ 'book' $\rightarrow$ plural [$gərk^her$] (Aбeвjan 1923:273).

In monosyllables, the $-k^h$ crucially must be syllabified as an Appendix in order to trigger selection of the polysyllabic plural; when it is syllabified as a Coda, the monosyllabic plural is selected.

Now, it is not immediately clear why Eastern Armenian should differ from Western Armenian in its treatment of syllable Appendices; it is also not clear why the presence of an Appendix should cause an apparently monosyllabic form to behave as if it were polysyllabic. In order to approach a solution to this problem, we need to consider the structures assigned by our syllabification algorithm to words of this type.

The initial syllable structures assigned to forms that eventually surface with initial and final Appendices are provided in (19).[3]
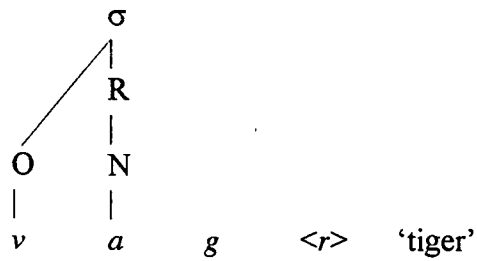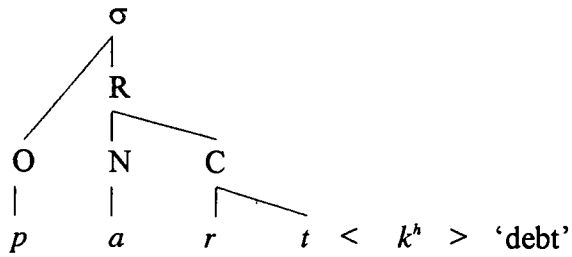
(19)
a. initial Appendix

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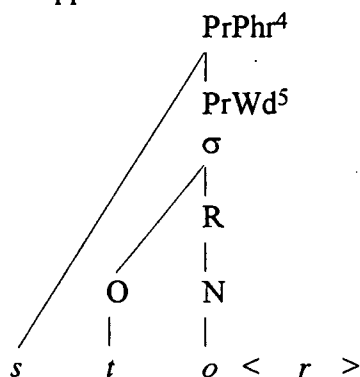
[3] My reasons for assuming that s attaches to the Prosodic Phrase node, whereas k^h attaches to the Prosodic Word node, are outlined in Vaux 1997.
[4] PrPhr = Prosodic Phrase.
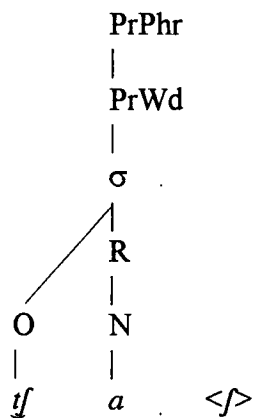[5] PrWd = Prosodic Word.

b. final Appendix

```
            σ
           /|
            R
           |‾‾‾‾|
  O    N    C
  |    |    |‾‾‾‾‾|
  p    a    r    t  <  kʰ  >   'debt'
```

```
            σ
           /|
            R
            |
  O    N
  |    |
  v    a    g    <r>    'tiger'
```
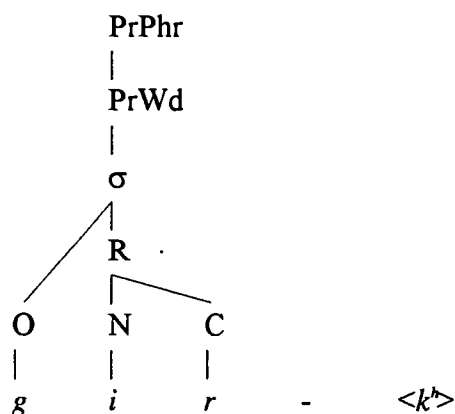
If we compare these representations to the representations in (20) of forms without Appendices, we notice one essential difference: the forms in (19) contain segments that are unparsed, but not extraprosodic. The forms in (20), on the other hand, contain no unparsed material that is not extraprosodic.

(20)
i. 'meal'
```
              PrPhr
              |
              PrWd
              |
              σ
             /|
              R
              |
      O    N
      |    |
      ʧ    a    <ʃ>
```

ii. 'book'   PrPhr
                    |
                  PrWd
                    |
                    σ
                   /|
                  / R   ·
                 / ┌──────
                O   N   C
                | | |
                g   i   r   -   <k^h>

In other words, if one ignores extraprosodic material, the representations in (20) each consist of a single simple syllable, whereas those in (19) contain surplus material in the form of either appendices or stray segments. Given this generalization, one can formulate the plural selection rule for Standard Eastern Armenian as follows:

(21) Standard Eastern Armenian plural selection

In the context [+plural, _]:

minimal σ   ⇔   -er

elsewhere   ⇔   -ner

Note that the Standard Eastern Armenian system in (21) differs from the Western system in (10) only in terms of the interpretation of the notation "σ": whereas in Standard Eastern Armenian the occurrence of σ in the rule is interpreted as "a single syllable and *only* a single syllable", in the Western dialects the σ notation is interpreted simply as "a single syllable". As long as the input form does not contain two or more syllables, the monosyllabic plural -er is selected; unparsed segments and appendices are ignored, since they do not add to the syllable count.

Let us consider how the analysis presented here accounts for the plural of *vagr* 'tiger' (Western *vak^hr*) in the Eastern and Western systems. The plural rule takes as its input the representation in (19b), wherein the *r* is marked as extraprosodic by FCE and the *g* is left unsyllabified due to the SBC. The Standard Western Armenian plural rule in (10)

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sees that the form contains only one syllable, and therefore selects the plural suffix *-er*. When the sequence *vak^{h}r-er* then enters the various phonological levels of syllabification, the first *r* is free to attach as an onset for the following *e*, the *k^h* attaches as a coda for the preceding *a*, and the final *r* attaches as a coda for the *e*. Note that in this derivation, the epenthesis that occurs on the surface in the Standard Western Armenian singular form [*va.k^{h}ɘr*] never has the opportunity to apply.
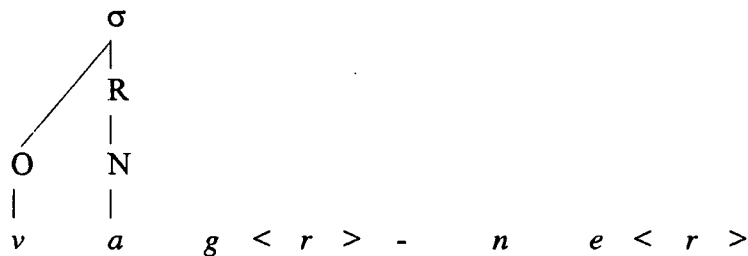
The Standard Eastern Armenian case is slightly different. Rule (21) detects that the representation in (19b) contains more material than just a minimal syllable, namely the stray *g*. Hence, the elsewhere case applies, and the suffix *-ner* is selected. As depicted in (22), when the sequence *vagr-ner* feeds into the cyclic syllabification component, the second cycle creates two open syllables, *gR* and *nE*; epenthesis and post-cyclic syllabification then produce the correct surface form [*va.gɘr.ner*].

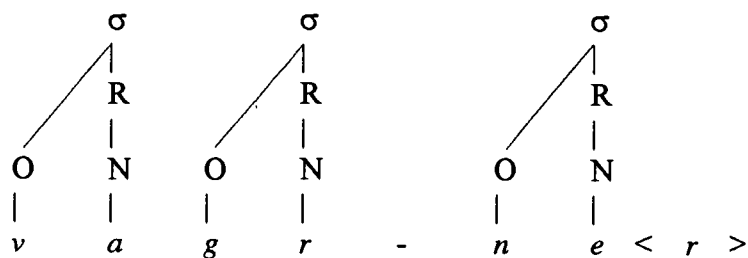(22) derivation of Standard Eastern Armenian *vagr-ner* 'tigers'
a. initial form

```
              σ
             /|
            / R
           /  |
          O   N
          |   |
          v   a    g   <r>   +   [+plural]
```
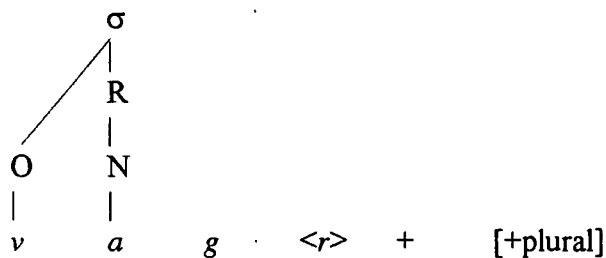
b. plural selection

```
              σ
             /|
            / R
           /  |
          O   N
          |   |
          v   a    g  < r >  -   n   e  < r >
```
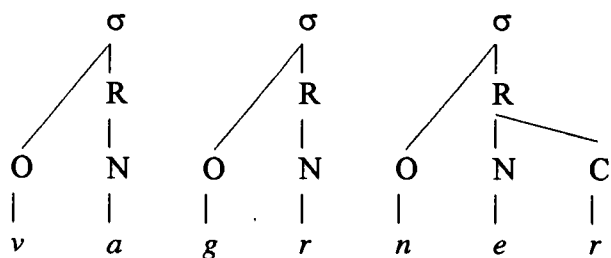
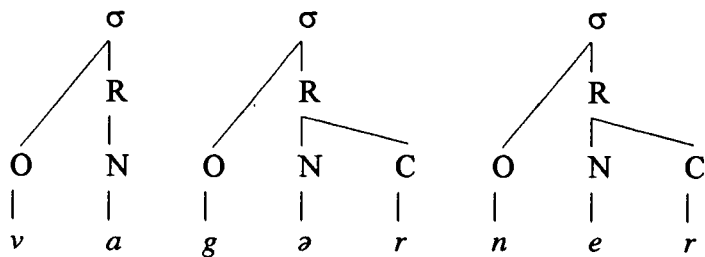c. first cycle of syllabification (*vag<r>*): applies vacuously

d. second cycle of syllabification (*vagr-ne<r>*)

e. post-cyclic syllabification (*vagr-ner*)

f. epenthesis and resyllabification

Now, one might object that the distinction between single syllables and minimal syllables that I have made in my analysis is unnecessary, since one can also formulate the Western plural rule as in (23): forms consisting of 2 or more syllables select *-ner*, and elsewhere *-er* is selected.

(23) an alternative analysis of the Western plural system

In the context [+plural, _]:

a. $\geq 2\,\sigma$ ⇔   *-ner*

b.   elsewhere   ⇔   *-er*

I see two problems with this analysis. First of all, it fails to capture the fact that the Eastern and Western systems are essentially identical. Given the analysis in (23), we have to say that the Western systems single out polysyllables, whereas the Eastern system singles out monosyllables; though the surface facts in the two systems are basically the same, the underlying systems that generate these surface forms are non-trivially different from one another. In the absence of compelling evidence to the contrary, I prefer to assume that the various dialects differ minimally from one another; given this assumption, the rules I have proposed in (10) and (21) are preferable to the analysis in (23).

The second problem I have with the analysis in (23) is that it makes reference to the notion of "two or more syllables". In the theory of phonology that I assume, phonological rules can only make reference to legitimate phonological entities, such as the segment, the syllable, the foot, and so on. There is no place for a hypothetical unit of the type "two or more syllables" in this model, whereas the "syllable" constituent referred to in (10) and (21) is eminently acceptable.
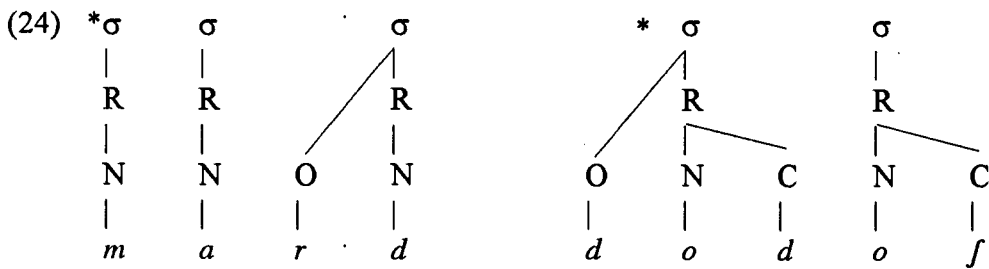
6. Analysis and Conclusions

We have seen so far that Armenian selects one plural suffix for monosyllabic words, and another suffix for polysyllabic words. This has an important implication for our theory of lexical representations. Recall that within Distributed Morphology all morphological operations—including processes of Vocabulary Insertion such as plural selection—apply before the level of Phonological Structure. Phonologists traditionally assume that syllable structure, being for the most part predictable, is assigned by rule at the level of Phonological Structure. If this assumption is correct, there should not yet be any syllable structure present in lexical items at the level of Morphological Structure. Consequently, morphological operations should not be able to make reference to syllable structure. However, this is exactly what happens in Armenian plural selection, as we have seen.

We have two ways of dealing with this problem: we can abandon the idea that all morphology occurs before phonology, or we can assume that vocabulary items contain syllable structure in the lexicon. In light of the host of arguments that have been presented

against the former possibility (q.v. Halle and Marantz 1993), I prefer to assume the existence of lexical syllabification.

At this point one wonders how morphemes come to have syllable structure in the lexicon. It cannot be an arbitrary property of lexical items, analogous to the arbitrary sequence of phonemes that each morpheme contains, because if this were the case we would expect a host of unattested sequences of syllable components of the type in (24) to appear.

(24)

```
  *σ      σ              σ          * σ          σ
   |      |             /|          /|           |
   R      R            / R         / R           R
   |      |           /  |        /  |⌐‾‾‾‾     ⌐‾‾‾‾
   N      N       O   N         O  N    C      N    C
   |      |       |   |         |  |    |      |    |
   m      a       r   d         d  o    d      o    ʃ
```

I assume instead that morphemes initially have no syllable structure, and then are run through the basic syllabification procedure that I outlined earlier. The syllable structure assigned in this way is then registered as part of the lexical entry of each vocabulary item when it is inserted in a given utterance.

To sum up, I have argued that the Armenian plural selection data provide evidence for two important claims concerning the representation of words in memory. The most important of these claims is that morphemes can have predictable prosodic structure in the lexicon. This runs counter to the guiding principle of underspecification theory that predictable information is not stored in lexical entries, but seems to be required in order to account for the Armenian facts. I also argued that the Armenian data provide independent confirmation of Borowsky and Itô's proposal that certain segments at word margins are marked as extraprosodic and remain unsyllabified until a later stage in the derivation. Finally, I have suggested that languages can interpret formal elements such as "σ" provided by rules in different ways. I hope that this discovery will facilitate further forays into the uncharted backwaters of the formal elements and operations manipulated by Universal Grammar.

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