Variation in a bracketing paradox: A case study in Armenian compounds

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Abstract

A morphology-phonology bracketing paradox is a case where the morphological and phonological structures of a word are not isomorphic. Armenian compounds display such a paradox in their pluralized forms. The plural suffix displays phonologically-conditioned allomorphy based on syllable-count. Endocentric compounds are paradoxically pluralized as monosyllabic if their head is monosyllabic. This paper documents the extent to which such a paradox shows exceptions and variation. These factors range from phonological restrictions on bisyllabic minimality, semantic change, the loss of morphological structure via grammaticalization, and the emergence of morphological structure via reanalysis.

Keywords: Armenian, compound, bracketing paradox, variation, grammaticalization

1. Introduction

Bracketing paradoxes are cases where a word has multiple contradictory hidden structures. In the case of Armenian, compound plurals display a bracketing paradox between their phonological structure (syllable count) and their morphological structure (syllable-counting allomorphy). Briefly put, compounds are polysyllabic. The plural suffix is -er for monosyllabic bases, -ner for polysyllabic ones. If a compound is exocentric, then it transparently takes the plural suffix -ner. But if a compound is endocentric and has a monosyllabic second-stem (the head), then the compound paradoxically takes the -er suffix.

The basics of this bracketing paradox have been described in depth in the philological and generative literature (§2) (Dolatian 2020, 2021b). In this paper, I go through exceptions and variations on the bracketing paradox in Armenian (cf. variation in English: Kang 1993; Spencer 1988; Sproat 1992). These are cases where an exocentric compound unexpectedly triggers the bracketing paradox, or when an endocentric compound does not undergo the bracketing paradox. These exceptions involve factors ranging from bisyllabic minimality (§3), semantic opacity (§4), morphologization (§5), to loanword adaptation (Avetisyan 2007; Marowt’yyan 2003; Sargsyan 1979, 1984, 1987). The end-result is to document how much inter-modal information can be gleaned thanks to the bracketing paradox.¹

2. Overview of compounds and the bracketing paradox

In Armenian, compounds are formed by concatenating two stems (STEM1 and STEM2) with the linking vowel -a-. Both simplex and compound words are prosodically parsed as single prosodic works, marked by final stress. We often find the reduction of destressed high vowels in STEM1 (Dolatian 2021a).

¹ In terms of transcription, we transcribe the segments /a,e,o,ɛ,ɔ,χ,ʁ,r/ as a,e,o,r,x,ɣ,ṙ. For Western Armenian, we do not mark aspiration on consonants because it is not contrastive in Western Armenian. Armenian citations are Romanized based on the ISO 9985 transliteration system. I transcribe the Eastern trill /ɾ/ as ṛ. Unless specified otherwise, data is transcribed based on the Western Armenian pronunciation.
(1) a. narîntʃ + hújt ‘orange + juice’ b. dźov + tsi ‘sea + horse’
naranʃ-a-hújt ‘orange juice’ dźov-a-tsi ‘seahorse’

The linking vowel is semantically vacuous (Mxit’aryan 2017). Diachronically, it developed from the case system of Classical Armenian (Abeğeryan 1965:190-194; Sevak 2009:146; Mxit’aryan 2017:187).

The main theoretical curiosity of compounds is that they display a bracketing paradox in the plural. Briefly put, the plural suffix displays two phonologically-conditioned allomorphs based on syllable count: -er after monosyllabic bases, -ner after polysyllabic bases.

(2) a. pág ‘yard’ b. tanág ‘knife’
pag-ér ‘yards’ tanag-nér ‘knives’

Compounds show a split in how they are pluralized when Stem2 is monosyllabic. I underline the counted syllables. In exocentric compounds, we unsurprisingly see that the -ner form is used because the compound is polysyllabic. Exocentric compounds include possessive compounds and deverbal compounds. In contrast in endocentric compounds, the -er form is paradoxically used when Stem2 is a monosyllabic head. Endocentric compounds include nominal compounds and adjectival compounds.

(3) Bracketing paradox in compounds

<table>
<thead>
<tr>
<th>Exocentric</th>
<th>Possessive</th>
<th>Deverbal</th>
</tr>
</thead>
<tbody>
<tr>
<td>kankr + hér</td>
<td>‘curly + hair’</td>
<td>sagav + xos-íl ‘seldom + to speak’</td>
</tr>
<tr>
<td>kankr-a-hér</td>
<td>‘curly haired’</td>
<td>sagav-a-xós ‘taciturn’</td>
</tr>
<tr>
<td>kankr-a-her-nér</td>
<td>(PL)</td>
<td>sagav-a-xos-nér (PL)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endocentric</th>
<th>Nominal</th>
<th>Deverbal</th>
</tr>
</thead>
<tbody>
<tr>
<td>dźov + márd</td>
<td>‘sea + battle’</td>
<td>dzár + xíd ‘tree + dense’</td>
</tr>
<tr>
<td>dźov-a-márd</td>
<td>‘sea-battle’</td>
<td>dzar-a-xíd ‘dense with trees’</td>
</tr>
<tr>
<td>dźov-a-márd-ér</td>
<td>(PL)</td>
<td>dzar-a-xíd-ér (PL)</td>
</tr>
</tbody>
</table>

The above data is a bracketing paradox (Newell 2019; Pesetsky 1985). For illustration, when a compound undergoes the bracketing paradox and takes the -er plural form, we say it got paradoxically pluralized. When the non-paradoxical -ner is used, we say the compound got transparently pluralized.

In the generative literature, the above bracketing paradox was first tackled in Vaux (1998) using morphological rebracketing. Dolatian (2020, 2021b) discusses in detail the synchronic nature of this bracketing paradox. He argues that the interaction between the bracketing paradox and cyclic phonology is evidence against morphological rebracketing. He analyzes the paradox by allowing realization rules to reference morphological heads (h) within a cyclic framework (cf. head-operation rules in: Aronoff 1988; Hoeksema 1985; Rainer 1993).

(4) Realization rules for the plural suffix

\[
\begin{align*}
\text{PL} &\rightarrow -\text{er} / [\sigma]_{\text{h}} \\
&\rightarrow -\text{ner} / \text{elsewhere}
\end{align*}
\]

The generalization on headedness is robust in contemporary Armenian. But this has not always been the case. In a study of compounding in early modern Armenian, Sargsyan (1979, 1987) notes that 19th century Armenian had relatively few compounds with a monosyllabic Stem2 (Sargsyan 1987:201). Once such compounds became more productive and widespread, speakers had varying judgments on how to pluralize them. Both transparent and paradoxical plurals for the same compound can be found in early literature, grammars, and dictionaries. For the same compound, variant plurals could be found in the works of the same author or the same lexicographer (Sargsyan 1979:35-6).

For example, in early modern Armenian, the endocentric compound foke-náv ‘steam-boat’ (5a) could either be paradoxically pluralized with -er in foke-náv-er or transparently pluralized with -ner in foke-náv-ner. Currently only the paradoxical plural is grammatical.

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2 For a survey of philological treatments of the linking vowel, see Mxit’aryan (2017:183ff).
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Optional transparent and paradoxical plurals in early Armenian (Sargsyan 1979:35-6)

<table>
<thead>
<tr>
<th>Compound</th>
<th>Meaning</th>
<th>Compound</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ʃokí + náv</td>
<td>'steam + boat'</td>
<td>gərág + géd</td>
<td>'fire + point'</td>
</tr>
<tr>
<td>ʃoke-náv</td>
<td>'steam-boat'</td>
<td>gərag-a-géd</td>
<td>'shooting point'</td>
</tr>
<tr>
<td>ʃoke-nav-nér</td>
<td>'steam boats'</td>
<td>gərag-a-ged-nér</td>
<td>'shooting-points'</td>
</tr>
<tr>
<td>ʃoke-nav-ér</td>
<td></td>
<td>gərag-a-ged-ér</td>
<td></td>
</tr>
</tbody>
</table>

In the face of this widespread variation within and across authors, early native grammarians could not yet state a generalization on the distribution of the bracketing paradox (Marowt’yan 2003:54-5). Eventually inter- and intra-speaker variation was levelled out (Sargsyan 1987:202) and the current generalization developed: endocentric compounds display the bracketing paradox.

The next few sections go through residual cases in contemporary Armenian where the bracketing paradox is exceptionally triggered in exocentric compounds or exceptionally blocked in endocentric compounds.

3 Phonological factors on the bracketing paradox

In terms of phonological factors, Dolatian (2020, 2021b) documents a circumscribed set of data which seem to contradict the simple analysis on the bracketing paradoxes. In the previous cases, a linking vowel was present, rendering the compound at least trisyllabic. But a linking vowel is not used in all types of compounds. For example, a linking vowel is not used if the second stem, Stem2, is V-initial: pa.j-imást (6a). In that case, the two stems are syllabified together without a linking vowel.3

(6) a. páj + imást ‘verb + meaning’
    pa.j-imást ‘verbal meaning’
    d. vórs + arád ‘prey + abundant’
    vor.s-arád ‘full of game’

b. sírd + uráx ‘heart + happy’
   sor.d-uráx ‘having a happy heart’
   e. torám + oʒíd ‘money + dowry’
   tara.m-oʒíd ‘monetary dowry’

c. tás + əngér ‘class + friend’
   ta.s-əngér ‘classmate’
   f. bár + jérk ‘dance + song’
   ba.r-ék ‘dance song’

d. ʃazíg + púnt ‘flower + bunch’
   ʃazig-e-púnt ‘bouquet’
   haʃ́v-e-dún ‘clearing house’

e. ʃazíg + taɣár ‘flower + pot’
   ʃazig-a-taɣár ‘flower pot’
   haʃv-a-senjág ‘accounting room’

In some compounds, the linking vowel is absent for arbitrary lexical reasons. Some compounds surface without any linking vowel at all even though Stem2 is C-initial: ʒam-géd (8). There are pairs of stems which

3 For some roots, root-initial e generally triggers glide-epenthesis when it is word-initial: jérk from orthographic <erk> ‘song’. Prescriptively, this glide does not appear when a stem-initial e is word-medial because of compounding: ba.r-érk. I use the term ‘prescriptively’ because colloquial speech tends to preserve the glide (Dum-Tragut 2009:14-5). More data is needed to confirm any statistical tendencies on the presence vs. absence of the glide inside compounds.

4 Other possible but rare linking vowels exist. Geworgyan (2007:172) notes the use of a linking vowel -i- in a handful of compounds. Ėloyan (1972:80) and Mxit’aryan (2017:182) note that recent borrowed compounds use a linking vowel -o-.
can form a compound either with or without the linking vowel: sal-(a)-kár (9a). The two compounds can be synonymous (9a) or not (9b). These un-linked compounds are less common than linked compounds. Éloyan (1972) argues that they arise from collocation, dialectal borrowings, loanwords, or sporadic diachronic syncope of the linking vowel -a-.

(8) a. ʒám + géd ‘time + dot’  b. tʃúr + védʒ ‘water + fall’
    ʒam-géd ‘period, term’  tʃor-védʒ ‘waterfall’

(9) a. sál + kár ‘anvil + rock’  b. tʃúr + dʒayíg ‘water + flower’
    sal-kár ‘flagstone, paving’  tʃor-dʒayíg ‘water pox’
    sal-a-kár tʃor-a-dʒayíg ‘water hawthorn’

The theoretical significance of the linking vowel comes from cases where the absence of the linking vowel renders the compound bisyllabic. For un-linked and endocentric bisyllabic compounds, we find variation in the type of plural suffix. Either the suffix is -er because we count the head, or it is -ner because we count the entire compound.

(10) a. xátʃ + kár ‘cross + stone’  b. kár + daʃ-el ‘stone, to carve’
    xatʃ-kár ‘cross-stone’  kar-dáʃ ‘stone carver, mason’
    xatʃ-kar-ér ‘cross-stones’  *kar-daʃ-ér ‘stone carvers, masons’
    xatʃ-kar-nér kar-daʃ-nér ‘tobaccos’

Dolatian (2020, 2021b) formalizes the above variation by mapping semantic heads to the prosodic stem as a sublexical prosodic constituent (PStems Downing 1999). Monosyllabic PStems in bisyllabic endocentric compounds can undergo optional prosodic restructuring. For space, I refer readers to Dolatian (2021b) for the analysis. These bisyllabic compounds are thus a case of having prosodic structure trigger the bracketing paradox.

4 Semantic factors and opacity

In terms of semantic factors, there are relatively few cases where we can see that semantic change affected a compound’s plural form. I document three such semantically-induced cases: semantic opacity, gradual semantic opacity, and the interaction between metaphoricity and fauna/flora names.

First, very rarely, language change can cause a nominal compound to become semantically opaque. Semantic opacity removes hyponymy, thus removing endocentricity and the bracketing paradox. To illustrate, consider compounds where STEM2 is the word ֶxod ‘grass’. This stem is used to name many types of grass-like plants and weeds. Most of these compounds are interpreted as endocentric and undergo the bracketing paradox (11a). One exception though is the word for ‘tobacco’ ֶdɔx-ә-xod, literally ‘smoke-grass’ (11b). Although tobacco is a type of plant, the connection between its etymology and usage is rather opaque. The concept of tobacco has now become less plant-like, owing to its widespread use in cigars and cigarettes. This disconnect between tobacco as a plant vs. a recreational substance has rendered this compound as exocentric. It is transparently pluralized.

(10) a. aɣves + xod ‘fox + grass’  b. dzux + xod ‘smoke + grass’
    aɣves-a-xod ‘foxtail’  dzux-a-xod ‘tobacco’
    aɣves-a-xod-ә ‘foxtails’  dzux-a-xod-ә ‘tobaccos’

Second, in some words, semantic opacity is gradual and on a cline. The word for airplane is a compound (12a) consisting of ‘air’ and ‘ship’, i.e. ‘a ship in/for the air, an airship’. Donabédian (2004:19) notes that this word used to have a clear hyponymic relationship, i.e. ‘an airship’, and thus should take only the paradoxical -er. However, it no longer has a clear hyponymic relationship. It is thus grammatical to pluralize this word either paradoxically with -er or transparently with -ner. Contrast ‘airplanes’ with the hyponymic ‘airfields’ which is only paradoxically pluralized: ot-a-taʃt-er (12b).
Metaphoric interpretations likewise interact with endocentricity and the bracketing paradox. The names of many aquatic animals and plants are compounds where Stem 1 is ‘water’ or ‘sea’, while Stem 2 is a noun which resembles the animal or plant. In some cases, the metaphoric link is pretty transparent and cross-linguistically common like ‘manatees’ as ‘water-cows’. But in other compounds, the metaphorical connection is unclear: ‘sea-mother’ for ‘jellyfish’. But regardless, these metaphorically-based compounds are grammatically treated as endocentric and trigger the bracketing paradox.

It is unclear how to formalize the contrast between these metaphoric meanings which trigger the bracketing paradox vs. those in (11b) which cannot. It seems that Armenian has grammaticalized a compounding construction for naming plants and animals, such that these are treated as morphologically endocentric despite the (biologically) non-transparent semantics.

In sum, the above cases show how semantic factors can trigger or remove the bracketing paradox.

5 Morphological changes around the bracketing paradox

In order for the compound to show a bracketing paradox, the compound has to be treated as endocentric. A necessary morphological condition for endocentricity is that Stem 2 and the compound share the same part of speech. An additional condition is that Stem 2 is treated as a morphologically complex stem, i.e., not an affix. All previously discussed compounds satisfied this additional morphological condition.

In section §5.1, I go through compounds where Stem 2 was originally parsed as a complex stem, but has now been demoted to a suffix. These words lost their status as endocentric compounds and can’t trigger the bracketing paradox anymore. Then in section §5.2, I go through words which have become reanalyzed as endocentric compounds, and thus now trigger the bracketing paradox.

5.1 Loss of the paradoxical plural

The conditions which lead to the loss of the bracketing paradox ultimately involve weakening the morphological complexity of Stem 2, whether by grammaticalization (§5.1.1), lexicalization (§5.1.2), or a complex interaction of multiple factors (frequency, bleaching) across dialects (§5.1.3). When a compound undergoes these changes, it is no longer parsed as endocentric, and it no longer triggers the bracketing paradox.
5.1.1 Gradual grammaticalization: from stem to suffix

Some compounds have Stem2 diachronically get reanalyzed as a suffix through a gradual process of grammaticalization. For example, a common Stem2 in compounding is the morpheme bed (14a). It can surface as a free-standing stem that means ‘leader’. It is often used in compounds to mean any type of leader: xəmp-a-béd ‘group leader’. Although these words look like hyponymic and endocentric compounds, they do not trigger the bracketing paradox. They are not pluralized as monosyllables with -er. Instead, they are transparently pluralized with -ner: xəmp-a-bed-ner.

(14) a. xúmp + béd  ‘group + leader’  b. náv + béd  ‘ship + leader’
xəmp-a-béd  ‘group leader’  nav-a-béd  ‘captain, ship-leader’
xəmp-a-bed-ner  ‘group leaders’  nav-a-bed-ner  ‘captains’

Impressionistically, the morpheme bed is being used less and less as a free-standing root. Instead, its appearance in compounds is becoming more common. These factors are causing the morpheme bed to be reinterpreted as a suffix. By not being its own stem anymore, these ‘compounds’ are being reanalyzed as simple root-suffix combinations.

This reanalysis or grammaticalization is gradual and incomplete. It is gradual because some dictionaries and sources still indicate both a paradoxical and transparent plural for some -bed final compounds: kjuɣ-a-bed-(n)èr (15a) (Marowt’yan 2003:53). Some paradoxical plurals are found even in neologisms: terasan-a-bed-nèr ‘lead-actors’ (15b) (Sargsyan 1979:37-9).

(15) a. kújɣ + béd  ‘village + leader’  b. terasán + béd  ‘actor + leader’
kjuɣ-a-béd  ‘village leader’  terasan-a-béd  ‘lead actor’
kjuɣ-a-bed-èr  ‘village leaders’  terasan-a-bed-nèr  ‘lead actor’
kjuɣ-a-bed-ner  ‘village leaders’  terasan-a-bed-ner  ‘lead actor’

But in general, the transparent plural is largely the norm now (Sargsyan 1979:37-9). There are likewise signs that this morpheme is getting bleached (Marowt’yan 2003:61).

The same process of grammaticalization is observed with other morphemes. A partial list of them is provided below, compiled from multiple sources (Sargsyan 1987:203; Avetisyan 2007:43). For the different morphemes in (16), their free-standing nominal form is rarely used. Some are farther along the grammaticalization cline than others. They are increasingly taking only transparent plurals. For some, a paradoxical plural either is obsolete or optional.

(16) Gradually grammaticalized morphemes and their transparent plurals (Sargsyan 1987:203)

<table>
<thead>
<tr>
<th>Stem1</th>
<th>Rare Stem2</th>
<th>Compound</th>
<th>Transparent plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>vért</td>
<td>‘end’</td>
<td>pán  ‘word’</td>
<td>vert-a-pán  ‘eloquent’</td>
</tr>
<tr>
<td>kórdz  ‘work’</td>
<td>tůl  ‘rest’</td>
<td>kordz-a-tůl  ‘work-striker’</td>
<td>kordz-a-tul-ner</td>
</tr>
<tr>
<td>ajki  ‘vineyard’</td>
<td>bán  ‘keeper’</td>
<td>ajke-bán  ‘vineyard-keeper’</td>
<td>ajke-ban-ner</td>
</tr>
<tr>
<td>namág ‘letter’</td>
<td>níf  ‘mark’</td>
<td>namag-a-níf  ‘postage stamp’</td>
<td>namag-a-nif-ner</td>
</tr>
<tr>
<td>hedzél  ‘to ride’</td>
<td>zór  ‘soldier’</td>
<td>hedzel-a-zór  ‘cavalry’</td>
<td>hedzel-a-zor-ner</td>
</tr>
<tr>
<td>hav  ‘chicken’</td>
<td>git  ‘animal product’</td>
<td>hav-git  ‘egg’</td>
<td>hav-git-ner</td>
</tr>
</tbody>
</table>

More sporadic cases of gradual grammaticalization have been observed by Marowt’yan (2003) and Sargsyan (1979, 1987). I leave investigating the prevalence of the paradoxical vs. transparent plural to future corpus work.
5.1.2 Lexicalization and bleaching

The bracketing paradox can likewise be lost via a combination of semantic bleaching, morphological frequency, and lexicalization. A simple case study is the morpheme ged (17). It can form a free-standing root that means ‘point’. It is used to form many punctuation-based compounds.

(17) Compounds with STEM2 ged

<table>
<thead>
<tr>
<th>Stem1</th>
<th>Stem2</th>
<th>Compound</th>
</tr>
</thead>
<tbody>
<tr>
<td>əstór ‘bottom’</td>
<td>géd ‘point’</td>
<td>əstór-a-géd ‘comma’</td>
</tr>
<tr>
<td>mét ‘inside’</td>
<td>géd ‘point’</td>
<td>mit-a-géd ‘semi-colon’</td>
</tr>
<tr>
<td>vért ‘end’</td>
<td>géd ‘point’</td>
<td>vert-a-géd ‘period’</td>
</tr>
<tr>
<td>pazm- ‘multi-’</td>
<td>géd ‘point’</td>
<td>pazm-a-géd ‘ellipis’</td>
</tr>
</tbody>
</table>

The above compounds look hyponymic and look like endocentric compounds. One would think that they should trigger the bracketing paradox and get pluralized with -er. But based on a corpus study, Sargsyan (1979:37-9) reports that all of the above compounds can be optionally pluralized with either -er or -ner. In my own speech and in Marowt’yan (2003:60)’s judgments, only the -ner form sounds grammatical. Thus, these words have lost or are losing their morphological structure as endocentric compounds.

I suspect that this change is because of frequency and lexicalization. The above words are well-established enough that they are no longer parsed as being actively derived as hyponymic compounds. We see the effect of frequency in two synonymous compounds that do not refer to punctuation: des-a-géd (18a) and hajets-a-géd ‘point-of-view’ (18b).

(18) a. des-nél + géd  ‘to see + point’  b. hajets-k + géd  ‘glance + point’

   des-a-géd  ‘point of view’  hajets-a-géd  ‘point of view’

   *des-a-géd-ér  ‘point of views’  hajets-a-géd-ér  ‘point of views’

   des-a-géd-nér  *hajets-a-géd-nér

The compound des-a-géd (18a) is the most frequent word to denote ‘point-of-view’. It appears to be hyponymic. But Sargsyan (1979:37-9) reports that it never triggers the bracketing paradox: des-a-géd-ner. I agree with her judgments. In contrast, the synonymous compound hajets-a-géd (18b) is infrequent and restricted to higher registers. It always triggers the bracketing paradox: hajets-a-géd-er.

In sum, lexicalization and frequency can cause an endocentric compound to lose its morphological structure and no longer trigger the bracketing paradox.

5.1.3 Semantic bleaching and grammaticalization across dialects

This section discusses similar effects in lexicalization and grammaticalization. A twist is that these effects cause the loss of the bracketing paradox in Western Armenian, but not Eastern Armenian.

Consider the two highly frequent morphemes: kır (19a) and nif (19b). The words have many senses. The underspecified meaning of kır is ‘writing’ while that of nif is ‘sign’. Their most frequent narrow meaning is ‘handwriting’ and ‘grade’ respectively. Each likewise forms a frequent verb: kər-él ‘to write’ (19a-ii) and nəʃ-ə  ‘to signal, mark’ (19b-ii).

(19) a. i. kır  ‘writing’  b. i. nif  ‘sign’

   ii. kər-él  ‘to write’

5 The stem hajets-k truncates its nominalizer -k. The behavior of -k. The diphthong ja undergoes destressed reduction to e. This is a fossilized rule from Classical Armenian, discussed in Dolatian (2020:ch2).
But compounds formed with these morphemes show dialectal, lexical, and diachronic differences in how they are pluralized. In Eastern Armenian, the morpheme kir is pronounced as gir (19a). It can form either endocentric nominal compounds or exocentric deverbal compounds: deɣ-a-gir ‘prescription’ vs. ‘prescription writer’ (20a). In contemporary Eastern Armenian (Sargsyan 1979:36), the former are paradoxically pluralized with -er, while the latter are transparently pluralized with -ner: deɣ-a-gir-er ‘prescriptions’ vs. deɣ-a-gir-ner ‘prescription writers’.6

(20) Eastern Armenian

\[
\begin{array}{ll}
\text{a. déɣ + gír} & \text{‘medicine + writing’} \\
deɣ-a-gír & \text{‘prescription or prescription writer’} \\
deɣ-a-gír-ér & \text{‘prescription writers’} \\
deɣ-a-gír-ér & \text{‘prescription writers’}
\end{array}
\]

The above data is as expected. Because the morpheme kir/gir can form either a noun (19a-i) or a verb (19a-ii), then it can form either hyponymic nominal or non-hyponymic deverbal compounds. But the pluralization of these compounds has been unstable, both diachronically and cross-dialectally. In Western Armenian, both hyponymic and non-hyponymic readings of ambiguous kir/gir-final compounds (20a) tend to be transparently pluralized with -ner: teɣ-a-kir-ner can mean both ‘prescription’ and ‘prescription writer’ in Western Armenian.

(21) Western Armenian

\[
\begin{array}{ll}
\text{a. téɣ + kír} & \text{‘medicine + writing’} \\
teɣ-a-kír & \text{‘prescription or prescription writer’} \\
teɣ-a-kír-ér & \text{(PL)}
\end{array}
\]

The tendency is so strong in Western Armenian that one comparative grammar found that all compounds with final -kir take a transparent plural even if the compound only has a single hyponymic meaning (Avetisyan 2007:43).7 A partial list of these compounds is below. In contemporary Western Armenian, the compounds in (22) seem hyponymic and endocentric but they are transparently pluralized with -ner: her-a-kir-ner ‘telegraphs’. They do not trigger the bracketing paradox.

(22) Hyponymic compounds with kir ‘writing (n.)’ (19a-i) which are transparently pluralized in Western Armenian (Avetisyan 2007:43)

<table>
<thead>
<tr>
<th>Stem1</th>
<th>Compound with Stem2 kir</th>
<th>Western Plural</th>
<th>Eastern Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>herú ‘far’</td>
<td>hera-kír ‘telegraph’</td>
<td>her-a-kir-ner</td>
<td>her-a-gir-ér</td>
</tr>
<tr>
<td>dzír ‘contour, edge’</td>
<td>džor-a-kír ‘plan, outline’</td>
<td>džor-a-kir-ner</td>
<td>tsor-a-gir-ér</td>
</tr>
<tr>
<td>hájd ‘clear’</td>
<td>hajd-a-kír ‘program’</td>
<td>hajd-a-kir-ner</td>
<td>hajt-a-gir-ér</td>
</tr>
<tr>
<td>kalux ‘head’</td>
<td>kalx-a-kír ‘capital letter’</td>
<td>kalx-a-kir-ner</td>
<td>galx-a-gir-ér</td>
</tr>
<tr>
<td>nagar ‘picture’</td>
<td>nágar-a-kír ‘description’</td>
<td>nágar-a-kir-ner</td>
<td>nákár-a-gir-ér</td>
</tr>
</tbody>
</table>

In contemporary Eastern Armenian, these compounds only receive a paradoxical plural: her-a-gir-ér ‘telegraphs’. This is expected. But historically in early modern Eastern Armenian, both transparent and paradoxical plurals were possible for the strictly endocentric nominal compounds in (22) and other endocentric nominals with -kir/gir (Sargsyan 1979:37-9).

6 Eastern Armenian has destressed high vowel reduction in deɣ-a-gor-er (20a). I abstract from this here.

7 Given this data, Avetisyan (2007:43) argued that the bracketing paradox is blocked in Western Armenian when Stem2 is a closed syllable with i: CiC. I think this is incorrect and that the right generalization is morphology, not phonological.
In the case of *nîʃ* ‘sign’ (19b), we see even more instability in (23). Some endocentric nominal compounds with *nîʃ* show both transparent and paradoxical plurals in Eastern Armenian: *astx-a-nîʃ-(n)èr* ‘asterisks’. Others only allow the transparent plural: *hatk-a-nîʃ-ner* ‘characteristics’.

(23) **Hyponymic compounds with *nîʃ* which are variably pluralized in Eastern Armenian**

<table>
<thead>
<tr>
<th>Group</th>
<th>Stem1</th>
<th>Nominal Stem2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doublet</td>
<td>namák ‘letter’</td>
<td>nîʃ ‘sign’</td>
</tr>
<tr>
<td></td>
<td>pʰôst ‘post’</td>
<td>namak-a-nîʃ ‘postage-stamp’</td>
</tr>
<tr>
<td></td>
<td>darójm ‘stamp’</td>
<td>pʰost-a-nîʃ ‘postage-stamp’</td>
</tr>
<tr>
<td></td>
<td>uyí ‘road’</td>
<td>darójm-a-nîʃ ‘postage-stamp’</td>
</tr>
<tr>
<td></td>
<td>darâm ‘money’</td>
<td>uye-a-nîʃ ‘landmark’</td>
</tr>
<tr>
<td></td>
<td>âxt ‘disease’</td>
<td>daram-a-nîʃ ‘currency’</td>
</tr>
<tr>
<td></td>
<td>xorúrtb ‘thought’</td>
<td>axt-a-nîʃ ‘symptom’</td>
</tr>
<tr>
<td></td>
<td>dás ‘class’</td>
<td>xorúrtb-a-nîʃ ‘symbol’</td>
</tr>
<tr>
<td></td>
<td>ástəy ‘star’</td>
<td>das-a-nîʃ ‘declension marker’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>astx-a-nîʃ ‘asterisk’</td>
</tr>
<tr>
<td>Transparent</td>
<td>ħatúk ‘special’</td>
<td>hatk-a-nîʃ ‘characteristic’</td>
</tr>
<tr>
<td></td>
<td>tʰápʰ ‘measure’</td>
<td>tʰapʰ-a-nîʃ ‘criterion’</td>
</tr>
<tr>
<td></td>
<td>tʰútsʰ ‘demonstration’</td>
<td>tsʰútsʰ-a-nîʃ ‘indicator’</td>
</tr>
</tbody>
</table>

The compounds in the Transparent Group can only be transparently pluralized in early modern and contemporary Eastern Armenian (Sargsyan 1979:37-9; Marowt’yan 2003:59). Based on my own judgments, this is the case for Western Armenian as well.

But for the compounds in Doublet Group, they could form either transparent or paradoxical plurals in early modern Eastern Armenian (Sargsyan 1979:37-9). Sargsyan reports that they still do (circa 1979). But Marowt’yan (2003:59) reports that many of the compounds in the Doublet Group only form transparent plurals in contemporary Eastern Armenian (circa 2003). My judgment is that Western Armenian also only allows the transparent plural.

I speculate that there are three reasons for the diachronic and cross-dialectal instability of these compounds with *kîr/gîr* and *nîʃ*: semantic shift, frequency, and bleaching. First, the free-standing bases of *kîr* (24a-i) and *nîʃ* are frequent (24b-i), but their meanings have semantically narrowed down. The word *kîr* generally refers to a person’s handwriting and not just any piece of text. Similarly, *nîʃ* generally refers to a person’s school-grades or points, and not just any symbol.

(24) a. i. kîr ‘writing (abstract)’ b. i. kîr ‘sign (abstract)’
    ‘handwriting (common)’ ‘grade, point (common)’
    ii. kər-ēl ‘to write’       ii. kər-ēl ‘to signal, mark’
    iii. kər-uṭjûn ‘writing (common)’ iii. nəʃan ‘sign (common)’

The ‘simpler’ meanings of these two roots is often expressed by other derivatives: *kər-uṭjûn* (24a-iii) and *nəʃan* (24b-iii).³

Second and third, the two morphemes frequently form many compounds. The morpheme *kîr* is analogous to the neoclassical bound root -graph used throughout English. It is used to form any text-related compound word, as demonstrated in (22). As for *nîʃ*, it is often used to form any compound that is abstractly related to ‘measuring’ or ‘signaling’, as demonstrated in (23). Some consider it bleached (Marowt’yan 2003:59).

With these three factors (semantic shift, frequency, bleaching), the fact that a transparent plural is frequent in Western Armenian is explainable. The above factors conspire to weaken the semantic salience of

³Both *nîʃ* and *nəʃan* were borrowed from Iranian (A.čaṙean 1971). One is derived from the other in the source language, but not in Armenian.
kír and níʃ. This weakening predicts that the rate in which these compounds are reanalyzed as suffixed words should be more likely in Western Armenian (Avetisyan 2007) and in old Eastern Armenian (Sargsyan 1979).

To explain why Eastern Armenian currently prefers to form paradoxical plurals for some of these compounds (Sargsyan 1979), it is ultimately because speakers still parse these compounds as endocentric nominals derived from a free-standing noun kír and níʃ. It is an arbitrary fact of the Eastern Armenian lexicon.

5.2 Creation of the paradoxical plural

In contrast to the above diachronic loss of a bracketing paradox due to morphological reanalysis, there are likewise cases where a bracketing paradox is created because of reanalysis. I discuss two such cases. One involves loanword adaptation (§5.2.1), the other is the recent creation of a new hyponymic subcategory (§5.2.2).

5.2.1 Loanword borrowing

One simple case involves borrowed words. If some borrowed word was a compound in a source language, it is no longer interpreted as a compound in Armenian. This is simply because the individual stems which make up the original compound do not exist in Armenian. Common examples are scientific terminology. These compounds are transparently pluralized with -ner: karom-o-som-ner (25a). (Sargsyan 1979:41-2).

(25) a. karom-o-söm  ‘chromosome’ b. eritr-o-sít  ‘erythrocyte’
   karom-o-söm-nér  ‘chromosomes’ eritr-o-sít-nér  ‘erythrocytes’

But sometimes the Stem2 in the compound enters the lexicon as a free-standing stem. This causes the word to be reanalyzed as a hyponymic compound. A common example is the borrowed word film (26a). Given some borrowed compound like mikr-o-film, the word is interpreted as a hyponymic compound. It is paradoxically pluralized with -er: mikr-o-film-ér.

(26) a. film ~ filím  ‘film’ b. film ~ filím  ‘film’
   mikr-o-film  ‘microfilm’ mult-film  ‘animated movie
   mikr-o-film-ér  ‘microfilms’ mult-o-film-ér  ‘animated movies’

Besides the now borrowed stem film, Sargsyan (1979:41-2, 1987:209-10) notes that reanalysis of borrowed compounds is more common in higher registers or scientific jargon. It varies by speaker and by the speaker’s personal vocabulary. To illustrate, consider the scientific compounds in (27). A compound like hip-o-tez ‘hypothesis’ (27a) cannot be decomposed by a lay speaker as being multi-morphemic. They would not be aware of what any of these sub-parts mean. Instead, it is analyzed as a whole chunk and transparently pluralized with -ner: hip-o-tez-ner ‘hypotheses’.

(27) a. hip-o-téz  ‘hypothesis’ c. bakteria-fág  ‘bacteriophage’
   hip-o-tez-nér  PL (lay speaker) bakteria-fág-nér  PL (lay)
   hip-o-tez-ér  PL (expert) bakteria-fág-ér  PL (expert)
   b. anti-téz  ‘antithesis’ d. mono-fág  ‘monophage’
   anti-téz-nér  PL (lay) mono-fág-nér  PL (lay)
   anti-téz-ér  PL (expert) mono-fág-ér  PL (lay)

However, in scientific circles, this compound is analyzable because a relevant specialist would know the meaning of the Stem2 tez ‘-thesis’. Because of this, the specialist can create a hyponymy relationship between

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9Many of these borrowed compounds include the linking vowel -o-. Although -o- is not a native linking vowel, it is parsed as a normal linking vowel just like the native -a-.
STEM2 and the compound: a ‘hypothesis’ is a type of ‘thesis’. A bracketing paradox ensues and the compound is paradoxically pluralized with -er: hip-o-tez-ér.

Another example comes from the names of dinosaurs. The borrowed word tinozav(ə)r ‘dinosaur’ has been reanalyzed as an endocentric compound. It is paradoxically pluralized with -er. What likely facilitates this endocentric parse is that the substring zav(ə)r is likewise used to name other dinosaurs like ‘tyrannosaurs’.

(28) a. tin-o-zav(ə)r ‘dinosaur’ b. diran-o-zav(ə)r ‘tyrannosaur’
tin-o-zavr-ér PL diran-o-zavr-ér PL

In sum, loanwords can develop a compound-like morphological structure. If this structure merits a hyponymic interpretation, then the bracketing paradox is triggered.

5.2.2 Emergence of nominal instruments from deverbals

A similar reanalysis is observed with some deverbal compounds. In general, deverbal compounds are non-hyponymic: kork-a-kord ʿcarpet maker’ (29a). They do not trigger a bracketing paradox. They are transparently pluralized with the polysyllabic-selecting -ner: kork-a-kord-ner.

(29) a. kórk + kórd-el ʿcarpet + to work’ b. xúmp + var-él ʿgroup + to lead’
kork-a-kórd ʿcarpet maker’ xámp-a-vár ʿgroup leader’
kork-a-kórd-ner ʿcarpent makers’ xámp-a-var-ner ʿgroup leaders’
cf. kórd ʿwork’ cf. vár non-existent

In the above compounds, STEM1 is interpreted as an internal argument for the deverbal STEM2 while the entire compounded is interpreted as the external argument. These compounds must be deverbal because of their verbal semantics. Some aren’t transparently related to the meaning of a nominal STEM2: a carpet-maker kork-a-kord (29a) works on carpets, but isn’t a type of work. Other compounds lack a nominal STEM2: there’s no noun var that forms xámp-a-var (29b).

The external argument or referent of these deverbal compounds can either be animate (29a) or an inanimate instrument: kaz-a-mux ‘gas-pipe’ (30a). But regardless, the compound is transparently pluralized with -ner because there is no hyponymy: kaz-a-mux-ner ‘gas pipes’.

(30) a. káz + máx-él ʿgas + to push’ b. kúnt + ísár-él ʿball + to scatter’
káz-a-mux ʿgas pipe’ kânt-a-tāsir ʿmachine gun’
káz-a-mux-nér ʿgas pipes’ kânt-a-tāsir-ner ʿmachine guns’
cf. máx non-existent cf. tāsir non-existent

But Sargsyan (1979:43) and Sargsyan (1987:211-2) observe the following recent trend. If a deverbal compound is interpreted as an animate person, then the compound is always transparently pluralized with -ner: kork-a-kord-nér (31a-i). This is expected because the compound is non-hyponymic. But if the compound is interpreted as an instrument, then it can be pluralized either transparently with -ner or paradoxically with -er: kaz-a-mux-(n)er (31b-i).

(31) a. i. kork-a-kórd ʿcarpet maker’ ii. xámp-a-vár ʿgroup leader’
    (= person) (= person)
kork-a-kórd-nér ʿcarpent makers’ xámp-a-var-nér ʿgroup leaders’
b. i. kaz-a-mux ʿgas pipe’ ii. kânt-a-tāsir ʿmachine gun’
    (= instrument) (= instrument)
kaz-a-mux-nér ʿgas pipes’ kânt-a-tāsir-ner ʿmachine guns’
kaz-a-mux-ér
Sargsyan postulates that this change is because speakers are reinterpreting deverbal instrument compounds as a *endocentric nominal* compound where STEM2 denotes the instrument. With this morphological reanalysis, the compound is now endocentric with STEM2.

Curiously outside of compounding, this reanalyzed STEM2 does not exist as a free-standing noun. That is, although the compound *kaz-a-mux* ‘gas pipe’ (31b-i) exists, there is no noun *mux* ‘pipe’. Sargsyan’s postulated reanalysis in fact means that speakers are creating a new sense for the morpheme *mux* that denotes the instrument. But crucially for these speakers, the new sense for nominal *mux* can only be found inside compounds.

Sargsyan (1987:211-2) notes that this reanalysis and the subsequent paradoxical plurals did not exist in the 19th century. They have been recently popping up around the middle of the 20th century. It is unclear how pervasive this new emergent process or construction will become in the current generation. She finds that some stems show this reanalysis more often others (Sargsyan 1979:43). Future corpus and experimental work would be useful here.

6 Conclusion

Bracketing paradoxes provide a window into the internal abstract structure of a word’s phonology and morphology. In the case of Armenian, compound plurals show that phonologically-conditioned allomorphy can be sensitive to semantic heads. In the base case, an endocentric or hyponymic compounds is pluralized based on counting the syllables of its head. To my knowledge, there is limited information on the variability of bracketing paradoxes cross-linguistically. This paper documents such variability for Armenian. Throughout the modern history of Armenian, there has been intra-speaker, inter-speaker, and dialectal variation in how some endocentric compounds can lose their hyponymic structure, and thus block the bracketing paradox. Conversely, a word can gain a hyponymic structure and thus trigger the paradox. Relevant factors for such changes can range from sporadic semantic changes, to grammaticalization, and to loanword adaptation.

References


