Number marking in Western Armenian: A non-argument for outwardly-sensitive phonologically conditioned allomorphy♣

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1. Introduction

The Western Armenian possessive plural data originally reported in Vaux (1998, 2003) have been asserted by Wolf 2011 to involve outwardly-sensitive phonologically conditioned allomorphy, a phenomenon widely argued to be unattested (Carstairs-McCarthy 1987; Paster 2006) and predicted to be impossible by the tenets of Distributed Morphology (Halle and Marantz 1993; Bobaljik 2000). We show that the full complexity of the Western Armenian system is better captured in an account that makes no reference to outwardly-sensitive phonological conditioning of this sort. The analysis is based on standard DM mechanisms of morpheme copying, displacement, and spellout (Harris and Halle 2005, Arregi and Nevins 2012), and thus relies on inwardly-sensitive phonological conditioning and outwardly-sensitive morphosyntactic conditioning. After presenting the relevant data in detail, we present an analysis based on morpheme copying and displacement, and compare this with the Optimal Interleaving alternative offered by Wolf (2011).

2. The data

Possessive phrases in colloquial Western Armenian are typically formed in one of two ways. If there is an overt possessive pronoun[1] it precedes the demonstrative, as in (1).

(1)   im   aj-s   sɛv   gadu-s
       my   demonstr.adj-1[2]   black cat-1poss.
       'this black cat of mine'

One can also see in (1) that in such cases the possessed noun or postposition[3] is marked with a possessive suffix[4], in this case /-s/, which displays overt agreement in person with first and second person singular possessors. Third person singular and all plural possessors instead suffix underlying /-n/, which surfaces as [ə] when unable to syllabify as a Nucleus. Achaṙyan 1953 considers this /-n/ to be the definite article rather than a possessive clitic homophonous with the article.[5] The resultant system is shown in (2).

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[1] The pronominal forms discussed here are called adjectives by e.g. Dōnelean 1899 (stats'akan atsakanner 'possessive adjectives') and Sakayan 2000, but morphologically are subject pronouns in the genitive case.

[2] We use "1" to refer to the morpheme /-s-/ that is used in various grammatical contexts to refer to things in the immediate environment of the speaker. (The 1st person possessive morpheme discussed here derives historically from this.)

[3] Modern Armenian allows constructions like (SWA) mɛtʃʰ-ɛɾ-ni-s (in-spurious.pl-poss.pl-1pers) 'among us' (lit. 'our in') (Riggs 1856:25).

[4] Achaṙyan 1953 calls this a dimorosh yod 'person-definite article' when it overtly agrees in person with its coreferent (i.e. –s when used with the 1st person singular or plural, -d when used with the 2nd person singular or plural or –n/-ə when used with the 3rd person singular), and voroshich' yod 'definite article' when it doesn't (i.e. –n/-ə when used with anything other than the 3rd singular). Sakayan 2000:52 calls all of them "possessive articles".

[5] This intriguing syncretism of a 3rd person possessive form with the definite article is found in other languages, suggesting that it is not a case of accidental homophony and

(2) possessive constructions in colloquial Western Armenian with overt pronoun

	singular possessor	plural possessor
1st person	im gadu-s	mɛɾ gadu-n
	'my cat'	'our cat'
2nd person	kʰu gadu-tʰ	tsʰɛɾ gadu-n
	'thy cat'	'y'all's cat'
3rd person	iɾ gadu-n	iɾɛntsʰ gadu-n
	'his/her/its cat'	'their cat'

If a possessed noun is plural, one inserts the regular plural allomorph, i.e. -ɛɾ- for monosyllables and -nɛɾ- for polysyllables, after the nominal root and before the possessive suffix. Case endings surface between the plural morpheme and the possessive suffix, as illustrated with the ablative suffix -ɛ- in (3).

(3) declined possessed forms of plural nouns

	singular possessor	plural possessor
1st person	im gadu-nɛɾ-ɛ-s	mɛɾ gadu-nɛɾ-ɛ-n
	'from my cats'	'from our cats'
2nd person	kʰu gadu-nɛɾ-ɛ-tʰ	tsʰɛɾ gadu-nɛɾ-ɛ-n
	'from thy cats'	'from y'all's cats'
3rd person	iɾ gadu-nɛɾ-ɛ-n	iɾɛntsʰ gadu-nɛɾ-ɛ-n
	'from his/her/its cats'	'from their cats'

The second means of forming possessive phrases appears superficially to differ from the construction just reviewed only in lacking an overt possessive pronoun, as in the singular and plural nouns with singular possessors in (4).

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merits a morphosyntactically principled account; see in particular Simonenko 2012 on the Finno-Ugric languages Komi and Mari. We cannot attempt such an account here.

(4) singular possessor constructions without overt pronoun

	singular noun	plural noun
1sg possessor	gadu-s	gadu-nɛɾ-əs
	'my cat'	'my cats'
2sg possessor	gadu-tʰ	gadu-nɛɾ-ətʰ
	'thy cat'	'thy cats'
3sg possessor	gadu-n	gadu-nɛɾ-ə
	'his/her/its cat'	'his/her/its cats'

The situation becomes more interesting when the possessor is plural. Many Western speakers optionally allow the possessive pronoun to remain unexpressed in such cases, parallel to (4). When a plural possessive pronoun is unexpressed, most speakers require that the possessed noun or postposition take the possessive plural suffix /-ni-/, the descendant of one of the Classical Armenian nominal plural affixes, -ani- (Karst 1901:179)[6]. As shown in (5b), this ni- morpheme normally surfaces between the nominal plural and the case suffix.

(5) possessive constructions with non-overt plural pronoun and (polysyllabic) possessee (Riggs 1856:25, Kʻirēchchean 1864:91-2, Aydənean 1883:37, Dōnelean 1899:83, Gulian 1902:26, Asatur 1902:156, Andonian 1966:85, Soviet Armenian Encyclopedia 1987)
a. nominative

	singular noun	plural noun
1pl possessor	gadu-ni-s	gadu-nɛɾ-ni-s
	'our cat'	'our cats'
2pl possessor	gadu-ni-tʰ	gadu-nɛɾ-ni-tʰ
	'y'all's cat'	'y'all's cats'
3pl possessor	gadu-ni-n	gadu-nɛɾ-ni-n
	'their cat'	'their cats'

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[6] Andonian 1966:85 states that "it is preferable to avoid using these suffixes especially in the plural cases as they are rather awkward." Sakayan 2000:52 states that plural possessives are limited to colloquial speech.

b. ablative

	singular noun	plural noun
1pl possessor	/gadu-ni-ɛ-s/	/gadu-nɛɾ-ni-ɛ-s/
	[gadunɛs]	[gadunɛrnɛs]
	'from our cat'	'from our cats'
2pl possessor	/gadu-ni-ɛ-tʰ/	/gadu-nɛɾ-ni-ɛ-tʰ/
	[gadunɛtʰ]	[gadunɛrnɛtʰ]
	'from y'all's cat'	'from y'all's cats'
3pl possessor	/gadu-ni-ɛ-n/	/gadu-nɛɾ-ni-ɛ-n/
	[gadunɛn]	[gadunɛrnɛn]
	'from their cat'	'from their cats'

Forms like gadunis 'our cat' in (5a) show that in the absence of an overt possessive noun or pronoun, 1st plural and 2nd plural possessors take the 1st and 2nd person possessive suffixes respectively, rather than the default 3rd person suffix that we saw in mɛɾ gadu-n and tsʰɛɾ gadu-n in (2).

Aydənean 1883 mentions that plural nouns with plural possessors can optionally drop the nominal plural suffix "when there's no confusion of meaning", so for example baɾdɛz-ni-s can mean both 'our garden' and 'our gardens'.

(6) optional nominal plural (Aydənean 1883:37)

baɾdɛz-ni-s ⟍⟍⟍⟍⟍⟍⟍⟍⟍⟍⟍ our garden

baɾdɛz-nɛɾ-ni-s ⟍⟍⟍⟍⟍⟍⟍⟍⟶ our gardens

One final subtlety is that the possessive plural suffix /-ni-/ is subject to a prosodic minimality effect, requiring that the base it attaches to contain at least two syllables. As can be seen in (7b), monosyllables normally satisfy this requirement by inserting the regular nominal plural affix for monosyllabic bases, -ɛɾ-, before the

possessive plural.[7] We refer to this semantically unmotivated morpheme henceforth as the "spurious plural".[8]

(7) possessive constructions with non-overt plural pronoun and monosyllabic possessee (Riggs 1856:25, K'irēchchean 1864:91-2, Aydənean 1883:37, Dōnelean 1899:83, Gulian 1902:26, Asatur 1902:156, Soviet Armenian Encyclopedia 1987)

	a. singular noun	b. plural noun
1pl possessor	dun-ɛɾ-ni-s	dun-ɛɾ-ni-s
	'our house'	'our houses'
2pl possessor	dun-ɛɾ-ni-tʰ	dun-ɛɾ-ni-tʰ
	'y'all's house'	'y'all's houses'
3pl possessor	dun-ɛɾ-ni-n	dun-ɛɾ-ni-n
	'their house'	'their houses'

The phonologically-motivated insertion of the spurious plural in such cases makes them homophonous with forms where both the possessor and possessee are plural (Riggs 1856:25, K'irēchchean 1864:91-2, Aydənean 1883:37, Dōnelean 1899:83, Gulian 1902:26, Asatur 1902:156, Andonian 1966:85); dun-ɛɾ-ni-s in (7) can therefore mean either 'our house' or 'our houses', and so on.

Despite the appearance of the spurious plural morpheme, verbs agree with the semantic number of the possessed noun, as we can see in the expression kʰɛfɛɾnitʰ ɑʁɛg ɛ 'how are you?' in (8a). This idiom literally means 'is your well-being good?'. One can tell the addressee is plural/polite because the possessive plural -ni- is used; if the

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[7] This phenomenon already surfaces in Middle Armenian (11th-15th centuries AD), as in Զագերս բունէրնէն տարած tsakers punernēn daradz 'my children [were] taken from their nests' (ՀԱՃԵ 215, cited in Petrosyan 1972).

[8] It is worth mentioning here that some dialects satisfy the same prosodic requirement by inserting an epenthetic vowel between the base and the possessive plural morpheme. Agulis for example inserts -ə- after monosyllabic bases, and Old Julfa inserts -ɛ-. We thus appear to have at least two different strategies for dealing with the prosodic requirement, one morphological and one phonological.

addressee were singular, the form would be kʰɛf-ət̪ʰ. Since kʰɛf is monosyllabic, though, the prosodic constraint mentioned above forces insertion of the spurious plural suffix ɛɾ, giving the final form kʰɛf-ɛɾ-ni-t̪ʰ. The verb ɛ 'is' nevertheless remains singular.

(8) number agreement with possessive plurals

a.　　kʰɛf-ɛɾ-ni-t̪ʰ　　　　　　　　　　　ɑʁɛg　ɛ-Ø
　　　well.being-spurious.pl-poss.pl-2pl.poss　good　be-3sg
　　　'how are you?' (lit. 'is your (pl./polite) well-being good?')
　　　Anonymous 1835:83 (from Smyrna or Istanbul)

b.　　kʰoɾdz-ɛɾ-ni-s　　　　　lav　　g-ɛɾt̪ʰa-Ø
　　　work-spurious.pl-poss.pl-1　good　imf.-go-3sg
　　　'our work is going well'
　　　Pṙoshean 1899 (1837-1907; from Ashtarak)

c.　　dɛʁ-ɛɾ-ni-s　　　　　　　　nɛʁ　　ɛ-Ø　　jɛv　gəriv-ə　　an-havasaɾ
　　　place-spurious.pl-poss.pl-1　narrow　be-3sg　and　battle-def.　un-equal
　　　'our location is narrow and the battle is unequal'
　　　P'ap'azean 1891 (1866-1920; from Van)

For at least some speakers, the plural suffix for monosyllabic nouns, -ɛɾ-, is not the only morpheme that can be inserted to satisfy the prosodic requirement imposed by –ni-. Several older grammars mention that monosyllabic nouns with irregular plurals employ their irregular plural suffix rather than -ɛɾ- when forming plural possessives, as shown in (9).

(9) irregular spurious plurals (Aydənean 1883:38; cf. also K'irēchchean 1864:91-2, Asatur 1902:156, Achaṙyan 1954:369, Petrosyan 1972)

X	Xes	our X	our Xes	gloss of X
mad	mad-və-nɛɾ	mad-və-ni-s	mad-və-(nɛɾ)-ni-s	finger
tsʰɛr-kʰ	tsʰɛr-və-nɛɾ	tsʰɛr-və-ni-s	tsʰɛr-və-(nɛɾ)-ni-s	hand
atʃʰ-kʰ	atʃʰ-və-nɛɾ	atʃʰ-və-ni-s	atʃʰ-və-(nɛɾ)-ni-s	eye
[vod-kʰ]	vod-və-nɛɾ	vod-və-ni-s	vod-və-(nɛɾ)-ni-s	foot[9]

K'irēchchean (1864:91-2) mentions that 'our eye(s)' may optionally be either atʃʰ-və-ni-s, as in (9), or the expected atʃʰ-kʰ-ɛɾ-ni-s; Achaṙyan (1954:369) states the same for 'our finger(s)', mad-və-ni-s ~ mad-ɛɾ-əs.

Also interesting in this connection is a form mentioned by Petrosyan 1972[10], hɛd-və-ni-s 'with us'. Since postpositions like hɛd 'with' do not otherwise have plural forms, it is not clear why the irregular plural -və- rather than the regular -ɛɾ- is inserted here.

The -və- suffix descends from one of the Middle Armenian plural affixes, -vi, which is still used in many varieties of modern Armenian as a marker for paired body parts. Double plurals like -və-ner are fairly common in Armenian; some other examples are given in (10).

(10) double plurals in Western Armenian

	singular	plural	gloss
a.	mad	mad-vi (rare), mad-və-nɛɾ	finger
b.	dəʁa	dəʁa-kʰ, dəʁa-kʰ-nɛɾ	boy
c.	maɾtʰ	maɾtʰ-ig, maɾtʰ-ig-nɛɾ	man

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[9] Forms from Asatur 1902:156; we have supplied the bare form.

[10] He states that it comes from ՀՄ, ՀԲ. Ն, 195, but we haven't yet figured out what text this refers to.

Forms like mad-və-nɛɾ 'fingers' and hɛd-və-ni-s 'with us' suggest that the possessive plural morpheme -ni- is not requiring that it attach to the plural of the possessed noun or postposition; were this the case, with the former we would expect *mad-və-nɛɾ-ni-s rather than mad-və-ni-s for 'our finger', and with the latter we should not expect any output at all, as postpositions do not have plural forms.

The attested forms can be accounted for if we assume that both /-vi-/ and /ner/ are plural morphemes; this being the case, insertion of either one of them should suffice to satisfy the prosodic requirement imposed by -ni-, which is precisely what we find with alternations such as atʃʰ-və-ni-s ∼ atʃʰ-kʰ-ɛɾ-ni-s.

The forms in (9) suggest furthermore that the -ɛɾ- in dun-ɛɾ-ni-s 'our house' is actually actually a plural morpheme, rather than a purely phonological phenomenon consisting of say a default epenthetic vowel [e] à la Spanish and a default epenthetic consonant [r] as some have proposed for English. An analysis of this type would run afoul of the fact that the epenthetic vowel in Western Armenian is [ə], and the epenthetic consonant is [j], and would fail to account for the insertion of spurious -və- in (9).

We can think of at least three additional arguments for the prosodic requirement imposed by –ni- being satisfied specifically by insertion of a plural morpheme, rather than phonological epenthesis or stem suppletion:

i. The ancestor of possessive plural –ni- in Middle Armenian was a regular nominal plural affix –ni-, which like both Modern –ni- and Modern -nɛɾ- (itself composed of Middle Armenian –ni- and the ancestor of the Modern monosyllabic plural affix, -eaɾ-) required that its host contain at least two syllables (Karst 1901:187). It seems reasonable to assume that this requirement was inherited unchanged by colloquial Western Armenian.

ii. Achaṙyan 1954:372 mentions that one normally cannot combine an overt possessive pronoun with the possessive plural –ni-, so that forms like *mɛɾ kʰini-ni-s 'our wine' in (11) are ungrammatical; one must say either mer kʰini-n or kʰini-ni-s.

(11) 'our wine'

    ✗   mɛɾ kʰini-ni-s

    ✓   mɛɾ kʰini-n

    ✓   kʰini-ni-s

This distribution matches with what we have seen thus far in this paper. Interestingly, though, Achaṙyan adds that one *can* combine an overt possessive pronoun with -ni- if the regular plural morpheme intervenes, so forms such as mɛɾ kʰini-nɛɾ-ni-s 'our wines' in (12) are grammatical.

(12) mɛɾ kʰini-nɛɾ-ni-s 'our wines'

This provides a good test for whether the spurious -ɛɾ- is a plural marker or just part of a secondary stem, and fortunately Achaṙyan (for other reasons) gives the example in (13):

(13) mɛɾ a-n   dun-ɛɾ-ni-s

      our demonstr-3 house-spurious.pl-poss.pl-1

      'that house of ours'

Here the -ɛɾ- must count as a plural morpheme in order for Achaṙyan's generalization to hold and make this construction grammatical. If the -ɛɾ- were phonologically epenthetic, or part of a suppletive stem dunɛɾ-, we would expect the construction in (13) to be ungrammatical.

iii. Our third and final argument involves the behavior of the instrumental suffix –ov-. In every variety of Middle and Modern Armenian that has the possessive plural -ni-, except for colloquial Western Armenian, all of the case suffixes follow the pattern we saw in (5b): they surface between the possessive plural –(a)ni- and the possessive suffixes, as shown in (14) (cf. Karst 1901:187 on Middle Armenian).

(14) morpheme ordering in the New Julfa dialect (Achaṙyan 1940:§269)

nominative	χatsʰ-ɛɹ-ani-s	'our bread(s)'
genitive/dative	χatsʰ-ɛɹ-an-u-s	
ablative	χatsʰ-ɛɹ-an-utsʰ-əs	
instrumental	χatsʰ-ɛɹ-an-uov-əs	
locative	χatsʰ-ɛɹ-an-um-əs	

Several older grammars of Western Armenian, however, specify that the instrumental suffix -ov- differs from the rest of the case suffixes in surfacing *before* the possessive plural -ni-, so for example 'with our garden' in (15) is baɾdɛz-ov-ni-s, not the expected *baɾdɛzn-ov-əs.

(15)   baɾdɛz-ov-ni-s, not *baɾdɛzn-ov-əs
        (K'irēchchean 1864:91-2, Aydənean 1883:37, Dōnelean 1899:83, Asatur 1902:156, Andonian 1966:85)

Aydənean, Dōnelean, and Asatur add that singular and plural possessed nouns do not merge in the instrumental, so for example 'by our father' is hajɾ-ov-ni-s (16b), whereas 'by our fathers' is hajɾ-ɛɾ-ov-ni-s (16c).

(16) selective merger in possessive plurals
a.   hayr-er-ni-s   'our father, our fathers'
b.   hajɾ-ov-ni-s   'by our father'
c.   hajɾ-ɛɾ-ov-ni-s   'by our fathers'

For speakers with the system just described, the situation is summarized paradigmatically in (17).

(17) singular and plural possessive paradigms

	polysyllables		**monosyllables**	
	'our garden'	**'our gardens'**	**'our house'**	**'our houses'**
N/A	baɾdɛz-ni-s	baɾdɛz-nɛɾ-ni-s	dun-ɛɾ-ni-s	dun-ɛɾ-ni-s
G/D	baɾdɛz-n-u-s	baɾdɛz-nɛɾ-n-u-s	dun-ɛɾ-n-u-s	dun-ɛɾ-n-u-s
Ab	baɾdɛz-n-ɛ-s	baɾdɛz-nɛɾ-n-ɛ-s	dun-ɛɾ-n-ɛ-s	dun-ɛɾ-n-ɛ-s
I	baɾdɛz-ov-ni-s	baɾdɛz-nɛɾ-ov-ni-s[11]	dun-ov-ni-s	dun-ɛɾ-ov-ni-s

The forms in (16) and (17) suggest that monosyllabic bases augmented by the instrumental suffix –ov- are able to satisfy the prosodic requirement imposed by the possessive plural –ni-, and insertion of the spurious plural morpheme is therefore unnecessary, which enables the singular and plural forms to remain distinct in the instrumental case.

Note that the stem allomorphy analysis of the appearance of spurious -ɛɾ-, wherein –ni- requires selection of a polysyllabic stem allomorph, does not provide a satisfying account for a form like dun-ov-ni-s 'by our house', which on this account should still surface with the spurious -ɛɾ-, as *dun-ɛɾ-ov-ni-s.

Interestingly, Andonian 1966:85 appears to describe a slightly different system, in which the instrumental case suffix precedes the possessive plural suffix, but the spurious -ɛɾ- is still inserted after monosyllabic singular nouns.
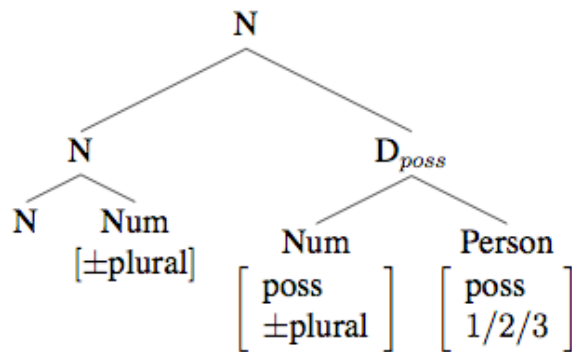
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[11] Hagop Hachikian (born in Istanbul in the 1960s) states that he prefers gadunernovs over gadunerovnis. (Achaṙyan and Aydənean were also from Istanbul.)

3. Analysis

In the syntax the possessive marker is a pronominal clitic that attaches to N:

(18)   Structure of possessed nouns

(19) Examples:

	N	Num	NumPoss	PrsPoss	
gadu-s	gadu			s	my cat
gadu-nɛɾ-əs	gadu	nɛɾ		s	my
gadu-ni-s	gadu		ni	s	our cat
gadu-nɛɾ-ni-s	gadu	nɛɾ	ni	s	our cats

Our analysis of spurious plurals is based on the following copying rule:

(20) *Possessive Plural Reduplication (PPR)*

X [poss, +plural] → X [poss, +plural] [poss, +plural]

where X is monosyllabic

PPR applies before Vocabulary Insertion at the plural possessive node; its two copies are spelled out differently, due to contextual restrictions on the relevant vocabulary entries listed below.

For a formalization of copying rules in DM, see Harris and Halle 2005. They discuss copying rules that apply after VI (and therefore operate on spelled-out terminal nodes), but Arregi and Nevins (2012) extend the formalism to apply to linearized

structures before VI. This extension accounts for copying phenomena in which the resulting copies are spelled out differently due to contextual restrictions on vocabulary entries, and provide evidence from Basque and other languages. We argue that this is precisely what is going on with spurious plurals in Armenian.

(21) Vocabulary entries for plural morphemes (1st version):
a. /ni/↔ [+plural, poss] / __ [poss]
b. /ɛɾ/ ↔ [+plural] / σ
c. /nɛɾ/ ↔[+plural]
      (On ɛɾ/nɛɾ alternation in plural nouns, see Vaux 2003.)

PPR and these entries account for all cases of spurious plurals that do not involve an irregular plural suffix. Consider first a non-spurious case:

(22) dun-ɛr-ni-s 'our houses'
dun - [+plural] - [poss, +plural] - [poss, 1]   → VI at [+plural]
dun - **ɛɾ** - [poss, +plural] - [poss, 1]   → VI at [poss, +plural]
    dun - ɛɾ - **ni** - [poss, 1]   → VI at [poss, 1]
    dun - ɛɾ - ni – **s**

PPR does not apply: the material preceding the plural possessive node is not monosyllabic, due to the plural suffix.
    Consider next its spurious plural counterpart; since the noun is monosyllabic and it is not plural, PPR applies:

(23) dun-ɛr-ni-s 'our house'
dun - [-plural] - [poss, +plural] - [poss, 1]   → [+pl] spelled out as Ø
dun - [poss, +plural] - [poss, 1]   → **PPR**
dun - **[poss, +plural] - [poss, +plural]** - [poss, 1]   → VI at 1st [poss, +pl]
    dun - **ɛɾ** - [poss, +plural] - [poss, 1]   → VI at 2nd [poss, +pl]
    dun - ɛɾ - **ni** - [poss, 1]   → VI at [poss, 1]
    dun - ɛɾ - ni – **s**

Crucially, /ni/ is contextually restricted to be adjacent to a (person) possessive terminal node, which prevents it from spelling out the leftmost copy of the possessive plural. In addition, /ɛɾ/ is an underspecified plural entry, which can thus spell out a plural possessive morpheme.

In nouns with irregular plurals, e.g. /mad-**və-nɛɾ**/, a different copying rule accounts for the double plural marking:

(24) *Iregular Plural Reduplication (IPR)*

X [+plural] → X [+plural] [+plural]

where X is one of several nominal roots: /mad, tsʰɛr, atʃʰ, …/

Like PPR, it applies before VI at the plural terminal node. We also require an additional plural entry, in (25b):

(25) Vocabulary entries for plural morphemes:

a. /ni/↔ [+plural, poss] / __ [poss]

b. /və/ ↔ [+plural] / mad, tsʰɛr, atʃʰ, …

c. /ɛɾ/ ↔ [+plural] / σ

d. /nɛɾ/ ↔[+plural]

(26) mad-və-nɛɾ 'fingers'

mad - [+plural]	→ **IPR**
mad - **[+plural] - [+plural]**	→ VI at 1st [+plural]
mad - **və** - [+plural]	→ VI at 2nd [+plural]
mad - və - **nɛɾ**	

(27) mad-və(-nɛɾ)-ni-s 'our fingers'

mad - [+plural] - [poss, +plural] - [poss, 1]	→ **IPR**
mad - **[+plural] - [+plural]** - [poss, +plural] - [poss, 1]	→ VI at 1st [+pl]
mad - **və** - [+plural] - [poss, +plural] - [poss, 1]	→ VI at 2nd [+pl]
mad - və - **nɛr** - [poss, +plural] - [poss, 1]	→ VI at [poss, +pl]
mad - və - nɛr - **ni** - [poss, 1]	→ VI at [poss, 1]
mad - və - nɛr - ni - **s**	

Only the leftmost plural copy is adjacent to the noun, and is thus realized as root-specific /və/; the rightmost copy is not, so it is realized as elsewhere plural /nɛɾ/. Note that PPR does not apply, since the plural possessive morpheme is preceded by more than one syllable.

The analysis provides a straightforward account of spurious plurals with irregular nouns:

(28) mad-və-ni-s 'our finger'

     mad - [-plural] - [poss, +plural] - [poss, 1]   → [-pl] spelled out as Ø

     mad - [poss, +plural] - [poss, 1]   → **PPR** (IPR is blocked)

     mad - **[poss, +plural] - [poss, +plural]** - [poss, 1] → VI at 1st [poss, +pl]

     mad - **və** - [poss, +plural] - [poss, 1]   → VI at 2nd [poss, +pl]

     mad - və - **ni** - [poss, 1]   → VI at [poss, 1]

     mad - və - ni - **s**

As in the previous spurious plural case (23), /ni/ cannot spell out the leftmost copy of the possessive plural morpheme, which is instead realized by root-specific plural /və/.

Application of PPR and IPR is governed by the Elsewhere Condition (Kiparsky 1973): both could apply in (28), but PPR (which applies to possessive plurals) is more specific than IPR, so application of the former blocks application of the latter. This explains why (28) does not involve three plural morphemes: *mad-və-nɛr-ni-s for 'our finger'.[12]

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[12] Interestingly, this analysis predicts that nouns that have irregular plural suffixes smaller than one syllable have spurious plurals in which plural possessive /ni/ attaches to a monosyllabic stem. A relevant example would be /hay/ 'Armenian', which used to have the irregular plural /hay-kʰ/ (Aydənean 1883). Our prediction for 'our Armenian' is /hay-kʰ-ni-s/, with a single application of PPR, as in (28). If correct, this would be evidence against the claim in Vaux 2003 and Wolf 2011 that spurious plurals are due to a prosodic requirement on the possessive plural morpheme to the effect that it must attach to a minimally disyllabic stem. Unfortunately, we do not have access to the relevant data, since -kʰ is no longer used as a plural marker in colloquial Western

Finally, consider the interaction of PPR with the placement of case morphemes. We saw earlier that case suffixes surface between plural possessive -ni and the person possessive marker:

(29)   N - Plural - PlPoss - **Case** - PrsPoss (e.g. baɾdɛz-nɛɾ-n-**ɛ**-s, 'our gardens, Abl')

However, the instrumental suffix surfaces to the left of the plural possessive in colloquial Western Armenian:

(30)   N - Plural - **Inst** - PlPoss - PrsPoss (e.g. baɾdɛz-nɛɾ-**ov**-ni-s, 'our gardens, Instr')

We assume that (29) is the default order delivered by the syntax. Evidence for this is the fact that in all other dialects of Modern Armenian, this is true even for the instrumental.

We account for the exceptional behavior of the instrumental with the following Local Dislocation rule (Embick and Noyer 2001):

(31) *Instrumental Displacement*

[poss, +plural] [instrumental] → [instrumental] [poss, +plural]

Dialects in which the instrumental surfaces in the same position as other case suffixes simply lack this rule.

Instrumental Displacement applies before Possessive Plural Reduplication. This predicts that the instrumental morpheme bleeds PPR. This is indeed what we see in the main Western Armenian dialectswe have investigated, which lack spurious plurals in the instrumental:

(32)   tsʰajn-**ov-ni**-s 'by our voice'   tsʰajn-**ɛɾ-ov-ni**-s 'by our voices'

Armenian. The prediction might be testable in dialects that still have this plural marker, such as Nor Nakhichevan and New Julfa.

However, we can also imagine a dialect in which Instrumental Displacement applies after our Possessive Plural Reduplication rule. In this dialect, Instrumental Displacement would counterbleed the insertion of the spurious plural morpheme created by PPR. Such a dialect may in fact exist in the form of that described by Andonian (1966:85), if it is true that the "singular and plural are the same" for this form:

(33) kʰiɾ-kʰ-**ɛɾ-ov-ni**-s 'by our book(s)'

If this is the right interpretation of what Andonian is saying, then we have evidence for both ordering possibilities for these rules across Armenian dialects, which strengthens the case for both rules.

4. Discussion: Comparison with Wolf (2011)

Recall that the basic data are as follows: the suffix -ɛɾ, usually an allomorph of the nominal Number head which appears with monosyllabic noun stems in the plural (34), appears unexpectedly in the context of a singular noun before the possessive plural agreement morpheme *–ni*. This unexpected *-er* is inserted only when *–ni* would otherwise be adjacent to a monosyllabic stem (compare (35) with (36)). This implies that *–ni* requires a bisyllabic foot to its left, and that this prosodic selection requirement of *–ni* forces the co-opting of a plural allomorph of the Number head despite the fact that Number is morphosyntactically singular.

(34)   gov 'cow'   gov-ɛɾ 'cows'; cf. bisyllabic gadu 'cat' gadu-nɛɾ 'cats'

(35)   gadu-s   'my cat'   gadu-ni-s   'our cat'
         gadu-nɛɾ-əs 'my cats'   gadu-nɛɾ-ni-s 'our cats'

(36) gov-əs   'my cow'   gov-ɛɾ-ni-s 'our cow' (unexpected -ɛɾ underlined)
      gov-ɛɾ-əs 'my cows'   gov-ɛɾ-ni-s 'our cows'

Wolf 2011 analyzes this pattern as a case of outwardly-sensitive phonologically conditioned allomorphy on the following grounds: the Number head's plural -ɛɾ allomorph is apparently being chosen over its usual Ø singular allomorph because of the prosodic requirements of –ni. This can be characterized as outwardly-sensitive conditioning because –ni is further away from the root than the Number head.

  However, since –ni is the only allomorph of the possessive plural in the language, the apparent phonological condition is in fact confounded with the morphosyntactic condition of the presence of possessive plural agreement. The generalization can thus be formulated equally well in terms of the morphosyntactic feature bundle corresponding to possessive plural agreement, which is what our copying analysis does. On such an analysis, the "outward" part of the conditioning is morphosyntactic, and the phonological part of the conditioning is "inward-looking", in line with standard DM.

4.1. More on Wolf 2011

Wolf 2011, taking the Armenian facts to be phonologically conditioned, proposes an Optimal Interleaving approach to this apparent case of outward sensitivity. Optimal Interleaving (OI) is a version of Optimality Theory with Candidate Chains (OT-CC), a version of OT in which whole derivations (conceived of as chains of basic operations) are compared with each other, rather than surface forms alone. OI differs from standard OT-CC in that morphological operations, including the insertion of Vocabulary Items, are included in the set of basic operations that can be performed. A leading idea of the OI approach in Wolf 2011 is that outwardly-sensitive phonologically conditioned allomorphy becomes possible when candidate derivations which differ only in their choice of allomorph for a particular morpheme are constructed.   For reasons that hinge the Local Optimality constraint on what constitutes a valid derivation, a property of OI which we do not have time to introduce in full here, it is usually impossible for a set of candidate derivations that differ in exactly this way to be constructed. Such a set can be constructed only if the two (or more) different choices of allomorph do not compete for Local Optimality, for instance if they violate different morphological faithfulness constraints. Wolf argues that the Armenian facts constitute precisely such a case.

Wolf 2011:10 proposes the following two "morphs" (roughly equivalent to VIs in DM) for the abstract Number morpheme:

(37) <SINGULAR, -Ø>
    <PLURAL, -ɛɾ>

In a case like *our cow*, in which an unexpected plural *–er* appears, these morphs allow for derivations to be constructed which differ only in which of these allomorphs is chosen. This is because inserting *–ɛɾ* violates a different set of morphological faithfulness constraints than inserting the null singular morpheme (in particular, inserting the plural morpheme violates DEP-MM([PLURAL])), a constraint against inserting a [PLURAL] morph in a non-plural context). Therefore, inserting a [PLURAL] morph does not count as a version of "the same" operation as inserting a [SINGULAR] morph, the two choices do not compete for the purposes of Local Optimality, and are thus the basis of two separate derivations which can be compared by EVAL.

    In this final comparison, EVAL will choose the candidate with the spurious plural, giving rise to the apparent outwardly-sensitive phonological conditioning, so long as the constraint requiring more than one syllable to *–ni*'s left is more highly ranked than DEP-MM([PLURAL]). This is shown in Wolf's tableau (10), reproduced below.

(38) Wolf (2011:12): Derivation of *our cow*; *[σ.ni >> DEP-MM([PLURAL])

	*[σ.ni	DEP–MM([PLURAL])
a. ☞ $\sqrt{}_1$-SG$_2$-PL.POSS$_3$-1P$_4$ <$\sqrt{}_1$, gov>, <PL$_2$, əɾ>, <PL.POSS$_3$, ni> <1P$_4$, s> go.vəɾ.nis		1
b. $\sqrt{}_1$-SG$_2$-PL.POSS$_3$-1P$_4$ <$\sqrt{}_1$, gov>, <SG$_2$, Ø>, <PL.POSS$_3$, ni> <1P$_4$, s> gov.nis	W1	L

Beyond the fact that taking the outwardly sensitive part of the generalization here to be phonological is unnecessary, there are a number of problems for this analysis.

(39) It is not clear how to account for Instrumental Displacement, and the different ordering interactions between this process and the insertion of spurious plurals seen across the dialects.

(40) No account is offered of Irregular Plural Reduplication, and relatedly no link is made between the presence of plural features on the possessor and the appearance of the spurious plural (in principle, any morph could be epenthetic).

(41) Wolf's two proposed implementations of his cover constraint *[σ.ni are problematic from the point of view of the rest of Armenian phonology.

To see this, consider each proposal in turn:

i. "One possibility is that it wants to be aligned with the right edge of a foot (McCarthy & Prince 1993)"

However, Western Armenian has primary final stress and secondary initial stress. To account for this, it is necessary to postulate exhaustive footing, at least at the left and right edges of words. This means that monosyllabic bases will have a degenerate foot, which should satisfy his constraint and therefore not trigger insertion.

ii. "another is that it wants to not immediately follow a stressed syllable, since most modern Armenian dialects have word-initial secondary stress"

This is problematic for possessive plurals that undergo the widespread rule of unstressed high vowel reduction/deletion, e.g. some speakers have dun 'house' → dən-er-ni-s 'our house' (others have dun-er-ni-s, which doesn't pose the same problem). Since Wolf assumes a sort of cyclic insertion scheme, the plural insertion should refer to the stress pattern as it stands at that point in the derivation. At this intermediate stage it should be the case that either (a) there is no stress yet (if it's all done post-cyclically), or (b) the final syllable of the base is stressed (if stress is done

cyclically). If (a), then the constraint won't do any work. If (b), it should trigger insertion in all forms. Neither of these yields the desired result.

5. Conclusions

The empirical generalization that outwardly-sensitive phonologically conditioned allomorphy is impossible, and the DM tenets concerning Vocabulary Insertion which stand on it, are not threatened by the Western Armenian data.

- The relevant generalization can be formulated as being outwardly sensitive only to morphosyntactic features, and inwardly sensitive to phonological ones (in accordance with standard DM- Halle and Marantz 1993; Bobaljik 2000).
- An implementation in terms of copying of a plural feature (a.) accounts for the source of the spurious plural, and (b.) provides a link to other parts of Armenian grammar in which such copying appears (i.e., Irregular Plural Reduplication).
- These feature copying rules are ordered in different ways with respect to Instrumental Displacement across the dialects, supporting a DM model in which PF operations are ordered (Arregi and Nevins 2008, 2012).

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