

The origin of the Proto-Indo-European nominal plural ending $*-\bar{o}s^*$

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Abstract: Under the view that Proto-Indo-European (PIE) formed its nominal plural forms by adding the plural marker $*-s$ to the case suffix, the ‘expected’ nom.pl. ending in thematic stems would be $*-oss$, in which the plural marker $*-s$ is added to the nom.sg. ending $*-os$. By Szemerényi’s law, such an original ending $*-oss$ would give $*-\bar{o}s$ with simplification of the final $*-ss$ and lengthening of the preceding vowel. Since the postulated development of $*-oss$ to $*-\bar{o}s$ matches the ending $*-\bar{o}s$ reconstructed for PIE, it is hypothesized in this paper that the scenario sketched above reflects the actual origin of this reconstructed ending.

Keywords: plural; thematic stems; Szemerényi’s law; ablaut

1. Introduction

In Proto-Indo-European (PIE), nominals belong either to the *athematic* or *thematic* declension. At the time of the attested Indo-European languages, the thematic declension was generally the more frequent type, and the default declension of nouns in the modern Indo-European languages is often the direct descendant of the thematic declension in PIE. The nominative plural ending reconstructed for the PIE thematic declension is $*-\bar{o}s$. The theory put forward in this paper is that this ending goes back to an original $*-oss$, and that the change from $*-oss$ to $*-\bar{o}s$ is phonologically regular. I will argue that a reconstruction that is both morphologically and phonologically regular should be preferred over the traditional explanation, which relies on an analogical extension across declension types.

PIE distinguished between two main categories of nouns, typically referred to as the *animate* and *inanimate* categories. This article will only discuss the animate category, as it appears to be the case that only this class of nouns could form ‘real’ plurals (variously referred to as *count plurals*, *distributive plurals*, and other terms), see the discussion in Clackson (2007: 102–103), Fortson (2010: 118, 131–132), Neri (2017: 23–24, 28–33), and Lundquist & Yates (2018: 2092–2094). The delimitation

* For helpful comments and feedback on a draft of this paper, I am grateful to Maria Evjen, Andrew Garrett, Martin Kümmel, and Luca Lukas.

itation to the animate category will therefore not be repeated in the following.¹

2. The Proto-Indo-European plural in **-s*

Of the eight nominal cases reconstructed for PIE, seven case forms can be reconstructed as ending in **-s* in the plural. Some of these provide good evidence that there is a plural maker **-s* that has been added to a case suffix. The reconstructed acc.pl. ending **-ms*, for instance, is overwhelmingly analyzed as being the accusative case suffix **-m* followed by the plural marker **-s* (Szemerényi 1996: 165; Tichy 2009: 70; Fortson 2010: 117; Beekes 2011: 188; Adrados 2016: 94; Kapović 2017b: 63; Neri 2017: 63; Lundquist & Yates 2018: 2084; Fritz & Meier-Brügger 2021: 170; Lindner 2021: 1). The instr.pl. ending **-b^his* is similarly analyzed as the pluralization of an instrumental particle **-b^hi* (Schmitt-Brandt 1998: 196–197, 216–217; Adrados 2016: 102, 160, 170; Kapović 2017b: 63; Neri 2017: 68, 70, 90). For the locative, there are indications that it was originally formed without an overt ending (Tichy 2009: 72; Beekes 2011: 187; Neri 2017: 81; Lindner 2021: 349). The loc.pl., which some reconstruct as **-s* (Szemerényi 1996: 186), can therefore be analyzed as the plural marker **-s* on the endingless locative case suffix (Neri 2017: 63, 89). There is no similar evidence that the dative and ablative plural endings **-mos* and **-b^hos* contain case suffixes **-mo-* and **-b^ho-*, yet it is difficult to imagine that it is purely coincidental that also these case forms end in **-s* in the plural (cf. Neri 2017: 68).² In summary, the case forms discussed so far are listed in Table 1.

¹ Comparative Indo-European linguistics has a very long scholarly tradition (Szemerényi 1996: 3–8; Bernabé 2010: 5–8; Fortson 2010: 8–11; Beekes 2011: 11–17; Swiggers 2017; Fritz & Meier-Brügger 2021: 15–26). Since it is not an aim in this article to provide a review of the existing literature on the topics discussed, I will limit the references to handbooks of Indo-European linguistics published since Szemerényi (1996).

² There is no agreement in the literature whether the dative and ablative plural endings began with **-m-* or **-b^h-* (cf. Szemerényi 1996: 160, 165; Schmitt-Brandt 1998: 215–218; Clackson 2007: 9, 99; Fortson 2010: 118–119; Kapović 2017b: 63; Lundquist & Yates 2018: 2088; Fritz & Meier-Brügger 2021: 203). For clarity of exposition, the reconstructions above follow Tichy (2009: 71), Beekes (2011: 186–189), and Neri (2017: 59, 68–69) in that the two case forms are assumed to have been different in PIE. This has no bearing on the discussion here, in which the only point is that both endings end in **-s*.

Case	Suffix	Plural
Accusative	*-m	*-ms
Dative	*-?	*-mos
Instrumental	*-b ^h i	*-b ^h is
Ablative	*-?	*-b ^h os
Locative	*-∅	*-s

Table 1: Nominal plural forms in PIE

The nominative case suffix in PIE was *-s (Szemerényi 1996: 160; Schmitt-Brandt 1998: 186; Tichy 2009: 69; Fortson 2010: 115; Neri 2017: 75; Lundquist & Yates 2018: 2083; Fritz & Meier-Brügger 2021: 202; Lindner 2021: 1–2). Following the structure outlined above, the ‘expected’ nom.pl. ending would thus be *-ss, with the plural marker *-s added to the case suffix *-s (Tichy 2009: 72; Lindner 2021: 1).

3. Thematic stems

The case suffixes mentioned in section 2 could be added directly to a *root*, which in PIE is the minimal unit with a lexical meaning. With a templatic root form *CVC-, this means that the nominative and accusative singular would be *CVC-s and *CVC-*ŋ*, respectively.³ These are called *root nouns*. Various derivational suffixes could also intervene between the root and the case suffix. Using the derivational suffix *-t- as an example, a noun could form a nominative and accusative singular *CVC-t-s and *CVC-t-*ŋ*, respectively. The combination of a root plus a derivational suffix is called a *stem*. When a derivational suffix ends with a consonant, including the resonants mentioned in footnote 3, the suffix and the stem it belongs to are both called *athematic*. Root nouns and athematic stems are called *athematic nouns*.

³ In PIE, the so-called *resonants* */m/, */n/, */r/, */l/, */j/, and */w/ had either a ‘consonantal’ or ‘vocalic’ realization, depending on their position within the word. Between consonants or between a consonant and the edge of the word, the resonants had a ‘vocalic’ realization. For nasals and liquids, a vocalic realization is indicated with a circle beneath the consonant: **ṃ*, **ṅ*, **ṛ*, **ḷ*. For the semivowels */j/ and */w/, a vocalic realization is indicated with the corresponding vowel symbols: **i*, **u* (Watkins 1998: 44; Clackson 2007: 33–35; Tichy 2009: 28–29; Bernabé 2010: 245–277; Fortson 2010: 60–62; Beekes 2011: 138–140; Kapović 2017a: 14, 30–31; Byrd 2018: 2059, 2068; Fritz & Meier-Brügger 2021: 108).

A derivational suffix that did not end with a consonant in PIE, ended in either **e* or **o*. These two vowels are analyzed as different realizations of the same abstract unit called the *theme vowel*. The derivational suffix **-no-*, for example, could be used to form a nominative and accusative singular **CVC-no-s* and **CVC-no-m*, respectively. A stem with such a *thematic* suffix is called a *thematic stem*, and the noun a *thematic noun*. Cf. Szemerényi (1996: 182), Watkins (1998: 54–56), Clackson (2007: 64–65, 92), Tichy (2009: 52, 55), Fortson (2010: 75–76, 83–84), Beekes (2011: 179), Kapović (2017b: 62), Neri (2017: 55–57), Lundquist & Yates (2018: 2082), and Fritz & Meier-Brügger (2021: 167–168).

4. **-oss* > **-ōs* by Szemerényi's law

In the thematic stem, the nom.sg. would end in **-os*, which can be decomposed into the theme vowel **-o-* and the nominative suffix **-s*. The 'expected' nom.pl. in thematic stems, then, would end in **-o-s-s*, in which the plural marker **-s* is added to the nominative case suffix (see section 2).

The ending **-oss* would, however, not be in accordance with the phonotactic principles of PIE, as no geminate consonants were tolerated (Schmitt-Brandt 1998: 91; Watkins 1998: 40; Byrd 2018: 2071). If geminate consonants were to arise in a word through morpheme concatenations or phonological assimilations, different outcomes can be observed. Here we will focus only on the outcomes of a geminate **ss*. In intervocalic position, a geminate **ss* would simplify to **s*. As an example, when the 2.sg.pres.ind.act. ending **-si* was attached to the root **h₁es-* 'be', we observe the form **h₁ési* with a singleton **s* instead of the expected **h₁éssi* (Schmitt-Brandt 1998: 91; Watkins 1998: 40; Tichy 2009: 24, 29; Bernabé 2010: 168; Fortson 2010: 70; Byrd 2018: 2071; Fritz & Meier-Brügger 2021: 59–60, 114–115; Lindner 2021: 173).

In word final position following a vowel, however, a geminate **ss* is simplified with lengthening of the preceding vowel, schematically **-Vss* > **-V̄s*. A couple of examples will illustrate this. When the nominative suffix **-s* is attached to a stem ending with the derivational suffix **-os-* or **-es-*, the resulting form has a lengthened vowel and a singleton **-s*, i.e. **-oss* > **-ōs* and **-ess* > **-ēs*. This can be seen in the nominal formations **h₁éws-os-s* > **h₁éwsōs* 'dawn' and **-men-és-s* > **-menēs* 'minded' (Szemerényi 1996: 115–116, 175; Schmitt-Brandt 1998: 175; Clackson 2007: 85; Kapović 2017b: 70; Byrd 2018: 2071–2072; Lundquist & Yates 2018: 2083; Lindner 2021: 92–93). The specific

change of $*-Vss > *-\bar{V}s$ is a subset of a more general sound change dubbed *Szemerényi's law*, which is widely accepted today as a regular sound change of PIE (Szemerényi 1996: 115–116; Schmitt-Brandt 1998: 91, 106; Clackson 2007: 79–80; Tichy 2009: 39; Fortson 2010: 70, 116; Kapović 2017b: 70; Neri 2017: 116–117; Byrd 2018: 2060; Lundquist & Yates 2018: 2083; Fritz & Meier-Brügger 2021: 202).

Putting all the available pieces together, we end up with the following picture: If we assume a morphologically regular nom.pl. formation $*-oss$ in the thematic stem, the regular sound change known as Szemerényi's law would alter it to $*-\bar{o}s$. The thematic nom.pl. ending that we can reconstruct on the basis of the Indo-European languages, is precisely $*-\bar{o}s$ (Szemerényi 1996: 186; Fortson 2010: 126, 128; Beekes 2011: 212; Lundquist & Yates 2018: 2083; Fritz & Meier-Brügger 2021: 204; Lindner 2021: 3). The central thesis in this paper, then, is that the reconstructed ending $*-\bar{o}s$ has regularly developed from a formation $*-oss$ in an older stage of the proto-language.

5. The traditional explanation of $*-\bar{o}s$

Although the reconstruction $*-oss$ and its subsequent development to $*-\bar{o}s$ might seem relatively straightforward, it is to my knowledge a novel interpretation that has not been suggested in the literature before. Instead, the literature is practically in universal agreement that the reconstructed ending $*-\bar{o}s$ is a contraction of an earlier sequence $*-oes$, which consists of the theme vowel $*-o-$ and the nom.pl. ending $*-es$ from the declension of athematic nouns (Szemerényi 1996: 185; Schmitt-Brandt 1998: 209; Watkins 1998: 47, 66; Tichy 2009: 70, 72; Fortson 2010: 126, 128; Beekes 2011: 213; Kapović 2017b: 64–65; Neri 2017: 85; Byrd 2018: 2058; Lundquist & Yates 2018: 2083; Fritz & Meier-Brügger 2021: 204; Lindner 2021: 3). The handbooks do not only present this reconstruction as the most probable one, but regard it as rather self-evident, saying that it is “evident” that $*-\bar{o}s$ “of course” “must represent” $*-oes$ (Szemerényi 1996: 185; Beekes 2011: 213; Fritz & Meier-Brügger 2021: 204). This traditional explanation does, however, suffer from several issues that will be addressed in the following subsections.

5.1 The aberrant ablaut of $*-es$

The nom.pl. ending in athematic nouns is $*-es$ (Szemerényi 1996: 160; Schmitt-Brandt 1998: 206–207; Watkins 1998: 65; Clackson 2007: 99; Tichy 2009: 70; Fortson 2010: 117; Beekes 2011: 186; Lundquist & Yates

2018: 2083; Fritz & Meier-Brügger 2021: 200–201; Lindner 2021: 1). Using the examples from section 3, this means that the nom.pl. of a root noun and a *t*-stem would be **CVC-es* and **CVC-t-es*, respectively. The traditional explanation for the nom.pl. ending **-ōs* in the thematic stem is that the ending **-es* from the athematic declension has been extended to the thematic declension, giving a thematic nom.pl. ending **-o-es* (see above).

The athematic ending **-es* represents, however, a challenge for our understanding of PIE phonology. On an abstract level, PIE has only one vowel, generally represented as **e*.⁴ There is one morpheme in every PIE word that is prosodically prominent and thus carries some form of ‘accent’. This accent is phonologically ‘free’, which means that its placement within the word is not determined by phonological properties. The location of the accent is either lexically prespecified or determined by the morphological category the word belongs to. When a morpheme carries the lexical accent, the vowel appears as **é*, with *´* representing the location of the accent. When a morpheme is unaccented, there is no vowel. When a morpheme has an **e*, it is in the *e-grade*, and when a morpheme has no vowel, it is in the *zero grade*. The conjugation of the verbal root **h₁es-* ‘be’ from section 4 can serve as an illustration. In the 3.sg.pres.ind.act. the form is **h₁és-ti* with an accented *e-grade* of the root **h₁és-* and unaccented zero grade of the ending **-ti*, whereas the 3.pl.pres.ind.act. **h₁s-énti* has an unaccented zero grade of the root **h₁s-* and an accented *e-grade* of the ending **-énti*. The PIE vowel can also appear as **o*, which, unlike **e*, can be both accented and unaccented. When a morpheme has the vowel **o*, it is in the *o-grade*. An example of this was seen in section 4, in which the derivational suffix **-es-* is in the *o-grade* when unaccented in **h₂éws-os-s* and in the *e-grade* when accented in **-men-és-s*. This distribution of the *e-*, *o-*, and zero grade is known as *ablaut*.⁵ While the distribution of the *e-grade* and zero grade is clear (the *e-grade* appears in accented morphemes, the zero grade in unaccented morphemes), there is no general agreement on what the deter-

⁴ A small number of words appear to have the vowel **a* (Szemerényi 1996: 135; Watkins 1998: 46; Clackson 2007: 36; Tichy 2009: 38; Bernabé 2010: 187–190; Fortson 2010: 78; Kapović 2017a: 42; Byrd 2018: 57–58; Fritz & Meier-Brügger 2021: 94–95), yet this is not accepted by everyone (Schmitt-Brandt 1998: 138–139; Beekes 2011: 141–143). For the ‘vowels’ **i* and **u*, see footnote 3.

⁵ Analogy can disturb this general picture. In the example **-men-és-s* given above, the unaccented root is expected to appear in the zero grade as **-mn-* (Lindner 2021: 92). In this case, the *e-grade* has probably been extended from the derivational base of **-men-és-s*, which is the noun **mén-os* ‘mind’ (cf. Clackson 2007: 85).

minants of the *o*-grade are. Cf. Szemerényi (1996: 74–77, 111–121), Schmitt-Brandt (1998: 104–107, 143–148), Watkins (1998: 50–52), Clackson (2007: 75–78, 86–88), Tichy (2009: 38–40, 48), Bernabé (2010: 184–187, 197–218, 347–353), Fortson (2010: 68, 79–81), Beekes (2011: 176–177), Kapović (2017a: 55–56), Byrd (2018: 2059, 2069), Lundquist & Yates (2018: 2121–2134), and Fritz & Meier-Brügger (2021: 152–161).

The athematic nom.pl. ending **-es* does not fit well within this ablaut scheme. The ending never carries the accent, yet it appears in the *e*-grade, which is normally associated with accented morphemes. For this reason, the ending **-es* is recognized as an anomaly (Schmitt-Brandt 1998: 207; Clackson 2007: 87; Lundquist & Yates 2018: 2083). There is no known explanation for this exception. Tichy (2009: 72) suggests that the vowel **e* is an epenthetic vowel that was inserted to prevent the original nom.pl. ending **-ss* from merging with the nom.sg. ending **-s* (see section 2). In a similar fashion, Neri (2017: 85) proposes that PIE originally had both a zero graded ending **-s* and an *e*-graded ending **-es* in the nom.pl., and that **-s* was ousted due to its similarity with the nom.sg. ending **-s*. Schmitt-Brandt (1998: 209) theorizes that the **e* is originally a pronominal element, and that the ending **-es* consequently should be decomposed as **-e-s*. Suffice to say that the ending **-es* is “of unknown origin” (1998: 209).

When explaining the thematic nom.pl. ending **-ōs* as a contraction of the theme vowel **-o-* and the ending **-es* introduced from the athematic stem, an anomalous ending of obscure origin is then used to account for the origin of another ending. If it instead were possible to explain the thematic nom.pl. ending **-ōs* as the phonologically regular outcome of a morphologically regular formation, such an account would appear preferable. And it is indeed possible to do so, as outlined in section 4.

5.2 Relative chronology

One of the implicit rationales for suggesting that the ending **-es* from the athematic declension has been extended into the thematic declension, is that the thematic declension is supposed to be a later innovation within the PIE period. The proposal, then, is that PIE only had athematic stems at an earlier stage of the language (cf. Tichy 2009: 57; Fortson 2010: 84). When the thematic declension came into existence, the athematic declension would then serve as a source for the grammatical suffixes in the thematic declension, and among these we find the athematic nom.pl. ending **-es*.

Support for the theory that thematic stems are younger than athematic stems is sought in the observation that thematic stems appear to have been productive in the individual daughter families, often at the expense of original athematic stems (Fortson 2010: 84). There are, however, independent reasons why the thematic declension would be more productive than the athematic declension (Schmitt-Brandt 1998: 178; Tichy 2009: 58; Fortson 2010: 84), and so this observation cannot be induced in support of a theory that these declensions belong to different chronological layers of PIE.

It is commonly assumed that the ablaut relationship between the accented *e*-grade and the unaccented zero grade belongs to a very old stratum of PIE (Tichy 2009: 40, 56; Fortson 2010: 81; Beekes 2011: 176–177). If thematic stems play no part in this ablaut pattern, this could be an indication that this stem type came into existence after this ablaut relationship was no longer productive. Conversely, if they do show such an ablaut pattern, it would indicate that thematic stems belong to early PIE and are just as old as athematic stems. The evidence clearly shows that the latter is true. A good illustration of this is the thematic suffix *-tó-, which derives verbal adjectives from roots. The suffix carries the lexical accent, which means that the root will be unaccented, and consequently we expect the root to be in the zero grade. This expectation holds true. As an example, we find that from **klew*- ‘hear’ is derived **klu-tó*- with zero grade of the root. Other examples include **deh₃*- ‘give’ → **dh₃-tó*- and **g^wem*- ‘come’ → **g^wm-tó*-. Cf. Szemerényi (1996: 47–48, 111–112, 323), Schmitt-Brandt (1998: 112, 268), Watkins (1998: 64), Clackson (2007: 54–55, 192), Fortson (2010: 109), Beekes (2011: 176, 280), Adrados (2016: 30), Kapović (2017b: 104), Lundquist & Yates (2018: 2116, 2122), Fritz & Meier-Brügger (2021: 108, 124, 140, 287), and Lindner (2021: 370).

Since the athematic nom.pl. ending *-es has an *e*-grade despite being unaccented, it has been suggested that this ending must have arisen after the ablaut pattern discussed above was no longer active in PIE (Schmitt-Brandt 1998: 206; Clackson 2007: 87). But this results in an ordering paradox. The ablaut in thematic stems illustrated above indicates that the thematic declension existed when the early PIE ablaut system was still phonologically productive. If the athematic ending *-es came into existence after this system was no longer active, it means that the athematic ending *-es did not exist at the time when the thematic declension formed its nom.pl. As a result, the athematic ending *-es cannot be the source of the thematic ending *-ōs.

If maintaining the view that the thematic ending $*-\bar{o}s$ has its origin in the athematic ending $*-es$, the only possible scenario is that $*-es$ replaced whatever ending the thematic declension already had. It is not obvious what this original ending would be other than the morphologically regular $*-oss$ discussed in section 4. But as an original $*-oss$ would give $*-\bar{o}s$ by Szemerényi's law anyway, it is not clear what the benefit is of a theory that proposes that a new ending $*-o-es > *-\bar{o}s$ replaced an original ending $*-\bar{o}s$.

6. Conclusion

Under the view that PIE formed its nominal plural forms by adding the plural marker $*-s$ to the case suffix, the 'expected' nom.pl. ending in thematic stems would be $*-oss$, in which the plural marker $*-s$ is added to the nom.sg. ending $*-os$. By the regular sound change known as Szemerényi's law, the original ending $*-oss$ would give $*-\bar{o}s$ with simplification of the final $*-ss$ and lengthening of the preceding vowel. Since the postulated development of $*-oss$ to $*-\bar{o}s$ matches the ending $*-\bar{o}s$ reconstructed for PIE, it is hypothesized in this paper that the scenario sketched above reflects the actual origin of this reconstructed ending.

The reconstructed ending $*-\bar{o}s$ is commonly analyzed as a contraction of $*-oes$, in which the ending $*-es$ has been extended from the declension of athematic stems. As the ending $*-es$ is a phonologically anomalous ending of unknown origin and age, it would be preferable to instead analyze $*-\bar{o}s$ as originating in a morphologically regular formation $*-oss$ through a phonologically regular change to $*-\bar{o}s$.

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