

LARYNGEAL BEFORE i/u IN GREEK;
THE ROLE OF MORPHOLOGY IN DIACHRONIC CHANGE

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One of the more neglected questions in generative-historical linguistics is whether the morphology of a language alone can determine diachronic change. This paper will discuss a problem of the historical phonology of Greek, which points in the direction of an answer to this question by showing the pitfalls of neglecting morphological considerations altogether. The problem concerns the development of the Indo-European laryngeal consonants $*H_1$, $*H_2$, and $*H_3$,¹ in initial position before [^{+sonorant} -syllabic] segments, more particularly [i] and [u], in the Attic-Ionic dialect of Ancient Greek.

Four phonological rules are involved in this development, namely Siever's Law, which mediated between [-syllabic] and [+syllabic] allophones of semi-vowels and sonants, Initial Laryngeal Vocalization, by which initial clusters of a laryngeal and a [-syllabic] segment developed an anaptyctic vowel, Rix's Law, by which clusters of a laryngeal plus a syllabic sonant (\bar{r} , \bar{l} , \bar{m} , \bar{n}) also developed an anaptyctic vowel, and Initial Laryngeal Loss, by which word-initial laryngeal consonants were lost before vowels. Attic-Ionic will be the focus of this paper because it is particularly in this dialect that forms are to be found which are not in accord with the expected results of the interaction of these rules--that is, they show vocalization of the laryngeals before i and u, rather than the expected loss.² An explanation for this deviation must be found, but although there is a ready phonological solution which has some theoretical interest in its own right, nevertheless, there are some difficulties accompanying it. Moreover, there is another solution based solely on morphological grounds, which, in light of the morphological complexity of Ancient Greek, is more likely than the phonological solution. First, then, some background about each of the rules and their interaction will be given, followed by a discussion of the possible solutions, and finally by some reflections on the relative importance of morphology and phonology in the historical changes of a language such as Greek.

Siever's Law was the phonological rule of Proto-Indo-European which mediated between [-syllabic] and [+syllabic] allophones of the sonants \bar{r} , \bar{l} , \bar{m} , \bar{n} , and the glides \bar{w} and \bar{y} . It can be formalized as follows:

$$(1) \text{ } \begin{matrix} \text{-syllabic} \\ [+sonorant] \end{matrix} \implies \text{ } [+syllabic] \text{ } / [-syll] \text{ } ___ [-syll]$$

that is,

$$(2) \begin{matrix} /R/ \implies [R] \\ /W/ \implies [U] \end{matrix}$$

where R, \bar{r} , W, and U are cover symbols for the following feature

bundles and segments:

- (3) R = [$\begin{smallmatrix} +\text{sonorant} \\ +\text{consonantal} \\ -\text{syllabic} \end{smallmatrix}$] r, l, m, n R̥ = [$\begin{smallmatrix} +\text{sonorant} \\ +\text{consonantal} \\ -\text{syllabic} \end{smallmatrix}$] r̥, l̥, m̥, n̥
W = [$\begin{smallmatrix} +\text{sonorant} \\ +\text{consonantal} \\ -\text{syllabic} \end{smallmatrix}$] w, y U = [$\begin{smallmatrix} +\text{sonorant} \\ +\text{consonantal} \\ +\text{syllabic} \end{smallmatrix}$] u, i

The [-syll] segments, R and W, were the underlying segments in Proto-Indo-European, and not any of the other possible combinations, /R/ and /U/, /R̥/ and /W/, or /R̥/ and /U/, even though in terms of naturalness, having /R/ and /U/ underlying yields the most natural vowel system, a vowel quadrilateral with i, u, e, and a. There are several arguments supporting this view. For one thing, it is clear that R and W must be treated alike, either both as underlying segments or both as derived segments. If they are not treated alike, for instance if R were an underlying segment but W a derived segment, then two phonological rules would be needed which would effect complementary changes in complementary environments:

- (4) R \implies [+syll] /C__C
U \implies [-syll] /V__V

Such a duplication in the rule system of a language would be costly by any evaluation metric. Given then, that R and W must be treated alike, it is unlikely that both were underlyingly [+syllabic], since that would yield a most unusual and unnatural vowel system:

- (5) $\begin{matrix} i & & u \\ & r & l \\ & m & n \\ & e & a \end{matrix}$

Therefore, the best approach is to take [-syllabic] R and W as the underlying Indo-European segments.

Furthermore, the Indo-European root-structure conditions argue against having [+syllabic] R̥ and U as underlying segments. The basic root shape is a monosyllable C̥¹eC̥³-, and constitutes a well-formedness condition on the underlying shape of root morphemes in Indo-European. If U or R̥ were underlying segments, then a root such as *weyd- 'see' would be tri-syllabic /ueid-/ underlyingly, and in fact any root with R̥ or U would be an exception to an otherwise unitary morpheme-structure-condition on root shape.

Thus, it will be considered established that Siever's Law in Indo-European had the form noted in (1) above. This rule, or at least one with the same effects, was retained in Pre-Greek. In the first place, the syllabic sonants which were created inter-consonantly by Siever's Law are presumed to still have been in Pre-Greek, especially to account for dialect variation in their development. Indo-European *r̥, for instance, appears in Cyprian with o-vocalism, where elsewhere in Greek, it appears with an -a-; cf.:

- (6) Cypr. korzía 'heart' *k̥rd- cf. Homeric kradiē
Cypr. 1 sg. aorist katēworgon 'hindered' < *katēw̥rgon
cf. Homeric édrakon < *éd̥rkon 'saw'

Furthermore, there are several W/U alternations in Greek, caused by the morphological ablauting rule which deleted the basic e-vowel of a root in certain morphological contexts, which can be accounted for by a rule like Siever's Law in Greek:

- (7) Pres. $\lambda\epsilon\upsilon\pi\omicron$ Aor. $\epsilon\text{-}\lambda\iota\pi\omicron$ 'leave'
 Pres. $\phi\acute{\epsilon}\nu\gamma\omicron$ Aor. $\epsilon\text{-}\phi\eta\gamma\omicron$ 'flee'
 Pres. $\pi\epsilon\upsilon\tau\omicron$ Aor. $\epsilon\text{-}\pi\iota\tau\omicron$ 'persuade'
 1 sg. $\epsilon\acute{\gamma}\text{-mi}$ 1 pl. $\iota\text{-men}$ 'go'

The Initial Laryngeal Vocalization rule, on the other hand, was not a rule of Indo-European. It is restricted in the several languages to Greek and Armenian, thus cannot be Common Indo-European. Basically, clusters of a laryngeal consonant plus a [-syllabic] segment in initial position developed an anaptyctic vowel. Thus the rule had the form:

- (8) $\emptyset \implies \text{ə} / \#H_x __ [-\text{syll}]$

so the result of a cluster $*H_xC\text{-}$ would be $*H_x\text{ə}C\text{-}$. This anaptyctic vowel later developed into a full vowel, the timbre of which in Greek was determined by the laryngeal, that is, eventually $*H_1\text{ə}C\text{-}$ yielded $\text{e}C\text{-}$ in historical Greek, $*H_2\text{ə}C\text{-}$ yielded $\text{a}C\text{-}$, and $*H_3\text{ə}C\text{-}$ yielded $\text{o}C\text{-}$. The following forms illustrate this change:

- (9) Grk. anēr 'man' < $*H_2\text{ənēr}$ < $*H_2\text{nēr}$, cf. Sanskrit nar-
 (with no vocalization)
 Grk. astēr 'star' < $*H_2\text{əstēr}$ < $*H_2\text{stēr}$, cf. Sanskrit stṛ-
 (with no vocalization), Hittite haš-terza (with $*H_2$ preserved initially)
 Grk. ewērsai 'dewdrops' < $*H_1\text{əwers-}$ < $*H_1\text{wers-}$, cf. Sanskrit varṣa- 'rain' (with no vocalization)

Furthermore, in what was an interesting Common Greek innovation, clusters of a laryngeal plus a syllabic sonant also developed an anaptyctic vowel, which was then colored by the laryngeal just as in the above case of anaptyxis. Therefore, clusters of Indo-European $*H_1RC\text{-}$ developed into $*H_1\text{ə}RC\text{-}$ at some point in Pre-Greek and later to $\text{e}RC\text{-}$ in historical Greek; similarly, $*H_2RC\text{-} \implies *H_2\text{ə}RC\text{-} \implies \text{a}RC\text{-}$, and $*H_3RC\text{-} \implies *H_3\text{ə}RC\text{-} \implies \text{o}RC\text{-}$. This development can be referred to as Rix's Law⁵³ and formalized as follows:

- (10) $\#H_x \left[\begin{smallmatrix} +\text{sonor} \\ +\text{syll} \\ +\text{cons} \end{smallmatrix} \right] [-\text{syll}] \implies \#H_x \text{ə} \left[\begin{smallmatrix} +\text{sonor} \\ +\text{syll} \\ +\text{cons} \end{smallmatrix} \right] [-\text{syll}]$

(this type of notation is used because this involves actually two changes--the insertion of ə and the change from R to ə). Examples of this development include:

- (11) Grk. argós 'white' < $*H_2\text{ərġ-ró-}$ < $*H_2\text{rġ-ró-}$
 argi- 'white' (in compounds) < $*H_2\text{ərġ-i-}$ < $*H_2\text{rġ-i-}$
 cf. Hit. horkiš 'white'
 Skt. rjrá-/rjī- 'ruddy'

Although this change may have been in part purely phonetic, in that the difference between [R] and [əR] is at best minimal, still the presence of the laryngeal was crucial because R developed differently between other consonants, e.g. *TrT \Rightarrow TraT, *TlT \Rightarrow TlaT, *TmT \Rightarrow TaT, and *TnT \Rightarrow TaT.

It is tempting perhaps to collapse the two vocalization rules (8) and (10), making (10) a generalization of (8) in some way, but this in fact does not seem possible. Given the features outlined above for these segments, the ə-insertion before [-syll] and before [+sonor, +cons, +syll] segments cannot be collapsed in a meaningful way. Even though in a different feature system, where, say, W was [+cons, +syll], collapsing of the rules to ə-insertion in the environment before [+cons] segments would be possible, an extra rule, converting R to R after ə would be needed, and also the subsequent change of *h before i/u in Attic-Ionic (see below) would be wholly unmotivated. Thus it seems necessary to posit these two distinct vocalization rules involving the laryngeal consonants in initial position.

The final rule involving laryngeals that is of interest here is the rule by which the laryngeal consonants were lost in Greek before [-cons, +syll] segments, as illustrated by all the cases above in which there was first coloring of the anaptyctic vowel, and then loss of the laryngeal before that vowel (cf. (9), (11)). This was probably a rather late development in Pre-Greek. Even though this same development, loss of the laryngeals before vowels, happened in all the other Indo-European language branches except the Anatolian branch (most notably represented by Hittite, cf. (9), under aster), it was most likely an independent innovation in each of the separate branches. In this regard, it is important to note that the laryngeals were certainly preserved until very late in Indo-Iranian, since there is an otherwise unexplainable vowel-lengthening in compounds such as Skt. sūnarā- 'virile' (literally "having good manliness") < *su-h₂ner-o- with *-uH₂- contracted to -ū-. Thus we posit this Laryngeal Loss rule:

$$(12) \quad H_x \Rightarrow \emptyset / ____ [\begin{smallmatrix} -\text{consonantal} \\ +\text{syllabic} \end{smallmatrix}]$$

as a development in Pre-Greek, and not a late Indo-European rule.

Thus, in zero-grade forms (those without the basic e-vowel) of roots of the shape *H_xeWC- or *H_xWeC-, that is surface Indo-European forms of the type *H_xUC- (from underlying /H_xWC-/ by Siever's Law), we would expect to find the outcome UC- in historical Greek, with the rules applying in their historical order, as in (13):

(13)		/H _x WC-/
	Siever's Law	H _x UC-
	Laryngeal-Vocalization	-----
	Rix's Law	-----
	Laryngeal-Loss	UC-

So, for the zero-grade of an IE root *H₂wegs- 'grow, increase', that is, *H₂ugs-, we would expect uks- in Greek (with assimilation in

voice of g to k before s), and for the zero-grade of a root $*H_1weH_2-$ 'deprive', that is $*H_1uH_2-$, we would expect $\bar{u}-$ in Greek (with $*uH_2$ contracted to $\bar{u}-$ as in Skt. sūnarā- above). Therefore, it is of some interest that there are forms in Attic-Ionic which derive from zero-grade forms of IE roots $*H_xeWC-$ or $*H_xWeC-$ which instead of the expected results, show a development to E_xWC- (where E_x is the vowel corresponding to H_x in timbre), presumably via $*H_xəWC- < *H_xWC-$. Thus we have to account for this apparently aberrant $\bar{ə}$ -insertion in an initial cluster of laryngeal plus i/u. This development is discussed in detail and treated carefully in Martin Peters (forthcoming), to whom I owe these data. The forms which show this development include:

- (14) $\acute{a}\nu\mu\alpha\gamma$ 'lay hold of' $< *H_2əy-nu- < *H_2i-new-$ cf. Skt. inóti 'sends'
 $\acute{a}\nu\acute{o}\varsigma$ 'terrible' $< *H_2əw-no- < *H_2i-no-$ cf. Skt. iná- 'strong'
 $\acute{\alpha}\omega\kappa\varsigma$ -ont- 'increasing' $< *H_2əwgs- < *H_2ugs-$ cf. Skt. ukṣant- 'IDEM'
 $\acute{\epsilon}\omega\nu\iota\varsigma$ 'bereft' $< *H_1əw-ni- < *H_1uH_2-no-$ cf. Skt. ūná- 'wanting'.

This deviation from the expected results of the interaction of these rules must be explained in some way. In terms of the phonological system alone, there is a ready explanation for this as a rule simplification, which could have then been interpreted as a rule reordering by subsequent speakers. Given Rix's Law as formulated in (10), then the generalization of the rule to (15):

- (15) $\#H_x [\begin{smallmatrix} +\text{sonorant} \\ +\text{syllabic} \end{smallmatrix}] [-\text{syllabic}] \Rightarrow \#H_x \begin{smallmatrix} +\text{sonor} \\ -\text{syll} \end{smallmatrix}] [-\text{syll}]$

that is, the simplification of (10) gained by deleting the restriction to $[+\text{consonantal}]$ segments in the second term of the rule, will produce the proper Attic-Ionic results for $*H_xUC-$, as in (16):

- | | | | | |
|--|------------|------|----------------------------------|------------|
| (16) | $/H_xWC-/$ | e.g. | $/H_2y-nos/$ | 'terrible' |
| Siever's | H_xUC- | | H_2i-nos | |
| H_x -Voc. | ---- | | ----- | |
| General- | $H_xəWC-$ | | $H_2əy-nos$ | |
| ized Rix's | $\cdot x$ | | | |
| (Later: $H_x - H_x E WC-$ | | | $H_2ay-nos$ | |
| Coloring $\cdot x \quad \cdot x \quad x$ | | | | |
| H_x -Loss | E_xWC- | | $\acute{a}\nu\acute{o}\varsigma$ | |

Thus, if historical change can come about due to considerations of the overall simplicity of the phonological component, we have a perfectly straight-forward explanation of this curious Attic-Ionic development. Furthermore, again ~~working~~ working under the assumption that simplicity in the phonological component is a prime motivation for sound change, we can hypothesize that the generation of speakers hearing forms like $*H_2əynos$ would have interpreted them as

being derived by only the rules Initial H_1 -Vocalization and Siever's Law, applying in that order, that is, by a system that was reordered with respect to that of the previous generation of speakers. This reordered system has the exact same outputs as the earlier system, and furthermore, provides for a much simpler system, since there is no longer any need for Rix's Law, generalized or otherwise:

(17)	$/H_1 WC-/$	e.g. $/H_2 y-n\acute{o}s/$
H_1 -Voc.	$H_1^x WC-$	$H_2 y-n\acute{o}s$
Siever's	x	-----
(Later,		
H_1 -Coloring	$H_1 E WC-$	$H_2 ay-n\acute{o}s$
H_1^x -Loss	$x E^x WC-$	$ayn\acute{o}s$).
x	x	

In this way, the reordering has led to a rule loss in a type of opaque situation (in the sense that Rix's Law obscured the effects of Siever's Law)--hence we have a sound change whose effect is achieved through a combination of several of the basic types of change envisioned in standard generative-historical theory. Moreover, we have what amounts to a "crazy" rule (or, actually, a "crazy" historical change), that is an anaptyctic vowel developing in an unnatural place, between a consonant and the vowels i/u, arising through the elimination of a single feature in a simplificatory rule change.

However, there are some problems with this facile phonological explanation. This change had widespread morphological ramifications within Attic-Ionic. Primarily, the result was that only roots with the basic e -vowel showed any full-grade/zero-grade ablauting allomorphy. That is, after the Attic-Ionic innovation in (15), the surface ablaut patterns in that dialect were as follows (assuming that the coloring of e to a full vowel E had also taken place), compared with the Indo-European and Pre-Greek patterns:

(18)	Indo-European	Pre-Greek	(Proto-)Attic-Ionic
a) Full	$H_1 e RC-$	$H_1 E RC-$	$H_1 E RC-$
Zero	$H_1^x RC-$	$H_1^x E^x RC-$	$H_1^x E^x RC- < *H_1 \partial RC-$
	x	$x x$	$x x$
b) Full	$H_1 ReC-$	$H_1 E_x ReC-$	$H_1 E_x ReC- < *H_1 \partial ReC-$
Zero	$x H_1 RC-$	$H_1 E RC-$	$H_1 E RC$
	x	$x x$	$x x$
c) Full	$H_1 e WC-$	$H_1 E WC-$	$H_1 E WC-$
Zero	$x H_1 UC-$	$H_1^x UC-$	$H_1 E WC- < *H_1 \partial WC-$
	x	x	$x x$
d) Full	$H_1 WeC-$	$H_1 E WeC-$	$H_1 E WeC- < *H_1 \partial WeC-$
Zero	$x H_1 UC-$	$H_1^x UC-$	$H_1 E WC- < *H_1 \partial WC-$
	x	x	$x x$

Thus even though the e -grade/zero-grade ablaut rule was an important morphological rule, one which figured in the derivation of several important morphological categories, including the thematic aorist and the ~~past passive~~ participle, its effects are obscured in Pre-Greek for roots of the type in (18a). In Attic-Ionic, this obscuring of the ablaut process is extended to include roots of the type in (18c) as well.

there is allomorphy in the first few segments of the full-grade as opposed to the zero-grade form, and this allomorphy could be reflected in the derivations through the rules formulated above. But in the pre-Attic-Ionic situation shown in (19), only a phonological theory that allows for very abstract underlying representations would have derivations that still involved those rules in any order. What must have been the case is that the speaker merely restructured his underlying representations for these forms, with no change therefore necessary in the rules, none of which would then have been applicable to the restructured underlying forms. Thus we see the undoing of the phonological solution to this problem--if it were a strictly phonological change, then there would be attendant morphological complications that would be hard to justify, and furthermore, if we admit the need for even some morphological considerations, say in an attempt to strike a balance between morphological and phonological pressures, then we find that there is in fact no need and no motivation for any changes in the phonological rule system. In what follows, then, the strictly morphological solution to this problem of vocalization of the laryngeal consonants before i and u in Attic-Ionic, the solution which appears to be preferable, will be discussed in somewhat greater detail.

We noted above that the morphological result of Rix's Law was that roots with a sonant and a vowel next to an initial laryngeal no longer overtly showed e-grade/zero-grade ablaut, cf. (18a). Given a situation as in (21), a purely formal analogy could create zero-grades $*H_x\bar{\epsilon}WC-$ of the type found in Attic-Ionic:

(21) a)	Full	H_xE_xRC-	.	H_xE_xWC-	
	Zero	$H_x\bar{\epsilon}RC-$.	H_xUC-	$\implies H_x\bar{\epsilon}WC-$
b)	Full	H_xE_xReC-	.	H_xE_xWeC-	
	Zero	$H_x\bar{\epsilon}RC-$.	H_xUC-	$\implies H_x\bar{\epsilon}WC-$

Thus this analogy stems from viewing the ablaut patterns as referring solely to morphological classes as defined by root shape. Roots of a particular shape, then, formed their zero-grade in a particular way, by a purely morphological process.

In such a situation, we might expect to find relic forms that reflect the old situation (i.e. with a zero-grade $UC-<H_xUC-$) which were outside paradigms with full-grade/zero-grade allomorphy. In fact, though, there are no such forms. This, however, does not really pose a problem for the morphological solution. We must assume a period of time in which the newly-created zero-grades $*H_x\bar{\epsilon}WC-$ and the older ones $*H_xUC-$ were in free-variation (this is essentially the Labovian model of how historical changes spread). At that point, forms of the shape H_xUC- that were extra-paradigmatic could be, by phonetic analogy, reshaped to $H_x\bar{\epsilon}WC-$, especially if they were transparent derivatives. Thus it is of importance that all the words which show this development and which do not have corresponding full-grades have rather obvious derivations, and so in principle could enter into full-grade/zero-grade allomorphy. A word like aynos, then, even though it has no attested full-grade corresponding forms, has

a transparent derivation as a *-no- participial form, and accordingly, could be derived from a hypothetical underlying root *H₂ey- which at that stage of Greek only had surface zero-grade forms. We can conclude, then, that H₂WC- zero-grades arose solely through morphological pressures.

Greek has a complex morphology, and for such a language, it is difficult to exclude the notion of formal morphological classes which can exert great influence on one another. Therefore, an explanation of this change in purely morphological terms is in some way natural for a language like Greek, and it avoids the problems alluded to above which a phonological solution encounters.

To sum up, what has been presented here is a complex historical change, certainly unnatural on the face of it, by which clusters of a laryngeal consonant plus [+syllabic] i or u developed an anaptyctic vowel, at least in Attic-Ionic Greek. This development runs counter to expectations that the laryngeal should have been lost before such a segment, thus producing forms UC- from an earlier *H₂UC-. A possible phonological explanation for this deviation was discussed and found to be lacking. What emerged was an explanation based only on morphological considerations of influence between various formal classes in the morphology. The theory of diachronic change needed for this explanation is one that takes into account the morphological complexity of a language relative to its phonology and essentially allows diachronic explanation in terms of the more complex component, the one most likely to undergo changes. Thus it is no accident that in a language like Greek, where there is at best only a handful of phonological rules that have no morphological conditioning to them, diachronic changes such as the one discussed here were effected by dint of the morphological system and not the phonological system. Therefore, the claim that stems from this is that in languages where the morphology is complex and the phonology is simple, diachronic change will tend to be caused by the pressures and influences of the various formal morphological classes and not by purely phonological pressures.³

NOTES

* I would like to thank Judith Aissen, Richard Sacks, Paul Kiparsky, Ives Goddard, and most especially Jochem Schindler, for giving their time to discuss with me various problems with the laryngeals and with this paper. The usual disclaimers as to their complicity in these results hold.

1. The distinctive features of the laryngeals are not wholly known; they seem to behave as if they were spirants as far as the phonology of Indo-European is concerned, and *H₃ was probably voiced, since it caused voicing of a preceding stop, cf. Skt. pihati, OIr. ibid <*pi-pH₃-e-ti 'drinks', but anything beyond that is speculation.

2. Whereas forms such as these seem to exist outside Attic-Ionic, the dialect boundaries are not clear-cut. That the change did not take place to the same extent in the other dialects as in Attic-

Ionic is certain though. See Peters(forthcoming).

3. It is unlikely that the laryngeal consonants turned directly in - to vowels--besides being a rather unnatural change, it would also require Pre-Greek to have had at least three schwa-like vowels, say [ʌ], [ə], and [ɪ], to account for the different timbres of the laryngeal vocalization, and this constitutes a rare, perhaps unparalleled vowel system.

4. Although this coloring of ə by the laryngeals in Greek repeats exactly the coloring of the basic e-vowel in Indo-European, there seems to be no way around the fact that the "coloring powers" of the laryngeals were preserved for some 2,5000 years from Indo-European to Pre-Greek, since the vowel timbre appropriate to a particular laryngeal always appears--there are no relic forms to suggest that the coloring was in fact a morphological replacement of a uniform reflex of *H_xə-.

5. So-called after Helmut Rix, who investigated and determined this change in an important and thorough paper--see Rix (1970).

6. For each of these words, there are morphological reasons for expecting a zero-grade and /or an equation with a clear zero-grade form in another language. Thus áynumay is a *-new- present-stem, which favors a zero-grade both in Indo-European and Greek, and aynós and eñnis are participial formations in *-no-, with eñnis having an adjectival ending -i- substituted for the *-o-.

7. It is even possible that Rix's Law was due to such a formal analogy, for Indo-European roots of the shape *H_xeC- in the full-grade, would have zero-grades *H_xC-, which in Greek would become *H_xəC- and then H_xE_xC-. So the situation could have been:

$$\begin{array}{lcl} \text{(i) Full } H_x E_x C- & : & H_x E_x RC- \\ \text{Zero } H_x \text{ə} C- & : & H_x \text{ə} RC- \end{array} \Rightarrow H_x \text{ə} RC-$$

8. Jochem Schindler has informed me that this claim can be substantiated for Indic and Slavic, and in the vast realm of Non-Indo-European languages, Ives Goddard claims that it is substantiated for the Algonquian languages, most notably Fox.

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