

Gk. ἔγνῶκα and the perfect of PIE *ǵneh₃- ‘know’

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As one equally at home on both sides of the synchronic-diachronic divide, our honorand needs no instruction in the difference between synchronic and diachronic explanations. Consider, for example, the morphologically irregular English plural *houses* [haʊzəz] (for expected [haʊsəz]). In a synchronic grammar of English, the irregular plural is accounted for by positing a lexically restricted rule or similar device to convert the stem-final voiceless [-s-] of the singular ([haʊs]) to the voiced [-z-] of the plural. Historically, the [-z-] in *houses* is entirely regular, the product of a long-ago sound change that voiced all non-geminate intervocalic fricatives. The [-z-] is synchronically “irregular” only because other instances of the inherited *s* ~ *z* alternation have been lost, and new, non-alternating plurals have been acquired through analogy, borrowing, and degemination of -*ss*-. And there is more. Many contemporary speakers now say [haʊsəz], with [-s-] in both the singular and the plural.¹ For such speakers there is no longer anything to explain synchronically at all, since the word is completely regular. Historically, there has been an analogical change: [haʊsəz] has replaced [haʊzəz] on the model of *kiss(es)*, *price(s)*, *race(s)*, and all the other *s*-final nouns where there is no singular : plural alternation. The change is formally reflected as a difference in synchronic grammars: speakers who say [haʊsəz] lack the special rule or diacritic feature that generates [haʊzəz] in the mental grammar of more conservative speakers.²

The reason for rehearsing this well-known example is that there is a tendency in some present-day linguistic writing to portray purely descriptive facts about a grammar — e.g., the existence of a lexically restricted *s* → *z* voicing rule — or descriptive differences between grammars — e.g., the difference between a grammar that contains such a rule and one that does not — as somehow historically explanatory. The origin of this tendency goes back to the early days of generative phonology, when it was easier than it is now to lose sight of the divide between synchrony and diachrony. One reason for the confusion was the vogue for exceedingly abstract, historically inspired underlying forms and synchronic rules that mirrored actual sound changes. If a rule that looked like the historical Great Vowel Shift was part of the synchronic phonology of English and was even *called* the “Great Vowel Shift,” it could seem a waste of time to fret over the distinction between the synchronic rule and the sound change five hundred years earlier.³ More importantly, there was a genuine effort in the early generative period to show that much of what traditionally passed for language change was better thought of as grammar change — rule addition, rule loss, rule simplification, etc. In the context of this discussion it was tempting to see a change like the replacement of [haʊzəz] by [haʊsəz] as the

¹ I first noticed the variant with voiceless [-s-] in 1998. Among undergraduates in my classes it now seems to be about as common as the standard form with [-z-].

² But [-z-] is apparently universal in the verb *to house*.

³ The Great Vowel Shift in particular was famously presented as part of the synchronic grammar of English in Chomsky and Halle 1968.

expression of a clean, grammar-simplifying operation of rule loss rather than as the cumulative effect of artificially set-up analogical proportions in the minds of individual speakers.⁴

We will not venture further into these waters. The “abstractness problem” in phonology has never been fully resolved, and it remains an open question whether and to what extent traditional analogy can be seen as triggered by the internal formal arrangements of a grammar rather than by specific configurations of surface forms or patterns. What *is* clear is that synchronic and diachronic explanations are different kinds of entities constructed for different purposes, and there is no *a priori* reason to expect that the mechanism we employ to generate a particular synchronic form or phenomenon will shed any light on how it came into being historically.

All these issues come to a head in the perfect of the Greek verb γινώσκω ‘come to know, know’. Under any set of expectations the perfect of γινώσκω should have been *γέγνωκα, with the standard reduplication of initial #TR- as #TeTR- and the insertion of -κ-, a Greek innovation, between the stem-final long vowel and the perfect active endings (cf. θνᾶ- ‘die’, perf. τέθνηκα; τλᾶ- ‘bear’, perf. τέτληκα; πλη- ‘fill’, perf. πέπληκα; etc.).⁵ But *γέγνωκα is not what we find. In Homer there is no attested perfect of γινώσκω at all, and when the perfect does appear, beginning in Pindar, it is ἔγνωκα, with what looks like the augment ἐ- taking the place of reduplication. “Augment reduplication” of this kind is common enough in Greek, but not in verbs beginning with stop + sonorant clusters. In the classical period ἐ-reduplication is the norm in verbs or roots beginning with stop + stop clusters (e.g., κτίζω ‘found’, perf. ἔκτικα; φθείρω ‘corrupt’, perf. ἔφθορα, ἔφθαρκα; πταίω ‘stumble’, perf. ἔπταικα), stop + sibilant clusters (e.g., ψάω ‘touch’, perf. ἔψασκα; ξέω ‘smooth’, perf. mid. ἔξεσμαι), sibilant + stop clusters (e.g., σπείρω ‘sow’, perf. ἔσπαρκα; ἴσχω ‘check’, perf. mid. ἔσχημαι; στέλλω ‘make ready’, perf. ἔσταλκα); and the specific cluster hr- (e.g., ῥιγέω ‘shiver’, perf. ἔρριγα; ῥέω ‘flow’, perf. ἔρρύηκα). The origin of reduplication of this type is well known. It began in cases where the historically regular reduplicating syllable *he-, typically from earlier *se-, was deaspirated to e- by Grassmann’s Law, as in ἔρριγα < *hehrīg- < *sesrīg- or ἔσχημαι < *hesk^h- < *sesk^h-. From here it spread to other kinds of s-clusters, and finally to obstruent clusters in general, sparing individual lexical items where an older, inherited reduplicated stem was well-established (e.g., κτάομαι ‘obtain’, perf. κέκτημαι beside ἔκτημαι; πίπτω ‘fall’, perf. πέπτωκα). But apart from obviously secondary cases like ἔγραμμαι beside γέγραμμαι (: γράφω ‘write’), ἔβλαστηκα beside βέβλαστηκα (: βλαστάνω ‘sprout’), and a few others where the two types of reduplication are attested side by side,⁶ augment reduplication is unknown in roots in #TR-.

In this context, let us now consider how a synchronic grammar of Greek might deal with the unexpected augment reduplication of ἔγνωκα, and what, if anything, this can tell us historically. The most straightforward synchronic “solution” would simply be to mark γινώσκω as forming an irregular perfect and listing this as ἔγνωκα. But current phonological practice demands something more explanatory. The irregularity of the verb γινώσκω is of a very specific type: it selects a kind of reduplication in the perfect that exists in Greek and is part of the language, but

⁴ The “grammar change” approach was classically expounded in the unpublished 1965 dissertation of Paul Kiparsky. Its development can be followed in Kiparsky’s later works, e.g., Kiparsky 2010.

⁵ The -κ- was an import from the “κ-aorist” (ἔθηκα ‘I put’, etc.) and, as in the aorist, originally confined to the active singular.

⁶ In καταγλωττίζω ‘kiss wantonly’ (Aristophanes) the perfect is only attested in the augment-reduplicated participle κατεγλωττισμένος.

that is “wrong” for a verb whose root begins with $\gamma\nu$ -. Situations like this, in which two or more phonological or morphological rules compete for applicability to a particular input form, are the essence of what the framework of Optimality Theory (OT) was invented to describe. An OT account of $\xi\gamma\nu\omega\kappa\alpha$ is given in Zukoff’s recent study of reduplication in Greek, Anatolian, Sanskrit, Germanic, and PIE (Zukoff 2017). Zukoff’s key claim (229) is that the orthographic sequence $\langle\gamma\nu\rangle$ was realized as $[\eta\nu]$ in Greek, so that the root we write as $\gamma\nu\omega$ - was actually $[\eta\nu\omega:-]$.⁷ He gives two possible pathways by which the phonetic onset $[\eta\nu-]$ could have blocked consonantal reduplication of the normal kind:

- 1) reduplication of nasal + nasal clusters was penalized by the constraint *PCR (“no poorly cued reduplication”), which had the effect of banning consonant repetition in initial clusters other than those consisting of a stop followed by a sonorant; or
- 2) the “correct” reduplication $*[\eta\epsilon\eta\nu\omega:-]$ would have been disallowed on phonotactic grounds, and the alternative outputs that might have taken its place (e.g., $*\gamma\epsilon\gamma\nu\omega$ - [g -] and $*\nu\epsilon\gamma\nu\omega$ - [n -]) were costlier, in constraint-violation terms, than $\xi\gamma\nu\omega$ -.

Zukoff does not make a clear choice between between these alternatives, both of which depend on his debatable reading of $\langle\gamma\nu\rangle$ as $[\eta\nu]$.⁸ Under the more traditional and still standard view that $\langle\gamma\nu\rangle$ stands for $[gn]$, an explanatory synchronic account of $\xi\gamma\nu\omega\kappa\alpha$ would have to identify some other property of the $\gamma\nu$ - onset as the cause of the failure of the root $\gamma\nu\omega$ - to reduplicate as $*\gamma\epsilon\gamma\nu\omega$ -. Zukoff himself suggests (256–8) that Steriade’s notion of minimal sonority distance (Steriade 1982) might be useful for this purpose.

The specific formal mechanism chosen to generate $\xi\gamma\nu\omega\kappa\alpha$ in a synchronic grammar is not of interest to us here. The important thing to understand is that “explaining” $\xi\gamma\nu\omega\kappa\alpha$ in the context of a synchronic phonological description means finding a synchronic phonological rationale for why the perfect of $\gamma\iota\gamma\nu\omega\sigma\kappa\omega$ is $\xi\gamma\nu\omega\kappa\alpha$ and not $*\gamma\acute{\epsilon}\gamma\nu\omega\kappa\alpha$. Such a rationale might in principle be discoverable; Zukoff’s theory is obviously a candidate. But none of this sheds any light on what actually happened. Even if, for the sake of argument, $\langle\gamma\nu\rangle$ was pronounced $[\eta\nu]$, as Zukoff claims, and even if the pronunciation $[\eta\nu]$ was the result of a pre-Greek sound change of $*g$ to $*\eta$ before nasals, as he implies, it would not follow that there was a historical form $*\gamma\acute{\epsilon}\gamma\nu\omega\kappa\alpha$ (*vel sim.*) that was eliminated because it had become synchronically costlier or “worse” than $\xi\gamma\nu\omega\kappa\alpha$.⁹ There is another historical possibility that a purely synchronic theory cannot take into account — the possibility that $*\gamma\acute{\epsilon}\gamma\nu\omega\kappa\alpha$ never existed.

The root $*\acute{g}neh_3$ - ‘recognize, know’ is found in every branch of the IE family, and its morphological profile at the PIE level is mostly uncontroversial. There is abundant evidence for a nasal present $*\acute{g}n-n(\acute{e})-h_3-$, with analogically transformed reflexes in Indo-Iranian (cf. Ved. 3 sg. *jānāti*, YAv. pl. *zānanti*), Baltic (Lith. 1 sg. *žinaũ*), Tocharian (A 2 sg. *knānat*), Celtic (OIr.

⁷ So too in another verb from the same root, $\gamma\nu\omega\rho\acute{\iota}\zeta\omega$, perf. $\xi\gamma\nu\omega\rho\acute{\iota}\kappa\alpha$ ‘make known’.

⁸ For the facts concerning the pronunciation of γ before nasals, see Allen 1968: 33–37. It seems clear that γ could stand for $[\eta]$ before μ , at least in the artificial word $\acute{\alpha}\gamma\mu\alpha$, the name given to the sound $[\eta]$ in the Greek grammatical tradition. As Allen points out, however, “there is no cogent [emphasis mine – JJ] evidence for $\gamma\nu = [\eta\nu]$, so that in this respect the Greek situation appears to be the reverse of the Latin.”

⁹ And indeed Zukoff makes no such explicit claim. But it is easy to see how a reader who accepts his synchronic analysis could be tempted to draw this conclusion.

ad·gnin), and Germanic (Go. *kann*, inf. *kunnan*).¹⁰ Predictably correlated with this was a root aorist **ǵn(é)h₃-*, with traces in Greek (ἔγνω), Vedic (2 sg. opt. *jñeyáḥ*), and, in secondarily sigmatized form, Slavic (*znaxъ*). There was also a set of forms in **-s-* and **-sk-*, including a Narten *s*-present **ǵnēh₃-s-* (cf. Hitt. *ganešzi* ‘finds’, etc.) and reduplicated and unreduplicated presents in **-ské/o-* (Gk. γινώσκω, Lat. (*g*)*nōscō*, etc.).¹¹ More questionable is whether there was a perfect **ǵeǵn(ó)h₃-*. The superficially attractive equation of Ved. perf. 1, 3 sg. *jajñau* with Lat. perf. (*g*)*nōuī*, supposedly pointing to a post-laryngeal-loss perf. 1, 3 sg. **ǵeǵnóu* (vel *sim.*), is a staple of the older comparative literature.¹² But the perfect of the root *jñā-*, as discussed by Kümmel (2000: 205 f.), is barely attested in Vedic, and Lat. (*g*)*nōuī* looks less like an old perfect, which would have been expected to generalize its reduplicated weak stem (cf. *dedī* ‘gave’, *stetī* ‘stood’), than a former root aorist (cf. *plēuī* ‘filled’ beside Gk. aor. πλητο ‘filled (intr.)’, *quiēuī* ‘rested’ beside YAv. aor. *šiiā-* ‘rejoice’ (*LIV* 393), etc.). In the other branches, Greek, as we have seen, has no perfect in Homer at all. Germanic, generally a good repository of inherited perfects, has two preterito-presents from the root **ǵneh₃-*, but neither is etymologically what it seems to be: Go. *kann* is a transformed nasal present, and OIcel. 1, 3 sg. *kná* ‘can’ is an analogically altered form of the strong verb **knē(j)an* (= OE *cnāwan*).¹³ The only IE branch with a well-formed, potentially old perfect of the root **ǵneh₃-* is Celtic, where OIr. 1 sg. *ad·gén*, 3 sg. *·géuin* ‘know(s), knew’ and Welsh *adwaen* point to earlier **gegna*, **-e*, with generalized weak stem.¹⁴ The question must be asked whether this Celtic stem is a retention or an innovation.

It is not hard to find cases where a particular tense stem of a particular verb can be projected back to the parent language on the basis of its occurrence in a single language or branch. Routine instances include the “stative” present middle of the root **steu-* ‘proclaim’, found only in Hitt. 3 sg. *ištuwāri* ‘becomes known’ < PIE **stuy-ór*,¹⁵ or the thematic present **néiH-e/o-* ‘lead’, found only in Indo-Iranian (Ved. *náyati*, YAv. *naiieiti*). These examples, despite their isolation, are convincing because the relevant forms are predicted by the morphological and semantic patterning of the roots **steu-* and **neiH-*, respectively.¹⁶ But this is not the case with the putative perfect **ǵeǵn(ó)h₃-* in relation to the root **ǵneh₃-*. Unlike the nearly synonymous perfect **u(ó)id-*, which is robustly attested all over the family (cf. Ved. *véda*, Gk. (Ϝ)οῖδα, Go. *wait*,

¹⁰ Compare *LIV* 168–70. The individual treatments of the nasal present, typically with analogical restoration of the full root before the historical infix (Ved. *jānāti* < **ǵnh₃-néH-*, Lith. *žino-* < **ǵnh₃-néh₂-*, Toch. A *knāna-* < “**ǵnō-na-*,” etc.) are discussed in Jasanoff to appear 8 f.

¹¹ Disentangling the sigmatic forms of this root is not a trivial undertaking. My most recent discussion is in Jasanoff 2019: 16–20.

¹² And has been repeated by me more than once, e.g., in *HIEV* 61–2. As will emerge from what follows, however, the locus of the Vedic 1, 3 sg. perfect in *-au* and the Latin perfect in *-uī* could not have been in this root.

¹³ Pace Harðarson 1993: 80. I likewise find it unlikely that an inherited perfect **(ǵe)ǵnō-* could have been transformed into a West Germanic *verbum purum* **knējan*, as claimed in *LIV* (170). More attractive is the possibility that **knējan* replaced ***knēsan*, the Germanic counterpart of Hitt. *ganešzi* (cf. Jasanoff 2019: 17).

¹⁴ The Welsh form goes back to **ate-wo-gegn-* (*LIV* 170).

¹⁵ To which, assuming the antiquity of the Hittite form, I would suggest adding PGmc. **stuwai[b]* ‘atones for’ (cf. *HIEV* 170).

¹⁶ **steu-* formed a “stative-intransitive system” (see below), with the foundational *h:e*-conjugation aorist **stóu-/st(é)u-* attested in Ved. pass. aor. *ástāvi* ‘has been praised’. In **neiH-*, the presence of a robust *s*-aorist (cf. Ved. *anaīṣam*, Hitt. 3 sg. pret. *naiš*, 2 sg. impv. mid. *nešhut*) and the parallelism with other verbs of motion or change of physical state (e.g., Lat. *uehō* : perf. *uexī* ‘convey’, OCS *vedō* : aor. *věsъ* ‘lead’, Ved. *dāhati* : aor. *adhāksam* ‘burn’, etc.) assure a thematic present for at least the “Inner” IE languages (*HIEV* 224–27).

etc.), the expected reflexes of **gég̃n(ó)h₃-* are remarkable mainly for their absence. This is because the PIE perfect was properly a middle-aligned (“protomiddle”) formation, associated with other protomiddle-based formations in derivational complexes that I have called “stative-intransitive systems” (*HIEV* 154 ff.). The root **gneh₃-*, unlike its near synonym **ueid-*, did not conform to the stative-intransitive pattern; it had neither the characteristic *h₂e*-conjugation aorist **g̃nóh₃-*/**g̃n(é)h₃-* nor the “stative” root present in 3 sg. **-ór* of stative-intransitive systems.¹⁷ The primary derivatives of **gneh₃-* are morphologically active; when they mean ‘know’ (stative = Ger. *kennen*), this is typically a development of ‘come to know, recognize’ (inchoative = Ger. *erkennen*). Gk. γινώσκω, with both stative and inchoative readings, perfectly illustrates the semantic fluidity of the root. In Latin the stative sense ‘know’ is represented by (*cognōuī*, synchronically a “perfect,” but historically an aorist meaning ‘I have recognized’). In Romance, the cycle is repeated: Fr. *connaître*, It. *conoscere*, and Sp. *conocer*, the reflexes of inchoative (*cognōscō* ‘come to know, recognize’, mean simply ‘know’.

OIr. *ad-gén* < **gegna*, then, is probably not old. The root **gneh₃-* did not make a perfect in PIE; when the need for a perfect arose in the individual IE languages, the languages either created a new form from scratch according to the productive method (so Skt. *jajñāu*, Celtic **gegna*) or modified an existing present or aorist for the purpose (so Go. *kann*, OIcel. *kná*; Lat. *gnōuī*). A historical explanation of ἔγνωκα thus need not start from the presumption that ἔγνωκα arose from **γέγνωκα* (*vel sim.*) via some combination of sound change and analogy; no halfway plausible account along these lines has ever been discovered.¹⁸ The other possibility is that ἔγνωκα is not historically a perfect at all, but a retooled present or aorist. In that connection attention turns specifically to the inherited aorist ἔγνων, -ως, -ω.

The general functional overlap of the perfect and the aorist needs no discussion. In the particular case of **gneh₃-*, the act of recognizing, as seen in the examples just discussed, commonly results in knowing.¹⁹ In some situations the aorist of γινώσκω can only be translated by what is, in effect, a Greek perfect. At *Il.* 20.19–21 Poseidon asks Zeus why he has summoned the gods together:

τὸν δ' ἀπαμειβόμενος προσέφη νεφεληγερέτα Ζεὺς·
 ἔγνωξ ἔννοσίγαιε ἐμήν ἐν στήθεσι βουλὴν
 ὧν ἔνεκα ξυνάγειρα·

‘Then Zeus, the cloud-gatherer, answered him, and said:
 Thou **knowest**, O Shaker of Earth, the purpose in my breast,
 for the which I gathered you hither’ (transl. Murray)

¹⁷ There is, to be sure, a hapax passive aorist *ájñāyi* at RV VI. 65. 1 (*ájñāyi tirás tāmās cid aktūn* ‘[Uṣas] has been recognized even across the shadows of darkness’). But this is a productively made oppositional passive to the active root aorist **ájñāt*, parallel, e.g., to *ádhāyi* ‘has been put’ beside active *ádhāt* and (*a*)*dāyi* ‘has been given’ beside active *ádāt*.

¹⁸ Note that even under the assumption of Zukoff’s sound change of **-gn-* > **-gn-*, there would have been no reason for inherited **γέγνωκα* [-gn-] to be unstable. The reduplication pattern indicated by the orthographic sequence γ_γν- remained viable at the key period in Greek, as shown by the persistence of the present γινώσκω.

¹⁹ In English too, “recognize” has a common stative reading (“I recognize that. . .”).

It was from usages like this, I suggest, that the perfect ἔγνωκα came into being. Speakers, especially young speakers, took the aorist ἔγνω in its resultative stative value to be the missing perfect of γινώσκω. But the paradigm ἔγνω, -ως, -ω, etc. did not have the formal trappings of a perfect. While the augment could be parsed as a kind of reduplication (albeit here in a root of the “wrong” structure), proper perfects ended in -α, -αζ, -ε, preceded in vowel-final roots by a hiatus-breaking -κ-. The solution for innovative speakers was to recharacterize the emerging perfect ἔγνω- by adding perfect morphology — the type of renewal seen (*mutatis mutandis*) in forms like substandard English *drowneded, flewed, knewed* for standard *drowned, flew, knew* or OE *ēode* ‘went’ for pre-OE **ēo*.²⁰ A formal parallel, as it happened, was already available in the language: in the compounds of the verb “to stand,” the perfect, for historically independent reasons, was made by substituting -κα, -καζ, -κε, etc. for the -ν, -ζ, -∅ of the nearly synonymous aorist (cf., e.g., aor. ἀνέστη ‘(has) stood up’ : perf. ἀνέστηκε ‘is standing’, etc.).²¹ The result, for innovators, was a split: on the one hand, the “real” aorist ἔγνω, -ως, -ω; on the other, the new perfect ἔγνωκα, -καζ, -κε — a transparent analogical innovation at the moment of its creation, but a descriptive anomaly for synchronic grammarians ever since.

²⁰ See, e.g., Rasmussen 1999: 382. The etymology of the “*ēo-*” part of *ēode* is disputed; the identity of the *-de* element as the redundantly added suffix of the dental preterite is not.

²¹ Another such case was ῥέω ‘flow’, with aor. ἔρρῆ and perf. ἔρρῆκε.

References

- Allen, W. Sidney. 1968. *Vox Graeca*. Cambridge: Cambridge University Press.
- Chomsky, Noam and Morris Halle. 1968. *The Sound Pattern of English*. Cambridge, Mass.: MIT Press.
- Harðarson, Jón Axel. 1993. *Studien zum urindogermanischen Wurzelaorist und dessen Vertretung im Indoiranischen und Griechischen*. Innsbruck: Institut für Sprachwissenschaft.
- HIEV*: see Jasanoff 2003.
- Jasanoff, Jay H. 2003. *Hittite and the Indo-European Verb*. Oxford and New York: Oxford University Press. 2003.
- Jasanoff, Jay H. 2019. The sigmatic forms of the Hittite verb. *Indo-European Linguistics* 7: 13–71.
- Jasanoff, Jay. H. to appear. Double nasal presents. Ms. 2020.
- Kiparsky, Paul. 1965. Phonological Change. Unpublished MIT dissertation.
- Kiparsky, Paul. 2010. Compositional vs. paradigmatic approaches to accent and ablaut, in *Proceedings of the 21st annual UCLA Indo-European Conference, October 30th and 31st, 2009*, eds. Stephanie W. Jamison et al., 137–181. Bremen: Hempen.
- Kümmel, Martin. 2000. *Das Perfekt im Indoiranischen*. Wiesbaden: Reichert.
- LIV = Lexicon der indogermanischen Verben. Die Wurzeln und ihre Primärstambildungen. Zweite, erweiterte und verbesserte Auflage bearbeitet von Martin Kümmel und Helmut Rix*. Wiesbaden: Reichert. 2001.
- Rasmussen, Jens Elmegård. 1999. Germanic Verschärfung: Tying up loose ends. *Selected Papers on Indo-European Linguistics*, 375–93. Copenhagen: Museum Tusulanum.
- Steriade, Donca. 1982. Greek Prosodies and the Nature of Syllabification. Unpublished MIT dissertation.
- Zukoff, Sam. 2017. Indo-European Reduplication: Synchrony, Diachrony, and Theory. Unpublished MIT dissertation.