Vendryes' Law and Stratal Optimality Theory

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Abstract

Ancient Greek is a pitch-accented language whose accentuation system has undergone a variety of sound changes. One such change is known as Vendryes' Law, which describes the retraction of accent in words of the moraic structure /μ.μ́μ.μ/:

(1)   **Vendryes' Law**
   a.   Example: he.tói.mos —> hé.toi.mos, 'ready'
   b.   General: μ.μ́μ.μ —> μ́.μμ.μ

This sound change occurred around 400BCE in Attic Greek, the dialect of Greek spoken around Classical Athens. Vendryes' Law is peculiar for having affected few words, leading scholars to question whether it was a regular sound change or a small-scale analogical change.

One of the leading formalizations of ancient Greek accent is Kiparsky's (2003) stratal optimality theory model. In this thesis, I modify Kiparsky's model to determine whether Vendryes' Law was a regular or analogical change by pitting two analyses against each other. In the first, I analyze Vendryes' Law as regular constraint reranking; in the second, as analogical lexicon optimization. I conclude that the latter analysis is most parsimonious; thus, Vendryes' Law describes an analogical change.

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Acknowledgements

Thank you first and foremost to Dr. Claire Bowern, not just for advising this thesis, but also for introducing me to the wonderful world of sound change and for being an excellent PI in my summer working for her lab, *and* for being very flexible as Director of Undergraduate Studies with my degree requirements so that I could complete my double major with classics on time.

Thank you to Dr. Natalie Weber, whose spring 2022 Phonology I class was my first introduction to linguistics and was all the convincing I needed to add this field as my second major. Equal praise is in order for their fall 2022 Phonology II class, which started my long, long journey of trying to understand stratal Optimality Theory (one which perhaps never ends).

Thank you to Dr. Raffaella Zanuttini and Dr. Jason Shaw for their excellent guidance as Chair and Director of Undergraduate Studies, respectively, through the senior linguistics courses LING 490 and LING 491.

Thank you to Dr. Egbert Bakker, who first taught me to consider ancient Greek from a linguistic perspective, and whose spring 2023 class on the history and structure of ancient Greek first introduced me to Vendryes' Law.

Thank you to my fellow senior linguists: Maya Melnik, Jem Burch, Isaiah Suchman, Alara O'Bryan, Sarah Sparling, Jaden Gonzalez, and Ester Luna. Some of us have been close friends for all of our time at Yale and some of us did not meet each other until senior year; all of us, though, are leaving this department as a tight-knit group of friends, and I am so eager to keep up with everyone's various trajectories through life.

Thank you, finally, to my parents for supporting me in my education and showing interest in what I study.

I am very grateful to all who have shaped me into the scholar I am today, and I look forward with excitement to the scholar I will continue to become.

Chapter 1

Introduction

1.1 Preliminaries

This thesis is concerned with a sound change in the diachrony of Attic Greek, the dialect of ancient Greek spoken in Attica throughout the classical period of ancient Greece, c. 500-300BCE. The sound change is known as Vendryes' Law, after Joseph Vendryes who first spelled out the phenomenon in 1904. In Vendryes' words, the law states:

(1)   **Vendryes' Law (Vendryes 1904: 263)**

Tout propérispomène à antépénultième brève devient en attique proparoxyton.

Any properispomenon with a short antepenult becomes a proparoxytone in Attic.

In ancient Greek grammatical terminology, a *properismenon* is a word with a circumflex accent on its penultimate syllable, and a *proparoxytone* is a word with an acute accent on its antepenultimate syllable. Collinge (1985: 200) has dated this phenomenon to the mid-5th century BCE, which means that there are many older Attic texts which we would not expect to demonstrate the phenomenon. Rather than making reference to any textual examples, Vendryes provides a list of words affected by his eponymous sound change, the entirety of which is given in (2):

(2)   **Examples of words affected by Vendryes' Law**

    a. *agróikos* ἀγροῖκος → *ágroikos* ἄγροικος, 'rustic'

    b. *akhréios* ἀχρεῖος → *ákhreios* ἄχρειος, 'useless'

    c. *gelóios* γελοῖος → *géloios* γέλοιος, 'funny'

    d. *eréemos* ἐρῆμος → *éreemos* ἔρημος, 'deserted'

    e. *hetóimos* ἑτοῖμος → *hétoimos* ἕτοιμος, 'ready'

    f. *homóios* ὁμοῖος → *hómoios* ὅμοιος, 'resembling'

    g. *tropáion* τροπαῖον → *trópaion* τρόπαιον, 'trophy'

In the past 100 years of scholarship on Greek accent, scholars have struggled with whether or not Vendryes' Law can be considered a regular sound change as opposed to anything more than, in Collinge's words, an "event report." The small size of Vendryes' list of examples suggests that this phenomenon was too small-scale to be considered a regular sound change in the Attic dialect. In this thesis, we decide between two analyses: either Vendryes' Law was a regular sound change whose effects were partially reversed by later analogical pressures, or Vendryes' Law was only ever an analogical change in the first place, explaining the small inventory of words which it affected. In the end, we opt for the latter analysis.

Part of the impetus for this thesis is a frustration with traditional Indo-Europeanist approaches to Vendryes' Law (discussed in §2.4). Vendryes' Law has too often been disqualified from being a regular sound change on account of small sticking points like lexical exceptions to the rule. However, in studying something as fraught as Greek accentuation, where the accent marks we have in our texts today come from later editors of the texts, we cannot rely too greatly on textual attestations of a word's accentuation for our understanding of how the word was actually pronounced by ancient speakers. Thus, in this thesis we take a more theoretical approach, seeking to use contemporary phonological theory as a diagnostic tool for determining whether Vendryes' Law was a regular sound change or an analogical change.

Our theoretical tool for this analysis is an extension of the work of Kiparsky (2003), who has

formulated a synchronic model of the ancient Greek accentuation system within stratal optimality theory. How exactly the ancient Greek accentuation system should be formally represented has been a matter of dispute for decades. Noyer (1997) was the first to recognize that the ancient Greek accentuation system requires some implementation of cyclicity; his solution was a rule-based cyclic derivational analysis. Kiparsky's stratal OT model is a direct response to some perceived shortcomings of Noyer's model.[1] Neither of these models devote much attention to the diachrony of ancient Greek, which is surprising considering the breadth of accent shifts that have occurred in the history of the language. Therefore, while these accounts may accurately represent the accentuation system at one point in the history of one variety of the language, it remains unclear whether or not they are suitable for encapsulating the full breadth of the diachrony of ancient Greek accent.

This thesis extends Kiparsky's stratal OT model of ancient Greek accent to the diachronic level in order to determine whether Vendryes' Law is best described as a regular sound change or an analogical change. Stratal OT has been chosen as the theory of focus because it has been touted as particularly well-suited to handle sound change (cf. Kiparsky 2015: 3). Thus, this thesis simultaneously determines the status of Vendryes' Law *qua* sound change and tests the efficacy of both Kiparsky's stratal OT model of ancient Greek accent and of stratal OT in general as a means for representing sound change. Ultimately, this thesis contributes to our theoretical understandings both of theoretical phonology, through the evaluation of stratal OT as an efficacious modeling tool for types of sound change, and of the Greek accentuation system, through refining our sense of how the Proto-Greek accentuation system was differentiated across different dialects of ancient Greek.

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[1]The interested reader is directed to Probert (2010) for a comparison of the two models, and to Ruan (2024) for a very recent representation of the ancient Greek accentuation system within the theoretical parameters of Construction Morphology.

1.2 Roadmap

In chapter 2, we review the fundamentals of ancient Greek accentuation as well as the complete body of literature on Vendryes' Law. In chapter 3, we review the core tenets of the stratal OT analysis of synchronic ancient Greek accentuation proposed by Kiparsky (2003) and we offer a theoretical discussion of how stratal OT can be applied to diachronic problems in cases of both regular and analogical change. In chapter 4, the bulk of this thesis, we provide two primary analyses of Vendryes' Law within the framework of stratal OT: one which presumes Vendryes' Law to have been a regular sound change, and one which presumes Vendryes' Law to have been an analogical change. We conclude in chapter 5 by determining that the latter analysis is more parsimonious and that Vendryes' Law should thus be considered an analogical change.

Chapter 2

Attic Greek Accent and Vendryes' Law

In this chapter, we first review the descriptive features of accentuation in the Attic dialect of ancient Greek, and of Vendryes' Law in particular. We then discuss the ancient grammatical sources for our knowledge of ancient Greek accentuation, and we consider the perspectives which ancient grammarians had on what would later be known as Vendryes' Law. Then, we conclude this chapter with a survey of existing scholarship on Vendryes' Law to lay the groundwork for how other scholars have addressed its contentious status as a regular sound change.

2.1   Descriptive Features of Ancient Greek Accentuation

In all dialects, ancient Greek featured a pitch accent. Ancient Greek syllable nuclei can either have one accentable mora (i.e., a short vowel) or two accentable morae (i.e., a long vowel or diphthong). There are three different diacritical marks in ancient Greek to indicate the pitch accent: the acute, circumflex, and grave.

The phonetic status of the grave accent has been long disputed and is ultimately not relevant to this thesis. The grave accent occurs only in place of an acute accent on the final syllable of a word, and this replacement only occurs when the word is followed by another non-enclitic word. Thus, we see in isolation *deineé* δεινή 'cunning' but followed by another word *deineè theá* δεινὴ

θεά 'cunning goddess.' It is most likely, from musical evidence, that the pitch of a grave-accented syllable is higher than that of an unaccented syllable but lower than that of an acute-accented or circumflex-accented syllable.[1] Because Vendryes' Law does not affect words with a word-final accentuation, the phonetic character of the grave need not be discussed further.

The circumflex accent can only appear on long vowels and diphthongs. A circumflex accent signifies that a syllable nucleus with two accentable morae is accented on its first mora. Thus, the pitch can be said to rise on the first mora and fall on the second mora.

Of course, an acute accent on a monomoraic syllable indicates that the mora is accented. But for bimoraic syllables, the pitch designated by the acute accent is less clear. It has long been assumed that an acute accent on a bimoraic syllable indicates the placement of accent on the second mora. Thus, a word like *kéer* κῆρ 'heart' would have a pitch accent on its first mora, whereas a word like *keér* κήρ 'fate' would have a pitch accent on its second mora. However, Sandell and Gunkel (2024) have recently challenged this assumption with evidence from ancient Greek musical manuscripts, arguing that an acute accent on a bimoraic syllable indicates a pitch accent over the *entire* duration of the syllable. For this thesis, I will continue with the earlier tradition of assuming that an acute-accented bimoraic syllable has its pitch accent on the second of its morae rather than on both.

Attic Greek features a free accent subject to two key limitations: the "law of limitation" and the "σωτῆρα rule," given in (3) and (4), respectively:

(3)   **Law of Limitation (adapted from Probert 2010: 2)**

If the final syllable is heavy (i.e. contains a long vowel or any vowel followed by more than one consonant), the accent may not fall further to the left than the final (or only) vocalic mora of the penultimate syllable. Otherwise, the accent may not fall further to the left than the final (or only) vocalic mora of the antepenultimate syllable.

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[1]See Debrunner (1929: 54-5), Sturtevant (1940: 100-1), Allen (1973: 245-48), and Devine and Stephens (1994: 180-83) for a further articulation of this argument.

(4)　**σωτῆρα rule (adapted from Probert 2010: 2)**

　　If the final syllable contains a short vowel, and if the accent falls on the penultimate syllable, the accent must fall on the *first* vocalic mora of the penultimate syllable. So named because of the accentuation of *sootéera* σωτῆρα 'savior.ACC.'

　　Therefore, the ancient Greek word has a maximum of three accentable syllables, all of which can receive either an acute accent or a circumflex accent (except for the antepenult, which cannot receive the circumflex accent). This yields five possible types of accented Greek words, given in (5) with their grammatical names provided in parentheses:

(5)　**Five Types of Accented Greek Words (adapted from Probert 2006: 62)**

　　a.　acute on ultima (oxytone): *ligurós* λιγυρός, 'shrill'

　　b.　circumflex on ultima (perispomenon): *agathóu* ἀγαθοῦ, 'good.GEN'

　　c.　acute on penult (paroxytone): *patéra* πατέρα, 'father.ACC'

　　d.　circumflex on penult (properispomenon): *sootéera* σωτῆρα, 'savior.ACC'

　　e.　acute on antepenult (proparoxytone): *ánthroopos* ἄνθρωπος, 'person'

　　However, this typology does not account for whether or not a word is accented on its farthest-left accentable syllable. For example, a paroxytone word like *paideuménou* παιδευμένου 'being.taught' has its accent as far to the left as possible. Because the final syllable is long, the accent cannot fall any farther left than on the final mora of the penultimate syllable, by the law of limitation. However, the paroxytone word *patéra* πατέρα, given in (5c), does *not* have its accent as far to the left as possible; if it did, it would be accented as *pátera πάτερα. We can distinguish between these two types of words by calling the former "recessive" and the latter "non-recessive." The default accentuation pattern of ancient Greek is recessive accent, though there are many words with non-recessive accent. These words have either inherited non-recessive accent from Proto-Indo-European (PIE) or have received their accent from being affixed with an inherently accented suffix. Thus, most words with non-recessive accent have their accent on the final syllable.

2.2   Descriptive Features of Vendryes' Law

Now that we have defined the terminology and typology for ancient Greek accentuation, we may turn to Vendryes' Law. To recapitulate, Vendryes observed that in Attic Greek, words which were historically properispomenon with a short ultima appear proparoxytone after around 450BCE. To this general observation we can add a few stipulations. First, if this was indeed a regular sound change, it seems to have been counteracted by analogical pressures within declension paradigms. For example, let us observe in (6) the paradigm for the noun *doteér* δοτήρ, 'giver':

(6)   **Declension paradigm of *doteér*, 'giver'**

	Singular	Plural
Nominative	*doteér* δοτήρ	*dotéeres* δοτῆρες
Genitive	*dotéeros* δοτῆρος	*doteérōn* δοτήρων
Dative	*dotéeri* δοτῆρι	*dotéersi(n)* δοτῆρσι(ν)
Accusative	*dotéera* δοτῆρα	*dotéeras* δοτῆρας
Vocative	*doteér* δοτήρ	*dotéeres* δοτῆρες

Besides the nominative singular, vocative singular, and genitive plural, we would expect all forms to exhibit recessive accent in post-450BCE Attic Greek. For example, we would expect **dóteeres* δότηρες in the nominative plural.[2] However, among nouns there is language-internal pressure for the accent to maintain its position between inflections within a paradigm. In this case, the nominative *doteér* δοτήρ is composed of the verb stem δο- and the masculine agentive suffix -τήρ, which is marked for acute accent; therefore, *doteér* δοτήρ is non-recessive and oxytone. In this declension, the nominative case ending is phonetically null.[3] When other non-null case endings are added, the accent does not move from its current syllable. However, it *does* retract one

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[2]As textual support for the claim that Vendryes' Law has not applied to this paradigm (or others like it): we see *dotéeres* δοτῆρες in both Homer's *Iliad* (*Il.* 19.44) and in Xenophon's *Cyropaedia* (*Cyrop.* 8.1.9), the latter of which was written in Attic Greek around 370BCE and therefore would be expected to exhibit the effects of Vendryes' Law (though see the following section on the authenticity of accentuation in today's ancient texts).

[3]The nominative case ending is **-s*, but in ancient Greek and other Indo-European languages [s] is deleted after liquids by a process known as Szemerényi's Law.

mora in compliance with the σωτῆρα rule. This all goes to show that, even in post-450BCE Attic Greek, both the σωτῆρα rule and analogical pressures toward the persistence of accent in nouns take precedence over Vendryes' Law. Thus, if the sound change were regular, it would have been "undone" by these pressures at some point after the fact. [4]

Contract verbs constitute another important exception to Vendryes' Law. Contract verbs are thematic verbs whose stems end in a vowel that contracts with the theme vowel. However, although all verbs receive recessive accentuation, these contract verbs receive their accent before the contraction process occurs. Thus, their accentuation has been called "opaque," as it is determined before the contraction that yields the word's surface syllabification. What follows in (7) is an example of how the contract verb *philéite* φιλεῖτε 'you.PL love' receives its accent:

(7)   **Deriving the accent of *philéite* φιλεῖτε**

   phile-eite φιλε-ειτε → *philé-eite* φιλέειτε → *philéite* φιλεῖτε

Contrast this with how the accent would appear if it were assigned *after* contraction, shown in (8):

(8)   **Incorrectly deriving the accent of *philéite* φιλεῖτε**

   phile-eite φιλε-ειτε → *phileite* φιλειτε → *phíleite* *φίλειτε

We will see this property of ancient Greek accentuation again as we turn to the stratal OT representation of the accentuation system in §3.1. For now, note that Vendryes' Law does not apply to the post-contraction forms of contract verbs. Thus, φιλεῖτε 'we love' does not appear in Attic Greek as *φίλειτε. Of course, we should not be surprised that Vendryes' Law does not apply: contract verbs appear in their contracted forms throughout the whole history of Attic Greek, including the pre-450BCE period. Contraction thus predates Vendryes' Law and is opaque

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[4]Collinge (1985: 200) cites *gunáikes* γυναῖκες 'women.NOM.PL,' *contra* expected *gúnaikes* γύναικες in Attic Greek as a particular lexical exception to Vendryes' Law, noting that these sorts of lexical irregularities are endemic to familial terms. However, we can just as well call the accentuation of γυναῖκες another example of the σωτῆρα rule and paradigm-regularizing analogical pressures taking precedence over Vendryes' Law. *guneé* γυνή, like *doteér* δοτήρ, is a third-declension noun; they differ, however, in that γυνή only exhibits persistence of accent in the nominative and accusative cases, in which cases the σωτῆρα rule certainly applies.

to Vendryes' Law. This means Vendryes' Law applied to the surface forms of words, not their pre-contraction underlying forms.[5]

At this point we must ask: what types of words *do* undergo Vendryes' Law? It cannot be any verbs, because verbs invariably demonstrate recessive accent, meaning that no verbs would ever be fit the short-long-short criterion of Vendryes' Law—if a verb had a short ultima, then it would be accented as proparoxytone in all dialects. Contract verbs are the only verbs that can appear properispomenon, and as we have just covered, these verbs are exempted from Vendryes' Law. Third-declension nouns cannot be subjected to Vendryes' Law because they are instead subjected to the stronger pressures of the σωτῆρα rule and paradigmatic leveling.

Indeed, the words we see most subjected to Vendryes' Law are a certain class of adjectives we will call the 2-1-2 adjectives. These are adjectives which decline in the second declension for the masculine and neuter genders and in the first declension for the feminine gender. Of course, not every inflectional ending for the 2-1-2 adjectives is a short vowel, and not every 2-1-2 adjective stem is of the appropriate shape to be subjected to Vendryes' Law. For a 2-1-2 adjective to be subjected to Vendryes' Law, its stem must consist of one short syllable and one long syllable, in that order. Even then, in the masculine a short ultima only occurs in the nominative singular, accusative singular, vocative singular, nominative plural, and vocative plural. In the feminine, a short ultima only occurs in the nominiative plural and vocative plural. In the neuter, a short ultima only occurs in the nominative singular, accusative singular, vocative singular, nominative plural, accusative plural, and vocative plural. Indeed, all the words Vendryes himself provides as examples of his eponymous sound law are these such adjectives.[6]

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[5] Another word—though not a verb—precluded from Vendryes' Law by contraction is the deictic pronoun *ekéinos* ἐκεῖνος 'that one,' which never appears as *ékeinos* ἔκεινος in Attic Greek. This word is a contraction of three morphemes, *e-ke-enos*; here too, accent must have been assigned before contraction and the word therefore must not have been affected by Vendryes' Law.

[6] One of them, *tropáion* τροπαῖον, is a noun which is a substantivization of the 2-1-2 adjective τροπαῖος.

2.3 Accent and Vendryes' Law: Ancient Perspectives

As noted above, Attic Greek is the dialect of ancient Greek spoken in Attica, and most notably in Athens, between c. 500-300 BCE. Many of the most famous authors in the history of the ancient Greek language wrote their seminal texts during this time—Thucydides, Plato, Sophocles, Aristotle, to name a few. But none of these authors wrote accent marks in their texts. Writing in accent marks would not become commonplace in Greek writing until the Middle Ages, and the accent marks which appear in the modern editions of ancient texts we use today have been added after the fact by scholars, based on how the scholar thinks the accent marks should have looked. Thus, while it is tempting to use textual examples as our evidence of Vendryes' Law, they are not definite indications of the accentuation practices of ancient Greek speakers. Additionally, we should not be alarmed if we find a Vendryes'-affected word in the works of an author who did not speak Attic Greek; this is merely indicative of the later editorial tendency to level the finer points of dialectal diversity in favor of a more uniformly legible, capital-A Ancient Greek. Thus, we should not be alarmed by the instances of ἕτοιμος and ἔρημος in the *Histories* of the Ionian author Herodotus.

However, this is not to say that the ancient Greeks were not aware of, and in fact deeply interested in, the phenomenon of accentuation. I defer the interested reader to Probert (2006: 15-52) for a particularly detailed account of ancient Greek accentuation at large. What is most important to note presently is that, while we do have robust accounts of the ancient Greek pitch accent from primary sources in antiquity, these accounts were written by grammarians from the Roman Empire who spoke a different but closely related dialect known as Koine Greek.[7] This is not to say that we have no evidence of the pitch accent from Athenian authors; we hear about confusions arising from improper accentuation, for instance, in Aristotle's *Sophistical Refutations* quoted below in (9):

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[7]By "accounts" I refer to both attestations of the accent's existence and grammatical descriptions of the accentuation system.

(9)   **Aristotle on accent-related ambiguities (Aristot. Soph. Ref. 177b-178a)**

And as for pronunciation there are no disputes, neither for written words nor for spoken words, except a few could occur, such as the following. A house is "where you lodge" (*hóu katalúeis*), right? Yes. Isn't "you do not lodge" (*ou katalúeis*) the negation of "you lodge?" Yes. But you claimed "where you lodge" (*hóu katalúeis*) to be a house—thus, a house is a negation. How this should be settled is clear: for the word uttered with higher pitch (*oksúteron*) does not mean the same thing as the word uttered with lower pitch (*barúteron*).[8]

In the written language of Aristotle's time, the confusion between "where you lodge" and "you do not lodge" is possible because "*hóu*" and "*ou*" would have both been written as "*OY*." in the Greek alphabet of Aristotle's time.[9] Accentuation was thus a salient feature of the Greek language for speakers of Attic Greek. In addition to this sophisticated example from Aristotle, we also have the famous story of the actor Hegelochus. In a performance of Euripides' *Orestes* the actor came to the line "I see a calm [sea]" (*galeén' horóo* γαλὴν' ὁρῶ), but improperly spoke the first word with perispomenon accent (*galéen'* γαλῆν'), changing the meaning to "I see a weasel." He was laughed off stage, compelled to quit acting, and ridiculed in the subsequent works of several comic poets and playwrights. It is practically obligatory to share this story when discussing ancient Greek accentuation, and not without reason–as with the passage from Aristotle, it demonstrates the salience of accentuation for speakers of ancient Greek.

The grammatical tradition concerning accentuation developed in the Hellenistic Period as the production of written texts increased, inspiring the Hellenistic grammarians to think more critically about the accentuation of Greek. However, the leading grammarian on accentuation, Herodian, comes from the Roman Empire. His largest work, *On general prosody*, does not survive in

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[8]All translations are my own.

[9]In Attic Greek and other dialects which have not undergone psilosis, the word-initial [h] is not written with any grapheme. In later manuscript traditions (and in the editions of texts we use today), word-initial [h] is, like the pitch accent, represented with a diacritical mark: <'>.

full but has been extensively quoted by later grammarians and scholiasts, such as in the works of Arcadius and Eustathius cited below in (10a) and (10b), respectively. As stated above, our grammatical accounts of accentuation were written in Koine Greek, which, though quite similar to Attic Greek, exhibits some key differences. One difference, of course, is in the accentuation of Vendryes-affected words.

Fortunately for us, these grammarians took note that words were accented differently in Attic Greek—Vendryes'-affected words included. See the following examples in (10) from Arcadius and Eustathius:

(10)   **Hellenistic grammarians on Attic accentuation**

a. *hétoimos* ἕτοιμος is Attic, and *hetóimos* ἑτοῖμος is general [*koinón* κοινόν][10] (Arcadius 70.7)

b. Therefore, he says, *akhréios* ἀχρεῖος...should be proparoxytone. And the Attic speakers clearly did this, as in the case of *eréemon* ἐρῆμον and *hetóimon* ἑτοῖμον, the Homeric words—for the later [*neoóteroi* νεώτεροι] Attic speakers appropriately made these proparoxytone as well, as Herodian says. (Eustathius 217.44-218.1)

This being said, not all accounts of Vendryes' Law suggest a difference between Koine and Attic Greek on the accentuation of Vendryes-affected words. In fact, the "correct" accentuation of these words in Attic Greek was not always clear even to the grammarians. See in (11), for example, the following two conflicting accounts of the accentuation of *akhréios/ákhreios*:

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[10]See Probert (2006: 280-81) for a defense of interpreting *koinón* as referring to the Koine Greek dialect as opposed to just the non-Attic dialects.

(11)   **Conflicting accounts on Attic accentuation**

a.   *...ákhreios* ἄχρειος (in general [*koinón*], but *akhréios* ἀχρεῖος is the Attic form, like *astéios* ἀστεῖος)... (Arcadius 99.25-100.1)

b.   *akhréion* ἀκρεῖον...Dionysius and Tyrannio put an acute accent on the first syllable, and as according to the rule...but the reading for the poet [Homer]...is properispomenon... (Schol. Il. 2.269 (A))

Here, (11a) suggests that the Attic form is properispomenon, meaning it has *not* undergone Vendryes' Law, whereas the Koine form is proparoxytone. Vendryes' Law has never been claimed to occur independently in Koine Greek, and Attic Greek is the only dialect in which Vendryes' Law occurred. Thus, any words in Koine Greek which exhibit the effects of Vendryes' Law and have unaffected counterparts in other dialects (e.g., Homeric Greek,[11] which has the unaffected *akhréion*) must have inherited their Vendryes-affectedness from Attic Greek. Then, surely (11a) must be wrong in saying that the Attic form is properispomenon, no?

We can reconcile the accounts in (11a) and (11b) by calling to mind the time at which the change described by Vendryes' Law is said to have occurred. At this point, we have been referring Vendryes' Law as a shift which happened after 450BCE, as this is the date that Vendryes himself ascribes to the sound change. While sound change is a gradual process and would not have occurred in one year, perhaps we can say that (11a) is referring to pre-Vendryes' Attic whereas (11b) is referring to post-Vendryes' Attic. In fact, from the examples cited in (12) we see an awareness of a "later" Attic in the grammatical tradition:

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[11]Homeric Greek is more of a literary register than a spoken dialect, but it is comprised of spoken dialects, none of which would have been affected by Vendryes' Law.

(12)   **Later Attic in the Grammatical Tradition**

    a. *homóios* ὁμοῖος is to be read like *allóios* ἀλλοῖος—for proparoxytone accentuation is of the later [*metagenestéroon* μεταγενεστέρων] Attic speakers. (Schol. Il. 14.521a (A))

    b. Every neuter possessive derived from a feminine has the acute three [syllables] from the end—such as *kephaleé* κεφαλή, *kephálion* κεφάλιον; *guneé* γυνή, *gúnaion* γύναιον— hence also from *tropeé* τροπή, *trópaion* τρόπαιον. But the old [palaioí] Attic speakers make it properispomenon [tropáion τροπαῖον]. (*Etymologicum Magnum* 769.14-17)

    c. *tropáion* τροπαῖον is old [palaiaá] Attic, of which there is Eupolis, Cratinus, Aristophanes, Thucydides—*trópaion* τρόπαιον is young [néa] Attic, of which there is Menander and the others... (Schol. Thuc. 1.30.1)[12]

The difference in accentuation between the "old" Attic and the "young" or "late" Attic is well-attested, both in the Herodianic and apparently non-Herodianic grammatical traditions. The scholia to Thucydides, even if they may not derive from Herodian, do reliably cite authors which fall in "old" Attic and "late" Attic, respectively. Probert (2004: 286) notes that the "old" Attic authors all wrote in the 5th century BCE, while Menander wrote in the 4th century BCE; thus, she extrapolates a dividing line of around 400BCE for the actuation of Vendryes' Law, which is not far off from Vendryes' own estimate. Probert concludes that Herodian must have derived this distinction between "old" and "late" Attic from the Hellenistic grammarian Trypho's treatise *On Attic Prosody*. Thus, the grammatical practice of distinguishing between these two forms of Attic Greek was present in the grammatical tradition from the Hellenistic Period all the way through the Medieval Period to which we date our scholia and the *Etymologicum Magnum*. As for how Trypho himself came upon this distinction, Probert suggests that the Hellenistic grammarians had some access to information about the pronunciation of Attic Greek at earlier points in time, perhaps through folk memory of the older sounds of words or through the speech of older, more

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[12]Probert (2004: 286) is skeptical of whether the latter two sources, the *Etymologicum Magnum* and the scholia to Thucydides, derive from the Herodianic tradition and is thus hesitant to include them in her analysis of these grammatical texts. Because they do not clash in any way with Herodian, I have opted to include them.

conservative Attic speakers.[13]

Before we move on, it must be emphasized that this circa 400 BCE date for Vendryes' Law is by no means absolute, nor is the list of authors given in the scholia to Thucydides wholly accurate. We see some words display the effects of Vendryes' Law in authors who predate the prescribed 400 BCE date. Euripides, for instance, uses the Vendryes'-affected *hétoimon* (for instance, in line 86 of his *Hercules*), and he predates Aristophanes, who is listed as an "old" Attic author in the scholia to Thucydides (and Aristophanes, for what it is worth, also uses the Vendryes'-affected *hétoimon*). Moreover, one author can use in the same text a word which *has* been affected by Vendryes' Law and a word which hasn't, even though they either both should be affected or both should be unaffected.

2.4   Vendryes' Law in Modern Scholarship

These sorts of inconsistencies have, in the time since Vendryes' identification of his eponymous sound law, led several scholars to push back against the treatment of Vendryes' Law as a sound change in its own right. The main dissenting opinion in this argument is that the sound change dscribed by Vendryes' Law did not occur independently in the Attic dialect, but was instead part of a larger leftward shift of accent in the change from the Proto-Indo-European accentuation system and the general ancient Greek one. Another key dissenting opinion argues that Vendryes' Law has too many exceptions to be anything more than a coincidence.

2.4.1   Dissent #1: Kiparsky (1967) on Iambic Retraction

Kiparsky (1967) was the first to argue that Vendryes' Law should instead be considered a constituent of a larger sound change in the diachrony of ancient Greek that pushed the accent further to the left in all kinds of words. Kiparsky noted that many words which end in an iamb and which

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[13]To a similar point, see Collinge (1985: 200), who suggests that Thucydides' use of the "old Attic" pre-Vendryes forms may constitute a deliberate archaism or anti-provincialism, much like his use of *ksún* for *sún* or of *-ss-* for *-tt-*.

inherited oxytone status from Proto-Indo-European appear in ancient Greek as paroxytone. One commonly cited example is *thugáteer* θυγάτηρ 'daughter,' which would have been inherited into Greek as **thugateér.* This had previously been accounted for with a law of iambic retraction first proposed by Bartoli (1930), who argued that accent retraction occurred in words that end in an iamb but contain at least three syllables overall. Bartoli claims this to have been a pan-dialectical sound change early in the Greek language. Kiparsky, however, notes that the words affected by Vendryes' Law are included in the set of words that would have been affected by Bartoli's Law: they end in iambs and necessarily contain three syllables. Kiparsky thus proposes that Bartoli's Law and Vendryes' Law be combined into one sound change called "iambic retraction" that occurred exclusively in the Attic dialect. Therefore, as far as Kiparsky is concerned, Vendryes' Law should not be thought of as its own sound change. However, Kiparsky's combination of Bartoli's Law and Vendryes' Law fails to account for the appearance of words like *thugáteer* in the works of author like Pindar, who did not write in Attic Greek and died well before 400BCE. Indeed, for Bartoli's Law to be combined with Vendryes' Law, we would need to presume an actuation date of around 400BCE for Bartoli-affected words like *thugáteer*, which simply does not work for the data we have. *Thugáteer* appears with post-Bartoli accentuation in Homeric Greek, which Kiparsky accounts for by calling it an 'Atticism,' but this is still in the wrong time frame. Thus, we must dismiss Kiparsky's early treatment of Vendryes' Law.

2.4.2   Dissent #2: Voyles (1974) on Exceptions to Vendryes' Law

Voyles (1974: 73), in discussing Vendryes' Law and another retraction law named Wheeler's Law, argues that "because there are as many exceptions to Wheeler's and Vendryes'...rules as there are instances of their application, it becomes questionable whether the stress retractions involved were in fact caused by the addition of a rule to the grammar." We have already addressed some of the exceptions to Vendryes' Law in §2.2 and offered explanations for each that allows them to be accommodated by Vendryes' Law. We will now entertain the exceptions which are quoted from Kiparsky and elaborated upon by Voyles.

Kiparsky identifies two categories of exceptions: lexical exceptions and accentual doublets. His lexical exceptions are *lokhéios* λοχεῖος 'pertaining to childbirth' and *ekhíinos* ἐχῖνος 'hedgehog.' The first, λοχεῖος, indeed has no clearly Vendryes'-affected accentuations; that is, every attestation of the word features properispomenon accent. However, the word is rarely attested, and as stated several times now we cannot use texts as the sole indicators of whether or not a particular accentuation would have been attested in ancient Greek. That being said, in line 1241 of Euripides' *Iphigenia in Tauris*, we find the form λοχεῖα, and though this play is dated to before 400 BCE, Euripides' plays have demonstrated the effects of Vendryes' Law for other words.[14] The same too holds for ἐχῖνος: we have attestations of the word, without accent retraction, in writings of Aristotle that postdate Vendryes' Law. We have explained previous "exceptions" to the regularity of Vendryes' Law with counteractive forces of analogical and paradigmatic leveling, but in the cases of λοχεῖος and ἐχῖνος there is no reason to expect either of these forces at play. Thus, from what little evidence we have, it seems that λοχεῖος and ἐχῖνος are exceptions to Vendryes' Law. These two lexical exceptions are important to note, but by themselves do not constitute their own grounds for throwing away Vendryes' Law entirely.

More interesting to pursue are these so-called "accentual doublets." In (13) we adapt Kiparsky's examples, whch are further elaborated by Voyles:

(13)   **Accentual Doublets in Attic Greek**

      a. *agoráios* ἀγοραῖος, 'pertaining to the *agora*,' vs. *agóraios* ἀγόραιος, 'vulgar'

      b. *ageláios* ἀγελαῖος, 'pertaining to a herd,' vs. *agélaios* ἀγέλαιος, 'common'

The proparoxytone words in these doublets are exceedingly rare: ἀγόραιος appears once in Aristophanes' *The Knights*, once in a 1st-century CE text by Josephus, and thence only appears in grammatical texts explaining the difference between it and its properispomenon counterpart.

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[14]While λοχεῖος is a rare word, the synonymous λόχιος appears much more frequently, and even appears in the same play. The derivational relationship between these two words is unclear, as they both have their first appearance in the works of Euripides; though the latter appears in a slightly earlier play, this is hardly conclusive enough evidence to say that the former derives from it. And even if it did, there is no reason why this would preclude it from an accent shift.

ἀγέλαιος has zero literary attestations whatsoever; it only appears in the same grammatical texts as ἀγόραιος. Moreover, these words are more than three syllables, and we have heretofore not seen any instances of Vendryes' Law affecting words of more than three syllables. So, we can assert that Vendryes' Law applied only to words of three syllables and leave these two accentual doublets out of the equation.[15]

We conclude this chapter by agreeing with previous scholars that there are some exceptions to Vendryes' Law which cannot be explained with the evidence we have, but by disagreeing with the conclusion that we must reject the regularity of Vendryes' Law as a sound change on account of those exceptions. For the remainder of this thesis, we will test the status of Vendryes' Law as a regular sound change from a new perspective within the diagnostic theoretical parameters of stratal OT.

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[15]There is certainly something interesting to be said about why the retraction of accent abstracts these adjectives further from the nouns from which they are derived; this, however, is outside the scope of this thesis.

Chapter 3

Stratal OT Preliminaries

In this chapter we discuss all the aspects of both stratal OT and of diachronic applications of OT that will be necessary for the two diachronic stratal OT analyses of Vendryes' Law developed in the chapter 4. We begin in §3.1 with an outline of Kiparsky's (synchronic) stratal OT model of the ancient Greek accentuation system. We conclude the chapter in §3.2 with a review of diachronic approaches to classical OT and how they can be extended to stratal OT for the purposes of our analysis.

3.1 Kiparsky's (2003) Stratal OT Approach to Ancient Greek Accent

In this section, we review the stratal OT model of representing ancient Greek accentuation proposed by Kiparsky (2003). Although Kiparsky's model does not explicitly incorporate any accent-based sound changes, in the following chapter we will use this model as the basis for a diachronic application of stratal OT to represent the actuation of Vendryes' Law, as the diachronic applications of OT have been of high scholarly interest in the decades since the first proposal of OT (on which see §3.2).

The impetus for Kiparsky's stratal OT model of ancient Greek accentuation is a response to

the allegation of Noyer (1997) that the assumptions of OT are incompatible with the grammatical demands of ancient Greek accentuation. Noyer, and thus also Kiparsky, focuses on the fact that, while *most* words in ancient Greek receive recessive accent at the level of underlying representation, *some* words (which constitute a morphologically identifiable class) are accented on the basis of *surface* structure. One class of words that appear to be accented on the basis of surface structure are compound nouns. Take, for instance, the noun *plóus* πλοῦς 'voyage' which receives circumflex accentuation. We would expect this word to be accented **ploús* πλούς on analogy with the observed generalization that accented word-final long vowels and diphthongs receive acute intonation in the nominative and accusative cases (cf. *poús* πούς 'foot'). However, we know that *plóus* derives from an uncontracted *plo.os*, and to derive the accentuation we see on the surface, the noun must receive recessive accentuation at the underlying level. Contrast this, then, with the genitive compound noun *períplou* περίπλου 'circumnavigation,' which must receive recessive accent at the surface level, as assigning recessive accent at the pre-contraction level would produce the incorrect surface form **periplóu* περιπλοῦ.

Noyer accounts for this discrepancy in accentuation with an analysis that employs cyclic phonological rules, and he claims that the cyclicity required precludes an OT analysis of the accent system. As Kiparsky says, it certainly precludes a *classical* OT analysis, but not a *stratal* OT analysis, as stratal OT is capable of dealing with phonological opacity through domain stratification (Kiparsky 2015: 21). Stratal OT allows for the application of OT at several morphological domains; most saliently here, the stem level and the word level.

In his 2003 paper, Kiparsky first establishes some core generalizations about the Greek accentuation system. He defines the default accent as a recessive accent (as we have discussed in §2.1), which falls on the penultimate syllable if the final syllable is heavy (-VCC, -VV, or -VVC) or on the antepenultimate syllable if the final syllable is light (-V or -VC; word-final singleton consonants are extrametrical). Second, Kiparsky states that the placement of accent depends on syllable weight, but the intonation of accent depends on mora count; the implications of this will not be relevant to our task at hand. For the implementation of recessive accentuation, Kiparsky

refers to the earlier analyses of Golston (1989) and Sauzet (1989) which theorize the construction of moraic trochees (i.e., those which contain either one heavy syllable or two light syllables). The construction of moraic trochees is done as follows: if the ultima is light and the penult is heavy, the moraic trochee is built on the penult; otherwise, build the moraic trochee directly from the right edge of the world. Then, recessive accent is placed immediately to the left of the moraic trochee, or if the moraic trochee occupies the beginning of the word, the recessive accent is placed on the moraic trochee's leftmost element. In (14) we present some examples adapted from Kiparsky:

(14)   **Recessive accentuation with moriac trochees (adapted from Kiparsky 2003: 7)**

    a. *án.(throo).pos* ἄνρθωπος

    b. *an.throó.(poo)n* ἀνθρώπων

    c. *(sóo).ma* σῶμα

    d. *soó.(ma.ta)* σώματα

    e. *soo.má.(too)n* σωμάτων

    f. *e.paí.(deu).sa* ἐπαίδευσα

    g. *pai.deú.(oo)* παιδεύω

    h. *pee.né.(lop)s* πηνέλοψ

This implementation of recessive accent can be formulated with two constraints,[1] adapted in (15) and (16) below from Kiparsky:

(15)   IDENT(ACC)

Corresponding segments in a foot have the same pitch.

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[1]We would also need two undominated constraints, one to require every word to have one pitch accent and one to require a moraic trochee to be built from the right edge of a word. We leave these out here as this is what Kiparsky does; however, when we further develop Kiparsky's stratal OT model in the following chapter, we formally define these two constraints, and we change the names of Kiparsky's constraints for clarity.

(16) ALIGN

> The head of a foot must bear a pitch accent.

IDENT(ACC) ensures that recessive accent falls before the moraic trochee where possible (i.e., that it recedes as far back as possible). ALIGN ensures that the accent falls as close to the moraic trochee as possible, and thus enforces the Law of Limitation. IDENT dominates ALIGN.

The one accentuation pattern that this fails to predict includes those disyllabic, circumflex-accented nouns ending in consonant clusters (ex: *kéeruks* κῆρυξ 'herald'; *katéelips* κατῆλιψ 'terrace'). To account for these Kiparsky adds the following undominated constraint which essentially enforces the σωτῆρα rule; we have adapted it below in (17):

(17) *μμ́.μ]

> No acute before a word-final mora.

Below in (18) and (19) are a few sample tableaux to illustrate how these three constraints are implemented:

(18)   **Sample tableau demonstrating the implementation of IDENT(ACC) and ALIGN**

an.throo.poon, ἀνθρωπων	*μμ́.μ]	IDENT(ACC)	ALIGN
a. án.throo.(poo)n, ἄνθρωπων			**!*
b. an.thróo.(poo)n, ἀνθρῶπων			**!
☞ c. an.throó.(poo)n, ἀνθρώπων			*
d. an.throo.(póo)n, ἀνθρωπῶν		*!	
e. an.throo.(poó)n, ἀνθρωπών		*!	*

(19)   **Sample tableau demonstrating the implementation of *μμ́.μ]**

kee.ruks, κηρυξ	*μμ́.μ]	IDENT(ACC)	ALIGN
☞ a. kée.(ruk)s, κῆρυξ			**
b. keé.(ruk)s, κήρυξ	*!		*
c. kee.(rúk)s, κηρύξ		*!	

These constraints are enough to represent recessive accentuation of non-compound words in ancient Greek. Kiparsky then moves to handle non-compound words subject to more opaque

phenomena: namely, contraction and final consonant deletion. We have shown in previous sections how contraction operates for Greek verbs. Final consonant deletion has similar effects on accentuation for neuter participles. In ancient Greek, the only consonants which can end a word are /n/, /s/, and /r/; any other word-final consonants are deleted.[2] Let us take the neuter participle *apoktéinon* ἀποκτεῖνον, 'killing.' From this surface form, we would expect an accent on the antepenult; however, this participle derives from an original *apoktéinont*, whose complex coda would force the recessive accent to fall on the penult. Thus, recessive accentuation must have been assigned before final consonant deletion.

As Noyer was right to point out, it is in cases like these that classical OT fails. Let us consider the contract verb *philéite* φιλεῖτε. The above constraints would incorrectly choose **phí.lei.te*[3] φίλειτε as the output, as shown in (20):

(20)   **The incorrect derivation of contract verb accentuation**

phi.lei.te, φιλειτε	*μμ́.μ]	IDENT(ACC)	ALIGN
☞ a. phí.(lei).te, φίλειτε			*
b. phi.(léi).te, φιλεῖτε		*!	

To answer this issue, Kiparsky adopts a stratal OT approach, where the stem level and constraint level are characterized by distinct constraint systems that operate in sequence—that is, the optimal output of the stem-level tableau becomes the input of the word-level tableau. Kiparsky cites Hedin (2000) who argues that contraction is a word-level phenomenon. Thus, taking our φιλεῖτε example, we show in (21) what we would happen at the stem level (i.e., pre-contraction):

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[2]This is slightly reductive. Some proclitics can also end in /k/. And, in the diachrony of ancient Greek, some word-final consonants were changed into acceptable varities; for instance, word-final *m from Proto-Indo-European appears in Greek as /n/.

[3]Note that *ei* is a diphthong here post-contraction; thus, we do not separate the two in our syllabification.

(21)   **Stem-level derivation of a contract verb**

phi.le.e.te, φιλεετε	*μμ́.μ]	IDENT(ACC)	ALIGN
☞ a. phi.lé.(e.te), φιλέετε			*
b. phi.le.(é.te), φιλεέτε		*!	

The output of this tableau, *phi.lé.(e.te)*, would then be fed as the input into the word-level tableau. However, contraction and final consonant deletion (though the latter does not occur in this case) need to occur at the word-level as well. To accomplish this, Kiparsky introduces two more undominated constraints which exist exclusively at the word level, given below as (22) and (23):

(22)   ONSET

Every syllable must have an onset.

(23)   *-CC

No word-final complex clusters allowed.[4]

The ONSET constraint drives contraction; the *-CC constraint drives final consonant deletion. With these constraints defined, below in (24) is the word-level tableau:

(24)   **Word-level derivation of a contract verb**

phi.lé.(e.te), φιλέετε	ONSET	*-CC	*μμ́.μ]	IDENT(ACC)	ALIGN
a. phi.lé.(e.te), φιλέετε	*!				*
b. phí.(lei).te, φίλειτε				*!	*
☞ c. phi.(léi).te, φιλεῖτε					
d. phi.(leí).te, φιλείτε			*!	*	*

This example gives the reader a sufficient sense of how Kiparsky's stratal OT analysis of ancient Greek accent operates.

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[4]Presumably some additional constraint would be required to protect the two word-final complex clusters which are permissible in ancient Greek, namely [ks] <ξ> and [ps] <ψ>. We do not include such a constraint here for the sake of keeping the tableaux neat.

3.2   Diachronic Stratal OT

In the next chapter, we will provide a diachronic application of Kiparsky's stratal OT model of Greek accentuation in order to demonstrate the actuation of Vendryes' Law. However, we must first clarify what it means exactly to extend stratal OT into the diachronic dimension. How, in other words, do we make stratal OT diachronic?

As Holt (2013: 546) has identified in his survey of different diachronic applications of OT, the predominant means by which historical linguists have extended classical (i.e., non-stratal) OT to the diachronic dimension is by proposing constraint rerankings. Zubritskaya (1997), in her foundational paper on palatalization assimilation in Modern Russian consonant clusters, addresses the loss of palatalization assimilation with a diachronic application of classical OT. She defines the constraint PAL, which requires maximal association of a feature and thus drives assimilation, and then she defines a family of markedness constraints that operate against palatalization. She argues that the process of regular sound change can be theorized as a gradual reranking of the PAL constraint below the other family of markedness constraints, implying that the direction of sound change is from more to less marked. This last detail will be crucial for our analysis of Vendryes' Law in the following chapter. Following from this reranking of constraints is what Inkelas (1995) "lexicon optimization." If there were only a reranking of constraints without any lexicon optimization, then new child learners of a post-reranking language would be imagined to supply antiquated input forms that incur an unnecessarily high number of violations. While one aspect of an OT grammar is its ability to accept any input and still select for the optimal output (i.e., "Richness of the Base"), it would be unparsimonious to presume that the "default" input to the system would be one which incurs a high number of violations for the sake of being identical to the pre-reranking input. Thus, lexicon optimization supposes that, as a consequence of constraint reranking, the new child learners of a language incorporate the post-reranking surface forms of words into their individual lexicons, and it is these forms that occur as inputs in OT derivations.

Though constraint reranking has been regarded as the most canonical method of showing diachronic changes with classical OT, it is by no means the only way. Reiss (2003) has argued that, in cases of analogy (both across and within inflectional paradigms), analogical change can be represented exclusively with lexicon optimization. For Reiss, lexicon optimization is not only a necessary consequence of constraint reranking, but also a phenomenon that can account for change on its own. However, in Reiss's account, lexicon optimization as the sole driver of change is only proposed for cases of analogical change and paradigmatic leveling, not for the kind of regular Neogrammarian change represented by Zubritskaya's account of constraint reranking in Modern Russian.

Reiss defines analogical change as the replacement of a form that is diachronically "regular" but appears irregular and opaque on the surface with a form that is diachronically "irregular" but appears regular and transparent on the surface. Reiss's examples are from Icelandic, but for this essay we can consider a similar example from Greek: the collapse of the PIE labiovelar. Whereas ancient Greek only has three places of articulation for stops (bilabial, dental, velar), PIE is also reconstructed to have had palatal and labiovelar stops. PIE labiovelars inherited into ancient Greek regularly changed into either dental stops or labial stops depending on the sound which follows them. Before the front vowels, the labiovelar *k^w regularly became the dental /t/. Before back vowels and consonants, the labiovelar *k^w became the bilabial /p/. However, note the lack of consonant alternation in the present tense paradigm of the verb *hépomai* ἕπομαι 'I follow,' whose PIE stem is *sek^w-, shown in (25):

(25)   **Present tense paradigm of *hépomai* ἕπομαι, 'I follow'**

	Singular	Plural
1st person	*hépomai* ἕπομαι	*hepómetha* ἑπόμεθα
2nd person	*hépeei* ἕπη	*hépesthe* ἕπεσθε
3rd person	*hépetai* ἕπεται	*hépontai* ἕπονται

If there had not been any analogical change to level the paradigm, we would expect the stem ἑπ- to appear only in the 1st person singular, 1st person plural, and 3rd person plural; in all

other forms we would expect a stem with a dental *ἐτ-. Thus, this example from the changeover between PIE and Greek fits with Reiss's definition of analogy: the "regular" (which is to say, diachronically expected) form *ἐτ- is replaced with a form that is diachronically irregular but makes the paradigm seem more uniform. How would this sound change be represented in OT? According to Reiss, simply by lexicon optimization. At some point in the development of the ancient Greek language, speakers would have begun pronouncing bilabials across this paradigm's verb stems, and this would be incorporated into the lexicon by child speakers.

So, both constraint reranking and lexicon optimization can be tools for representing sound change in classical OT; the former is used for regular sound change and entails lexicon optimization as a necessary consequence, while the latter can be used by itself for cases of analogical change.

However, these proposals have been given for classical OT, and we are not working with classical OT. As both Noyer (1997) and Kiparsky (2003) have shown, classical OT is theoretically insufficient for representing the opacity and cyclicity effects—and although these effects do not directly bear on Vendryes' Law, we must presume that the phonological grammar for Greek accentuation is the same for all words, and so we must preserve the stratal OT analysis even for our handling of Vendryes' Law. Can we extend constraint reranking and/or lexicon optimization to sound change in stratal OT, or do we need to devise new methods of construing sound change?

The literature on sound change in stratal OT is much more complicated than the scope of both this thesis and this phonological puzzle would allow.[5] For our purposes, let us assume that both constraint reranking and lexicon optimization can be adapted to fit within the theoretical medium of stratal OT. In fact, constraint reranking is particularly well-suited to stratal OT. One of the main tenets of stratal OT is that the constraints and their rankings can differ between strata. Following this logic, we could feasibly rerank constraints at, say, the stem level while preserving the ranking of constraints at the word level. This would facilitate the reranking of constraints

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[5]I defer the interested reader to Bermúdez-Otero (2007, 2015, 2018) for more on the theoretical mechanics of sound change in stratal OT.

for handling a sound change that manifests at the stem level without changing the architecture of the grammar at the word level. As for lexicon optimization, we must presume that it only occurs at the lowest level of the grammar (i.e., the stem level), as the output of the stem level is directly input into the word level without any chance for intermediate optimization. In other words, the stratal OT phonological system only interfaces with the lexicon at the stem level, so lexicon optimization can only affect the input at the stem level.

So, both constraint reranking and lexicon optimization will be available to us in the next chapter as tools for representing the actuation of Vendryes' Law with the theoretical machinery of stratal OT. The question, to be settled next, is *which* tool we must use.

Chapter 4

Regular or Analogical? Two Diachronic Stratal OT Analyses of Vendryes' Law

In this chapter we answer the question of how Vendryes' Law's regularity by presenting two possible analyses within the parameters of diachronic stratal OT. In the first analysis, Vendryes' Law is treated as a regular sound change, and we suppose that the sound change occurred in the grammar by the reranking of constraints. In the second analysis, Vendryes' Law is treated as an analogical change, and we suppose that the sound change occurred in the grammar strictly by lexicon optimization.

4.1   Constraint Reranking: Vendryes' Law as Regular Sound Change

In this analysis, we suppose that Vendryes' Law was a regular sound change. The input would have been any three-syllable properispomenon word, and the output would have been a three-syllable proparoxytone word.

Let us take the Vendryes'-affected word *hetóimos/hétoimos* ἑτοῖμος/ἕτοιμος as an example. If we were to put this word into Kiparsky's stratal OT algorithm without changing anything, we

would receive its proparoxytone, post-Vendryes' form as in (26) below:

(26)   **Default tableau for deriving ἕτοιμος**

he.tói.mos	*μμ́.μ]	IDENT(ACC)	ALIGN
☞ a. hé.(toi).mos			*
b. he.(tói).mos		*!	

This confirms something which has been suggested throughout this thesis: recessive accentuation is the default pattern of accentuation in ancient Greek. Any accentuation which is not recessive is marked. Thus, the pre-Vendryes' forms of these words given originally in (2) are *marked*, and we can think of Vendryes' Law as removing the marked accentuation pattern of these words and rendering them susceptible to receive the unmarked recessive accent.

Kiparsky's stratal OT model of ancient Greek accent only represents the application of recessive accent and the ways in which the placement of recessive accent is complicated by morphophonological processes of inflectional contraction, final consonant deletion, and compound word formation. That is, his model does not include any kind of lexically marked accent. His remarks on lexically marked accent are brief, and they deserve to be quoted in full. Below, Kiparsky speaks primarily concerning the predictable tendency for two-mora word-final syllables to receive an acute accent in the nominative and accusative cases, before speaking about lexically marked accent more generally:

It is not an inherent property of any particular case morpheme, but a morphophonological property associated with the direct cases, *qua* morphological categories. Just how it should be handled is difficult to decide: perhaps by a morphologically triggered alignment constraint, or by a floating accent anchored to the right edge of the word. What is clear is that the final acute intonation of the strong cases is a marked intonation on final syllables, and circumflex by ALIGN is the default.

As a matter of fact, morphological right-edge accent is practically the only kind of lexically marked accent in Greek. It has been long recognized that the overwhelming

majority of basic stems in Greek are either recessively accented, or accented on the stem-final syllable (Kuryłowicz 1952:131 ff., Steriade 1988b). Penult accent hardly occurs in underived stems, though many inherently accented derivational suffixes can yield stems with penult accent. For example, nonderived words with penult accent, such as a hypothetical *peléku-s*, do not occur, although there are many derived words with penult accent, such as *anthroop-ísk-o-s* ἀνθρωπίσκος 'little person'. Once morphology is taken into account, stems can be divided into accented and unaccented stems, the former with a lexically associated stem-final accent, the latter with recessive accent. Both are preserved as far as the undominated constraints on accent and intonation permit. (Kiparsky 2003: 9-10)

A few aspects of Kiparsky's remark must be addressed. First, as Kiparsky does not decide how to handle the lexically marked accents within the architecture of his OT model, we must do so ourselves. Second, Kiparsky only considers morphologically right-edge accented words as lexically marked, and does not consider words with lexically marked penultimate accentuation. He writes that some words receive penultimate accentuation because they feature an inherently accented suffix in the penultimate position, as is the case with *anthroopískos* ἀνθρωπίσκος. But this is a different case from our Vendryes'-affected words. While the words we are dealing with are indeed derived words, their suffixes do not carry inherent accent in the same way that the diminutive -ίσκ- does in the case of ἀνθρωπίσκος. Words affected by Vendryes' Law feature either one of two accents: the adjectivizing suffix -ιος (most Vendryes'-affected words) or the etymologically ambiguous -μο- suffix (for ἑτοῖμος and ἐρῆμος)[1]. Crucially, neither of these suffixes bear accent (although, for the former, the PIE suffix from which it descends, *-yós*, does bear an accent), so the penultimate accentuation of the Vendryes'-affected words cannot be the result of the same inherent suffixal accentuation as we see with ἀνθρωπίσκος.

Three problems now stand before us. First, we must understand *why* the Vendryes'-affected words are lexically marked for properispomenon accent. Second, we must revise Kiparsky's

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[1]ἀγροῖκος is a special case, discussed below.

stratal OT model to incorporate one or more constraints that maintain lexically marked accent for inputs which have it. Third, we must figure out how to rerank our constraints in order to remove the lexically marked accent of our Vendryes'-affected words *without* removing the lexically marked accents of other classes of words (namely, right-edge-accented words and words who carry penultimate accentuation by virtue of their derivational suffixes).

4.1.1 Why are Vendryes'-affected words lexically marked for properispomenon accent?

In addition to there being only a small class of words affected by Vendryes' Law, the words contained in this class are of different and uncertain enough etymologies that it is difficult to ascribe a unilateral answer to this question. However, from the words whose etymologies are better understood, we can surmise that the sources of these lexically marked properispomenon accents are all based in early Greek contraction processes.

Our key example in this regard is ἀχρεῖος 'useless.' ἀχρεῖος can be split into three morphemes: ἀ- is the so-called "alpha privative," a nominal negator; -χρέ- is from the root for "need," from the PIE stem *$g^h reh_1$- (cf. ancient Greek χρή, "it is necessary (impersonal)"), and the adjectivizing suffix -ιος. From this alone, it should be clear that when the latter two morphemes combine, the epsilon contracts with the iota to produce a diphthong, and as a result the accent is respelled as a circumflex. As for why we have an epsilon instead of an eta, we can look to the Ionic form ἀχρήϊος and suppose that the eta shortened to an epsilon (which is typical) and then contracted with the iota to create a circumflex-accented diphthong. So, the lexically marked accent of this word comes from contraction in its morphological composition.

This can be extended to ὁμοῖος, which is composed of parts ὁμό- and -ιος; evidence for the accentuation of the first morpheme comes from the distended epic form ὁμοίϊος.[2] We have to assume a similar process for γελοῖος. The stem of this word is γέλα-, so the reason for the placement

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[2]Though see the relevant dictionary entry from Beekes (2010), who argues that the accentuation of ὁμοῖος is modeled on that of ποῖος.

of accent and source of omicron in γελοῖος are both unclear. But we do have an epic distended form in γελοίϊον, which suggests that this word underwent a similar process as ὁμοῖος to arrive at its properispomenon accentuation. Lastly, we can presume a similar process for τροπαῖον, which is derived from the composition of τροπή and -ιος; the source of the alpha (as opposed to the expected epsilon, cf. ἀχρεῖος) can be ascribed to some Attic-Ionic alternation between η and ᾱ.

So, contraction with the -ιος suffix accounts for most of our Vendryes'-affected words. But how do we explain the lexically marked accentuation of ἑτοῖμος, which does not feature this suffix? Indeed, the etymology of this noun is unclear. Kuiper (1933: 278ff) has proposed a de-locative formation from the locative *ἑτοῖ (from ἑτός). However, Beekes dismisses this as a mere guess: neither *ἑτοῖ nor *ἑτός are attested words (though *ἑτός is argued to derive from *ἑτός, "in vain"), and the meaning of the -μο- suffix is unclear. This latter point also obscures the source of lexically marked accent on ἐρῆμος, as we do not know the etymology of this word.

Lastly, we can explain the accent on ἀγροῖκος through contraction, although this word does not feature the -ιος suffix. This word is composed of the components ἀγρός and οἶκος; it should be clear how properispomenon accentuation would result from this contraction.

Then, we have satisfactory explanations for almost all of our Vendryes'-affected words: their lexically-marked properispomenon accentuation arises from contraction at the addition of derivational suffixes.

4.1.2 Problems with a diachronic stratal OT analysis

To successfully incorporate lexically-marked accent into Kiparsky's stratal OT model, we must introduce some number of constraints at the stem-level that require inputs with lexically-marked accents to keep their accents. This is not difficult; it is as simple as introducing an input-output faithfulness constraint ranked above the IDENT and ALIGN constraints that assign recessive accent. This way, any assignment of recessive accent by these two IDENT and ALIGN constraints is blocked by the preservation of lexical accent enforced by our new input-output faithfulness con-

straint. However, before we go ahead with such a constraint, we should consider the implications of what might happen when we rerank such a constraint for the diachronic implementation of Vendryes' Law. Imagine a constraint as in (27):

(27)   IDENT-IO(ACC)

Assign a violation for every segment in the output which is accented differently from the corresponding segment in the input.

And since we have just defined a constraint called IDENT-IO(ACC), let us now in (28) redefine Kiparsky's IDENT constraint for clarity:

(28)   EQUAL FOOTING (EQFT)

Assign a violation for every foot in which the two morae of the foot do not carry the same accent. (Formerly known as IDENT.)

If we were to crucially rank IDENT-IO(ACC) above both EQFT and ALIGN, we would achieve the following desirable results for both our Vendryes'-affected words (29) and for other words that carry lexically-marked accent (30):

(29)   **Tableau for pre-Vendryes' ἑτοῖμος**

he.tói.mos, ἑτοῖμος	IDENT-IO(ACC)	EQFT	ALIGN
a. hé.(toi).mos, ἕτοιμος	*!*		*
☞ b. he.(tói).mos, ἑτοῖμος		*	

(30)   **Tableau for a word with lexically-marked accent**

poús, πούς	IDENT-IO(ACC)	EQFT	ALIGN
a. (póu)s, ποῦς	*!*	*	
☞ b. (poú)s, πούς		*	*

However, looking ahead to the issue of constraint reranking, we come upon a problem. If we were to implement Vendryes' Law by demoting IDENT-IO(ACC) to the bottom of the constraint

ranking, this would cause our Vendryes'-affected words to receive default recessive accentuation, as we would hope for. However, this would also cause *other* words with lexically marked accent, such as the above πούς, to receive default recessive accentuation. We do not want this. So, a simple input-output faithfulness constraint is not enough. We should also mention now that, while we could postulate an ultraspecific markedness constraint that targets words of the shape /μ.μ́μ.μ/ and argue that Vendryes' Law is in effect a promotion of this constraint to undominated status. However, such a specific constraint is against the spirit of OT. A founding principle of OT is the cross-linguistic universality of constraints, and no other language would have such a targeted markedness constraint be crucially ranked in its grammar.

In short, our goal is to find a way to rerank this IDENT-IO(ACC) constraint without having said reranking affect the accentuation of words like the morphologically accented πούς and ἀνθρωπίσκος. There are two ways we can do this. The first is by introducing another stratum between the stem and word levels. The second is by positing a morphological faithfulness constraint to protect words like πούς from undergoing the same accent retraction as our Vendryes'-affected words. We present the following two analyses below. In both analyses we use ἀσφοδελός 'covered in asphodel' as our test case to ensure that we have not overgeneralized any accentuation changes to the rest of the words with lexically marked accent. We have chosen this word as our test case because its marked accent is very transparently derived from the accented adjectivizing suffix -ός and can readily be contrasted with the recessively accented nominal form, ἀσφόδελος 'asphodel.' Let us proceed now with the analyses.

4.1.2.1   A Three-Stratum Analysis

One of the hallmark features of stratal OT is the ability to present different constraint rankings at different strata within a phonological grammar. Because we are seeking to change the *stem*-based idiosyncratic accent of Vendryes'-affected words without affecting the *suffix*-based marked accent of words like ποδούς and ἀσφοδελός, we argue here that we can add an extra stratum to Kiparsky's analysis that puts the affixation of derivational and inflectional suffixes on their

own stratum, separate from both the suffix level. Kiparsky is unclear about whether or not stem accentuation occurs at its own stratum separate from the affixation of suffixes to the stem; in one of his tableaux (Kiparsky 2003: 8) he suggests that this may indeed be the case. By this analysis, accent would be assigned at the stem level and then retained at the suffix and word levels.[3] Thinking ahead, we can foresee several issues this may pose, and we save time now by formalizing the constraints necessary to circumvent them. They are all presented below in (31-34):

(31) ALIGN-(μμ)-R

Assign a violation for every output which does not have a moraic trochee built from the right edge of the word.

(32) 1ACC

Assign a violation for every output which has more or less than one accent.

(33) *>3σ-ACC

Assign a violation for every output which has an accent placed more than three syllables from the right edge of the word.

(34) ALIGN-ACC

Assign a violation for every accentable mora in between the position of the output's accent and the head of the moraic trochee (Restatement of Kiparsky's ALIGN).
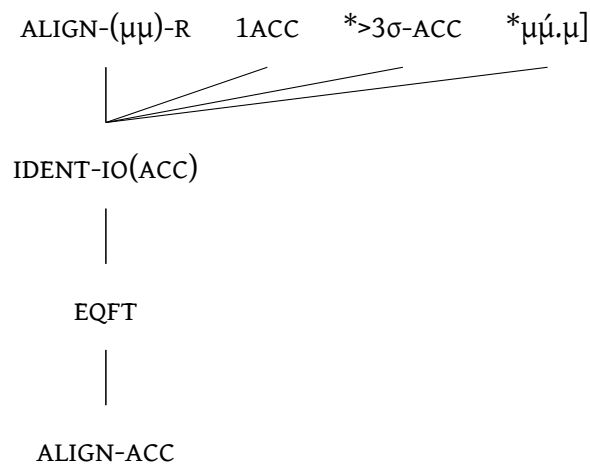
All of these constraints have been underlyingly assumed in our tableaux before this point, but we must formalize them now. The first constraint requires that a moraic trochee be built from the right edge of the word, as specified in §3.1. The second constraint requires that each word have

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[3]We should note here that there is one Vendryes'-affected word which may have necessarily undergone the sound change at the postlexical level: *égooge* ἔγωγε 'I[emphatic].' This word is derived from the combination of the pronoun ἐγώ and the clitic γε, which should yield *ἐγῶγε but which appears in all dialects and at all times as ἔγωγε. Because this accentuation is derived from enclisis, the change must have occurred at the postlexical level, where enclitics are presumably incorporated into the prosodic word. We have left this example out from the present analysis, not only because it merits a thesis of its own, but also because the so-called pre-Vendryes' form *ἐγῶγε is not attested, creating suspicion as to whether or not this is truly a Vendryes'-affected word.
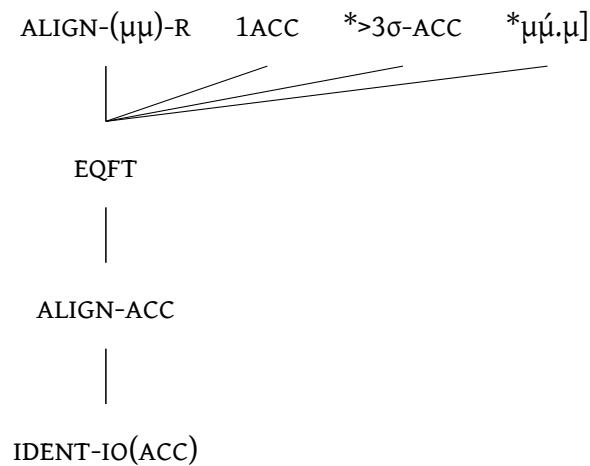
only one accent. This will be relevant for when we accent a stem and then attach an inherently accented suffix. The third constraint, though quite redundant with our typical recessive accent constraints, is defined to avoid those cases in which a stem receives proparoxytone accent and is then suffixed to extend the syllable count of the word. Lastly, the final constraint is a restatement of Kiparsky's ALIGN constraint, but named and defined with more clarity.

In (35-38) we provide the constraint rankings for the three strata, including in (36) the state of the stem level's constraint ranking after the reranking process has occurred:

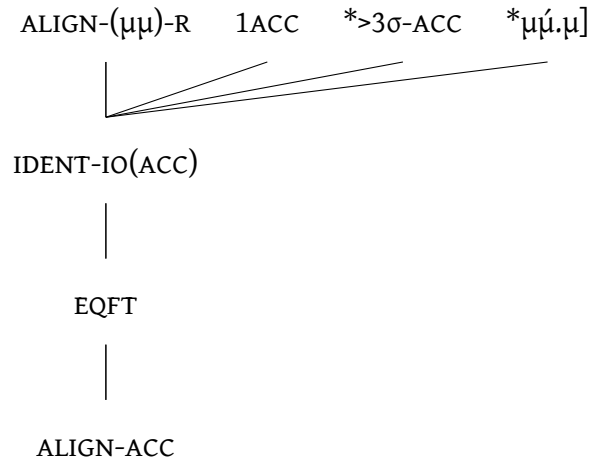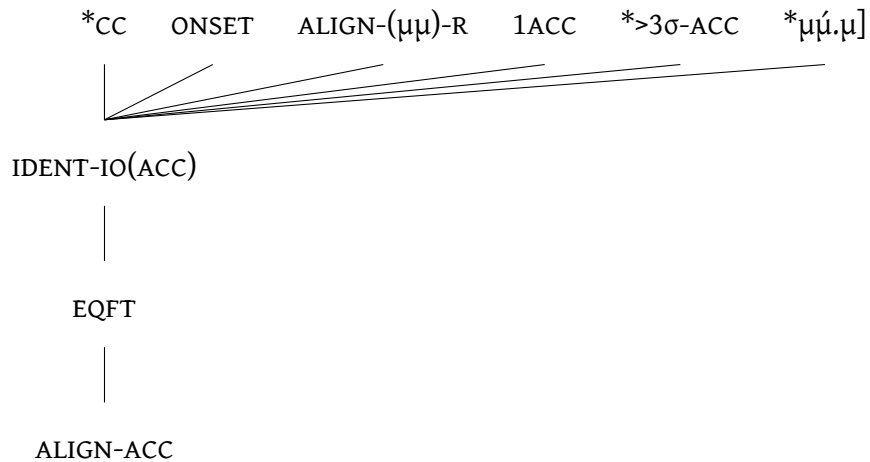(35)   **Stem level constraint ranking**

ALIGN-(μμ)-R   1ACC   *>3σ-ACC   *μμ́.μ]

IDENT-IO(ACC)

EQFT

ALIGN-ACC

(36)   **Reranked stem level constraint ranking**

ALIGN-(μμ)-R   1ACC   *>3σ-ACC   *μμ́.μ]

EQFT

ALIGN-ACC

IDENT-IO(ACC)

(37)   **Suffixal level constraint ranking**

ALIGN-(μμ)-R   1ACC   *>3σ-ACC   *μμ́.μ]

IDENT-IO(ACC)

EQFT

ALIGN-ACC

(38)   **Word level constraint ranking**

*CC   ONSET   ALIGN-(μμ)-R   1ACC   *>3σ-ACC   *μμ́.μ]

IDENT-IO(ACC)

EQFT

ALIGN-ACC

The crucial thing to note about this set of constraint rankings is the reranking in (36), where IDENT-IO(ACC) is demoted below the two recessive accent constraints, EQFT and ALIGN-ACC. Also, while we have the word-level constraint ranking specified here, the word-level phenomena are not crucial to our present analysis, as we are most concerned with what occurs at the stem and suffixal levels.

Now, for some examples. Below are the stem (39) and suffixal (40) tableaux for the derivation of ἑτοῖμος, before the application of Vendryes' Law.

(39)   **Pre-Vendryes' Stem Level Tableau**

he.(tói)-, ἑτοῖ-	ALIGN-(μμ)-R	1ACC	*>3σ-ACC	*μμ́.μ]	IDENT-IO(ACC)	EQFT	ALIGN-ACC
a. hé.(toi)-, ἔτοι-					*!*		*
☞ b. he.(tói)-, ἑτοῖ-						*	

(40)   **Pre-Vendryes' Suffixal Level Tableau**

he.(tói)-mos, ἑτοῖ-μος	ALIGN-(μμ)-R	1ACC	*>3σ-ACC	*μμ́.μ]	IDENT-IO(ACC)	EQFT	ALIGN-ACC
a. hé.(toi).mos, ἔτοιμος					*!*		*
☞ b. he.(tói).mos, ἑτοῖμος						*	

Now, if we were to rerank the IDENT-IO(ACC) constraint at the stem-level, we would correctly derive the post-Vendryes' form ἔτοιμος, as shown below in (41-42):

(41)   **Post-Vendryes' Stem Level Tableau**

he.(tói)-, ἑτοῖ-	ALIGN-(μμ)-R	1ACC	*>3σ-ACC	*μμ́.μ]	EQFT	ALIGN-ACC	IDENT-IO(ACC)
☞ a. hé.(toi)-, ἔτοι-						*	**
b. he.(tói)-, ἑτοῖ-					*!		

(42)   **Post-Vendryes' Suffixal Level Tableau**

hé.(toi)-mos, ἔτοι-μος	ALIGN-(μμ)-R	1ACC	*>3σ-ACC	*μμ́.μ]	IDENT-IO(ACC)	EQFT	ALIGN-ACC
☞ a. hé.(toi).mos, ἔτοιμος							*
b. he.(tói).mos, ἑτοῖμος					*!*	*	

To confirm that the system works on words with inherently accented morphemes, let us now derive ἀσφοδελός post-reranking (43-44):

(43)   **Post-Vendryes' Stem Level Tableau (Lexical Accent)**

as.(pho.de)l-, ἀσφοδελ-	ALIGN-(μμ)-R	1ACC	*>3σ-ACC	*μμ́.μ]	EQFT	ALIGN-ACC	IDENT-IO(ACC)
☞ a. ás.(pho.de)l-, ἄσφοδελ-						*	
b. as.(phó.de)l-, ἀσφόδελ-					*!		

(44)   **Post-Vendryes' Suffixal Level Tableau (Lexical Accent)**

ás.pho.(de.l-ó)s, ἄσφοδελ-ός	ALIGN-(μμ)-R	1ACC	*>3σ-ACC	*μμ́.μ]	IDENT-IO(ACC)	EQFT	ALIGN-ACC
☞ a. as.pho.(de.l-ó)s, ἀσφοδελός					*	*	*
b. ás.pho.(de.l-ó)s, ἄσφοδελός		*!	*			*	***
c. as.pho.(dé.l-o)s, ἀσφοδέλος					**!*	*	
d. as.phó.(de.l-ó)s, ἀσφόδελός		*!			**	*	**
e. as.phó.(de.l-o)s, ἀσφόδελος					**!*		*

These two examples should suffice in demonstrating the adequacy of this analysis for representing the actuation of Vendryes' Law via constraint reranking.

4.1.2.2   A Morphological Faithfulness Analysis

Besides needing to posit an additional stratum between the stem level and the word level, one point of theoretical weakness with the three stratum analysis is its redundant constraint. Even if it is true for ancient Greek that words cannot be accented further left than the third syllable (by the law of limitation), this constraint has already been encoded by ALIGN-ACC, which pulls the accent as close to the head of the moraic trochee as possible. Yet, the *>3σ-ACC constraint is necessary because it prevents recessively accented stems like ἀσφοδελ- from obtaining preantepenultimate accent when affixed with a non-accented derivational suffix. In OT, it is explanatorily inadequate to have a constraint with such a specific target, especially when said target is almost entirely accounted before by other more broadly-defined constraints.

The morphological faithfulness analysis avoids this, ironically, by positing a new constraint in (45) which is both more plausible and less redundant:
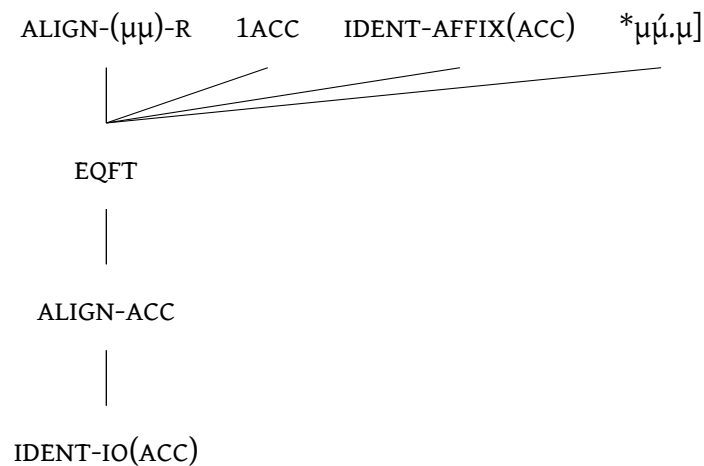
(45)   IDENT-AFFIX(ACC)

Assign a violation for every segment in the output which belongs to an affix and which does not carry the same accent as the corresponding segment in the input.

In (46-48) we provide the constraint rankings for the two strata, including in (47) the state of the stem level's constraint ranking after the reranking process has occurred:

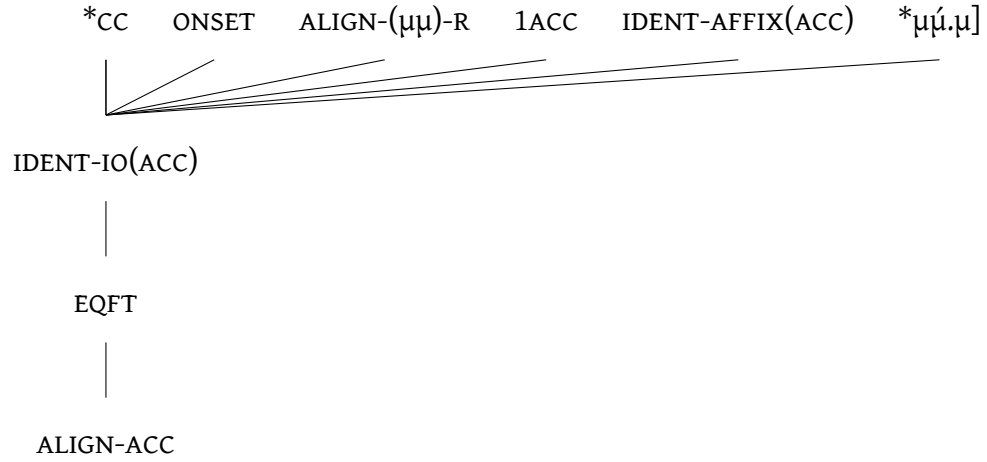(46)   **Stem level constraint ranking**
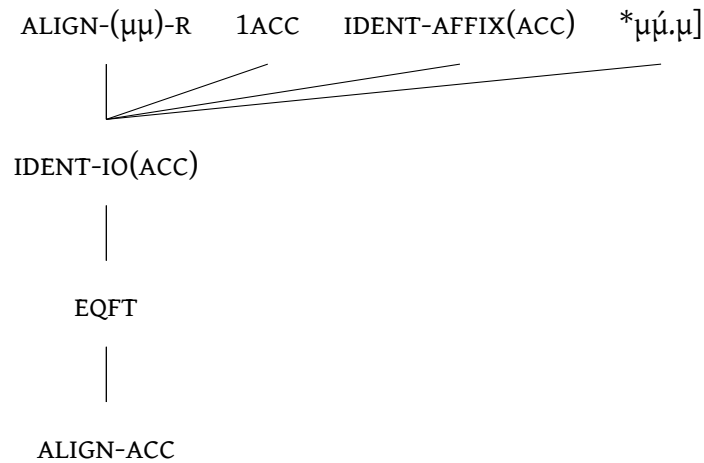
ALIGN-(μμ)-R   1ACC   IDENT-AFFIX(ACC)   *μμ́.μ]

IDENT-IO(ACC)

EQFT

ALIGN-ACC

(47)   **Reranked stem level constraint ranking**

ALIGN-(μμ)-R   1ACC   IDENT-AFFIX(ACC)   *μμ́.μ]

EQFT

ALIGN-ACC

IDENT-IO(ACC)

(48)   **Word level constraint ranking**

*CC   ONSET   ALIGN-(μμ)-R   1ACC   IDENT-AFFIX(ACC)   *μμ́.μ]

IDENT-IO(ACC)

EQFT

ALIGN-ACC

We will not demonstrate the effectiveness of this model in deriving both ἑτοῖμος and ἕτοιμος; instead, we will verify in (49) that it remains functional on ἀσφοδελός in the post-reranking state:

(49)   **Post-Vendryes' Stem Level Tableau (Lexical Accent)**

as.pho.(de.l-ó)s, ἀσφοδελ-ός	ALIGN-(μμ)-R	1ACC	IDENT-AFFIX(ACC)	*μμ́.μ]	EQFT	ALIGN-ACC	IDENT-IO(ACC)
☞ a. as.pho.(de.l-ó)s, ἀσφοδελός					*	*	
b. as.phó.(de.l-o)s, ἀσφόδελος			*!			*	**
c. ás.pho.(de.l-ó)s, ἄσφοδελός		*!			*	***	*
d. ás.pho.(de.l-o)s, ἄσφοδελος			*!		*	**	**

Thus, we have demonstrated that the morphological faithfulness analysis, like the three-stratum analysis, is adequate for representing the actuation of Vendryes' Law as a regular sound change.

4.1.2.3   Which one is better?

Of these two constraint reranking analyses, the second is a more parsimonious analysis and is thus more theoretically sound. The three-stratum analysis requires the positing of a constraint to militate against accent placement, *>3σ-ACC, that is redundant with several of our other constraints. The constraints ALIGN-(μμ)-R, EQFT, and ALIGN-ACC have all been painstakingly designed to implement recessive accentuation into the OT grammar. In comparison, the *>3σ-ACC is theoretically inelegant and does not do anything that these three constraints cannot handle on their

own. In fact, the only reason for positing the *>3σ-ACC constraint is to circumvent another problem created by the three-stratum analysis: the risk of preantepenultimate-accented words. This problem arises when a stem which is three syllables or longer (such as ἀσφοδελ-) is accented at the stem level and then receives a suffix at the suffixal level. And this problem, of course, would not arise if we did not have to postulate the stem and suffixal levels as two different strata. In short, the three-stratum analysis creates a problem (the *>3σ-ACC constraint) to solve a problem (preantepenultimate accentuation) which was created by its very conceit: the stratification of the suffix as discrete from the stem. This is evidently a bad model.

Meanwhile, the morphological faithfulness analysis has issues, but they are not as egregious. While morphologically specificied constraints are frequently attested in the literature on OT,[4] it is far more cross-linguistically common for the *stem* to be the subject of a morphologically specified constraint, not the affix. Moreover, our IDENT-AFFIX(ACC) constraint is effectively redundant with our IDENT-IO(ACC) constraint, since the two do the same thing but the former has a more narrow scope than the latter. Any output which violates the former constraint will also violate the latter, which is indicative of their redundancy in functional load. That said, this second analysis does not require us to posit any additional stratification of the grammar, and its redundancies are less glaring; thus, if we were analyze Vendryes' Law as a regular sound change via constraint reranking, this would be the analysis by which to do it. But it is also worth noting now that the demotion of faithfulness constraints to represent regular sound change is far less cross-linguistically common than the demotion of markedness constraints; as discussed in Zubtriskaya's work, the direction of sound change in OT representations is from more marked to less marked. Therefore, since any regular change analysis we use has some constraint-based redundancies, and since any regular change analysis requires the typologically rare demotion of a faithfulness constraint, we should already be skeptical of the accuracy of a regular change analysis of Vendryes' Law. Let us keep this in mind as we move to consider Vendryes' Law as an analogical change.

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[4]For examples, see Fukuzawa (1999), Itô and Mester (1999, 2001), Kraska-Szlenk (1997, 1999), and Pater (2000).

4.2 Lexicon Optimization: Vendryes' Law as Analogical Change

In this analysis, we suppose that Vendryes' Law was actually not a regular sound change in the Neogrammarian sense, but was instead an analogical change that restored proparoxytone accentuation to a small group of words in Attic Greek. It should be immediately clear to the reader that this analysis is much more appealing. We have previously stated throughout this thesis that recessive accentuation is the default type of accentuation in ancient Greek. The pre-Vendryes' varieties of the words in question (i.e., their properispomenon forms) are thus marked, and the actuation of Vendryes' Law is a removal of their lexically marked accent from their corresponding lexemes. Thus, in this analysis, there is no constraint reranking. Instead, all change occurs in the mental lexicon—for OT purposes, all change occurs at the level of the input.

The implementation of this is not hard to imagine; we simply remove the accent from the input. Thus, the input *he.(tói).mos* becomes *he.(toi).mos*, and we proceed with our OT algorithm as follows in (50):

(50)   **Vendryes' Law via Lexicon Optimization**

he.toi.mos, ἕτοιμος	ALIGN-(μμ)-R	1ACC	*μμ́.μ]	IDENT-IO(ACC)	EQFT	ALIGN-ACC
☞ a. hé.(toi).mos, ἕτοιμος						*
b. he.(tói).mos, ἑτοῖμος					*!	

As we can see, recessive accentuation carries out as normal; now, the only purpose of IDENT-IO(ACC) is to prseserve lexically marked accents which are not retracted under Vendryes' Law, such as words with inherently accented derivational suffixes (ἀσφοδελός, ποδούς).

The more pertinent question in cases of analogy concerns the motivation for analogy. However, this is not difficult to answer. First of all, Vendryes'-affected words are marked in their pre-change accentuation, as we have stated. But they are not only marked with respect to recessively accented words in ancient Greek–they are marked with respect to *all* words. Recall that, for words which are not given default recessive accent, the overwhelming preference is to have

accent on the ultima, whether by inheritance from PIE or by carrying some inherently accented suffix. Therefore, Vendryes'-affected words are highly marked for their penultimate accentuation against the *entire* Greek lexicon. As for what the analogues driving the change could be, there are at least three words of the same metrical shape as the Vendryes'-affected words (μ.μμ.μ) but which only ever appear with proparoxytone accent: δίκαιος 'just,' μάταιος 'futile,' and βέβαιος 'steady.' These three alone are convincing enough as analogues that would motivate the restructuring of our Vendryes'-affected words in the lexicon. But even if these words in particular were not the analogues, we could imagine that *any* recessively accented word could serve as an analogue, since this pattern of accentuation is so overwhelmingly regular in ancient Greek. It does not take a large stretch of the imagination to consider an ancient Greek speaker pronouncing ἑτοῖμος as ἕτοιμος on analogy with all the other words in ancient Greek that take proparoxytone recessive accent. Our Vendryes'-affected words are exceptionally marked in the Greek lexicon and are thus and under high pressure to conform to the regular patterns of Greek accentuation.

Chapter 5

Conclusion: Vendryes' Law was an Analogical Change

In this thesis we have presented a history of scholarship on Vendryes' Law, incorporating both ancient and modern grammatical sources, followed by two primary analyses within the methodological confines of stratal Optimality Theory to determine whether Vendryes' Law was a regular sound change or an analogical change in the diachrony of ancient Greek. Based on the analyses offered in the previous chapter, Vendryes' Law was in all likeliness not a regular sound change, but an analogical change.

In the last century, scholars in the field of Greek accent have struggled to reconcile the apparent clarity of Vendryes' Law with the paucity of words affected by it. It is puzzling that a change to such a small set of words in the Attic Greek lexicon would have been so substantially remarked upon in the Greek grammatical tradition centuries after the actuation of the sound change. However, we must remember how salient the proper pronunication of the pitch accent was to speakers of ancient Greek—we cannot forget the ridicule of Hegelochus and his "I see a weasel!" Therefore, what seems to us to be a minor change in a single dialect of Greek may have in fact been much more significant to ancient Greek speakers, and may have even operated as a kind of dialectal shibboleth.

However, this is not to say that the sound change was regular across the Greek lexicon. While it would be possible for a regular sound change to target such a specific subset of words delineated by their moraic, syllabic, and accentual structures (three syllables of the shape μ.μμ.μ, necessarily marked with properispomenon accent), it is simply more parsimonious, given the overwhelming regularity of recessive accentuation and the overwhelming irregularity of lexically marked properispomenon accentuation, to presume that Vendryes' Law describes an analogical change. Given that the analogical change analysis is predicated on child learners, we can turn to the Tolerance Principle (Yang 2005, 2016): child learners will only tolerate so much irregularity in the face of a parsimonious generalization, so our small set of seven Vendryes'-affected words with highly irregular, lexically marked penultimate accentuation make sense as natural victims to the analogical chopping block. This assumption is then corroborated by our application of stratal OT to the issue, as we have shown that this sound change is rather resistant to documentation within stratal OT as a regular sound change, but lends itself quite readily to documentation within stratal OT as an analogical change.

In the process of demonstrating that Vendryes' Law was an analogical change, this thesis has made several important contributions for both classicists and linguists. Most importantly, this thesis has demonstrated how contemporary phonological theory can be utilized as a diagnostic tool for assessing how a sound change occurred in the distant past. We hope this tool will be more enticing to future scholars of historical linguistics than the traditional 20th-century approach of selecting individual exceptions to supposed "sound laws." Additionally, this thesis has provided concrete examples of how diachronic methods of analysis, even those first proposed for classical OT, can be implemented into the theoretical framework of stratal OT. Stratal OT has been commended by its designers for its well-suitedness at representing sound change within an OT system; however, examples of said diachronic applications have been sparse within the literature. This thesis hopes to have demonstrated the diachronic aptitude of stratal OT by combining its fundamental principles about stratification with earlier work on OT sound change through constraint reranking and lexicon optimization. Additionally, this thesis hopes to give future au-

thors the tools to examine other sound changes in the diachrony of Greek within the theoretical framework of stratal OT. Most interesting to explore would be the actuation of Wheeler's Law, which unlike Vendryes' Law occurred at a pan-dialectal stage in ancient Greek and has a more convincing case for regularity. Lastly, this thesis is now the largest piece of scholarly writing on the sound change known as Vendryes' Law. We hope that this will encourage future scholars to pay more attention to the minutiae of Indo-European linguistics: sometimes, that is where the most interesting problems are to be found. In the meantime, this thesis has demonstrated that Vendryes' Law was indeed not a sound law—assuming that the phrase "sound law" implies a regular Neogrammarian sound change—but instead an analogical change that occurred in the around 450-400 BCE to restore default recessive accentuation to a select few words in the Attic Greek lexicon.

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