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Penthemimeral Elision in Tragic Trimeters

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Abstract: This paper provides a statistical survey of the incidence of elision at the penthemimeral caesura in the iambic trimeters of Greek tragedy. It updates and builds on the work of Descroix (1931) by considering the rates of elision of different types of words: lexicals, nonlexical polysyllables, and nonlexical monosyllables. While all tragedians elide less at the caesura than throughout the line, in Aeschylus the rate of this reduction is far greater for lexicals and polysyllabic nonlexicals than it is for monosyllabic nonlexicals. On this evidence, and the evidence of interlinear elision, it is tentatively suggested that lexicals and nonlexical polysyllables should together be considered as the more constrained elisions. When the rates of constrained elision are examined, the difference between Aeschylus and later Euripides is revealed to be twice that obtained when bulk figures are used. This difference is attributed to a combination of Euripides' adoption of more fluent phrasing towards the end of his career and the tragedians' different approaches to compositional constraints.

Keywords: Greek tragedy, Iambic trimeter, Elision, Caesura

Sometimes in the iambic trimeter, there is an elision over the penthemimeral caesura, as in οὐ μὴν γυναικῶν γ' εἷς δυοῖν ἔφυν πόσις (Eur. *Hel.*, 571). The frequency of lines with this feature, which I shall call penthemimeral elision (PE), in tragedy has been documented by Descroix,[1] who finds that the proportion of trimeters with PE in individual tragedies varies from about four to ten percent, with the rate in Euripides being generally higher than in Aeschylus or Sophocles. But these bulk figures take no account of the type of words that are elided, a factor that could be important given that some metrical and prosodic features, including elision itself at times, are impacted by the lexicality of the words involved: the elision of lexical words is rare in Callimachus and Isocrates, for ex-

1 Descroix (1931) 262–263. Van Raalte (1986) 167–168 provides similar counts, but only for a sample of two plays from each tragedian.

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ample.[2] I begin, therefore, by separately considering the frequency per tragedian of trimeters with PE of lexicals (LPE) and of nonlexicals (NPE). The results of these counts are presented in Table 1, but it is necessary first to define what is being counted.

I am investigating elisions that occur at the penthemimeral caesura, defined as any word-group end after the fifth position.[3] This means that all elisions that occur after the fifth position but within a word-group are disregarded.[4] In identifying word-groups, I have followed the list of non-structural word-boundaries given by Van Raalte,[5] which mainly means disregarding elisions of the following types: between a preposition and its noun (e.g., ἐπ' ἀνδρὶ, Aesch. *Ag*. 1400), between a word and an enclitic (e.g., τόδ' ἐστὶ, Aesch. *Cho*. 170), after a prepositive particle (e.g., ἀλλ' εἶπον, Soph. *OT* 1161), and in a stock phrase (e.g., σάφ' ἴσθ', Aesch. *Pers*. 337).[6] I consider as lexical: all nouns, verbs (except for the enclitic forms of εἰμί and φημί), and adjectives, as well as those adverbs that are derived from adjectives. Nonlexical words include adverbs relating to time or

2 Maas (1962) 73; Devine/Stephens (1994) 262 (who also observe that elision of lexical words in most prose inscriptions is rare); and Hedin (2000) 183 (on Isocrates only). Hedin's investigation into elision at the caesura in Eur. *Bacch*. found no evidence for a difference of approach to lexical and nonlexical words, but as he himself notes (p. 199 n. 20), the data set is small, and a larger set could reveal a significant difference. As far as other metrical features are concerned, Devine/Stephens (1983) 1 observe that at bridges word boundaries involving nonlexicals are more common than between lexicals.

3 This uses the commonly accepted definition of a caesura as any place where a word-group end occurs much more frequently than would normally be expected; see Maas (1962) 33 and West (1982a) 192. I do not dispute this definition, but if we accept West's (1982b) 293–294 explanation of how caesurae arose – that poets composed in cola, and the caesura is the meeting place of the two cola – then it is clear that a line can have only one functional caesura; see Van Raalte (1986) 18, 172, 406 n.37. It is possible that a poet would have a different practice with regard to PE when it occurs at functional caesura compared with when it does not. To test this by counting PE at every functional caesura is not feasible, since determining where the functional caesura is for each line would be too subjective. But it can be tested, to some extent, by counting only lines where there is PE with no accompanying break at position seven. I give these figures in note 8.

4 Maas (1962) 84. There are occasions where a caesura possibly interrupts what would normally be a word-group, e.g., καλῶς κάτοιδ'· ἀλλ' ὡς τάχιστά μοι μολὼν (Soph. *OC* 1475). I have discounted all these, but they are too few to make a substantial difference to my calculations (Aeschylus has none, and I found only single figures in both Sophocles and Euripides).

5 Van Raalte (1986) 162–165 gives details both of the rationale for using word-groups and of the classifications used in her figures.

6 The texts used for all quotations and for counts of PE are: Page (1977) for Aeschylus, Lloyd-Jones/Wilson (1992) for Sophocles, and Diggle (1981–1994) for Euripides. I exclude lyric trimeters, but include those that are part of an epirrhematic exchange. I also exclude lines that are obelised or in square brackets.

space (e.g., οὐκέτι, ἐνθάδε), pronouns, conjunctions, particles, and all other words.[7]

Table 1

	Trimeters	PEs (%)	LPEs (%)	NPEs (%)
Aeschylus	3496	153 (4.4)	32 (0.9)	121 (3.5)
Sophocles	7471	379 (5.1)	136 (1.8)	243 (3.3)
Euripides	16095	1376 (8.5)	560 (3.5)	816 (5.1)

Table 1 shows that the differences between the tragedians are much greater for lexicals: LPEs are almost four times as common in Euripides than in Aeschylus, while NPEs are only about one and a half times as common.[8] It is possible, however, that this is a product of the rates of elision for these types of word, and is not related to the caesura position. To investigate this, I have counted lexical and nonlexical elisions at all internal positions in the trimeter as a point of comparison. This count has been generated with the aid of a computer program and uses different editions to those used for the counts of PE.[9] The large numbers involved

7 For a definition of lexical words see Devine/Stephens (1994) 291–292. For a comparable attempt to classify words, see Hedin (2000) 141, although he uses a third category – semilexical – for pronouns and nonlexical adverbs. Devine/Stephens (1994) 343–345 also identify a semilexical category, though it is defined differently to Hedin's. For the sake of simplicity (and bearing in mind that Hedin 2000, 183 makes no distinction between nonlexicals and semilexicals in his conclusions about the domain of elision for Isocrates), it seems better to keep the binary division in the first instance.

8 It should be kept in mind that Euripides uses penthemimeral caesura more than Aeschylus and Sophocles (in 82 % of lines, compared to 75 % and 74 % in Van Raalte's 1986, 168 counts). This would account for a small fraction of the higher percentage of PE found in Euripides, but the difference would still be substantial, even if allowance were made for this factor. If I count only those PEs which are not accompanied by a word-group end at position seven, i.e., those where the penthemimeral caesura is very likely functional, the percentages are: for Aeschylus 2.9 % (PEs), 0.6 % (LPEs), and 2.3 % (NPEs); for Sophocles 3.0 %, 1.3 %, and 1.8 %; for Euripides 6.4 %, 2.6 %, and 3.7 %. Naturally, these percentages are lower than those given above, but the ratios both between LPEs and NPEs and between different tragedians remain broadly similar, with Euripides being slightly further away from the other two tragedians on these counts. This suggests that the distinctions made in this paper regarding the tragedians' differing practice around PE, which are made only when the differences are very large, would remain valid if applied only to PE at functional caesura.

9 The texts used are those made publicly available as XML files by the Perseus project: Smyth (1922–1926) for Aeschylus; Jebb (1892–1900) for Sophocles; and Murray (1902–1909) for Euripides. These are edited to tag the iambic trimeters and then enriched with lexical data from the Diorisis

mean that textual variants are unlikely to significantly impact the overall picture.[10] In order to exclude elisions that occur within a word-group, I need to disregard the same types of words as described above for the manual counts: all elided prepositions, conjunctions, negatives, and prepositive particles, as well as any elided words followed by enclitics or postpositive particles. I have also disregarded σάφ', as it only ever appears when followed by a form of οἶδα as part of a set phrase. A count performed in this manner will not be perfect, but this approach makes it more feasible to use a large sample and is probably preferable to a manual count of fewer lines.[11] With these counts, as throughout this paper, I try to refrain from drawing interpretative conclusions except where the statistical evidence is overwhelming, which should further mitigate any imperfections in the counts.

Table 2

	Elisions at positions 1–11			PEs		
	Lexical	Nonlexical	Lexical percentage	LPE	NPE	Lexical percentage
Aeschylus	461	1061	30.3 %	32	121	20.9 %
Sophocles	1480	2828	34.4 %	136	243	35.9 %
Euripides[12]	740	1267	36.9 %	560	816	40.7 %

project (for details of this project, see Vatri/McGillivray, 2018). The computer program produces a list of all elided words which is ordered by part of speech and by lemma. This list is checked manually, and each word is assigned to the relevant class.

10 On the validity of using older editions when the numbers involved are large, see Baechle (2007) 325 and Butterfield (2008) 351. The accuracy of this method and the impact of using a different edition were checked by comparing the list produced for Aesch. *Sept.* against a list produced manually from the edition of Page (1972). The computer-assisted method found 297 elisions, the manual method 294. Of these, 289 appear in both lists, meaning that the computer-assisted list is over 95 % accurate. Furthermore, many of the textual discrepancies will not impact my counts, e.g., at *Sept.* 631 both τόν τ' and τόνδ' would appear in the count of nonlexical elisions.

11 There can be significant variation in the rate of elisions between plays (e.g. in Soph. *OT* there are 0.70 elisions per trimeter, while in *Aj.* there are 0.57), so a sample using only one or two plays per tragedian could be misleading.

12 The Perseus project does not make available XML versions of the texts for the first volume of Murray's Euripides (*Alc.* to *Hec.*), so it is necessary to use only a sample of his plays for the counts at all positions. Since some aspects of Euripides' style vary over his chronology, I have used one play from each of the four categories defined by Zielinski (1925) 140–141: *Med.*, *Suppl.*, *Tro.*, and *Bacch.* This involves making a manual count for *Med.*, for which I use the edition of Diggle (1981–1994). Because the counts of PE are smaller and more subject to fluctuations, using only a sample for these is much less satisfactory, so the total figures for Euripides are used in the PE columns. The distortion

It appears from Table 2 that lexical elisions are avoided at the caesura more than elsewhere in Aeschylus: the probability that as few as 32 of the 153 PEs would be lexical if their frequency were the same as it is at positions one to eleven is 0.0061.[13] The fact that there is almost no change for Sophocles and a statistically significant increase for Euripides suggests that the difference on Aeschylus' part is to some extent the result of compositional choices, rather than being solely the result of constraints that impact all three tragedians, such as would be the case if, for example, lexical words were more likely to be the wrong shape to appear elided before the caesura.[14]

A more precise measure of this difference can be calculated by counting the number of elisions and the number of word-group ends (that is, places where an elision of the type I am counting could occur) at the various positions within the line. Van Raalte counted the word-group ends for two plays from each tragedian and found that on average, in Aeschylus, there are 3.23 word-group ends per trimeter (ignoring those word-group ends that coincide with the end of a line) and a penthemimeral caesura in 75 % of lines; for Sophocles, the figures are 3.35 and 74 %; for Euripides, they are 3.33 and 82 %.[15] We can use these figures to estimate the total count of internal word-group ends in all the trimeters under examination, and in turn use these counts to calculate the rate that elided lexicals and nonlexicals appear. This involves assuming that the number of word-group ends, both at position five and at all points in the trimeter, is constant throughout a tragedian's works, and so may produce some distortion. However, the benefit of

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that comparing the two features across different sample groups might cause is probably preferable to the distortion that might be caused by selecting a sample of plays with a non-representative rate of PE.

13 All probabilities given in this paper are calculated using the same method. The distribution is assumed to be binomial (in this case, the elided word is either lexical or not, but elsewhere it might be that a trimeter either has the type of PE in question or it does not), and a hypothetical population is posited, from which the sample is hypothesised to be drawn. The mean of this population is the same as that in the sample that is used as a basis of comparison. In the present example, the mean of the hypothetical population is 0.303, since the basis of comparison is the proportion of all elisions in Aeschylus that are lexical. The concept of a hypothetical population, though not always made explicit, is standard in this type of work; see Devine/Stephens (1982) 38; Cropp/Fick (1985) 26 n.19. It allows us to test whether the difference between two figures is significant or more likely the result of random variation. Any probability below 0.01 is highly significant.

14 Since we might expect any failings in the methodology of counting the frequency with which words are elided throughout the line to apply to all tragedians, it is justifiable to consider any differences between tragedians reliable. Devine/Stephens (1978) 2 make a similar argument about the frequency of appositive boundaries at Porson's bridge.

15 Van Raalte (1986) 260–261 gives counts for Aesch. *Sept.* and *Ag.*, Soph. *Phil.* and *OT*, Eur. *Med.* and *Or.*

this method is that it makes it feasible to use a much larger data set of elisions.[16] Table 3 shows the percentage of word-group ends that are occupied by elided lexicals and nonlexicals for positions one to eleven and position five separately.

Table 3

		Aeschylus	Sophocles	Euripides[17]
Positions 1–11	Trimeters	3536	7608	3627
	Word-group ends estimate	11421	25487	12078
	Elided lexicals % (count) [A1]	4.0 % (461)	5.8 % (1480)	6.1 % (740)
	Elided nonlexicals % (count) [B1]	9.3 % (1061)	11.1 % (2828)	10.5 % (1265)
Position 5	Trimeters	3496	7471	16095
	Word-group ends estimate	2622	5529	13198
	Elided lexicals % (count) [A2]	1.2 % (32)	2.5 % (136)	4.2 % (560)
	Elided nonlexicals % (count) [B2]	4.6 % (121)	4.4 % (243)	6.2 % (816)
A2 as a percentage of A1 [C]		30 %	42 %	69 %
B2 as a percentage of B1 [D]		50 %	40 %	59 %

In Aeschylus, the occurrence of LPEs appears to be significantly more constrained – having a rate that is 30 % of the rate of lexical elision at all places in the line – than is the occurrence of NPEs, whose rate is 50 % of nonlexical elision throughout the line. This pattern is not found in Sophocles, whose proportions are almost identical for both types of PE, nor in Euripides, for whom lexical elisions are reduced less at position five than are nonlexical elisions (69 % and 59 %). The data presented in row C of Table 3 show that the differences in the rate of LPE between the three tragedians remain when allowance is made for the increase in lexical elisions at any point in the trimeter.

16 The rate of elision is known to vary a lot between plays (see note 11), seemingly more so than the rate of word-group end. This means it is probably more accurate to use the full corpus to count elisions and sample the word-group ends rather than to sample both.

17 As in Table 2, for Euripides I use a sample for positions one to eleven and the full figures for position five. See note 12 for an explanation.

There also appears to be a difference in the tragedians' practice with regard to the type of nonlexical words found in PE. Table 4 gives a count for the most commonly occurring words, along with the percentage they make up of all the NPEs in that author.

Table 4

	Aeschylus	Sophocles	Euripides
δέ	70 (58 %)	46 (19 %)	216 (26 %)
τε	16 (13 %)	18 (7 %)	99 (12 %)
γε	10 (8 %)	38 (16 %)	90 (11 %)
με, σε, σφε	7 (6 %)	27 (11 %)	124 (15 %)
All monosyllables	**103 (85 %)**	**129 (53 %)**	**529 (65 %)**
ὅδε, ἥδε, τόδε, etc.	9 (7 %)	46 (19 %)	159 (19 %)
Other polysyllables	9 (7 %)	68 (28 %)	128 (16 %)

It is clear that in Aeschylus monosyllables make up a significantly higher proportion of NPEs than they do in Sophocles or Euripides.[18] That these figures cannot be attributed solely to the greater frequency of these monosyllables can be demonstrated by a comparison with the frequency of elision at all points in the line, applying the same approach used in Table 3 above. Table 5 shows that even allowing for the frequency with which these words might appear anywhere in the trimeter in their elided form, nonlexical monosyllables are elided at the caesura in Aeschylus much more frequently than are nonlexical polysyllables. In fact, the reduction in the rate of elided nonlexical polysyllables at the caesura is greater than that for elided lexicals in all three tragedians (compare row D in Table 5 with row C in Table 3).[19] Given also that Aeschylus appears more reluctant to elide at the caesura in general, the obvious inference is that something about nonlexical monosyllables means that their elision at the caesura is more acceptable.[20] This is supported by the fact that they make up a high proportion of words elided at

18 The probability that figures as high as in Aeschylus could be obtained from a population having the same proportions as Euripides is less than 0.0001.

19 One possible explanation for this is that lexicals more commonly have shapes which are difficult to fit in the trimeter unless elided at position five. See note 43 for an example.

20 Maas (1962) 88 observes that elision at the caesura is allowed "especially when the syllable elided happens to be δέ or τε." My data suggest that for iambic trimeters γε (and probably με, σε, and σφε) should also be included in that list. Devine/Stephens (1994) 234 list γε, δέ, με, σε, τε as words which are unconstrained in their elision across commas.

period end: eight out of nine secure instances in Sophocles and two of three in earlier lyric are monosyllables.[21]

Table 5

		Aeschylus	Sophocles	Euripides[22]
Positions 1–11	Trimeters	3536	7608	3627
	Word-group ends estimate	11421	25487	12078
	Nonlexical monosyllables % (count) [A1]	5.8 % (658)	5.9 % (1505)	6.9 % (834)
	Nonlexicals polysyllables % (count) [B1]	3.5 % (403)	5.2 % (1323)	3.6 % (431)
Position 5	Trimeters	3496	7471	16095
	Word-group ends estimate	2622	5529	13198
	Nonlexical monosyllables % (count) [A2]	3.9 % (103)	2.3 % (129)	4.0 % (529)
	Nonlexicals polysyllables % (count) [B2]	0.7 % (18)	2.0 % (113)	2.2 % (287)
A2 as a percentage of A1 [C]		68 %	40 %	58 %
B2 as a percentage of B1 [D]		19 %	39 %	61 %

There is some justification in the data, therefore, for treating nonlexical monosyllables as a separate class from other nonlexicals. It is possible that the reason these words make up such a high proportion of elisions at caesura and period end is that they are frequently occurring and relatively low in the hierarchy of lexicality, compared to say ὅδε or οὗτος, and that it is merely a coincidence that they are all monosyllables. There are certainly some polysyllables that are also frequently elided at the caesura, for example τινα, which is elided twice at the caesura in Aeschylus (at a rate that is almost as high as – 79 % of – its elided appearances at all points in the line), and which is also elided at period end at Alcman PMGF 1.18. However, the numbers involved are too small to draw secure conclusions, and perhaps the monosyllabic nature of these words contributes towards their less

21 West (1982a) 33, 47, 84. The examples in lyric are Sappho 31.9 Voigt (δέ) and Alcman PMGF 1.40 (ϝε).

22 As in Tables 2 and 3, for Euripides I use a sample for positions one to eleven and the full figures for position five. See note 12 for an explanation.

constrained elision. Devine and Stephens have identified that, in addition to the semantic weight of a word, its "phonological substance", which is surely low for monosyllables, is a factor determining how susceptible a word is to the kind of phonological processes that facilitate resolution, breaches of Porson's Bridge, and suchlike.[23] It is plausible that the same hierarchy applies to elision.

On these grounds, therefore, I proceed with a tentative tripartite classification of PEs – LPEs, polysyllabic NPEs and monosyllabic NPEs – giving the figures for all extant dramas in Table 6. I include a combined figure for LPEs and polysyllabic NPEs, which I call constrained PEs, as the occurrence of these appears to be similarly restricted. As Descroix observed, the practice of Euripides seems to change slightly over time, and so I include totals for two subgroups of Euripides' tragedies: *severior* and *semiseverus* (S+ and S) and *liber* and *liberrimus* (L and L+).[24] For the sake of a broader comparison, I include also figures for the fragments of the early iambographers and of fourth-century tragedy.[25]

Table 6

		Trim-eters	All PEs (%)	LPEs (%)	Poly. NPEs (%)	Mono. NPEs (%)	Constrained PEs (%)
Iambo-graphers	Total	435	13 (3.0)	1 (0.2)	3 (0.7)	9 (2.1)	4 (0.9)
Aesch.	Pers.	427	19 (4.4)	5 (1.2)	2 (0.5)	12 (2.8)	7 (1.6)
	Sept.	512	27 (5.3)	2 (0.4)	4 (0.8)	21 (4.1)	6 (1.2)
	Supp.	470	27 (5.7)	6 (1.3)	3 (0.6)	18 (3.8)	9 (1.9)
	Ag.	837	28 (3.3)	3 (0.4)	4 (0.5)	21 (2.5)	7 (0.8)
	Cho.	617	27 (4.4)	7 (1.1)	4 (0.6)	16 (2.6)	11 (1.8)
	Eum.	633	25 (3.9)	9 (1.4)	1 (0.2)	15 (2.4)	10 (1.6)
	Total	**3496**	**153 (4.4)**	**32 (0.9)**	**18 (0.5)**	**103 (2.9)**	**50 (1.4)**

23 Devine/Stephens (1978) 21.

24 Descroix (1931) 269–270. The classification combines the four categories of Zielinski (1925) 140–141 into two; I exclude *Rhes.*, as the near-consensus now is that it is not Euripidean.

25 For the iambographers, I counted trimeters ascribed to Archilochus, Semonides, Solon, and Hipponax in West (1989–1992). Hipponax is included on the assumption that practice regarding PE is not impacted by whether a poet wrote choliambics or regular trimeters. For fourth-century tragedy, I used Snell (1986). For both samples, I did not restrict the count to complete lines, but included all lines where I could be reasonably confident whether or not there is PE.

Table 6: (continued)

		Trim-eters	All PEs (%)	LPEs (%)	Poly. NPEs (%)	Mono. NPEs (%)	Constrained PEs (%)
[Aesch.]	PV	776	42 (5.4)	14 (1.8)	6 (0.8)	22 (2.8)	20 (2.6)
Soph.	Aj.	970	35 (3.6)	8 (0.8)	16 (1.6)	11 (1.1)	24 (2.5)
	Ant.	893	44 (4.9)	18 (2.0)	13 (1.5)	13 (1.5)	31 (3.5)
	Trach.	973	45 (4.6)	14 (1.4)	12 (1.2)	19 (2.0)	26 (2.7)
	OT	1182	88 (7.4)	34 (2.9)	29 (2.5)	25 (2.1)	63 (5.3)
	El.	1121	55 (4.9)	24 (2.1)	13 (1.2)	18 (1.6)	37 (3.3)
	Phil.	1065	51 (4.8)	18 (1.7)	15 (1.4)	18 (1.7)	33 (3.1)
	OC	1267	61 (4.8)	20 (1.6)	16 (1.3)	25 (2.0)	36 (2.8)
	Total	**7471**	**379 (5.1)**	**136 (1.8)**	**114 (1.5)**	**129 (1.7)**	**250 (3.3)**
Eur.	Alc.	781	55 (7.0)	13 (1.7)	13 (1.7)	29 (3.7)	26 (3.3)
	Med.	1001	70 (7.0)	36 (3.6)	18 (1.8)	16 (1.6)	54 (5.4)
	Heracl.	885	74 (8.4)	27 (3.1)	11 (1.2)	36 (4.1)	38 (4.3)
	Hipp.	982	89 (9.1)	39 (4.0)	16 (1.6)	34 (3.5)	55 (5.6)
	Andr.	908	68 (7.5)	21 (2.3)	22 (2.4)	25 (2.8)	43 (4.7)
	Hec.	908	76 (8.4)	29 (3.2)	17 (1.9)	30 (3.3)	46 (5.1)
	Supp.	902	61 (6.8)	30 (3.3)	11 (1.2)	20 (2.2)	41 (4.5)
	S+ and S	**6367**	**493 (7.7)**	**195 (3.1)**	**108 (1.7)**	**190 (3.0)**	**303 (4.8)**
	HF	964	89 (9.2)	42 (4.4)	16 (1.7)	31 (3.2)	58 (6.0)
	Ion	1014	103 (10.2)	41 (4.0)	15 (1.5)	47 (4.6)	56 (5.5)
	Tro.	771	82 (10.6)	42 (5.4)	14 (1.8)	26 (3.4)	56 (7.3)
	El.	937	82 (8.8)	31 (3.3)	23 (2.5)	28 (3.0)	54 (5.8)
	IT	1050	85 (8.1)	31 (3.0)	13 (1.2)	41 (3.9)	44 (4.2)
	Hel.	1172	104 (8.9)	45 (3.8)	19 (1.6)	40 (3.4)	64 (5.5)
	Phoen.	815	60 (7.4)	22 (2.7)	14 (1.7)	24 (2.9)	36 (4.4)
	Or.	1058	109 (10.3)	45 (4.3)	28 (2.6)	36 (3.4)	73 (6.9)
	Bacch.	902	75 (8.3)	31 (3.4)	15 (1.7)	29 (3.2)	46 (5.1)
	IA[26]	469	44 (9.4)	18 (3.8)	7 (1.5)	19 (4.1)	25 (5.3)
	L and L+	**9152**	**833 (9.1)**	**348 (3.8)**	**164 (1.8)**	**321 (3.5)**	**512 (5.6)**

26 For *IA*, I counted only those trimeters in the top two of Diggle's four authenticity categories.

Table 6: (continued)

		Trim-eters	All PEs (%)	LPEs (%)	Poly. NPEs (%)	Mono. NPEs (%)	Constrained PEs (%)
	Cycl.	576	50 (8.7)	17 (3.0)	15 (2.6)	18 (3.1)	32 (5.6)
	Total	**16095**	**1376 (8.5)**	**560 (3.5)**	**287 (1.8)**	**529 (3.3)**	**847 (5.3)**
[Eur.]	Rhes.	675	40 (5.9)	7 (1.0)	1 (0.1)	32 (4.7)	8 (1.2)
4th-cent. Tragedy	Total	311	12 (3.9)	5 (1.6)	4 (1.3)	3 (1.0)	9 (2.9)

The value of this analysis is shown by the cases of *Prometheus Bound* and *Rhesus*. The inauthenticity of both plays is now almost a consensus,[27] but nonetheless they show how a nuanced approach to PE can reveal a different picture to the total figures. In its total number of PEs, *Prometheus Bound* is within the normal range for Aeschylus.[28] But when monosyllabic NPEs are discounted, the remaining frequency (2.6 % for constrained PE) is comfortably higher than any Aeschylean tragedy. If we take Aeschylus' average frequency (1.43 %) as the basis of comparison, then the probability that the number of constrained PEs would be as high as it is in *Prometheus Bound* is 0.0096. In respect of PE, then, *Prometheus Bound* is significantly different to Aeschylus' extant tragedies.

Although the frequency of all PEs in *Rhesus* is lower than every Euripidean tragedy, Ritchie is right to argue that it is consonant with the earliest extant plays.[29] But there is a very high proportion of monosyllabic NPEs in *Rhesus*, which disguises how small the number of constrained PEs (eight) is. The frequency of constrained PE in Euripides is at its lowest in *Alcestis* (26 from 781 trimeters). If we take

27 Manousakis (2020) 25–45 summarises scholarship on the authenticity of *PV* and goes on, in pages 143–222, to find it un-Aeschylean by the application of automated authorship attribution techniques. See Fantuzzi (2020) 16–23 for a brief summary of the scholarship on the authenticity of *Rhes*.

28 In the counts of Descroix (1931) 262, *PV* has a higher frequency of all PEs than any play of Aeschylus, and from this Griffith (1977) 84, 101 tentatively concludes that there is some evidence for divergence from the practice of Aeschylus. The discrepancy between Descroix's total of 50 PEs in *PV* and mine of 42 is mainly accounted for by my disregarding of five elisions which occur within a word-group. Although Descroix (1931) 253–254 does appear sensitive to the concept of word-groups, his counts suggest that he must have been counting words as they were printed: when I counted using the same edition (Mazon 1920), I found 48 PEs in *PV*, five of which are internal to a word-group.

29 Ritchie (1964) 286–287. Taking the rate of *Alc.* as the basis of comparison, the probability that the total number of PEs in *Rhesus* would be as low as 40 is 0.14, which is too high to attribute any significance to it.

this as the basis of comparison, then the probability that there would be as few as eight in *Rhesus* is 0.0004. It is true that in Euripides there is a little more fluctuation in the rates of constrained PE than we would expect if the distribution were entirely random, but for the probability to be so small, even when the play closest to it in respect of this feature is used as the point of comparison, shows that the treatment of PE in *Rhesus* is radically different to that found anywhere in Euripides. It has been observed that in the trimeters of *Rhesus* there is a combination of both early and late features, suggesting it is the work of a later, probably fourth-century, imitator of fifth-century tragedy.[30] In respect of PE, its style is closest to Aeschylus, with a relatively low proportion of constrained PE. The high proportion of all its PEs that are monosyllabic NPE (80 %) distinguishes it clearly from fragmentary fourth-century tragedy, where the same proportion is just 25 %.[31]

There is also an enormous difference between *Oedipus Tyrannus* and the rest of Sophocles' tragedies,[32] providing a reminder, if it were needed, that individual features of style can vary significantly within an author's corpus. However, Sophocles may be exceptional in this regard. Kitto has argued forcefully that the varying frequencies of resolutions and *antilabe* in Sophocles occur because the different plays demand these particular effects at different frequencies and that they are not unconscious features of Sophocles' style.[33] Possibly we should regard Sophocles' use of elision in the same way.[34]

The increase in the rate of PE from Euripides S+ and S to L and L+ is not huge and is inconsistent (note the relatively low rate in *Phoen.*), but it is too large to ascribe to chance.[35] There are other metrical features that have a comparable, though

30 Liapis (2012) lxv–lxvii; Fantuzzi (2020) 24–27.

31 Even with a sample of 12 for fourth-century tragedy, we can be confident of this: the probability that three or fewer would be monosyllabic, taking the proportion in *Rhesus* as the basis of comparison, is less than 0.0001. As an aside, I would also note that the relatively infrequent occurrence of PE in fourth-century tragedy may be a result of the sample's fragmentary nature. The PE percentages that Descroix (1931) 262–263 records for the fragments of the three major tragedians are all lower than for any single one of their extant plays, which suggests that there could be something about the type of fragments that tend to survive that means they are less likely to contain PE. This might apply to the fragments of the iambographers as well.

32 Taking the average for all Sophocles as the point of comparison, the probability that the frequency of PE would be as high as it is in *OT* is 0.0003.

33 Kitto (1939), though he allows that chronology might impact the rate of *antilabe* (p. 183).

34 Kitto (1939) 192 advises that the rate of elision in Sophocles should be checked to see if it varies with mood. For an example of this type of work, see De Gooijer/Laan (2001), who map the varying frequency of elision in Eur. *Or*. The effect of PEs is one of the features investigated in Soph. *Aj*. and *Phil*. by Olcott (1974), but the treatment is less systematic.

35 Taking the rate for S+ and S as the basis of comparison, the probability is less than 0.0001 that the rate for L and L+ would be as high as it is.

more consistent and distinct, increase within Euripides' chronology, most notably the rate of resolution and the frequency of appositive boundaries at Porson's Bridge.[36] Devine and Stephens put forward the convincing hypothesis that both these developments are a result of Euripides' increasing use of less deliberate, or more fluent, speech.[37] They have also observed that the domain of elision is less syntactically constrained in Euripides' later plays, which they associate with the same phenomenon.[38] It seems likely that the increase in Euripidean PE is related to this, since syntactical breaks occur frequently at the penthemimeral caesura.

And yet in some respects, the rates of PE do not follow the same pattern as other markers of fluency of speech: First, the rate of resolution is twice as high in Aristophanes as it is in Euripides *liberrimus*,[39] but it is obvious from the figures of Descroix that PE is less frequent in Aristophanes than in later Euripides.[40] Secondly, whereas the rate of resolution and appositives at Porson's Bridge is as high or higher in Aeschylus than it is in Euripides *severior*, the earliest extant plays of Euripides have rates of constrained PE more than double that found in Aeschy-

36 For chronological developments in Euripides' use of resolutions, see Zielinski (1925) 133–240, with the reassessment by Devine/Stephens (1980). Devine/Stephens (1981) describe how the appositive boundaries at Porson's Bridge become more common within Euripides' chronology (except for *Cycl.* and the pro-satyric *Alc.*).

37 Devine/Stephens (1981) 60.

38 Devine/Stephens (1994) 234–235 observe the increasing proportion of constrained (i.e., lexical) elisions over commas, and attribute it to "the progressively greater access to fluent phrasing in the stylistic development of Euripides." While their regression analysis confirms a link between chronology and this proportion, there are some anomalies: *Hipp.* has a higher proportion than *Hel.* and *IA*. See also Laan (1995) 275, who finds that the rate of elision over a punctuation mark at the caesura is 1.8 % for *Med.* but 5.8 % for *Or.* Hedin (2000) 194 observes that the domain of elision is greater in Demosthenes than Isocrates, and links this to Demosthenes' style being closer to everyday usage, while in Isocrates' written Greek there is probably a "tendency to select a more formal or more deliberate phonostyle" that would restrict the domain of elision.

39 See Van Raalte (1986) 136 for a comparison of resolution rates. Devine/Stephens (1981) 60 n.32 observe that "Euripides limits himself to a far lower point on the phonostylistic parameter" than Aristophanes.

40 There needs to be some allowance for the fact that penthemimeral caesura is less common in Aristophanes, so using Descroix's (1931) 263–264 figures and counting only lines with penthemimeral caesura, I find that 7.9 % of them involve elision (464 of 5841). Using my own figures and Van Raalte's (1986) 260–261 count of the rate of penthemimeral caesura in Euripides (82 %), I estimate the equivalent rate in Euripides (L and L+) to be 11.1 % (833 of 7505) for all PE and 6.8 % (512 of 7505) for constrained PE. When one considers that Descroix's figures, unlike mine, include elisions within word-groups and that in a small sample five out of eleven Aristophanic PEs were monosyllabic NPEs, then it is clear that the rate in Aristophanes is lower than in later Euripides. Van Raalte (1986) 168 finds almost no difference between the rates of PE in Aristophanes, early Euripides, and Sophocles, though the figures are based on only a sample (Ar. *Eq.* and *Nub.*).

lus.[41] Lastly, while elisions at any point in the line (which surely is also an indicator of fluency) are roughly as common in Sophocles as in Euripides, PE is much less common in Sophocles.[42] This all suggests that factors other than fluency of speech, perhaps what we might call metrical or compositional constraint, influence the rate of PE.[43] Although their phonostyle hypothesis is in part offered as an alternative to the attribution of variations in metrical features across authors to variations in metrical strictness,[44] Devine and Stephens do acknowledge that such constraints can play a part, as in their model for the compositional process:

> The poet assesses the probability of phonological boundary marking in any particular linguistic context; he also assesses the strength of the metrical requirement, i.e. the disruption that would be inflicted on the metrical pattern by failure to meet the requirements of bridge or caesura in question in the style in which he is writing. Next, he computes the overall cost of locating the linguistic structure at the bridge or caesura as a function of the coefficients of linguistic boundary marking and metrical disruption. Finally, he makes the decision whether to pay that cost on the basis of available compositional alternatives and considerations of general artistic and aesthetic appropriateness.[45]

41 For a comparison of rates of resolution, see Van Raalte (1986) 136. For appositives at Porson's Bridge, see Devine/Stephens (1983) 3.

42 See Tables 3, 5, and 6 for full figures, but a specific comparison is illustrative: the rate of all lexical elision in Soph. *Phil.* is 6.6 % and LPE is 1.7 %, while in Eur. *Bacch.* the rates are 6.4 % and 3.2 %. Baechle (2007) 76 n. 61 makes a similar point, noting how the rates of elision throughout the line are, surprisingly, lower in Aristophanes than in Sophocles (for the figures see Van Raalte 1986, 260–261).

43 One of the anonymous reviewers points out that the data around one such compositional factor have already been collected. Baechle (2007) 57, building on the work of Hilberg (1879), asserts that in the trimeter the tragedians were reluctant to lengthen short final syllables ending in a vowel. One impact of this is that words of the shape ⏑ – – ⏑^{v} are difficult to fit into the line unless they are elided. There must, therefore, have been more incentive for a tragedian to elide these words at position five than other word shapes. The data support this deduction: Baechle (2007) 319 finds that this word-shape appears elided at position five in the majority of its appearances (78 % in Aeschylus, 94 % in Sophocles, and 95 % in Euripides). These words make up a disproportionately large proportion of all LPEs (38 % in Aeschylus and Sophocles, and 33 % in Euripides, based on my own counts and using the sample listed in note 12 for Euripides). That such a high proportion of LPE is accounted for by words that cannot easily be placed elsewhere further emphasises the general constraint on LPE. The slightly lower proportion in Euripides could result from his greater freedom in using LPE of words of other shapes. A parallel point can be made about words of the shape ⏑ – – that are followed by a postpositive monosyllable ending in a short vowel: these account for 42 % of monosyllabic NPEs in Aeschylus, 40 % in Sophocles, and 29 % in the Euripides sample (Baechle 2007, 316).

44 Devine/Stephens (1981) 63–64.

45 Devine/Stephens (1984) 133. On the interrelation of phonostylistic and metrical factors, see also pages 138–141 (≈Devine/Stephens 1983, 22–25).

A model that, like this one, takes account of both linguistic factors and poets' aesthetic judgements in respect of metrical requirements would seem the best explanation for the data relating to PE. Euripides' increasing access to a greater phonostylistic range would contribute to the modest but statistically significant increase in PE within his chronology, but the tragedians' different aesthetic judgements, or perhaps different approaches to the actual method of composition,[46] would account for the differences between Aeschylus, Sophocles, and earlier Euripides.

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46 If the caesura is the meeting place of two cola, then PE must occur through the composition of a six-syllable colon, presumably with the intention of eliding the final syllable (see West 1982b, 292–297). It is plausible that how frequently a poet composed verses in this way would vary from poet to poet independently of the phonostylistic parameters available to them.

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