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## METRICS OF THE ELEGIAC COUPLET

In his 1951 study of the Latin elegiac verse of Tibullus, Propertius, and Ovid, Platnauer included the following tabulation of the distribution of dactyls and spondees in samples of their work: <sup>1</sup>

<i>Hexameter</i> (First four feet: D = dactyl, S = spondee)						
<i>Type</i>	<i>Tibullus</i>		<i>Propertius</i>		<i>Ovid</i>	
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
DDDD	7	1.8	5	1.3	25	6.7
DDDS	35	9.2	17	4.7	34	9.0
DDSD	21	5.8	24	6.6	38	10.0
DDSS	53	14.2	32	8.6	45	12.0
DSDD	16	4.2	9	2.4	36	9.5
DSDS	53	14.1	43	11.0	51	13.8
DSSD	24	6.6	22	6.0	40	10.7
DSSS	74	20.0	61	16.5	50	13.7
SDDD	3	0.8	10	2.8	6	1.6
SDDS	17	4.7	11	3.0	11	3.0
SDSD	8	2.1	19	5.0	9	2.4
SDSS	19	5.0	44	12.0	8	2.1
SSDD	2	0.5	5	1.3	6	1.6
SSDS	16	4.2	28	7.5	8	2.1
SSSD	8	2.1	11	3.0	2	0.5
SSSS	17	4.7	32	8.6	4	1.0

<i>Pentameter</i> (First two feet)						
<i>Type</i>	<i>Tibullus</i>		<i>Propertius</i>		<i>Ovid</i>	
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
DD	89	24.0	90	24.1	115	30.9
DS	218	58.6	161	43.0	195	52.4
SD	20	5.2	62	16.5	31	8.3
SS	46	12.2	60	16.4	32	8.4

Platnauer draws limited conclusions from these data. He observes that lines beginning with a dactyl (both hexameter and pentameter) greatly outnumber those beginning with a spondee and that "this preference for a dactylic opening, marked even in Propertius, is stronger in Tibullus and stronger still in Ovid." He then goes on to list the number and percentage of lines with spondaic first feet in all the works of the three elegists. This listing (p. 38) does not concern us here, but we cite Platnauer's conclusions: "Nothing very striking emerges from these figures, except perhaps the comparative 'lightness' of the Ovidian openings already mentioned, a lightness which seems

<sup>1</sup> Maurice Platnauer, *Latin Elegiac Verse: A Study of the Metrical Usages of Tibullus, Propertius and Ovid* (Cambridge 1951) 36 f. The data are drawn from Ovid, *A. A. II* and the same number of lines (746, presumably the first 746) of Tibullus I and Propertius II. Platnauer (p. 2) lists the editions consulted: Tibullus: Postgate<sup>2</sup> (Oxford 1924); Propertius: Phillimore<sup>2</sup> (Oxford 1907); Ovid: Ehwald (Leipzig 1903). Texts used here: Tibullus: same; Propertius: Barber (Oxford 1953); Ovid: Kenney (Oxford 1961). Differences are insignificant for present purposes.

to increase in his later works. It seems also that Ovid is a little more prone to initial dactyls in hexameters than in pentameters.”<sup>2</sup>

More of interest can be done with the data presented by Platnauer. To begin, we extract and list the number and percentage of all the hexameter lines with a dactylic first foot (= Dxxx), a spondaic first foot (= Sxxx), a dactylic second foot (= xDxx), etc.

Type	Tibullus		Propertius		Ovid	
	Number	%	Number	%	Number	%
Dxxx	283	75.9	213	57.1	319	85.5
Sxxx	90	24.1	160	42.9	54	14.5
xDxx	163	43.7	162	43.4	176	47.2
xSxx	210	56.3	211	56.6	197	52.8
xxDx	149	39.9	128	34.3	177	47.5
xxSx	224	60.1	245	65.7	196	52.5
xxxD	89	23.9	105	28.2	162	43.4
xxxS	284	76.1	268	71.8	211	56.6

(Note that Ovid is more dactylic than the other two in every foot, not merely the first, although his percentage for Dxxx is the highest listed. Note the symmetry for Tibullus where Dxxx is nicely balanced by xxxS. Note also that the feet become less dactylic as the line moves from first to fourth foot, with the exception of xDxx and xxDx in Ovid.)

We can also list the total number and percentage of dactyls and spondees within the first four (variable) feet of the hexameter:

Type	Tibullus		Propertius		Ovid	
	Number	%	Number	%	Number	%
Dactyls	684	45.8	608	40.8	834	55.9
Spondees	808	54.2	884	59.2	658	44.1

(Note that, all in all, the most striking fact is not the preponderance of dactyls in Ovid but the preponderance of spondees in Propertius.)

Next, we list the number and percentage of all the pentameter lines with a dactylic first foot (= Dx), a spondaic first foot (= Sx), a dactylic second foot (= xD), etc.:

<sup>2</sup> Platnauer, p. 38. Two other conclusions which may be drawn: Tibullus I and II has an extraordinarily high percentage of pentameter dactylic openings. *Fasti* has an extraordinarily high percentage of hexameter dactylic openings.

Type	Tibullus		Propertius		Ovid	
	Number	%	Number	%	Number	%
Dx	307	82.3	251	67.3	310	83.1
Sx	66	17.7	122	32.7	63	16.9
xD	109	29.2	152	40.8	146	39.1
xS	264	70.8	221	59.2	227	60.9
Dactyls	416	55.8	403	54.0	456	61.1
Spondees	330	44.2	343	46.0	290	38.9

(Note that Tibullus and Ovid are very similar in the first foot; that Propertius and Ovid are very similar in the second foot; that Tibullus and Propertius are very similar in total proportion of dactyls and spondees.)

We now have a somewhat clearer picture of the metrical behavior of the three authors, at least so far as these samples are concerned. We have rearranged Platnauer's data to reveal more clearly the extent to which Ovid is more dactylic than the other two poets. Let us now accept the differences in distribution of dactyls and spondees as given and proceed to another mode of analysis.

We ask the following question: does the fact that a particular foot is dactylic or spondaic have any influence on the metrical form of the contiguous feet? For example, we see in Propertius that there are 213 cases of Dxxx and 162 cases of xDxx, i.e., 57.1% of the hexameter lines are Dxxx and 43.4% are cases of xDxx. If "it makes no difference" to one foot whether or not the other is dactylic, we can calculate about how many instances there should be of DDxx, i.e., of lines with a dactyl in both of the first two feet. We take "it makes no difference" to mean that lines with an initial dactyl are no more or less likely to have a dactyl in the second foot than lines with an initial spondee. Hence, we may assume that both sorts of lines will have about the same proportion of dactyls in the second foot (i.e., 43.4%). We then follow a simple arithmetical procedure: (213 [the number of hexameter lines with initial dactyls] multiplied by 0.434 [the proportion of xDxx] gives us 92.4) which is the requisite number within the limits of acceptable statistical variation. In fact, the Propertian sample contains 78 instances of DDxx rather than the expected 92.4. The facts may be conveniently laid out in the following 2x2 tableau: <sup>3</sup>

<sup>3</sup> The statistical techniques employed here have been discussed at length in N. A. Greenberg, "Metrical Shape, Initial Stress, and Crosstabulation," *Revue = RELO* 1978 (No. 3) 1-44. Chi squared and two-by-two contingency tables are discussed in any elementary textbook on statistics. See, for example, W. J. Dixon and F. J. Massey, *Introduction to Statistical Analysis*<sup>3</sup> (McGraw-Hill 1969) 237-43. The measure Tau beta (Tb) is described in N. H. Nie et al., *SPSS: Statistical Package for the Social Sciences*<sup>2</sup> (McGraw-Hill 1975) 227 f.

*Propertius (hexameters)*

	xDxx	xSxx	Totals
Dxxx	DDxx 78 (92.5)	DSxx 135 (120.5)	213
Sxxx	SDxx 84 (69.5)	SSxx 76 (90.5)	160
Totals	162	211	373

(Actual value in each of the four cells is accompanied by the expected value in parentheses. Expected values are arrived at by multiplication of marginal totals and division by grand total. Thus the expected value for the cell labelled DDxx on the upper left is:  $213 \times 162 / 373 = 92.5$ . [The previous figure of 92.4 is due to rounding errors.] Note that the difference between expected and actual values in each cell is the same, i.e., 14.5.)

We have arrived at the expected value of 92.5 for DDxx on the assumption, on the “null hypothesis”, that there is no statistical association between the metrical form of the first foot (i.e., whether it is a dactyl or a spondee) and the metrical form of the second foot. If we take 373 lines and randomly assign a dactylic first foot to 57.1% of them and then take those same 373 lines and randomly assign a second dactylic foot to 43.4% of them, then we shall expect to find that about 92 or 93 of them will have dactyls in the first two feet. The number may well be larger or smaller than 92 or 93, but the larger the disparity, the more unlikely it is to have occurred randomly or by chance.

The degree of unlikelihood is assessed through the statistical measure called chi squared. Could our present disparity or deviation of 14.5 be the result of chance or randomness? Chi squared for the above tableau is 8.74. A table of values of chi squared tells us that this value (8.74) of chi squared is significant at the 99.5% level (i.e. the P-level = 99.5) for one degree of freedom. In words, if one were to draw 1000 samples of 373 lines from a large population of lines of which 57.1% were Dxxx randomly distributed and of which 43.4% were xDxx randomly distributed, one would not expect to find more than five samples containing so few as 78 instances of DDxx. We therefore conclude that cases of Dxxx and xDxx are associated statistically.

Since 78 is less than the expected value of 92.5, we conclude that the association is negative. Cases of Dxxx have a clear tendency not to be also cases of xDxx and vice versa. By the same token, there are fewer cases of SSxx than would be expected on the null hypothesis of

random distribution. Just so, there are more cases of DSxx and SDxx than would be expected. In sum, the evidence indicates a tendency toward alternation of metrical form in the first two feet of the hexameter lines of Propertius. The size of that tendency is given by a measure called tau beta. Tau beta in this case is  $-0.159$ . (The negative quantity indicates negative association.)<sup>4</sup>

What does it mean to say that Propertius has a tendency toward metrical alternation in the first two feet of the hexameter line? As we shall see, Propertius is probably not alone in that tendency, and it may well be that some such tendency, a sort of tendential undertone, is inherent in the language, although the strength of that tendency may vary over time.<sup>5</sup> Nevertheless, it is also clear that poets writing at the same time differ in the degree to which they adhere to such a tendency. It is more powerful in some than in others. A tendency is a habit, a mannerism, a fashion, and we do not know why some individuals succumb (if that is the right verb) more readily to fashion than others. Nor can we tell what triggers that adherence. Thus, it may be that the form of the first foot triggers a readiness in Propertius to come up with a second foot of contrasting form. That seems intuitively acceptable on the vague hypothesis that verses are composed from beginning to end. Our evidence, however, does not go beyond simple association, and we are not entitled to designate either of the first two feet as the dependent or independent variable. It could just as well be the other way around, that the form of the second foot triggers the formation of the first. Or, and this seems even more intuitively acceptable, we can conjecture that poets compose in phrases rather than a foot at a time and, with regard to the dactylic hexameter, they are conditioned by its strongest formal constraint, the demand that the line conclude with a dactyl and

<sup>4</sup> Chi squared is used to indicate whether an association exists, and it varies with the size of the sample. Thus a sample of 746 lines with the same degree of association (and the same tau beta score) would produce a chi squared score of 18.12. Since all samples in the present enterprise are of the same size, chi squared scores are also comparable.

The values of chi squared and tau beta are arrived at as follows. Given the following tableau:

	a	b	a + b
	c	d	c + d
Totals	a + c	b + d	N = a + b + c + d

$$\text{Chi squared} = \frac{N(|ad - bc| - N/2)^2}{(a + b)(c + d)(b + d)(a + c)}$$

$$\text{Tau beta} = \sqrt{\frac{ad - bc}{(a + b)(c + d)(b + d)(a + c)}}$$

<sup>5</sup>A large amount of comparative material has been amassed in Greenberg (note 3, above).

trochee or spondee. It has been suggested elsewhere that such conditioning results in the tendency toward initial dactyls and metrical alternation.<sup>6</sup> Be the above as it may, it seems clear that the measured intensity of such tendencies affords a powerful means of describing a part of the stylistic individuality of any particular poet. Ovid has been described as a mannered poet because of this peculiar propensity for dactyls, and this is true as far as it goes. In the same way, we may describe the individuality of Propertius by pointing out his proclivity for alternation in the first two feet of the hexameter.

We may now ask whether the same tendency toward metrical alternation is found in other parts of the line and in the other authors. If we follow exactly the same procedures for Tibullus and Ovid, we add the following results:

	<i>Tibullus</i>	<i>Propertius</i>	<i>Ovid</i>
DDxx actual value:	116	78	142
DDxx (expected value):	(123.7)	(92.5)	(150.5)
Chi squared:	3.06	8.74	5.59
P-level:	90%	99.5%	97.5%
Tau beta:	-0.10	-0.16	-0.13

The tendency toward metrical alternation in the first two feet of the hexameter is present in the samples from Tibullus and Ovid but not to the degree found in the sample from Propertius. We therefore have less confidence in inferring that the characteristics of our samples from these authors could not be the result of random variation. Larger samples with the same characteristics would enlarge that confidence, but the differences between the poets would remain, and would continue to afford a powerful way of describing one sort of metrical behavior.

Other aspects of individual metrical behavior appear as we turn to the other pairs of contiguous feet. Here are the findings for the second and third feet of the hexameter lines:

	<i>Tibullus</i>	<i>Propertius</i>	<i>Ovid</i>
xDDx actual value:	62	43	76
xDDx (expected value):	(65.1)	(55.6)	(83.5)
Chi squared:	0.31	7.08	2.12
P-level:	40%	99%	80%
Tau beta:	-0.03	-0.14	-0.08

The contrast here is very striking. The findings for Tibullus and Ovid are so small that we have no right (especially in the case of Tibullus) to reject the null hypothesis of random variation. The tendency toward metrical alternation remains clear in Propertius.

The findings for the third and fourth foot of the hexameter:

<sup>6</sup>Greenberg (note 3, above) 21.

	<i>Tibullus</i>	<i>Propertius</i>	<i>Ovid</i>
xxDD actual value:	28	29	73
xxDD (expected value):	(35.6)	(36.0)	(76.9)
Chi squared:	3.06	2.51	0.50
P-level:	90%	80%	50%
Tau beta:	-0.10	-0.09	-0.04

The tendency toward alternation has at last weakened in Propertius and has practically disappeared in Ovid. Tibullus and Propertius are at last very much alike, and with that symmetry peculiar to Tibullus, the tendency for alternation here is as great as that for the first two feet.

Variation is possible in the first two feet of the pentameter line and so it has been of interest to see whether the same sort of tendency toward alternation is present. The findings:

	<i>Tibullus</i>	<i>Propertius</i>	<i>Ovid</i>
DD actual value:	89	90	115
DD (expected value):	(89.7)	(102.3)	(121.3)
Chi squared:	0.00	7.01	2.73
P-level:	5%	99%	90%
Tau beta:	-0.01	-0.14	-0.09

We have good reason to believe that there is no such tendency in Tibullus. Propertius has the tendency toward alternation in abundance and Ovid probably has it, but to a lesser degree.

To the degree that these findings are surprising, they are also valuable. We now know interesting things about the metrical behavior of Tibullus, Propertius, and Ovid which we did not know before, despite the fact that we have not gone beyond the data gathered by Platnauer. We are now able to make somewhat more informed judgments about the metrics of any particular passage. Consider, for example, the opening four lines of each sample:

Diuitias alius fuluo sibi congerat auro	(DDSD)
et teneat culti iugera multa soli,	(DS)
quem labor assiduus uicino terreat hoste,	(DDSS)
Martia cui somnos classica pulsa fugent:	(DS)
Tibullus 1.1.1-4	

Quaeritis, unde mihi totiens scribantur amores,	(DDDS)
unde meus ueniat mollis in ora liber.	(DD)
non haec Calliope, non haec mihi cantat Apollo.	(SDSD)
ingenium nobis ipsa puella facit.	(DS)
Propertius 2.1.1-4	

Dicite 'io Paean' et 'io' bis dicite 'Paean':	(DSSS)
decidit in casses praeda petita meos.	(DS)
laetus amans donat uiridi mea carmina palma	(DSDD)
praelata Ascraeo Maeonioque seni.	(SS)
Ovid, <i>A.A.</i> 2.1-4	



How the beginnings of poems merge with their sequels is a matter of interest. The passages from Propertius and Ovid are introductory and self-referential, i.e., they refer explicitly to the writing of poetry, while the Tibullan passage makes no such reference. It is nice, therefore, to note the proportion of dactyl to spondee in the twelve variable feet in each passage. Tibullus has his usual slight dactylic majority. But Propertius, normally the most spondaic, has eight dactyls to four spondees and the dactylic Ovid has a preponderance of spondees. The latter two passages are thus set apart from their authors' normal practice. On the other hand, habit will out: Propertius with his strong tendency toward metrical alternation has in verse 3 the only example of a fully alternated line. The same verse also smacks of the rhetorical with its repetitions. Just so in Ovid, the repetitions in the first verse are both rhetorical and playful, and the mock solemnity of the whole is emphasized by the un-Ovidian succession of spondees in the first and fourth verse. Do we press too hard in seeing a parallel in contextual and metrical arrangement? Perhaps. The criticism of literature must always have a large element of subjectivity, but it can do no harm and it may help to have such judgments supported by reasoned aggregates of observation. On the other hand, it would be arrogant to suppose that these data have been exhausted. By now, it should also be clear that methods of the sort described here can also be applied to other sorts of data. We conclude with what is no more than a single example of the analysis of data which were not gathered by Platnauer.

Consider the following question: does the opening of the hexameter line of an elegiac couplet have any association with the opening of its accompanying pentameter line? The data cannot be derived from Platnauer's observations and must be gathered independently. Using the same samples, the following data were compiled:<sup>7</sup>

(Dxxx-Dx indicates a distich with an initial dactyl in each line. Dxxx-Sx is a distich with initial dactyl in hexameter and initial spondee in the pentameter, and so on.)

	<i>Tibullus</i>		<i>Propertius</i>		<i>Ovid</i>	
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Dxxx-Dx	236	63.3	144	38.6	270	72.4
Dxxx-Sx	45	12.1	68	18.2	49	13.1
Sxxx-Dx	74	19.8	109	29.2	40	10.7
Sxxx-Sx	18	4.8	52	13.9	14	3.8

<sup>7</sup> Alert readers will detect disparities between the numbers below and the totals from Platnauer's data listed above for Tibullus and Propertius. Our counting and recounting produces for Tibullus: Dxxx = 281; Dx = 310 (rather than 307). For Propertius: Dxxx = 212; Dx = 253 (rather than 251). These disparities may be due to differences in texts, ambiguous scansion, or, most probably, counting errors. Happily, these disparities do not affect our statistical findings in any significant way. *Humanum est errare*.

We apply our standard procedure with the following result:

	<i>Tibullus</i>	<i>Propertius</i>	<i>Ovid</i>
Dxxx-Dx actual value:	236	144	270
Dxxx-Dx (expected value):	(233.6)	(143.8)	(265.1)
Sxxx-Sx actual value:	18	52	14
Sxxx-Sx (expected value):	(15.6)	(51.8)	(9.1)
Chi squared:	0.40	0.00	2.96
P-level:	40%	5%	90%
Tau beta:	0.04	0.00	0.10

Matters have been dramatised a bit by including the actual and expected values for Sxxx-Sx. What association we can find, and there is none for Propertius and practically none for Tibullus, is positive, i.e., hexameters beginning with a dactyl tend to be accompanied by pentameters beginning with a dactyl, and so also for spondees. We should have expected only 9 instances of Sxxx-Sx from dactylic Ovid, but we find 14. Two of these instances are contiguous:

i nunc, claude fores, custos odiose puellae,  
et centum duris postibus obde seras:  
quid tuti superest, cum nominis extat adulter  
et credi, quod non contigit esse, cupit?  
Ovid, *A.A.* 2.635-638

The passage is interesting. Ovid's tone expressing contempt for those who would sully a lady's name through false claims of intimacy may be more sincere than usual. Again, critics may differ. Sincerity is only one possibility; others may find the dominant tone to be mock stentorian, and there is surely a darkly humorous reversal present in the idea of false adultery. There can, however, be no doubt that the metrical behavior of these lines is unusual in ways previously unsuspected and we have, therefore, some added justification for the attempt at critical explanation. As said above, analysis of formal characteristics like meter cannot replace critical judgment but it may help to define the boundaries within which criticism takes place.

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