Localization in the Hexameter

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April 2006 (v.2)

Though a word shaped $-\cdots$ can theoretically occur 5 different places in a hexameter line, it turns out that over 85% of the time a word that shape will occur in one of two locations. This restriction of a word shape that might fit several places to only two or three is known as *localization*. It further turns out that localization habits are quite consistent across hexameter poets from Homer down to the Hellenistic period.

The first systematic account of word shape localization was by Eugene G. O'Neill, Jr. in *The Localization of Metrical Word-types in the Greek Hexameter*, Yale Classical Studies, 8:105-178. His work was followed up by several people in the same journal.

O'Neill's pages of tables include the statistics for seven different poets. For this article I will only include the statistics for the *Iliad*, the *Odyssey* and Hesiod, which in O'Neill's paper is 1000 hexameters taken from both the *Works and Days* and the *Theogony*.¹

I first started looking into localization as a tool to help me with my own Greek verse composition. It is not the purpose of such work to produce works to rival Homer, of course, but to gain a deeper appreciation for the subtleties of the literature in our own reading. The next time some commentator says a word is emphatic in this or that position of a hexameter line, you should check the localization. It may be the word could go nowhere else.

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¹Though Hellenistic poets are somewhat more restrictive in localization, it is not usually by much. They differ from earlier practice more in the rhythm of the full line. Since my own interest is in the archaic poets, I left out later poets.

Notation. First, it's necessary to talk about particular positions in the hexameter line. Here I will be using van Raalte's notation:

$$-\frac{\overset{a}{}\overset{b}{}}{1} \quad \frac{\overset{a}{}\overset{b}{}}{2} \quad \frac{\overset{a}{}\overset{b}{}}{4} \quad -\frac{\overset{a}{}\overset{b}{}}{6} \quad -\frac{\overset{a}{}\overset{b}{}}{7} \quad \frac{\overset{a}{}\overset{b}{}}{8} \quad -\frac{\overset{a}{}\overset{b}{}}{9} \quad \frac{\overset{a}{}\overset{b}{}}{10} \quad -\frac{\overset{a}{}\overset{b}{}}{11} \quad \frac{\overset{a}{}}{12}$$

In the work of O'Neill and Porter, position 2a is $1\frac{1}{2}$, 6a — a common caesura position — is $5\frac{1}{2}$, etc. An even position number without the 'a' or 'b' indicates contraction except for position 12, which is anceps and can only ever hold a single syllable.

In most of the localization literature the position of a word shape is identified by the position of the *last syllable*. I will follow that convention here. So, in the opening line of the Iliad — $\mu \hat{\eta} \nu \nu \nu$ ἄειδε, $\theta \epsilon \dot{\alpha} - \mu \hat{\eta} \nu \nu$ is in position 2a, ἄειδε in 4a and $\theta \epsilon \dot{\alpha}$ in 5.

O'Neill's method was to identify any syllable in position 12 as long. Since a word naturally $\neg \neg \neg$, for example, will be identified as $\neg \neg \neg$ when it occurs in position 12, tables nine and ten should be taken together. All such shapes ending in $\neg \neg$ should be compared to those ending in $\neg \neg$.

Reading the tables. In the tables I include the statistics for the most common localizations. In the final row I list in descending order of frequency those positions which occur less than 10% of the time in all of the three corpora. If a position is not in this list, then that word shape never occurs in that position.

The table numbering here is the same as in O'Neill's paper. I have omitted the tables from 28 on, which contain rare word shapes and other statistics not about localization itself.

	Table One: ~				
Positions	Il.	Od.	Hesiod		
2a	15.1%	12.1%	13.0%		
2b	15.1%	16.6%	13.9%		
4a	11.3%	8.9%	8.7%		
ба	14.3%	15.0%	17.6%		
6b	12.9%	14.0%	11.3%		
10a	11.1%	12.5%	12.5%		
10b	8.4%	8.9%	10.1%		
(Others: 4h	o, 8b, 8a			

Table Two: -

Positions			Hesiod
1	32.6%	30.5%	29.0%
3	19.4%	21.5%	27.2%
9	11.0%	30.5% 21.5% 10.2%	9.5%
Others	2, 7, 4,	6, 8, 5, 1	2, 11

Table Three: $\sim\sim$			
Positions	Il.	Od.	Hesiod
2b	18.0%	17.1%	14.5%
4b	19.4%	21.3%	12.7%
6b	15.3%	13.2%	18.0%
8b	36.7%	31.9%	42.1%
10b	10.6%	16.5%	12.9%

Table Four: \lor -

Positions	Il.	Od.	Hesiod
3	31.2%	26.4%	21.9%
5	12.9%	10.1%	13.6%
7	52.5%	26.4% 10.1% 59.4%	61.7%
	Others:	11, 9	

Table Five: $- \lor$

Positions	Il.	Od.	Hesiod
2a	28.7%	27.9%	32.1%
5a	27.8%	30.1%	23.3%
10a	35.9%	27.9% 30.1% 34.3%	36.8%
	Others:		

Table Six: --

Positions	Il.	Od.	Hesiod
2	21.2%	20.2%	21.1%
5	14.0%	12.5%	16.2%
7	6.4%	8.0%	10.5%
12	41.3%	8.0% 41.7%	39.0%
Ot	hers: 3, 9	9, 8, 4, 11	

Table Seven:	
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Positions	Il.	Od.	Hesiod
3	13.9%	13.5%	13.6%
5	41.0%	34.0%	32.9%
7	33.8%	39.8%	38.9%
9	9.4%	10.7%	13.4%
	Others	s: 11	

Table Eight: -	_00
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Positions	Il.	Od.	Hesiod	
2b	25.7%	33.8%	32.3%	
8b	29.4%	27.6%	28.0%	
10b	35.3%	31.5%	36.2%	
Others: 4b				

Table Nine: $\neg \neg \neg$

Positions	Il.	Od.	Hesiod
4a	11.6%	8.2%	12.5%
6a	75.8%	82.4%	66.3%
10a	3.1%	3.5%	15.0%
	Others	s: 8a	

	Table Te	n:		
Positions	Il.	Od.	Hesiod	
12	92.1%	92.9%	95.7%	
	Others	: 8, 4		

Table Eleven: $\neg - \neg \neg$				
Positions	Il.	Od.	Hesiod	
8b		95.6%		
10b	3.2%	1.5%	10.0%	
Others: 4				

Table Twelve:				
Positions				
6a	59.7%	54.4%	54.9%	
10a	31.9%	54.4% 39.2%	42.4%	
Others: 4a, 8a				

Table Thirteen:

1a	ble I hirt	een: $00-0$	0
Positions	Il.	Od.	Hesiod
ба	56.9%	62.5%	55.2%
10a	39.5%	33.1%	38.4%
	Others:	4a, 8a	
Та	ble Four	een:	_
Positions	Il.		Hesiod
3	49.4%	50.3%	46.0%
5	34.7%	31.8%	34.7%
12		11.3%	
(, Dthers: 9	11, 7, 8	
T	able Fifte	en:	
Positions			Hesiod
3	42.2%	37.3%	37.9%
5		48.6%	
9		9.0%	
	Others:	11, 7	
Ta	ble Sixte	en	_
Positions		Od.	
	Il.		Hesiod
Positions	Il.	<i>Od.</i> 100%	Hesiod
Positions 12	<i>Il.</i> 96.2% Others	<i>Od.</i> 100% : 8, 4	Hesiod 96.5%
Positions 12	Il. 96.2% Others	<i>Od.</i> 100% : 8, 4 teen:	Hesiod 96.5%
Positions 12 Tab	Il. 96.2% Others ole Seven Il.	Od. 100% : 8, 4 teen: Od.	Hesiod 96.5%
Positions 12 Tab Positions	Il. 96.2% Others ole Seven Il. 63.8%	<i>Od.</i> 100% : 8, 4 teen:	Hesiod 96.5% Hesiod 64.8%
Positions 12 Tab Positions 8b 10b	Il. 96.2% Others ole Seven Il. 63.8% 36.2%	<i>Od.</i> 100% : 8, 4 teen: <i>Od.</i> 68.4% 31.6%	Hesiod 96.5% Hesiod 64.8% 35.2%
Positions 12 Tab Positions 8b 10b Tab	Il. 96.2% Others De Seven II. 63.8% 36.2% De Eighte	<i>Od.</i> 100% : 8, 4 teen: <i>Od.</i> 68.4% 31.6% een:	Hesiod 96.5% Hesiod 64.8% 35.2%
Positions 12 Tab Positions 8b 10b Tab Positions	Il. 96.2% Others ole Seven Il. 63.8% 36.2% ole Eighte Il.		Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod
Positions 12 Tab Positions 8b 10b Tab Positions 8b	Il. 96.2% Others ole Seven Il. 63.8% 36.2% ole Eighte Il. 70.1%	Od. 100% : 8, 4 teen: Od. 68.4% 31.6% een: Od. Od. 63.2%	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7%
Positions 12 Tab Positions 8b 10b Tab Positions	Il. 96.2% Others ole Seven Il. 63.8% 36.2% ole Eighte Il. 70.1% 29.9%	$\begin{array}{r} Od. \\ \hline 100\% \\ \vdots 8, 4 \\ \hline teen: \\ Od. \\ \hline 68.4\% \\ 31.6\% \\ \hline een: 00-0 \\ \hline 0d. \\ \hline 63.2\% \\ 35.5\% \\ \end{array}$	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7%
Positions 12 Tab Positions 8b 10b Tab Positions 8b 10b	Il. 96.2% Others ole Seven Il. 63.8% 36.2% ole Eighte Il. 70.1% 29.9% Others	$\begin{array}{r} Od. \\ \hline 100\% \\ : 8, 4 \\ \hline \\ teen: \\ Od. \\ \hline 68.4\% \\ 31.6\% \\ \hline \\ een: 00-0 \\ \hline 0d. \\ \hline 63.2\% \\ 35.5\% \\ \hline \\ s: 4b \\ \end{array}$	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7% 42.2%
Positions 12 Tab Positions 8b 10b Tab Positions 8b 10b Tab	Il. 96.2% Others Ole Seven Il. 63.8% 36.2% Ole Eighte Il. 70.1% 29.9% Others	$\begin{array}{r} Od. \\ 100\% \\ : 8, 4 \\ teen:, \\ Od. \\ \hline 68.4\% \\ 31.6\% \\ een: 00-, \\ \hline 0d. \\ \hline 63.2\% \\ 35.5\% \\ s: 4b \\ een: 0 \end{array}$	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7% 42.2%
Positions 12 Tab Positions 8b 10b Tab Positions 8b 10b Tab Positions	Il. 96.2% Others Others 0le Seven Il. 63.8% 36.2% Dle Eighte Il. 70.1% 29.9% Others Dle Ninet Il.	$\begin{array}{r} Od. \\ 100\% \\ : 8, 4 \\ teen: \\ Od. \\ \hline 68.4\% \\ 31.6\% \\ een: 00-0 \\ \hline 0d. \\ \hline 63.2\% \\ 35.5\% \\ s: 4b \\ een: 0 \\ Od. \\ \hline Od. \\ \hline 0d. \\ \end{array}$	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7% 42.2% Hesiod
Positions 12 Tab Positions 8b 10b Tab Positions 8b 10b Tab Positions 5	Il. 96.2% Others ole Seven Il. 63.8% 36.2% ole Eighte Il. 70.1% 29.9% Others ole Ninet Il. 41.7%	$\begin{array}{r} Od. \\ 100\% \\ : 8, 4 \\ \hline 100\% \\ : 8, 4 \\ \hline 100\% \\ : 8, 4 \\ \hline 0d. \\ \hline 68.4\% \\ 31.6\% \\ \hline 0d. \\ \hline 0d. \\ \hline 63.2\% \\ 35.5\% \\ \hline 35.5\% \\ \hline s: 4b \\ \hline een: \circ \\ Od. \\ \hline 0d. \\ \hline 45.6\% \\ \end{array}$	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7% 42.2% Hesiod 63.5%
Positions 12 Tab Positions 8b 10b Tab Positions 8b 10b Tab Positions	Il. 96.2% Others ole Seven Il. 63.8% 36.2% ole Eighte Il. 70.1% 29.9% Others ole Ninet Il. 41.7%	$\begin{array}{r} Od. \\ 100\% \\ : 8, 4 \\ teen: \\ Od. \\ 68.4\% \\ 31.6\% \\ een: 0 - 0 \\ Od. \\ 63.2\% \\ 35.5\% \\ s: 4b \\ een: 0 \\ Od. \\ 45.6\% \\ 54.4\% \end{array}$	Hesiod 96.5% Hesiod 64.8% 35.2% Hesiod 54.7% 42.2% Hesiod 63.5%

Tat	ole Twei	nty:	0-00
		2	

Positions	Il.	Od.	Hesiod	
5	28.3%	23.5%	39.3%	
9	67.9%	23.5% 76.5%	55.4%	
Others: 7				

Table Twenty-one: $$			
Positions		Od.	Hesiod
4a	17.8%	12.5%	6.4%
6a	66.7%	70.0%	68.1%
10a	15.6%	12.5% 70.0% 17.5%	25.5%

Table Twenty-two: $-\circ\circ-\circ$

	.6% 4.39	%
6a 62.5% 42	.8% 78.39	%
10a 27.5% 53	.6% 17.49	%

Table Twenty-three: ----

	Positions	Il.	Od.	Hesiod
-	12	96.5%	96.3%	90.2%
		Others:	9, 5, 4	

Table	Twenty-	four:	··
Positions			
12	100%	100%	100%

Table Twenty-five:				
Positions	Il.	Od.	Hesiod	
5	44.4%	83.3%	16.7%	
7	22.2%	0%	0%	
9	0%	0%	66.7%	
11	33.3%	16.7%	16.7%	

Table Twenty-six: $\bigcirc \bigcirc$	
1	

Positions	Il.	Od.	Hesiod
ба	16.2%	19.4%	27.3%
10a	83.8%	80.6%	72.7%

Table Twenty-seven: $\bigcirc - \bigcirc \bigcirc - \bigcirc$

Positions	Il.	Od.	Hesiod
6a	0%	8.3%	50.0%
10a	100%	91.7%	50.0%

Syntactic Localization

Not only are individual word shapes localized, but some syntactic patterns are prone to localization, too.² For example, at the end of a line one often finds a noun shaped $-\circ$ and a verb shaped $\circ-\circ$, such as $\check{\alpha}\lambda\gamma\epsilon$ ' $\check{\epsilon}\theta\eta\kappa\epsilon\nu$ in *Il.1.2*. I'll represent that pattern so:

 $\underline{}^{\mathbb{N}} \cup \bigcup \underline{}^{\mathbb{V}} \cup 12, 6a$

Again using the convention that the shape is localized by the last position, this pattern can occur in positions 12 or 6a. In the schemata V is a verb, N a noun, **p** a pronoun, **a** an adjective, **av** an adverb and **pcp** a participle. A single bar is a word boundary, the double bar the caesura.

Before the caesura:

$-\underline{\cdots}-$	5,3	pcp, av, a, V (3)
$\cup \underline{v} \cup$	6a, 12	
\underline{v}_{\cup}	6a, 2a	
$\underline{\smile}^{\underline{v}}$	ба	
$\underline{}$	5	
$\underline{N} \cup \overset{a}{\cup} -$	3, 5	ἀνδρὶ φίλῷ, χεῖρας ἐμάς
$\underline{\mathbb{N}}$ $\underline{\mathbb{N}}$ $ $ $-\underline{\mathbb{N}}$ $\underline{\mathbb{N}}$ $-$	5	ໄλίου αἰπεινῆς, ἔγχεϊ χαλκείφ

²This section is based on Joseph A. Russo's *The Structural Formula in Homeric Verse*, Yale Classical Studies, 20:219-40. I'm not prepared to accept the concept of a structural *formula*, but the appendix contains useful and interesting localization information.

Note that in this group the noun and adjective agree:

$^{\mathrm{N}} \cup \left \begin{array}{c} \overset{\mathrm{p}}{\smile} - \end{array} \right \underline{\overset{\mathrm{a}}{\smile}} - (\smile)$	5 (6a)	νηυσίν ἕπι γλαφυρῆσι
$^{\mathrm{N}} \cup \left \begin{array}{c} \overset{\mathrm{p}}{\smile} \end{array} \right - \underbrace{\overset{\mathrm{a}}{\smile}}{\overset{\mathrm{a}}{\smile}} - (\bigcirc)$	5 (6a)	νύκτα δι' ἀμβροσίην
$\frac{N}{2}$ $\underbrace{\longrightarrow}$ $\frac{P}{2}$ $\underbrace{\longrightarrow}$ \underbrace	5 (6a)	ούρανὸν ἐς πολύχαλκον
$\frac{a}{\Box}$ \bigcup $\frac{p}{\Box}$ $\bigg $ $\frac{N}{\Box}$ $\bigg $	5 (6a)	ποικίλου ἐκ δίφροιο
$-\overset{a}{\smile}-\left \overset{p}{\smile}\right \overset{N}{\smile}-$	5	ήμετέρφ ἔνι οἴκφ
$-\underline{\overset{a}{\smile}}- \underline{\overset{N}{\smile}}-(\bigcirc)$	5 (6a)	σκηπτούχοι βασιλήες
$ \begin{array}{c c} \underline{^{N}} \cup & & \underline{^{pcp}} - (\cup) & 5 \ (6a) \\ \underline{^{av}} & \vdots & \underbrace{ & \cup & \underbrace{ & \cup & - \underbrace{^{pcp}} - (\cup) & 5 \ (6a) \\ \end{array} $) ίστὸν) ἔνθα	' ἐποιχομένην καθεζόμενοι, ἂψ ἀπονοστήσειν

After the caesura:

$\underline{N} \cup \bigcup \underline{V} \cup \underline{U}$	12, 6a	άλγε' ἔθηκεν, μῦθον ἔειπε
$\underline{\overset{\mathrm{p}}{\smile}} \mid \underline{\overset{\mathrm{N}}{\smile}} \mid \cup \underline{\overset{\mathrm{V}}{\smile}}$	12	μετὰ δ' ἰὸν ἕηκε, ἐπὶ μῦθον ἔτελλεν
$ \underbrace{ -\overset{\mathrm{N}}{\overset{\mathrm{pcp}}{\longrightarrow}} \left \overset{\mathrm{V}}{\overset{\mathrm{v}}{\longrightarrow}} \right }_{\overset{\mathrm{pcp}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} }_{\overset{\mathrm{pcp}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} }_{\overset{\mathrm{v}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\longrightarrow}} \underbrace{ -\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}{\overset{\mathrm{v}}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}{\overset{\mathrm{v}}}}{\overset{\mathrm{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}{\overset{v}}{\overset{v}}}{\overset{v}}}{\overset{v}}{\overset{v}}}{\overset{v}}}$	12	άλγεα τεύχει, νείκεα βάλλει
$-\underline{\smile}^{\mathrm{pcp}}-\underline{\smile}$	12	αἰθομένοιο, χωομένοιο, ἐρχομενάων
$(\bigcirc) \stackrel{\mathrm{N}}{\underbrace{\smile}} \stackrel{\mathrm{a, pcp}}{-\underbrace{\smile}} - \stackrel{\mathrm{v}}{\underbrace{\smile}} $	12	ούρανοῦ ἀστερόεντος
$-\overset{\mathrm{N}}{\cup}\cup$ $ -\overset{\mathrm{a}}{-}$	12, 10a, 6a	ὄρκια πιστά, ἤματα πάντα
$-\stackrel{\mathrm{v}}{\cup}$ $ $ $\stackrel{\mathrm{N}}{-}$	12	ὥλεσα λαόν, ἵκετο θυμόν
$-\overset{\mathrm{a}}{\cup}\cup$ $ $ $^{\mathrm{N}}\underline{\cup}$	12, 10a	οἴνοπα πόντον, νήπια τέκνα

Crossing the caesura:

$$(\bigcirc) \xrightarrow{\mathbb{P}} \left| \xrightarrow{\mathbb{N}} \right| \xrightarrow{\mathbb{P}^{\text{EP}}, \mathbb{V}} 7$$
 ἐν κονίῃσι πεσών, ἐνὶ στήθεσσι βαλών

With noun and adjective agreeing:

$$\mathbb{N} \cup | \cup - : _ \bigcirc : _ \nabla \cup | = _ 7$$
 παίδα δ' ἐμοὶ λύσαιτε φίλην
νοῦσον ἀνὰ στράτον ῶρσε κακήν