

MIND THE GAP: INTER-WORD SPACING AND METRICAL ORGANIZATION IN OLD ENGLISH VERSE

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IT HAS OFTEN been noted, but never sufficiently explained, that the space between words in manuscript copies of Old English verse reflects aspects of metrical form, with larger spaces falling at the end of verses.¹ Readers are more likely to be familiar with the conventional view that in early medieval English manuscripts, vernacular verse is “written continuously, like prose,” with use of metrical pointing varying from text to text.² A variety of more nuanced metrical cues, namely lineation, caesura-spacing, and line-end punctuation, are typically introduced by editors in modern print editions.³ While these presentational emendations make the texts vastly more approachable for the reader, they obscure both the ambiguities and the range of cues that exist *in situ*. Simon Thomson’s chapter on dry-point markings in this volume demonstrates how a critical return to neglected aspects of textual materiality may reveal previously unknown readerly habits. If inter-word spacing indeed correlates with the basic verse-contours of Old English poetry, then a study of spacing may act both as a new source of data related to metrics, and also as a window onto contemporary practices of reading and writing.

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1 See Norman E. Eliason, Review of “Robert D. Stevick, *Suprasegmentals, Meter, and the Manuscript of Beowulf*,” *Speculum* 45 (1970): 175–78 at 175. For an attempt at explanation of this phenomenon, see A. N. Doane, “The Ethnography of Scribal Writing and Anglo-Saxon Poetry: Scribe as Performer,” *Oral Tradition* (1994): 420–439 at 420 <http://journal.oraltradition.org/issues/9ii/doane> [accessed August 22, 2017].

2 Quotation from Peter S. Baker, *Introduction to Old English*, 3rd ed. (2012), 124. For an overview of spacing practices in the major poetic codices of Old English verse, see Abdullah Alger, *The Verbal and Visual Rhetoric of Old English Poetry: An Analysis of the Punctuation and Formulaic Patterns in the Exeter Book (Exeter, Cathedral Library, MS 3501)* (PhD thesis, University of Manchester, 2010). Katherine O’Brien O’Keeffe discusses pointing practice as an aspect of “the development of graphic conventions” in manuscript copies of OE verse (*Visible Song: Transitional Literacy in Old English Verse* (Cambridge: Cambridge University Press, 1990), *passim*, quotation at 128).

3 For a full index of key technical terms used in this chapter and volume, readers should consult the Glossary of Metrical Terms in the Appendices. Even *Beowulf Repunctuated*, a purposefully low-intervention edition, introduces lineation with only the briefest acknowledgement (*Beowulf Repunctuated*, ed. Bruce Mitchell and Susan Irvine, *OEN Subsidia*, 29 (2000), 6). See also R. D. Fulk and Christopher M. Cain, *A History of Old English Literature*, 2nd ed. (Chichester: Wiley, 2013), 65.

In this chapter, I will examine inter-word spacing across several folios from the text of *Beowulf* in British Library, Cotton Vitellius A XV, offering a model for the statistical analysis of inter-word spacing in Old English verse.⁴ Previous studies in this area have largely centred on word division (i.e. the absolute presence or absence of space between words and morphemes) rather than differences in the size of those divisions.⁵ The only extensive work carried out on varying degrees of inter-word spacing to date is that of Robert Stevick, whose several publications on “graphotactics” argue that inter-word spacing acts as “a system of notation” for metrical and suprasegmental features of Old English verse.⁶ The methodology and approach of this present study will differ from Stevick’s in two main ways. First, where Stevick assigned value on a scale of 1 to 7 to each space by looking at them rather than by measuring, I will take measurements in pixels from high-resolution images, producing more detailed, accurate and transparent data.⁷ Second, where Stevick strives to account for spacing as an “intentional” and systematic indicator of linguistic and prosodic features, I am interested in what the data shows about scribal interaction with spacing and prosody, whether or not it constitutes a deliberately applied system.⁸

4 This builds upon work from my PhD thesis, with the present chapter producing and examining a new dataset (Burns, *Visual Craft*).

5 E. G. Stanley suggests that scribes are uninterested in word-spacing in “Review of ‘O’Keeffe, K. O’B., *Visible Song: Transitional Literacy in Old English Verse*,” *N&Q* 38 (1991): 199–200, 199. Fulk and Cain suggest that spacing of syllables tends to be determined by stress in *A History of Old English Literature* 65. On aspects of the relationship between word-division and metrical form, see Thomas A. Bredehoft, “Secondary Stress in Compound Germanic Names in Old English Verse,” *JEL* 31 (2003): 199–220; Megan E. Hartman, “Stressed and Spaced Out: Manuscript-Evidence for Beowulfian Prosody,” *Anglo-Saxon* 1 (2007): 201–20.

6 Stevick defines “graphotactics” as “the incidence and measure of spacings between strings of written symbols of a text, where both the graphic symbols and the spacings carry linguistic information” (Stevick, *Old English Graphotactics* <http://faculty.washington.edu/stevickr/graphotactics/> [accessed August 22, 2018]). Robert D. Stevick, “Scribal Notation of Prosodic Features in *The Parker Chronicle*, Anno 894 [893],” *JEL* 1 (1967): 57–66; Robert D. Stevick, *Suprasegmentals, Meter, and the Manuscript of Beowulf* (1968); Robert D. Stevick, *Beowulf: An Edition with Manuscript Spacing Notation and Graphotactic Analyses* (1975); Robert D. Stevick, “Graphotactics of the Old English ‘Alexander’s Letter to Aristotle,’” *Studia Anglica Posnaniensia: International Review of English Studies* 40 (2004): 3–13. Stevick’s online work has been extensively cited, but during the publication of this volume I discovered that his website has become at least temporarily non-operational. Stevick’s work on *Beowulf* was well received by a number of reviewers: Eliason, Review, 176–77; Thomas Cable, “Review of ‘Beowulf: An Edition with Manuscript Spacing Notation and Graphotactic Analyses, Robert D. Stevick, Ed.,’” *Computers and the Humanities* 11 (1977): 49. But see also scepticism in Christopher J. E. Ball, “Review of ‘Suprasegmentals, Meter, and the Manuscript of Beowulf. By Robert D. Stevick,” *RES* 21 (1970): 476–78.

7 My methodology will be described in greater detail below. Further on Stevick’s methodology, see Robert D. Stevick, “The Measure of Spacing,” *Old English Graphotactics* (1999), xxi–ii http://faculty.washington.edu/stevickr/graphotactics/PDF_files/Measure.pdf [accessed December 1, 2017].

8 On Stevick’s approach, see Stevick, *Beowulf: An Edition*, x; Stevick, *Suprasegmentals*, 7, 14–15, 18; Stevick, “Scribal Notation,” 57. On spacing accuracy and anomaly in conventions, see Stevick,

The correlation between lexical spacing and metrical structure in manuscript witnesses of Old English verse is readily visible *in situ*, and is well illustrated by a short sample of text from *The Wanderer*. This elegiac poem opens on folio 76v of the Exeter Book, and the first three manuscript lines of text include nine half-line breaks. Of these, at least six are visibly larger than the surrounding inter-word spaces which do not fall at half-line breaks.⁹ Only at the half-line breaks following “miltse” (line 2a) and “sae” (line 4b) is this pattern not apparent, and it is likely that the spacing of “miltse” has been compromised due to its position close to the right-hand margin.¹⁰ This brief sample exemplifies a broader principle which will emerge from the data gathered and presented in this chapter: the horizontal width of the space following the concluding word of any given on- or off-verse tends to be greater than the horizontal width of the spacing following words which do not fall at the end of a verse. However, this pattern is not entirely consistent, as suggested by this example from *The Wanderer*. I will suggest that such patterns point towards scribes’ mental engagement with rhythm and other features of verse texts during the copying process, and that the results garnered from textual samples in this chapter forcefully make the case for a full-length, computer-aided study of word spacing across the corpus of Old English verse.¹¹

Methods and Parameters

Six folios of *Beowulf* have been used as the basis for the dataset analysed in this chapter (132r–137v). Measurements at the end of words were captured in a spreadsheet, summaries of which are presented and discussed below. The primary challenge in obtaining this data was one of definition: neither “space” nor “words” nor even “the page” manifest as straightforward or static objects for measurement, and different

Suprasegmentals, 72–73. Stevick’s theory of the meaningfulness of spacing pushed him towards an assessment of suprasegmental criteria, such as pitch, an approach which drew particular criticism from Ball (“Review,” 477–78). Note also that Stevick’s work relied upon an isochronous reading of Old English metre, following the work of John C. Pope (Stevick, *Suprasegmentals*, 64–65, 67–68, and see also 18–19). Pope’s views on OE verse isochrony have not generally been accepted, on which see Haruko Momma’s chapter in the present volume, especially 229.

9 These are the spacings following “anhaga” (line 1a); “gebedeð” (line 1b), “mod cearig” (line 2b), “lagu lade” (line 3a), “hondum” (line 4a), and “wræc lastas” (line 5a). It is possible that the spacing after “sceolde” (line 3a) fits this pattern too. Quotations from *The Wanderer* in this paragraph are taken from the manuscript source, with original manuscript spacing replicated, with reference to Christopher A. Jones, *Old English Shorter Poems*, vol. 1 (Cambridge, MA: Harvard University Press, 2012), 129. Images of the Exeter Book manuscript can be accessed at *The Exeter Book*, Exeter Cathedral Library and Archives & University of Exeter Digital Humanities Lab, <https://theexeterbook.exeter.ac.uk/single.html>.

10 I am grateful to Winfried Rudolf for noting to me in conversation the tendency for scribes to compress their handwriting towards the right-hand margin.

11 Here, my findings chime with Daniel Donoghue’s discussion of scribal “inner speech,” and his examination of verse syntax (Daniel Donoghue, *How the Anglo-Saxons Read Their Poems* (Philadelphia: University of Pennsylvania Press, 2018) for example, 8–9).

researchers may establish different parameters to define these objects. In the first place, determining what constitutes the beginning and end of a word is beset by mechanical and categorical questions. It is frequently a challenge to distinguish between the main concluding (or opening) stroke of a character, and an ornamental stroke or a smudge, particularly when both ink and parchment are shades of brown. In this study, any part of a stroke clearly intended to be part of the letter by the scribe, whether ornamental or not, has been included for measurement, including graphic marks above or below the x-height and baseline respectively, and long tongues and tails (characteristically found on concluding letters **e** and **a**).

A second definitional issue arises from the occasions upon which space is not only used between words, but within them. In the “aerated script” used by scribes of Old English verse texts, space may be used not only to separate words, but also to separate elements or morphemes within words; furthermore, discrete words are sometimes written with little or no space between them.¹² For example, in the extract from *The Wanderer* discussed above, the compounds *wræclastas* and *lagulade* are each encoded on the page as two letter-strings, “wræc lastas” and “lagu lade”, respectively, while another common habit of the Exeter Book scribe is use of space to separate prefixes (such as *ge-*) from the root syllable of a word. In *Beowulf*, “in” and the first element of “geardagum” (line 1a) are written continuously, while the compound elements “gear-” and “-dagum” are separated into two letter-strings by spacing. Furthermore, it is not always clear if a lexical unit has been visually divided. See, for example, *Beo* 17, “forgeaf” on fol. 132r, which has been treated as a single unit in this chapter, but might alternatively be read as featuring additional inter-syllabic space between *for-* and *-geaf*.¹³ While intra-word spacing has the potential to tell us a great deal about word stress and scribal conceptions of lexemic units, it falls beyond the scope of the current chapter. Therefore, where single words are encoded as two or more letter-strings, only the space at the end of the full word has been measured, and I have taken measurements between all discrete words, even where there is little or no space between them.

Finally, the page itself is subject to changes of both environment and media: manuscripts will expand and contract according to conditions of humidity and temperature, and the processes of digital capture and storage may involve (at greater or

¹² In his account of the development of word-separation in the medieval west, Paul Saenger notes that early medieval English manuscript texts are not encoded with the “canonical separation” (application of space after each discrete lexical unit) with which a modern reader of English is familiar, but adhered to an earlier phase of development which he calls “aerated script,” in which space is commonly used to delineate morphemic blocks rather than single words (including, for example, prefixes separated from root syllables, or space between the elements of compound words), in *Space Between Words: The Origins of Silent Reading* (Stanford: Stanford University Press, 1997), 32–44. On these aspects of “orthographic practice” in the context of early medieval reading, see Donoghue, *How the Anglo-Saxons Read*, 134–37.

¹³ *Beowulf* quotations throughout are from the MS source, with reference to Klaeber 4 and *ASPR*.

lesser levels) loss of information and fidelity.¹⁴ These problems raise the question of what, precisely, is being measured in any given set of data, and ties any such measurements to a particular rendering of the manuscript object. For this chapter I used high-resolution digital images hosted on the British Library's website; these quality facsimiles are freely accessible to other scholars.¹⁵ I have excluded text that is too damaged to reasonably be measured.

Collectively, these issues are a reminder that there is no single way to numerically represent the page. However, a transparent account of methods easily replicable by other scholars allows us to make a meaningful impression of its textual dimensions, and of the patterns that inform its layout.

Data Analysis

The individual measurements between words across the three folios were collected into three groups, according to their placements relative to metrical verses:

Table 5 Definitions of the three categories of inter-word spacing

Group #	Description
0	Spaces which do not coincide with a metrical break
1	Space falling after the final word of the on-verse
2	Space falling after the final word of the off-verse

Visualizing these groups in a written line draws attention to the significantly larger quantity of Group 0 values in any given text (Group numbers formatted in bold):

<i>Beo</i> 1646	hæle (0) hildedeor (1) hroðgar (0) gretan (2)
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For each page, and within each of these groups, mean values were produced, showing the average width of a single space for each Group on a given page. The highest and lowest values for each Group were also produced, to show the range of values around the mean

¹⁴ I am grateful to Peter Stokes for making some of these observations in a personal communication, and for stressing the problems and difficulties in taking measurements from the page.

¹⁵ Cotton MS Vitellius A.xv, British Library online, Digitized Manuscripts www.bl.uk/manuscripts/FullDisplay.aspx?ref=cotton_ms_vitellius_a_xv. Staff at the British Library have confirmed in private communication that their images are taken at a resolution of 300 dpi.

Table 6 Average spacing units by metrical group across six folios of *Beowulf*

Folio	Average size of a space (pixels)			
	0	1	2	Average across groups
132r	51.3	75.9	119.5	67.7
132v	39.6	76.2	94.3	57.3
133r	46.7	88.1	81.6	59.8
133v	48.9	96.6	91.5	65.5
134r	52.8	84.5	80.1	63.8
134v	53.0	75.6	96.7	65.4
135r	47.7	57.4	74.1	54.0
135v	57.3	68.8	74.0	64.9
136r	44.2	80.9	81.6	57.4
136v	52.1	76.4	93.5	63.5
137r	41.9	62.9	79.1	54.5
137v	43.4	79.8	86.8	59.0
Average across folios	47.4	77.1	88.9	60.6

Table 7 Proportional difference between average spacing units by metrical group across six folios of *Beowulf*

Folios	Average size of spacing by group, as a multiple of the average size of spacing in Group 0		
	0	1	2
132r	1	1.5	2.3
132v	1	1.9	2.4
133r	1	1.9	1.7
133v	1	2.0	1.9
134r	1	1.6	1.5
134v	1	1.4	1.8
135r	1	1.2	1.6
135v	1	1.2	1.3
136r	1	1.8	1.8
136v	1	1.5	1.8
137r	1	1.5	1.9
137v	1	1.8	2.0
Average across folios	1	1.6	1.9

average. After unmeasurable spaces were excluded, 802 data points remained.¹⁶ Tables 6 and 7 present these data.

Table 6 shows that on average, the size of spaces in Groups 1 and 2 are larger than the size of spaces in Group 0. However, because scribal handwriting size may vary from page to page, pixel-measurements on different folios may not be directly comparable with one another.¹⁷ Table 8 makes the data comparable across folios by representing average spacing for each group as a proportion of the size of Group 0. For example, on folio 136v, spaces in Group 1 are on average 1.5 times the size of spaces in Group 0, while spaces in Group 2 are on average 1.8 times the size of Group 0. This can be compared to very similar results on the next page, fol. 137r, where spaces in Group 1 are on average 1.5 times the size of spaces in Group 0, while spaces in Group 2 are on average 1.9 times the size of Group 0. On average across the full set of folios (see the final row of Table 7), spaces in Group 1 are 1.6 times the size of spaces in Group 0, while spaces in Group 2 are 1.9 times the size of spaces in Group 0. This means that space following a word concluding an on-verse is, on average, going to be around one-and-a-half times larger than the space following a word which does not conclude a verse, whereas space following a word that concludes the off-verse is on average going to be almost twice the size of spaces following words which do not conclude a verse.¹⁸ This table makes clearer and more nuanced the pattern which we have already observed: spacing distinguishes not only verse-final spacing (Groups 1 and 2) from non-verse-final spacing (Group 0), but furthermore it distinguishes spacing which follows the on-verse from spacing which follows the off-verse. This creates a visual hierarchy analogous with modern editorial layout conventions, where the least spacing is applied after words which do not conclude a verse (a single space), more space is applied after words which conclude the on-verse (a caesura), and the most space is applied after words which conclude the off-verse (a line-break). In both modern and manuscript texts, spacing patterns reflect the subordination of half-lines within the structure of the full line.

There is, however, significant variance from folio to folio. While Table 8 shows that across the set of folios, spacing in Group 2 is, on average, around twice as large as spacing in Group 0, this ranges from 1.3 to 2.4 times, while the average spacing in Group 1 ranges from 1.2 to 2.0 times the average size of spacing in Group 0. On folio 134r, spacing in

16 The full dataset can be accessed by writing to the author directly.

17 For example, if Scribe A were to turn a page and begin writing in a slightly larger hand, we would expect inter-word spacing to be larger, accordingly. This would be a result of increased handwriting size and not of a change in approach to spacing, and so the two pages would not be directly comparable. Stevick discusses this issue in "The Measure of Spacing," *Old English Graphotactics* (1999), xxi–ii faculty.washington.edu/stevickr/graphotactics/PDF_files/Measure.pdf [accessed December 1, 2017]. Saenger adopts a different and equally viable method of handling this problem in *Space Between Words*, 27.

18 These results correspond extremely closely with the results of a similar study which I produced in 2018, using largely different folios from *Beowulf*, as well as some text from *The Wanderer* in the Exeter Book. The methodology for this study was predominantly the same, though with some

Table 8 Range of spacing values by group across six folios of *Beowulf*

Folio	Range of spacing values (pixels)		
	0	1	2
132r	117	110	173
132v	98	101	121
133r	133	69	50
133v	94	93	80
134r	100	114	47
134v	105	100	180
135r	229	68	151
135v	78	37	73
136r	166	96	58
136v	128	48	45
137r	125	112	129
137v	159	92	82

Group 2 is barely distinguished from spacing in Group 1, and on folio 133r, spacing in Group 1 is in fact on average slightly larger than spacing in Group 2. Furthermore, the range of spacing values for each group on each folio is generally broad. Table 9, below, shows the range between the smallest number of pixels belonging to a particular group on a particular folio, and the largest such measurement.

Within each Group there is a significant spread of occurrences across these ranges, particularly at Position 0. For example, on folio 132r, spaces in Group 0 are on average 51.3 pixels each. However, Group 0 on that page carries values ranging from -12 pixels to 118 pixels, with only 38 percent of values falling between 40 and 64 pixels, around the average.¹⁹ On the same page, Group 1 spacings range from 19 pixels to 148 pixels, with over half of these falling between 60 and 90 pixels, around the 75.9 pixel average. Group 2 values range between 57 pixels and 230 pixels, with only 31 percent of values falling between 100 and 140 pixels, around the average 119.5 pixel average. If scribes were striving to use word spacing as a system of notation, as argued by Stevick, it is likely that measurements would fall within a fairly narrow range, with occasional anomalous outliers and the vast majority of measurements falling at or very close to

experimentation rotating images, and some difference in making the measurements comparable between folios (Burns, *Visual Craft*, chap. 3, especially 187n89).

19 In the measurements, a negative value indicates that not only is there no space between the final letter of one word and the first letter of the next, but there is in fact identifiable overlap between the letters, usually due to an overhanging ascender or underhanging descender.

an average value. However, the large ranges within each Group are not being caused by occasional anomalies, but by a generally broad distribution of spacing values. Overall, the data from the sample sets suggests two things: first, that inter-word spacing displays an identifiable pattern, with the ends of the on- and off-verse generally marked by larger inter-word spaces; second, that this regularity is not consistent enough to reflect a systematic programme by scribes.

Conclusions: Some Hypotheses and Suggestions

This chapter has shown that in a sample of folios from *Beowulf* the scribe on average utilizes a greater degree of inter-word spacing after on-verses than between words which do not fall at the end of a verse, and a greater degree of inter-word spacing after off-verses than after on-verses. This corresponds with our modern understanding of the structure of Old English metrical lines. However, it has also shown that this pattern is not consistent enough to suggest scribes were systematically deploying spacing in this way. In his book on early medieval English reading practice, Daniel Donoghue addresses the “not-systematic-yet-not-random pattern of punctuation” in much of the Old English verse manuscript record by turning to the physiological experiences of scribes.²⁰ In a similar vein, the non-systematic spacing patterns demonstrated by the data above may reflect the scribe’s physiological response to the process of reading and copying texts, and specifically their response to metrical rhythm. The individual and non-systematic nature of such a response accounts for the inconsistent application of spacing patterns, while broad patterns identifiable between folios (and scribes) indicate familiarity with Old English metrical structure.

A scribe’s processes of reading are affected by the mental demands of copying, but are also embodied in the physical actions of copying. Unlike a non-copyist reader, the scribe must—however briefly—hold a portion of the text mentally intact, suspended between the exemplar and the new page. The parallelisms and rhythms found in the metrical line or verse may aid the speed, fluidity, and accuracy of this process of reading, memorization, and writing. The scribe who looks at an exemplar seeking to commit a certain portion of it to short-term memory might choose a metrical unit like a verse; after recording this memorized unit, the scribe raises the pen and looks back up at the exemplar to memorize the next line. The scribe then lowers the pen back to the vellum, leaving a larger space between verses than between the continuously copied words within a verse. Numerous scenarios might affect or alter such a process: the presence of sense-units and rhetorical structure offering an alternative or complementary framework for memorization; the need to compress writing to fit in a particular space; or an interruption causing the scribe to put down the pen.

Spacing, then, may be a graphic side-effect of mnemonics, influenced by the scribe’s individual engagement with and reliance on rhythmic form. Such a theory complements the work of several scholars on the role of aural engagement in scribal activity. Malcolm

²⁰ Donoghue, *How the Anglo-Saxons Read*, 128.

Parkes speaks of an “aural response ... in the mind’s ear,” while Thomson imagines “a scriptorium where scribes ... could hear and, to some degree, represent metrical rhythms in their writing.”²¹ Approaching an examination of sound in silent reading both through modern literary representations of “inner speech,” and also through cognitive psychological data, Donoghue suggests that because “the inner voice never grows quiet ... the only kind of reading is oral.”²² For the scribe listening to that “inner voice,” the only kind of copying is aural.

A second response to the existence of non-systematic patterns at the level of the folio is to see whether those patterns become more systematic at a more granular level of capture, such as the verse line. The following lines from *Beowulf* on folio 132r of the Nowell Codex (lines 3–5, 10–13) are demonstrative of the trends shown by the data more broadly:²³

hu ⁻³ ða ⁷¹ æþelingas ⁸¹ ellen ^{EL} fremedon. ¹⁹²
 Oft ⁵⁶ scýld ⁸⁸ scefing ⁹⁷ sceapen[... ^{EL} þreatum ¹¹⁰
 monegum ¹⁰³ mægþum ¹⁰² meodo ⁸¹ setla ^{EL} of ⁴⁷ teah ¹⁰⁷
 ...
 ofer ²⁸ hron ¹³⁰ rade ⁸⁰ hýran ⁷⁰ scolde ⁷¹
 gomban ^{EL} gýldan ⁶⁴ þæt ⁷ wæs ³⁶ god ⁷⁴ cýning. ¹⁵⁴
 ðæm ⁶⁸ eafera ³⁸ wæs ^{EL} æfter ⁵⁴ cenned ⁷⁹
 geong ⁶³ in ²⁴ geardum ⁷¹ þone ⁴⁵ god ^{EL} sende ⁵⁷

Within each verse of this extract, the largest space tends to fall at the end of the off-verse (Group 2), or else at the end of the on-verse (Group 1), with lines 3a and 10a as exceptions. The large space between “hron” and “rade” in line 10a is caused by the erasure of a character between the two elements of the compound.²⁴ The spacing after the off-verse features some of the largest values in the set (e.g. 192 pixels at line 3b and 154 at line 11b), but also one of the lowest (57 pixels at line 13b). Three values in lines 4a, 5a and 5b fall within the higher spacing values for the folio as a whole, and yet do not fall at metrical breaks. In line 13, the breaks after the on-verse and the off-verse are the largest within the line, but they are certainly not among the highest values for folio 132r as a whole.

21 M. B. Parkes, *Their Hands Before Our Eyes: A Closer Look at Scribes: The Lyell Lectures Delivered in the University of Oxford, 1999* (Aldershot: Ashgate, 2008), 66; Thomson, “Whistle While You Work”: Scribal engagement with Old English poetic texts,” in *Sensory Perception in the Medieval West*, ed. Simon Thomson and M. Bintley (Turnhout: Brepols, 2016), 100. See also Doane, “Scribe as Performer,” 420, 431–32.

22 Donoghue, *How the Anglo-Saxons Read*, 7 and also 36–42.

23 Spacing values between words and morphemes are in pixels. This style of layout is adapted from that used by Stevick. EL indicates end of the MS line.

24 As two elements of a compound word, the space between “hron” and “rade” was not included in the statistics for the analyses and tables above; however, I have provided it here to illustrate the paleographic features, including erasure, which can affect word-spacing. A second inter-word space provided in this extract falls in “ofteah” (line 5b). Capturing this kind of additional data could shed light on the scribal treatment of word-elements as a further area of spacing study.

This raises the possibility that a pattern of metrical spacing may be more localized than general. Across the data from all of the sample folios, in 75 percent of verses with at least one measurable space in Group 0, and at least one measurable space in Group 1 or Group 2, the space at the end of the on- or off-verse was larger than any other measured space in the verse.²⁵ This means that in three-quarters of measurable cases, larger spacing within the line delineated metrical structure locally. It should also be noted that the two largest spaces in the extracts, at the ends of lines 3 and 11, fall not only at the end of metrical lines, but at the end of semantic units (represented by the use of a full stop in the edited text). Further analysis of data at a highly granular level might, therefore, be able to demonstrate a more systematic relationship between verse boundaries and inter-word spacing.

The absence of an intentional system of inter-word spacing does not mean that Scribe A was necessarily unaware of these patterns on the folio, or that lexical spacing might not sometimes be deployed intentionally for effect in Old English texts.²⁶ Other scholars have been inclined to see similarly inconsistent patterns as reflective of deliberate scribal strategies and priorities.²⁷

The patterns and hypotheses presented here are an invitation to further study of inter-word spacing in Old English verse. A full-scale study would require the gathering of further data on two axes: first, obtaining information from a significant number of lines, such as the full text of *Beowulf*; second, identifying other aspects of those lines which might affect inter-word spacing, such as verse grammar, rhetorical units, and manuscript punctuation. The first of these tasks would ideally be carried out via computer software, using OCR technology.²⁸ The weight of the second task will be considerably lessened by the data to be made available through the CLASP project. From such an exercise, we stand to gain greater insight into the specific reading practices of the medieval copyist, and into individual scribes' experiences of the rhythms of their texts. If marks of punctuation are indeed "mute witnesses" to the "inner speech" of the scribe,²⁹ then inter-word spaces may be their "invisible" counterparts.

25 A similar value was found in Burns, *Visual Craft*, Chapter Three, using 3 sample folios of Scribe A in the *Beowulf* manuscript (fols. 132r, 156v, and 173r), where in 76 percent of the half-lines for Scribe A, across all three sample folios, the spacing at the end of the any given verse was greater than any of the other spaces within the same verse, even where the spacing at the end of that verse was not amongst the higher values within its respective folio as a whole.

26 For some examples of deliberate and aesthetic uses of space and spacing in Old English verse texts, see Burns, *Visual Craft*, 137–39; 153–54; 261–75.

27 See Thomson, on the degree to which scribes end folios with complete half-lines, in "Whistle While You Work," 99–122, especially 118–19. Thomson concludes (p. 121): "it is clear that scribes sometimes organized their copying around the contents of the texts and that they seem to find it easier to do so when those texts were structured metrically, and, further, that they sometimes ... organised their copying on purely metrical criteria." Donoghue questions whether scribes may have anticipated the eye-movement of readers in their use of punctuation, Donoghue, *How the Anglo-Saxons Read*, for example, 129, 138.

28 I am grateful to Nick White for his conversations with me on this subject.

29 Donoghue, *How the Anglo-Saxons Read*, 154.

