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Spelling variation and text alignment

An investigation of German *Mirabilia Romae* from the year 1500

<https://doi.org/10.1515/zfs-2021-2032>

Abstract: In the 15th century, at a time when codification via dictionaries and grammars had not yet taken effect, printers, editors, and compositors were already producing pamphlets and books that had to meet the new requirements of the letterpress, especially as regards the arrangement of white space and uniform line justification (even-margined on the left and right). The following analysis investigates five German editions of the *Mirabilia Romae* (Marvels of the City of Rome), a well-known pilgrim guide, all printed in 1500 for the contemporaneous Jubilee year and thus for short-term sale. The results show that compositors used different means for text alignment: In addition to deviations in line counts and the repositioning of lines, they chose extended or contracted spelling variants, predominantly on the second half of the page. The most frequent variants are abbreviations in the form of tildes. However, just a few spelling patterns with tildes were used. With respect to explanatory processes in a historical perspective, the results call for a closer consideration of page format, text layout (*mise-en-page*) and line justification when evaluating spelling variation in early book printing.

Keywords: spelling, incunabula, line justification, printing, *Mirabilia Romae*

1 Texts in early book printing

Texts are our daily bread; as linguists we examine their layout, form, and function. In a historical perspective, however, it is often necessary to thoroughly consider the extra-linguistic conditions of text production to adequately evaluate and understand the specifics of historical texts. One area in which a strong relation between internal and external variables becomes particularly apparent are texts in early book printing. In incunabula (printed with movable type before 1501), the layout, structure, punctuation, and orthography of texts were closely related to the workflow and technical equipment in the printing shop. This can easily be il-

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lustrated by two examples: the order of typesetting and the materiality of types and blanks.

The pages of a text were not necessarily set in type consecutively. The printer's sheet often contained more than one leaf (broadside); in folio format there were two leaves, in quarto format four, in octavo eight leaves, in duodecimo twelve, each with two pages (front and back side of the leaf). The outer forme contained only a limited number of consecutive pages (cf. Werner 2019: 42–55 for an illustration): a quarto sheet, for example, comprised pages 1, 4, 5 and 8 (with pages 2, 3, 6 and 7 to be printed on the inner forme), while an octavo sheet contained pages 1, 4, 5, 8, 9, 12, 13 and 16 (with pages 2, 3, 6, 7, 10, 11, 14 and 15 to be printed on the inner forme). The order of setting was therefore not *seriatim* page by page from 1 to 8 or 1 to 16, but according to the front or back side of the sheet (outer and inner forme), respecting the conjugate (conjoined) leaves. For example, pages 2 and 3 were only set after pages 1 and 4 had already been sent to the press. Therefore, when casting off, the printer had to calculate in advance as precisely as possible how much manuscript text and how many lines would fit on a page. One can imagine that the calculations often had to be “smoothed out” during the ongoing process of typesetting, either by adding or subtracting one or more lines or by setting individual lines narrower or wider in order to gain or save space. For the first printer in Ulm, Johann Zainer, for example, Bolton (2016: 60–62) demonstrates extreme variations in the number of lines in several works.

As regards the materiality of types and blanks, one must bear in mind that typefaces were produced by three-dimensional pieces of type made from lead, tin, antimony, bismuth, and copper (Berger and Rode 2017: 372–382). When setting an individual line, the compositor not only placed these letter types in his composing stick but also added word spacing pieces lacking reliefs, so-called negative or blind spaces (quads). This was necessary because types had to fit tightly and be securely fixed and locked in the chase (an iron frame). Moving pieces of type could make the print blurry or even come loose upon the impact of the press. Thus, hand-press printed texts are not a series of letters or words, but are formed by individual choices of black and white, of letter types as well as different blind word spaces. During the typesetting process the compositor therefore had to make grammatical judgments, e. g.: Could or should a compound be written either as a single word or separately? Could or should a word be hyphenated at the end of the line? And if so, could or should an individual hyphenation be morphological or syllabic (cf. Ruge and Voeste 2018)? In contrast to manuscripts, these grammatical judgments always had to be weighed against typographical decisions, for example, avoiding so-called “rivers” of vertical white space (cf. Figure 1, to the left) or too many adjoining lines with hyphenations following each other. One is tempted to assume that in the early days of letterpress printing, these aesthetic

Figure 1: To the left: river of white space in *Das Bayrische Landrechtbuch* 1495: LVlr. To the right: white spaces, Wittenberg, early 16th century (taken from Berger and Rode 2017: 331).

details in the distribution of white space were of minor importance. However, as recent archaeological excavations have shown, blind spaces were manufactured in a surprising variety of widths, even surpassing the sets common in modern times (Berger and Rode 2017: 331; see Figure 1, to the right).

In this context, the interplay of orthography with the new requirements of the letterpress is of interest, especially as regards the arrangement of white space in line justification (even-margined on the left and right). Schmitz (2018: 122–123) mentions several possibilities used by compositors to compensate for an inaccurate casting off or to better justify lines. These included both typographical options (tighter or looser typesetting, use of smaller or larger fonts) and orthographical ones (use or omission of abbreviations, choice of spelling variants). It is therefore quite possible that the spelling of a word was related to line justification. For instance, word spellings could be extended by combining consonants or contracted by using tildes (*branndt* vs *brād* ‘fire’) (for English cf. Brekle 1964; Rutkowska 2013; Shute 2017). In the following, I will explore the interconnection of typography and orthography using the example of several German editions of the pilgrim guide to the city of Rome *Mirabilia Romae* (Marvels of the City of Rome).

2 *Mirabilia Romae*

The year 1500, which will be the focus of the study below, was an *annus jubilaеus*, a holy year of universal pardon in Western Christianity. These Jubilees were in-

troduced in 1300 by Pope Boniface VIII. Already in the Middle Ages, people had received forgiveness of sins for making a pilgrimage to Rome and regularly visiting one of the basilicas of St. Peter, St. Paul, St. John Lateran, or Sta. Maria Maggiore for a short time. In the 15th century there had been several *anni jubilaei* (1413, 1423, 1450, 1475). Hundreds of thousands of people had made the pilgrimage to Rome for this purpose, travelling in part along well-known trade routes from the southern German cities because this route to Rome was safer, easier, and cheaper than a journey by ship to Jerusalem. It is not hard to imagine that the pilgrimage generated a great demand for travel guides: hundreds of handwritten and printed copies of the *Mirabilia Romae* are still known today. Besides the Latin and Italian versions there are also German, Dutch, English, French, and Spanish ones. For German, 80 manuscripts and 54 prints have been identified so far (Miedema 1996: 95–144, 204–221; Wagner 2012: 87).

The text of the *Mirabilia* we encounter in the incunabula is an extended version of the original text from the 12th century and, following Hain (1831: 415), it is usually referred to as *Mirabilia Romae vel potius Historia et descriptio urbis Romae*. This extended version contains a description of the foundation and the first kings of Rome, covers the emperors until the Donation of Constantine, presents the most important churches with their respective relics, and gives an overview of the calendar days on which special indulgences were granted there. From the *annus jubilaus* of 1475 onwards, this text was the most widely used pilgrimage guide for Rome (cf. Miedema 2017: 126). In the years 1499 and 1500 alone, 17 German prints were produced for the new *annus jubilaus*, most of them (14) in Rome itself, and three additional ones in Strasbourg, Erfurt, and Nuremberg (cf. Miedema 1996: 210–214). The most common format of the incunabula was octavo; there are only three quarto editions (1481, 1482, 1500) and one in duodecimo (1500 [?]). For the following study, five copies, including one quarto and four octavo editions, all of them printed in 1500, were compared (cf. Table 1).¹

Apart from Matthias Hupfuff, little is known about the printers (see, e.g., Haebler 1924; Esch 2007; Lincoln 2019). The most experienced printer of German *Mirabilias* was certainly Stephan Planck, who was born in Passau and had worked in Rome since 1479 (Maas 1976: 123). Eucharius Silber, a clergyman who initially belonged to the diocese of Würzburg, repeatedly reprinted Planck's editions. Only later did Johannes von Besicken (from Besigheim near Stuttgart), who had probably learned the trade in Basel, become involved as well. In 1493 and 1494, he published seven German editions in association with the Roman

¹ The GW-numbers in Table 1 refer to the *Gesamtkatalog der Wiegendrucke*, a union catalogue of incunabula: <<https://www.gesamtkatalogderwiegendrucke.de/GWEN.xhtml>>.

Table 1: Text selection for this study (all incunabula printed in 1500).

GW No.	Site	Printer	Format
M 23623	Rome	Johannes Besicken, Martinus de Amsterdam	octavo
M 23630	Rome	Johannes Besicken, Martinus de Amsterdam	octavo
M 23631	Rome	Stephan Plannck	octavo
M 23633	Rome	[Eucharius Silber]	octavo
M 23634	Strasbourg	[Matthias Hupfuff]	quarto

printer Sigismund Meyer (from Marchsheim near Donauwörth), and, in 1500, in collaboration with Martinus de Amsterdam (whose surname is unidentified). More detailed information is available about the Strasbourg printer Matthias Hupfuff. Duntze (2007) traces his career, his publishing programme, and his contacts (including authors such as Thomas Murner, Sebastian Brant, and Johannes Geiler von Kaysersberg). Hupfuff’s programme shows a high proportion of German texts, a functional orientation, and a specialisation in shorter texts printed in octavo or quarto (Duntze 2007: 308). Apparently, Hupfuff included the *Mirabilia* in his programme because he counted on a good demand in the Jubilee year of 1500 (Duntze 2007: 143–145). All these printers produced the *Mirabilia* as a functional text for the current Jubilee event and thus for short-term sale. Strong sales are attested by the rapid reproduction: In 1500, Plannck published three issues, Johannes Besicken & Martin of Amsterdam as many as six or seven (cf. Miedema 1996: 212–214). The following study will show just how much effort their editors and compositors put into these editions.

3 Deviating line counts

Editors and compositors tried to achieve a standard number of lines on every page (cf. Bolton 2016: 59–60; Hellinga 2000). It helped to keep the press balanced if the text blocks were of the same size, and it saved time if the spacing material did not have to be changed. However, if, as described above, the casting off was not accurate, it had to be corrected during the printing process. While Stephan Plannck and Matthias Hupfuff managed to precalculate more accurately, the compositors of Eucharius Silber and Johannes Besicken & Martinus de Amsterdam often had to add an extra line to straighten out incorrect calculations. Table 2 presents the line counts per page (23–24 lines) in the earlier edition stemming from the workshop of Johannes Besicken & Martinus de Amsterdam (M 23623). It has not yet been investigated whether compositors first tried to insert more text on the page via

Table 2: Line counts per page in M 23623 (wc referring to full-page woodcuts).

		line counts per page															
		wc	20	wc	11	23	23	23	23	23	23	23	23	23	23	24	24
gatherings	A																
	B	23	23	24	24	24	23	24	24	24	24	23	24	24	24	24	24
	C	22	wc	21	23	23	23	23	23	23	23	23	23	23	wc	23	23
	D	16	wc	23	23	23	23	23	23	wc	23	23	15	wc	23	23	wc
	E	24	wc	23	23	22	wc	23	23	23	23	21	23	23	23	23	23
	F	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
	G	23	23	23	23	23	23	23	23	23	23	23	24	23	23	23	23
	H	23	24	24	24	24	24	24	21								

omissions or abbreviations and, if this proved unsuccessful, only decided to add an extra line in the second step. However, a comparison of the deviating 24-line pages with the adjacent correct 23-line ones in M 23623 suggests that this was not the case here. In fact, the number of tildes, abbreviations, and omitted hyphens indicates the opposite, namely that the compositors knew in advance that they did not need to save space on the 24-line pages: on the pages with 23 lines, 14.5 % of the words were abridged on average, while on the pages with 24 lines only 11.9 % show abbreviations.²

The strategy of simply adding one more line was, apparently, the easier way to compensate for inaccurate precalculation. The alternative option of placing more text on 23 lines, on the other hand, would have required more detailed page planning because it would have forced the compositors either to truncate the text or to abbreviate individual words all over the page. This may have been difficult for several reasons: The text genre itself and the rapid reproduction (due to the strong demand during Jubilee years) may have resulted in less careful planning by the editor.³ In addition, the compositors could not straighten out the imprecise casting off without substantial effort. Let us recall the operational sequence: The compositor placed the type line by line in his composing stick (up to three or four lines at most), filling out every line so that it fitted tightly, then transferring them to the galley (a wooden tray). This step-by-step procedure meant that the compositor only ever handled a few lines; this bottom-up process tended to lead to ad hoc decisions (so-called *bricolage*, cf. Voeste 2018: 10–14). If the compositor had

² The figures are as follows: A15: 7.4 %, B3: 6.7 %, B7: 7 %, B10: 12.1 %, E1: 16.8 %, G12: 25.5 %, H2: 7.5 % (all with 24 lines); A14: 21.1 %, B2: 8.7 %, B6: 8.8 %, B11: 12.9 %, G13: 20.6 %, H1: 14.7 % (all with 23 lines).

³ This is also supported by the fact that in the second edition (M 23630) from the workshop of Johannes Besicken & Martinus de Amsterdam, the deviating lines were not corrected. Perhaps the first edition (M 23623) was used directly as a template for the second one.

**¶ Der vierd haubt altar ist vnser frowen da mā alle
 tag vff singt neben sant Perero Capellen.
 ¶ Der. v. haubt altar yst zū sant Leo des paßts vnd
 ¶ Der. vi. haubt altar ist * da ligt er lybhafftig
 ¶ Der. vii. altar ist zū sant Vero? * zū sant Lucia.
 nica do man das angefiht vnsero lieben herren Ihesu**

Figure 2: Page C3r (lines 5–10) of the Hupfuff edition (M 23634).

wanted to change something afterwards, he would have had to redistribute parts of the already finished lines back into the type case and set those lines again in his composing stick.

A closer look at the Strasbourg quarto edition of Hupfuff confirms that the page layout was done in such a bottom-up process. The edition is essentially based on 32-line pages, but, as the headings were centred and set in a larger type size, there are a number of pages with fewer lines (28–31 lines, depending on the number of headings per page). To comply with the overall page layout, strips of metal sometimes were inserted before the headings (a procedure called *leading*, cf. Werner 2019: 13). Despite this accomplished design, there are two pages (B3r and C3r) for which the page planning failed. On both pages, the number of lines was reduced by placing text at the end of the following line and separating it from the subsequent text by white space and an asterisk. Figure 2 shows an excerpt (lines 5–10) where one line was able to be saved in this way. Interestingly, this page contains only 31 lines (one line too short), which means that the reductions proved to be unnecessary. Nevertheless, the compositor stuck to his repairs and did not correct lines 5–10 afterwards. This behaviour proves that the page layout was indeed done in stages, following ad hoc decisions, i. e. in a bottom-up process.

This practice can also be attested for the workshop of Stephan Plannck. Plannck's compositor "smuggled" remaining words of a paragraph into the next line as well (cf. pages F2r, G5v and G7v). To this end he used white space in conjunction with the following capital letter (a Lombardic capital), which emphasises the beginning of the next section (see Figure 3, showing lines 19–23), and started the remaining text with an opening bracket. In contrast to the editions by Johannes Besicken & Martinus de Amsterdam, however, additional abbreviations can be observed here. If one compares the number of tildes (e. g. *ā* for *an* 'at'), abbreviations (e. g. *d3* for *das* 'the') and omitted hyphens in word separation at the end of lines in relation to the number of words per page, there are noticeable differences compared to the preceding and following pages (see Figure 4): On the three pages with the above-mentioned line reduction at the end of paragraphs,

In pelgrāe weiß kom̃t. Es steet auch ein crütz
 zwischē der kirch vnd sant Sebastian da wūrt
 (dē die .x. tusent ritter erschlagē.
Domine quo vadis. Bep der selben capel
 da begegnet sant peter vnserē herrē wā

Figure 3: Page F2r (lines 19–23) of the Planck edition (M 23631).

Figure 4: Reductions per page (pages F2r, G5v, G7v with ‘smuggled’ words [red bars] in comparison to preceding [blue bars]/following [green bars] pages) (in percent), Planck edition (M 23631).

the number of omissions and abbreviations (in red) is considerably higher than on adjacent pages.

This brief insight into the problems the compositors faced and the techniques they used to cope with them shows that the compositors did indeed change the spelling of words, at least as far as the omission of letters (and hyphens) is concerned. This issue will be analysed in more detail in the following section.

4 Spelling variation and line justification

In order to find out whether the spelling of a word had been deliberately changed (contracted or extended), one would, in principle, have to make sure that it de-

Table 3: Examples of the distribution of variants.

No.	M23623 (JB&MdA)	M23630 (JB&MdA)	M23631 (StP)	M23633 (EuS)	M23634 (MH)
1	<i>kirchen</i>	<i>kirchen</i>	<i>kirchen</i>	<i>kirchen</i>	<i>kirchen</i>
2	<i>iückfrau</i>	<i>iunckfrau</i>	<i>iunge fraw</i>	<i>iückfraw</i>	<i>iungfrow</i>
3	<i>ftat</i>	<i>ftat</i>	<i>ftat</i>	<i>ftatt</i>	<i>ftat</i>
4	<i>lant</i>	<i>lant</i>	<i>land</i>	<i>land</i>	<i>landt</i>
5a	<i>nun</i>	<i>nun</i>	<i>nu</i>	<i>nw</i>	<i>nũn</i>
5b	<i>nu</i>	<i>nu</i>	<i>nw</i>	<i>nw</i>	<i>nun</i>

viated from the template. It goes without saying that this is next to impossible because the templates have usually not been preserved. In the field of spelling history, we therefore draw on different methods of data collection and comparison (cf. Voeste 2020; forthcoming) to compensate for this loss. For the evaluation of the *Mirabilia*, inter-textual variable analysis (TERVA) is an appropriate tool. It compares the frequency and range of variants in different text copies with the objective of identifying diachronic, diatopic or other types of specific features. If, as here, the same reference text is used as a basis, a cross-textual variable analysis (CTVA), which is a subtype of the inter-textual analytical method, can even be carried out. Cross-textual investigation involves comparing possible alterations in different editions of the same text to identify a pattern of intentional changes.

In the following CTVA, 751 words were compared as single items, line by corresponding line. Quite different scenarios are possible (see Table 3): The variants of the editions can be identical (No. 1), each can be different (No. 2), they may only differ in one single edition (No. 3) or in more than one (No. 4),⁴ and the distribution of variants can be incongruent (No. 5a–b). In many cases, it is possible to assume with a certain degree of probability that variants deviate from the original text or template (and were thus deliberately chosen) – that is, if the majority of the other editions do not contain these variants. In No. 3, four of five compositors chose the variant <ftat> ‘city’ and only the edition from the workshop of Eucharius Silber features the form <ftatt>. It is therefore highly probable that the spelling of <ftat> had been changed to <ftatt> on purpose. Cases such as these are therefore relevant for the detection of possible extensions (*wardt* instead of *wart* ‘was’) and contractions (*di* instead of *die* ‘the’). Extensions and contractions must have been crucial to ensure that the line was justified and that the types fitted tightly.

⁴ In 278 cases the variants in all five editions are consistent, in 306 cases there are two different variants, in 134 cases three, in 29 cases four, and in four cases five different variants occur (Σ 751).

Somewhat different, in my opinion, is the matter of abbreviations with tildes. It seems unlikely that compositors adopted a short form like <vñ> ‘and’ from the template, but rather that they interpreted it from the start as a reaction to the demands of line justification (flush left and right). This is supported by the fact that the two editions from the workshop of Johannes Besicken & Martinus de Amsterdam exhibit a different pattern in this respect. Although they were printed in short succession, bear the same casting off and therefore presumably derived from the same template, the instances of abbreviations with tildes nevertheless differ. The compositor must have decided individually with which words and in which exact positions he wanted to use tildes.

In the *Mirabilia*, abbreviations were *the* means of choice to justify the lines. The most common tool was the tilde (Σ 479), which occurs with the vowels <a> (65), <e> (227), <i> (3), <o> (22), <u> (22) and with <n> (140). Other abridgements are only of minor importance (see the footnote and below for the omission of <e>).⁵ The uneven distribution among vowels can be explained by phonological peculiarities of German. The characteristic stress pattern in German is the trochee; it leads predominantly to graphic correlates ending in *-en* (rarely also in *-em*), which occur particularly frequently in verbs (in the infinitive or in plural inflection) as well as in noun and adjective declension. In most instances they are inflections, but not exclusively (cf. *Regen* ‘rain’, *gegen* ‘against’). Since these unstressed schwa syllables (or their respective written correlates) regularly occur in texts, they represented ideal candidates for abbreviation. When creating the typeface characters and sorting the type case, the craftsmen in the workshops could take care to keep this particular type sort <ē> available in large numbers in a more spacious compartment. Moreover, as <ē> stands in the final position of a word and its phonic correlate is unstressed, easy decoding by the reader is facilitated.⁶ This also accounts for the fact that <ē> is otherwise only rarely used, and if so, only in

⁵ There are relatively few such instances (25). Besides the Latin abbreviations <q̃> and <⁹>, the following cases occur: <ⁱ> for omitted <er> (10); abridged *das* and *was*: *dʒ* (1), *daf* (2), *wʒ* (3), *waf* (1); *di* (2) instead of *die*; *vm* (2) instead of *vmb*; and omitted <c> in <ch> (3) or <ck> (1). For the discussion of omitted <e> (additional 28 cases), see below.

⁶ The tendency to abbreviate the unstressed second syllables fits perfectly well with the typical phonological word structure in German. One is tempted to state that a so-called *canonical graphematic foot* is already involved here, as it has been described for New High German (cf. Evertz and Primus 2013; Evertz 2018: Ch. 4). Historical linguists, however, are hesitant to transfer graphematic regularities of writing and reading from today to earlier times for several reasons. On the one hand, the patterns we see in individual texts are not necessarily representative for the respective period; on the other hand, we know that these patterns are not yet fixed, but may well change again in subsequent times. It is therefore problematic to speak of pattern effects or canonical structures provided one wants to exclude a teleological view.

Figure 5: Comparison of the most frequent patterns (without and with tildes) in all five editions.

monosyllables (26 vs 201 cases). Being monosyllabic, they are easy to decode as well: *dē* ‘the_{dat/acc}’ (19), *zwē* ‘two’ (5) and *gē* ‘against’ (2). Another noteworthy feature can be seen when looking at the examples with the vowel <o>: all instances consist of *vō* ‘of, from’ (22).

Of little surprise is the high number of <n> with tilde (140). Here, again, an easy to decode, frequent abbreviation is used, namely the short form *vñ* for *vnd* ‘and’ (137 of 140 cases, aside from which only *fiñ* ‘sense’ [2] and *wañ* ‘when’ occur). Interestingly, the counterpart, extended *vnnd* variants, were not used at all. This is even more astonishing as the *vnnd* variants will play an important role in the microtypography of the 16th and 17th centuries (cf. Voeste 2008: 96).

For abbreviations with tildes, we can assume that the compositors did not abridge at random, but instead used only a few familiar patterns. In the *Mirabilia* there are four noticeable patterns that account for 80 % of all tildes: final <ē> with corresponding schwa syllables, as well as the highly frequent function words <vñ>, <dē> and <vō>. Figure 5 shows the numbers of these four types with and without tildes in comparison. Between 27 % and 47 % of these spellings were abbreviated.⁷ Although all compositors used these patterns, they did so with different intensity. Among the octave editions, the second copy from the workshop of Johannes Besicken & Martinus de Amsterdam has the highest number of tildes (118), and that of Eucharius Silber the lowest (76).⁸ Only the quarto edition, with only

⁷ The percentages are: *vñ* (47 %), *vō* (37 %), <ē> (35 %), *dē* (27 %).

⁸ The numbers of tildes are: 116 (M 23623), 118 (M 23630), 101 (M 23631), 76 (M 23633), 68 (M 23634).

68 instances, has fewer. However, the lower total number of tildes in the quarto edition does not necessarily imply that the overall number of abbreviations in the individual lines is also lower. If one compares the number of abridgements per line in the quarto and octave editions, the longer lines of the quarto editions may well contain more reductions (cf. Voeste 2020: 152).

Alongside the 479 abbreviations with tildes, there are also some examples (Σ 28) of abridgement by omitting an <e> (for a corresponding schwa). Here the advantages of a CTVa with several editions become particularly evident, as these variants can be compared to the majority of unabridged cases, resulting in a high probability that the reductions were intentional. The <e> was left out in absolute final position (similar to Upper German apocope) or in final position before <t> or <n> (verb inflection: *beger[e]t* ‘desired’, *gepor[e]n* ‘born’ or before <s> (noun declension, genitive case: *land[e]s* ‘country_{gen}’).⁹

It is obvious that this procedure – in the opposite direction – could also be used for extension. And this is indeed the case: 51 examples prove that extensions with <e> did follow a certain regularity. In addition to the cases of reduction just mentioned (Σ 40), there are examples before suffixes (*buech[e]lein* ‘booklet’, *iung[e]ling* ‘youngling’, *wilig[e]lich* ‘willingly’, *sterck[e]ften* ‘strongest’) and a few isolated cases.¹⁰ Overall, the picture for extensions is not as uniform as for abridgements. There are some instances of gemination of the narrow consonants <l> and <t> as well as of correlating dentals, where <dd> or <dt> were chosen as a broader alternative (Σ 19). One could interpret them as extensions, but they do not occur in a systematic way.¹¹

A final comparison of abbreviations (88 %) and extensions (12 %) clearly shows that reductions, especially those with tildes (83 %), are the most important means of regulating line justification.

⁹ Cf. *al* (1), *gantz* (1), *kunig* (4), *mer* (1), *pyn* (1)/*pein* (1), *fatzt* (1), *schôn* (1), *felb* (2); *begert* (2), *gepaut* (2), *kriegt* (1)/*kriegt* (1), *regiert* (4); *geporn* (2); *kunigs* (1)/*kûnigs* (1), *lands* (1).

¹⁰ Cf. *alle* (2), *erwelte* (2), *gerichte* (2), *habe* (2), *hette* (1), *hœchfertige* (1), *iare* (1), *ime* ‘to him’ (1), *ine* ‘him’ (2), *iunge* (1), *kriege* (1)/*krige* (1), *kûnige* (1), *leude* (1), *nûtze* (1), *reyche* (1), *riete* (2), *Rome* (2), *tode* (2), *volcke* (1), *fprûnge* (1); *gerегieret* (1)/*gerегiret* (1), *getauffet* (2), *faget* (1); *bruderen* (2), *keiferen* (2); *kuniges* (2); before suffixes: *buechelein* (1), *iungeling* (1), *wiligelich* (1), *elteften* (1), *manhaftigeften* (2), *sterckefsten* (1); isolated cases: *gelücklichen* (1), *haübet* (1), *mauer* (1), *pabeft* (1).

¹¹ Cf. *landt* (1), *todt* (1), *wardt* (1), *widder* (3), *all* (5), *befollen* (1), *ftatt* (4), *vatters* (1), *planett* (1), *hultten* (1).

Figure 6: Divergences between the two editions, M 23623 and M 23630 (Σ of letters).

5 Typesetting in comparison

The availability of the *Mirabilia* also gives us the opportunity to trace the methods of typesetting even more closely. Using the example of the workshop of Johannes Besicken & Martinus de Amsterdam (M 23623 and M 23630), we can compare two octavo editions from the year 1500 that both originate from the same template and are even based on the same casting off, i. e. each page of the two editions begins and ends with the same word or word part. If we look at the editions in detail, we can see how strictly the compositors adhered to the template and how they dealt with the requirement to end the page with a particular word. For this purpose, 12 pages (A2r–A7v, B1r) with a total of 261 lines were compared (10 % of the text). Almost half (47 %) of the lines are identical. In the other half, however, the divergences are not evenly distributed across the lines. Rather, a pattern emerges: The deviations increase in the middle of the page (starting at line 10 of 23) and only decrease again shortly before the end of the page. Figure 6 shows the sum of all additions (plus) and subtractions of letters (minus) on the 23-line pages. It illustrates that lines 10 to 20 are the ones where most deviations (>10) occur, including

den geschafft zu ertréckē: vñ die diener wurf
fen die kind beide in ein busch by dē drasser
genant die Lyber: vnd ein wolffin vnderwāt
sich der kinde vñ neret sie in maß als obe sie
ire welffin werē so lange bis ein hirtē die kin
de fant, der nam die kind vñ biacht sie siner
hufzfravē genāt Laurétia. die knabē wuch
fen an schonē vnd an tugendē: vnd koment
dar noch an die hofte der landes herren. In
den selben zptten wart gros kriege vnd off

de geschafft zu ertrénckē: vñ die diener wurf
fen die kind beide in ein busch by dem was,
ser genant die Lyber: vnd ein wolffin vnder
want sich der kinde vnd neret sie in maß als
obe sie ire welffin werē so lange bis ein hirtē
die kinde fant, der nā die kind vnd biacht sie
siner hufzfravē genāt Laurentia: die knabē
wuchsen an schone vnd an tugendē: vnd ko
ment dar noch an die hofte der landes herrē
In den selbē zptten wart gros kriege vnd off

Figure 7: Lines 11–20 on page A3v of M 23623 (left) and M 23630 (right).

“repairs” and adjustments, which were made fairly quickly. The final three lines contain hardly any deviations: the readjustments had already been made. In Figure 7, a comparison of samples taken from both editions shows typical deviations affecting the lines in question (11 to 20, page A3v).

What conclusions can be drawn from this? If we take the interrelation of line justification and spelling seriously, it is advisable to pay particular attention to spelling peculiarities in the second half of a page until almost the end of the page. If the example of the *Mirabilia* from the workshop of Johannes Besicken & Martinus de Amsterdam can indeed be generalised, deviations from the template as well as possible adjustments can be expected in this section. Most of the compositors’ individual choices can be found starting in the middle of the page – before readjustments are made immediately afterwards in order to put the precalculated word precisely at the end of the page.

6 Conclusions

The investigation has shown that compositors used several means to achieve accurate text alignment: Apart from deviating numbers of lines and repositioned lines, we encounter extended or contracted spelling variants, especially on the second half of the page. It comes as no surprise that the most common spelling variants were abbreviations in the form of tildes. They were given preference over extensions. What is surprising, however, is that the tildes that occur can be attributed to only a few frequent patterns.

A detailed look at the *Mirabilia* (as an example of a functional text in the early history of printing) has thus revealed the close interrelation between text alignment and orthography. On the one hand, the range of spelling variants was an important resource for solving aesthetic and typographical problems. Especially in

the 15th and early 16th centuries, compositors could change and regulate a word's spelling to optimise line breaks or to save entire lines.

On the other hand, the typographical possibilities likely also opened important fields of experimentation for spelling. Compared to handwriting, the type-set written word possessed a new, metallic materiality. In retrospect, it is impossible to fully gauge all the consequences of attention being drawn to the tagmatic structure of words. This applies not only to the aspect of production, but also to reception: The much more constant printed “image” of words may have led to completely different reading and reception habits, which in turn had consequences for the interpretation of orthographical variants (up to morpheme constancy).

However, it remains important for the linguistic study of sources from the past to take the relevant historical background into account. When evaluating spelling variants, this should also include the production process of typesetting, especially in the period of early printing.

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