
Random or Reasoned: Design and the Scholarly Journal Article

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Abstract

The contemporary form of the digital scholarly journal article is examined in light of best practices as described in the design literature. A sample of 80 articles selected from the disciplines of history, design, communication, physics, and biology was collected with broad representation from a variety of publishers including independent and open access publishers. The articles were analyzed in terms of layout and typography. Disciplinary differences are noted and described with an eye for artefacts of the print tradition. Sample profiles for articles are provided for each discipline, along with overall recommendations for scholarly journal article layout and design.

Keywords

Design principles; Digital scholarship; Tools and practices; Knowledge dissemination

Introduction

The form of the scholarly journal article can be said to be so recognizable and pervasive that it is rarely a focus for the reader. The syntagmic combinations of elements that we expect to see assembled in article design and layout are instrumental in denoting an item in hand as a scholarly article. Having confirmed the nature of the material, the reader is free to focus on content while article appearance fades into the background. One may wonder, if article appearance is less visible and important to the reader, whether this is made possible by great care being invested in article design, or whether readers have simply become desensitized to a host of inferior design choices. This paper will explore the extent of article invisibility with respect to design by examining a sample of current articles in light of design wisdom on the topics of layout and typography. The extent to which the article remains pre-digital in its appearance, as well as design variability across a number of disciplines will also be examined. Ultimately, this article seeks to answer whether there is a dominant form for the scholarly article, and whether this form is a model of good design.

One may question whether we are seeking invisibility as the design ideal, in that the design of the

page does not distract from what it is intended to communicate. To quote American type designer Frederic W. Goudy, “The perfect type would be completely invisible” (van Gaalen, 2010, p. 53). Indeed, the concept of invisibility is invoked when we think of the arrangement of words on a printed page, and this can be directly related to the functionality of the page itself. Eric Gill, British sculptor and typeface designer claims that “Legibility, in practice, amounts simply to what one is accustomed to” (van Gaalen, 2010, p. 27). We may then say that conforming to a dominant, expected layout for an article contributes to its function as a means of disseminating ideas. In following this logic, layouts that attract the eye can be considered a model of brokenness, or at the very least, distracting for the reader. A paper that becomes obtrusively visible, or present-at-hand to the reader, could be considered a failure with respect to design in that it interferes with its own legibility.

Article design has not evolved in a significant manner in its shift to digital environments. Indeed, the electronic journal article has been criticised for not changing its form. In its current state, the article is often little more than a second-generation digital surrogate, in that it retains elements of print ideals that evolved for the sake of economy and ease of material transmission and dissemination. Hall (2008) labels this as “papercentrism”, and attributes the largely “pre-digital” layout of the digital to issues of legitimacy and academic authority (p. 59). This pervasiveness of the ink-on paper world, claims Hall, evokes the legacy system of peer review “completely with their social cultural and economic hierarchies and filters, standards and values, rules and procedures” (2008, p. 59). Hall may be correct in associating our affinity for a handful of syntagms to the hegemony of academic authority, or it may well be that our clinging to old forms is simply a measurement of cost effectiveness and a nod to the legibility of the established ideal. A step towards exploring this question is by examining and describing the extent to which the contemporary PDF remains pre-digital. Any number of pre-digital artefacts and conspicuous absences of particular elements in light of the affordances of the digital can be identified and quantified, and an attempt in this direction will be made with the collected sample.

The appearance of the contemporary electronic journal article may reveal more than identifiable artefacts of our print heritage. There is also the question of the extent to which article layout and design diverge by discipline, and what this may signify. Hall (2008) claims that the creation of discipline is contingent on contamination by the other, by “what comes before the establishment of the discipline’s identity” that makes the delineation of discipline and its founding possible (p. 72). He suggests that the process of demarcation and delineation that enables a discipline to establish and maintain its own identity continues as an ongoing process. In Hall’s estimation, the discipline has to continually refer to that which lies outside its limits. The degree to which this demarcation and contamination is present across disciplines will be investigated in this paper with respect to design elements. Design may very well play a role in showing whether the structuring of communications within a discipline is a deliberate means of signifying that a work belongs, while simultaneously creating subtle boundaries that exclude other the other. If the article is truly generic in its form then there should be little design deviance across disciplines in favour of a universal style that appeals for legibility. Beyond the act of distinguishing one category of publication from

the other, design variability across publications may also suggest differing discipline-rooted reading styles and expectations among readers.

Literature review

An editorial team considering the groundwork for a new journal will struggle to find specific advice for article layouts. This is surprising considering the continued growth in the area of scholarly publishing, where the number of active, peer reviewed academic journals as recorded by *Ulrich's' Periodicals Directory* exceeds 65,000 ("UlrichsWeb", 2014). An exploration of reference materials for journal publishers is found to be lacking with respect to supplying advice for article design, typography and layout. David Soloman (2008), in his *Guide to Developing Open Access Journals*, recommends that journals develop style guides to aid authors in the formatting of their submissions, but he does not provide any further specifics on what such a style guide should contain (p. 67-68). Soloman (2008) does advise that other journals in the field or similar fields be examined for their appearance when developing a layout for a journal (p. 67). He also emphasizes the advantages of the PDF in that it is preferred by the majority of readers and that "it supports a quality consistent with typeset document" (Soloman, 2008, p. 66-67). Similarly, the *Handbook of Journal Publishing* does not describe best practices for layout. Its substantive chapter on the process of journal production is very high level, choosing to dissect the anatomy of a journal issue but not the article itself (Morris, 2013, p. 120-123).

In contrast to the manuals for journal editors, much can be found in the design literature that underscores the importance of taking care in crafting the appearance of the printed page as well as improving the user experience. Frascara cites Cross and Roy who assert "it is indispensable at the outset to define not how the design must look, but what the design must do" (2004, p. 94). In the case of journal article design, there is a need to promote ease of reading. Walsh (2006) suggests that reading is a constant interaction between the reader and the text that occurs within both an immediate and wider socio-cultural context (p. 25). Writing in support of this interaction, White suggests that the purpose of design is to sluice information effortlessly off the page (2011, p. 79).

Walsh (2006) identifies typographical arrangement, formatting, layout, font and punctuation as modes that activate a meaning-making process for the reader (p. 34). The idea of unity is also deemed important to reading as "repeated visual logic guides the eye and helps the reader scan" (XEROX Corporation, 1988, p. 4-5). The difference of readability in contrast to legibility is noted by White, who emphasizes that readability is about making a page comfortable to read (2011, p. 13). He writes that readability is the "quality of attracting and holding a reader's interest" while legibility is the "ease with which type can be understood under normal reading conditions" (White, 2011, p. 163).

LAYOUT

Audience reception is linked by Middlestadt (1999) in her study to layout and connotation (p. 273). She concludes that “design decisions matter”, and that “practitioners need time for at least some thoughtful consideration of design decisions” (Middlestadt, 1999, p. 273). To this end, Xerox Corporation (1988) suggests, “the principal goals of page layout are visual recognition and legibility” (p. 4-5). It is recommended that a page be divided into a wide text or reading column and a narrower empty column (Xerox Corporation, 1988, p. 4-15). Xerox (1988) claims that this “layout lends itself to the fastest possible scanning by the reader and adds a special character to the document” (p. 4-15). With respect to page size, two standard sizes are suggested, one at 8.5” x 11” and the other at 5.5” x 8.5”. The smaller size is recommended for ease of handling but can result in a 56%-75% increase in page count (Xerox Corporation, 1988, p. 4-15). The larger size is recommended to accommodate a lengthier text and numerous illustrations. Hartley and Sydes (1996) caution that choice of page size is significant as it affects text layout, including column widths, interline spacing, choice of typeface, and position of images (p. 3)

Discussion of layout continues in the Xerox Corporation documentation, with recommendations that headers, footers, and page numbers should be flush left on verso and flush right on recto pages (Xerox Corporation, 1988, p. 4-46). Other layout findings are surfaced by Hartley and Sydes’ study of structured abstracts. Their research indicates reader preference for centering abstracts on the page (Hartley and Sydes, 1996, p. 27). They also recommend (1996) that “subheadings in structured abstracts be printed in bold capital letters”, with the abstract separated by lines above and below the text (Hartley and Sydes, p. 27).

Butterick offers a complete layout makeover of a traditional word-processed research paper. His pre-makeover sample is a Times New Roman document with double spacing, one-inch margins, and headings that are centered and underlined (2010). He recommends shortening line length to 65 characters per line and turning hyphenation on, reducing line spacing, flush left bold headings, the use of professional fonts, and the removal of all underlining (Butterick, 2010). The finished product has a more spacious appearance with its generous margins, and is efficient in that it fits more words on a page.

UNITY AND WHITESPACE

The concept of unity is an important design principle, and can be achieved by relating elements through proximity, similarity, repetition, and rhythm (White, 2011, p. 37). The relative nearness of elements, or proximity, creates a perception of relatedness that is often achieved through alignment (White, 2011, p. 77). Alignment also plays a role in the depiction of similarity, as elements that share similarities are seen as alike (White, 2011, p. 77). Unity may most easily be recognized with the presence of repetition and rhythm, where repeated elements establish a rhythm, which can then be exploited by meaningful breaks (White, 2011, p. 77). Unity can also be achieved through the use of whitespace and consistent use of type (White, 2011, p. 77). We are cautioned that variety disintegrates unity, and that as a result, we must treat borders, whitespace,

typefaces, illustration and photo sizes, style, logo and colour with consistency (White, 2011, p. 129).

The placement of whitespace can communicate function. Scholar's margins in books, with their increased outer margin size, invite readers to make notes by providing ample space for note taking (White, 2011, p. 37). Wider outside margins can also be used to grab the reader's attention with small images and secondary display type (White, 2011, p. 79).

Whitespace can be passive, and this is often the effect created by the centering of elements, while the asymmetrical positioning of elements creates activated, dynamic space (White, 2011, p. 77). The Xerox Corporation recommends that a generous amount of whitespace be reserved as a blank presentation area that accommodates the popping out of headings and accommodation of wider graphics (1988, p. 4-5). Noted also is that this added whitespace may prove necessary to accommodate translation. In the case of the German language, 30% more space is needed to accommodate a text in contrast to English (Xerox Corporation, 1988, p. 4-5).

LINE LENGTH, LEADING, AND JUSTIFICATION

From the perspective of search and retrieval, reading speed, and reading comprehension, studies have shown no significant difference between justified and unjustified text (Hartley and Sydes, 1996, p. 4). The Xerox Corporation, however, makes specific recommendations for justification, with reference materials such as articles receiving an endorsement for justification (1988, p. 4-32). White cautions designers to be careful with justified type, especially when working with narrower columns and shorter lines, as word spacing should be invisible and should hold the integrity of the line (2011, p. 167). As such, properly set justified text requires a minimum of 5 word spaces per line so that there is enough room to absorb leftover space (White, 2011, p. 195).

The maximum length of characters per text column recommended by the Xerox Corporation is not to exceed 2.5 times the length of the lowercase alphabet (1988, p. 4-31). This is in agreement with White (2011) who stresses that type size should be proportional to line length, where type size should increase with line length (p. 165), and that "well set text has 50-60 characters per line, including spaces and punctuation" (p. 194). In contrast, Butterick allows for 45-90 characters per line, with the caveat that he refers to both print and only text display (2010). Dyson's review and synthesis of research pertaining to reading from the screen also emphasizes the significance of line length. He cites that studies in line length report faster reading for longer lines, with the number of characters as the variable responsible for differences (Dyson, 2004, p. 390).

Line spacing, according to Dyson, is key to text legibility. Leading between lines should make a white bar for each return by the reader, and lines with more than 60 characters require additional line spacing to facilitate a return (Dyson, 2004, p. 195). Line spacing as recommended by the Xerox Corporation should be a single space in the running text (primary leading) and a space and a half between paragraphs (1988, p. 4-32). Butterick is more precise, suggesting line spacing at 120-145% of the point size (2010). Spacing around other visual elements should always be 1, 1.2,

2 or 3 times the primary leading (Xerox Corporation, 1988, p. 4-32). Allowing for the flexibility of a variable baseline in lieu of a fixed one allows for the flexibility to apply vertical spacing rules consistently, and to determine stopping points in the text (Hartley and Sydes, 1996, p. 6). It is also advised that column spacing should maintain unity and relation between columns but be greater than a word space so that readers won't 'jump the gutter' by accident when reading (White, 2011, p. 193).

For vertical spacing of major headings, Hartley and Sydes (1996) recommend using two lines of space above, and one below (p. 5). For secondary headings, one line of space above and one below is recommended (Hartley and Sydes, 1996, p. 5). Hartley and Sydes also suggest indenting paragraphs within subsections (although spaces between paragraphs in lieu of indents are also acceptable), and to provide two units of space above a table caption or start of a figure (1996, p. 5). White (2011) cautions that the first paragraph of text after a heading should never be indented (p. 193). He explains that it spoils the clean left corner of the text and is redundant as the typographic contrast between the heading and text signals a new idea (White, 2011, p. 193).

TYPOGRAPHY

White (2011) suggests that typography is the voice of the printed page, and that "writing can and should be considered graphic speaking" (p. 149-153). As such, much care should be taken in font selection. Butterick discourages the use of system fonts such as Times New Roman and Arial, and encourages the purchase of a professional font, as it "gives you the benefit of a professional designer's skills without having to hire one" (2010). This is opposed by the Xerox Corporation which advocates a voice restricted to the following typefaces: Optima, Helvetica, and Times New Roman (1988, p. 4-49).

The Xerox Corporation does, however, promote font family contrast, where serifs are paired with sans serifs (Xerox Corporation, 1988, p. 4-49). When selecting a font, the designer should aim for a strong contrast between regular and bold variants of the typeface, a spacious appearance that is easy on the eye, and the ability to display many characters per line (Xerox Corporation, 1988, p. 4-49). Williams (1994) calls the combining of typefaces that belong to the same font category a conflicting relationship, because the similarities are disturbing due to insufficient contrast (p. 75). He recommends a contrasting relationship for font choices in a document, where font faces from different font categories generate visually appealing designs due to contrast emphasis (Williams, 1994, p. 75). The use of one type family without much variety in style, size and weight, is called a concordant relationship, and not recommended because it is sedate and dull in appearance (Williams, 1994, p. 75).

Hartley and Sydes (1996) indicate that serifs in printed text may be easier to read because the spacing between letters is increased slightly, but according to their research there does not seem to be any conclusive proof to support of this line of thinking (p. 8). This is in contrast to White (2011) who writes that serif is easier to read because it creates "open letter spacing and horizontality", and also has "more contrast between thick and thin strokes" (p. 195). A sans serif should be

compensated for by adding line spacing to ease reading (White, 2011, p. 195).

Type sizes as recommended by the Xerox Corporation (1988) correspond to material types, with reference materials at 10-point, student materials at 11-point and instructor materials at 12-point (p. 4-31). A span of 10-12 points for printed documents is also acknowledged by Butterick (2010). White (2011) is in agreement with 10-point being the smallest legible type although some 8-point fonts appear as large as 10-point fonts due to relative height (p. 165).

To promote word recognition and faster reading, the Xerox Corporation (1988) recommends, with the exception of document titles, setting all headings, subtitles, figures, lists, and table headings in downstyle (p. 4-34). To channel the “forthright contemporary character” of downstyle, the first letter of the first word is capitalized, as well as the first letter of proper nouns and all acronyms (Xerox Corporation, 1988, p. 4-34)

With respect to emphasis, the Xerox Corporation (1988) recommends the sparing use of all caps and boldface, underlining for a darker look than surrounding body copy, and the use of italics to add a slight textural difference (p. 4-33). White (2011) cautions designers to be sparing with italics as they are harder to read than roman and should only be used briefly for emphasis (p. 165). This is echoed in the research findings of Hartley and Sydes (1996), where italics are found to be ranked lowest in reader preference for use in headings (p. 36). Butterick is very much against the use of underlining unless one is referring to a hyperlink, recommends that bold and italic be used sparingly, and prescribes that all caps be restricted for less than one line of text (2010).

Methodology

To explore the morphology of the journal article within and across disciplines, a content analysis was conducted. The focus of this study was on PDF representations of the scholarly article. PDF samples were selected from the disciplines of design, communication, history, biology, and physics. All samples were obtained from the most recent issue available to maintain currency and consistency. Journal titles were selected to reflect larger and smaller publishers, university presses, as well as open access and independent scholar led publications. Care was taken to select more than one journal from major publishers to see if variance exists between scholarly titles. Classifications provided by the Directory of Open Access Journals, Ulrich’s Periodicals Directory, Web of Science, and publishers as were used to identify a variety of titles within each discipline.

A total of 80 samples were collected. 20% of the samples came from online-only journals, and 25% of the samples were open access as defined by the Directory of Open Access Journals. Collected samples were all examined on a computer monitor, and observations with respect to the various categories of interest as identified in the literature were recorded. Where statistics are compared across disciplines, they are calculated as the total of percentage occurrences by discipline, as the number of articles selected by discipline was uneven. This is an attempt at normalized representation across the five disciplines.

This study was also partially motivated by an interest in identifying common practices for PDFs in these disciplines, and as such, additional categories were added to the content analysis, including: verso/recto emphasis, continuous page numbering, use of colour, use of indents, use of downstyle, header and footer metadata and layouts, and reference alignment.

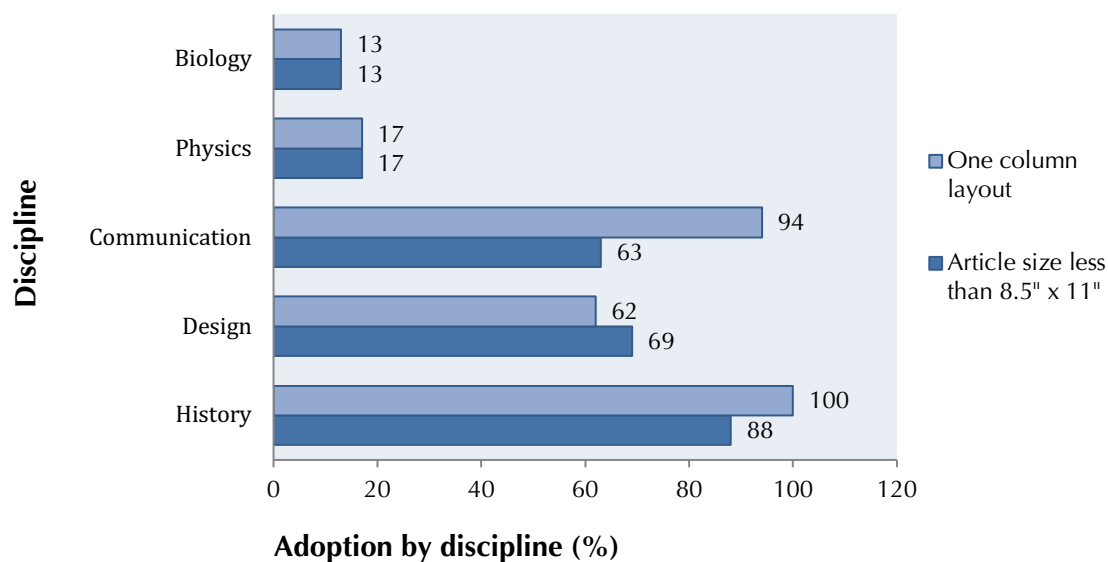
The samples were evaluated for their adherence with respect to the series of recommendations found in the literature. Additional dimensions were also captured to identify patterns in layout that provide a more detailed picture used to draft generic article templates for the five disciplines examined.

Results and discussion

Samples were divided into two categories to evaluate page size: articles that approximate 8.5x11" in size, and those that are smaller in size. Across the entire sample, there is close to an even split in adoption, where 51% are about 8.5" x 11" in size and the remaining 49% are smaller. Figure 1 shows the spread by discipline where we can see that the sciences favour a larger page size.

With respect to number of columns used in layout, it is clear that there is a strong correlation with page size: smaller pages correlate with a single column and larger ones with two columns.

Figure 1: Adoption of smaller page size and one column layout

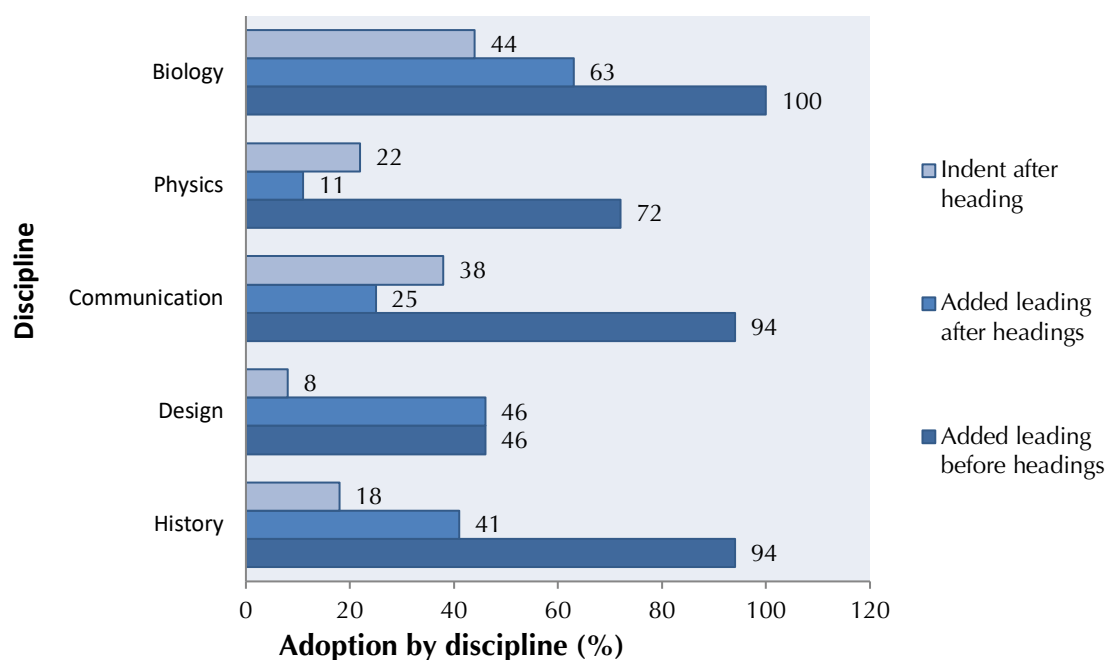


Overall we see a very slight favouring of one layout over another, with 56% of the sample showing a single column layout. The two-column model is preferred for biology and physics in stark contrast to history and communication, which are almost exclusively one column. The overwhelming uptake of the smaller page size in conjunction with the single column of text in

disciplines such as history is logical in light of the Xerox Corporation (1988) recommendations, where a smaller page size and a single reading column are recommended for ease of reading (p. 4-15).

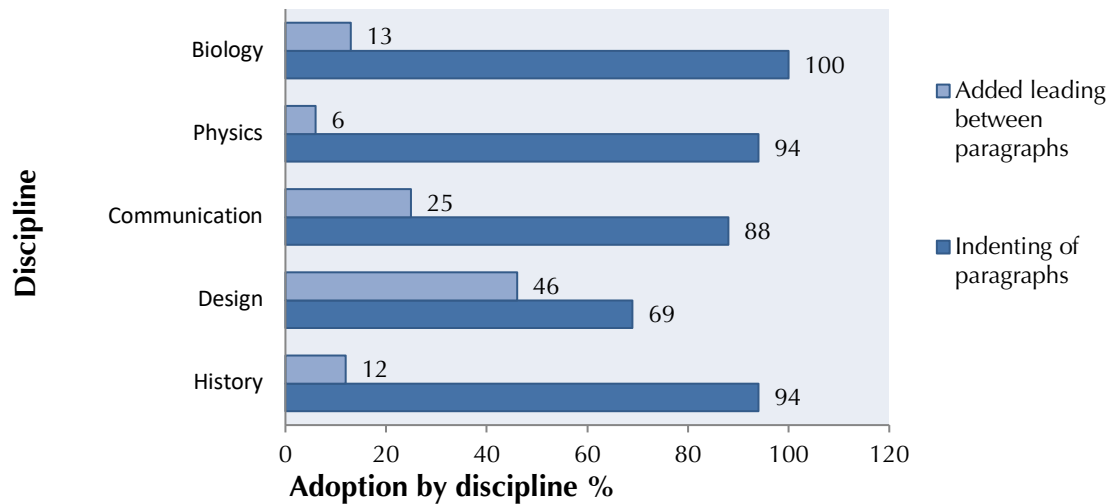
Paragraph delineation is shown by way of adding indents to the beginning of paragraphs and adding line spacing (leading) between paragraphs. Figure 2 shows the uptake of these devices by discipline. Indenting is the preferred method of paragraph delineation, and is used by 90% of the sample. This is likely the case as indents are an efficient use of space. It should be noted, however, that added leading can have a very pleasing, spacious effect to the page, providing a visual break for a reader committed to reading an entire text. This added leading, however, only appears in 19% of the entire sample. Indenting and added leading are less frequently used in conjunction; this is likely due to their redundancy in denoting the same meaning.

Figure 2: Delineation of paragraphs



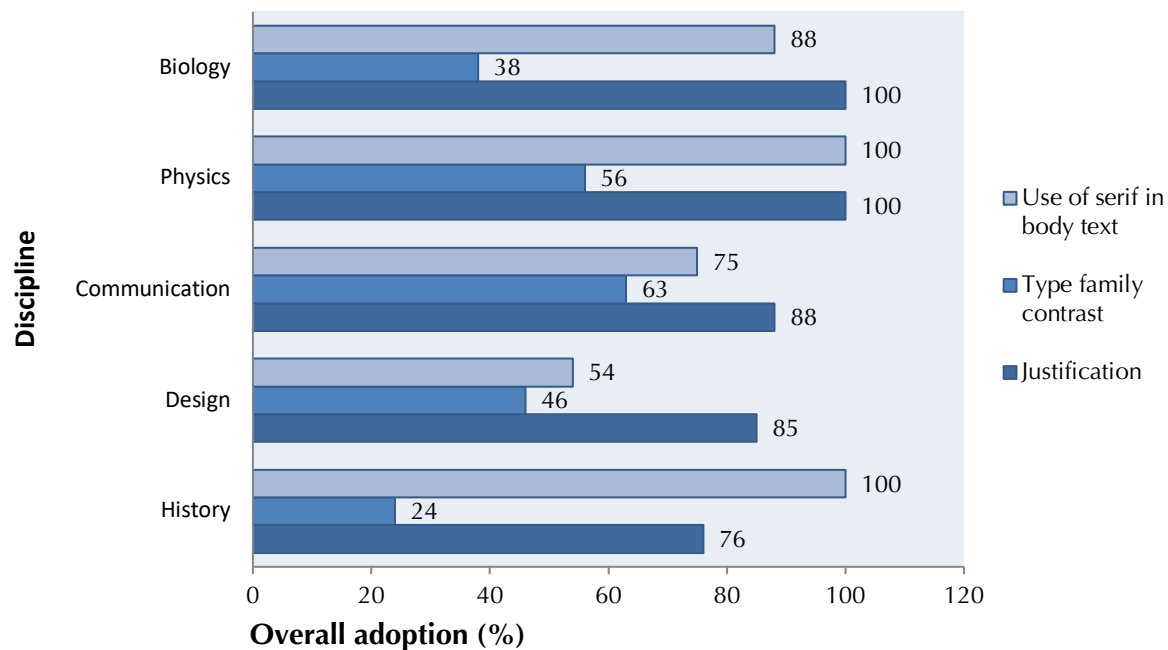
Overall, indenting after headings is limited in uptake; with 26% of the sample demonstrating this added signalling. In contrast, added leading before headings is quite popular, and can be found in 83% of the sample. Some redundancy in the delineation of headings is noted, particularly in biology where headings are given added leading before and after and are followed with a paragraph indent. The redundancy in signalling observed in biology makes sense when considering that a two column layout, larger page size, and absence of added leading between paragraphs contributes to a very condensed and crowded look to a page. This added flag could presumably guide a reader skimming the document for relevant data or information to find what they are looking for more quickly.

Figure 3: Delineation of headings



The use of justification is recommended in the literature, with the caveats that special care is taken to ensure that spacing between words is not visible and that appropriate use of hyphenation is applied (White, 2011, p. 195). The sample shows agreement with the literature, as a 90% rate of adoption of justification is observed. Communication and design make use of some rough ragged edges to text (non-justified), but these are set in more activated and contemporary contexts, with layouts that approximate the Xerox Corporation ideal.

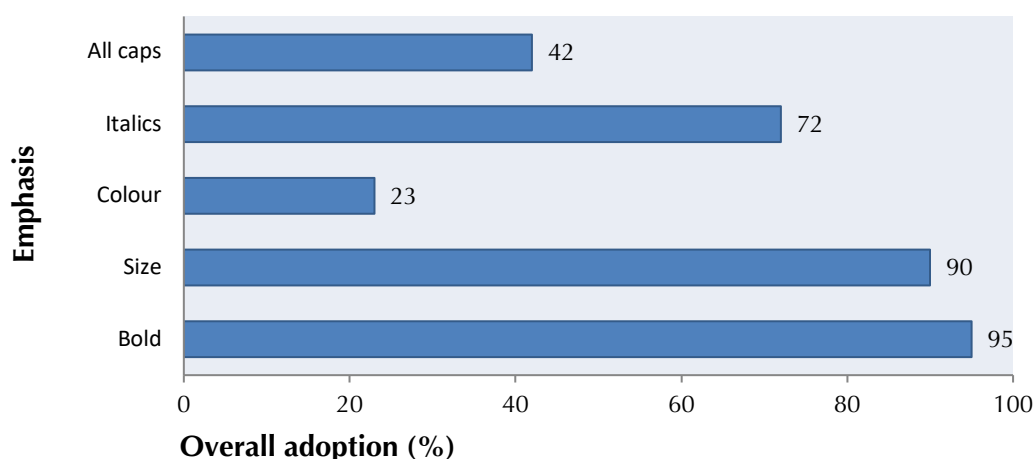
Figure 4: Treatment of text



With respect to ease of reading, a case can be made in support of using the serif font family for body text for reasons such as horizontality and increased contrast between thick and thin strokes (White, 2011, p. 195). In the overall sample, the adoption of serif for body text is high, at 85% overall. Design in particular diverges from this practice (Figure 4), achieving a more contemporary look and feel by applying appropriate leading in the body text and the use of ample and often-activated whitespace. Use of downstyle for headers is also recommended by the Xerox Corporation for ease of reading, but uptake across the sample is low, at 43% overall.

Emphasis can be achieved through a variety of means, and typography provides a wealth of alternatives. In Figure 4, we see that there is some uptake of font family contrast at 45% overall. This type of contrast adds character to articles and helps titles and headings stand out. Communication achieves this aesthetic with a conscious and thoughtful uptake of 63%.

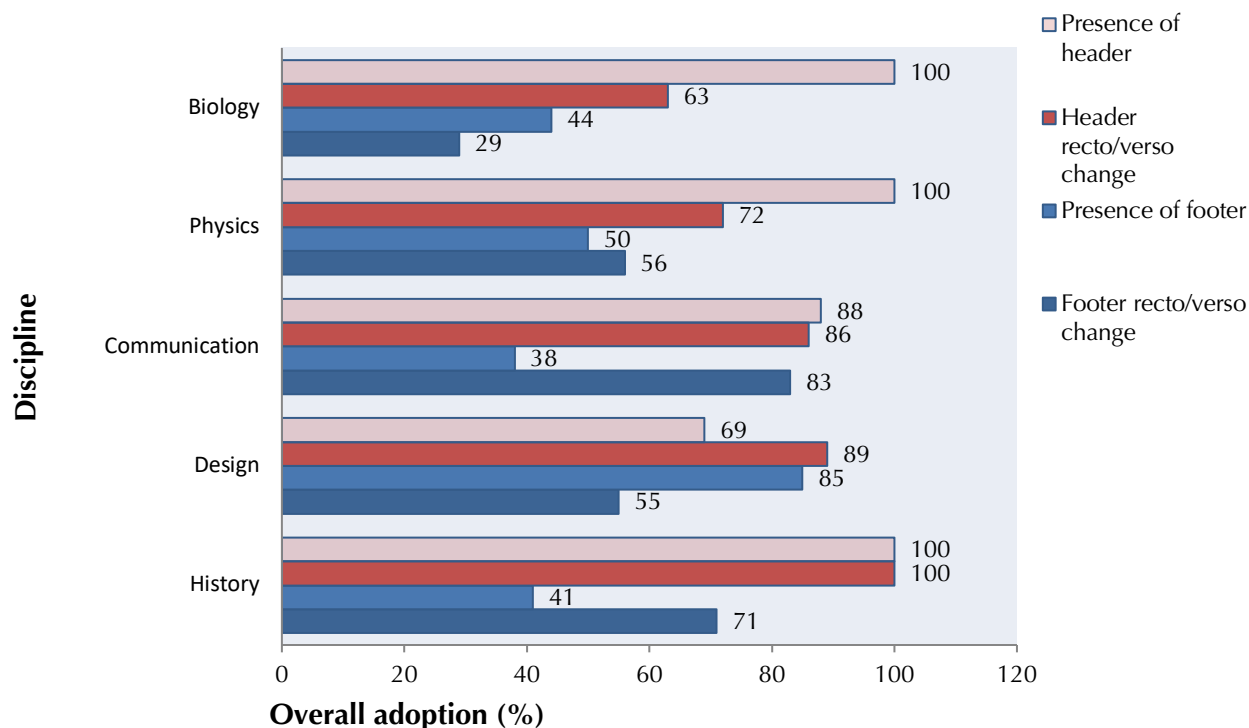
Figure 5: Adoption of modalities for emphasis



In the case of very plain and static layouts, font family contrast on its own is often insufficient and needs to be coupled with added emphasis. Applying a point size increase and bold to headers can help to add the necessary contrast to invigorate a design. Additional modalities for adding emphasis are examined in Figure 5, showing most interestingly a lack of colour use across all disciplines. Considering that PDFs were evaluated exclusively for the purposes of this study, it is puzzling that so few of the articles make use of colour. Context helps with this evaluation, as 80% of the total sample publishes both online and in print. As a result, lack of colour use can potentially be explained as a cost-saving measure for print surrogates.

The pre-digital, print focused nature of the PDF can be observed in the use of continuous page numbering throughout an issue or entire volume. This signals that the article is one part of a greater whole, and can be found in 66% of the overall sample. The changing orientation of headers and footers also evokes the pre-digital, as it offers an approximation of recto/verso orientation. Figure 6 illustrates this recto/verso emphasis by discipline. Overall, 79% of headers and 59% of footers exhibited shifting recto/verso orientations. These pre-digital artefacts do make sense in light of much of the overall sample being available in both print and digital formats.

Figure 6: Use of headers and footers



It should be noted that headers were more often used than footers for all disciplines, with 93% of articles having headers but only 50% of articles displaying footers. The absence of footers, particularly for dense two-column layouts, created a sense of spaciousness. In the case of history, footers could potentially interfere with footnotes and as a result were often omitted.

From the results presented above, sample profiles for each of the dominant features of the five disciplines are presented as follows:

History articles appear on smaller pages with one column of text. Line lengths are greater than 65 characters, and paragraphs are indented with no added leading between them. Headings have added line spacing before but not after, and the entire article makes use of the serif font family exclusively. Headers are present and show a recto/verso orientation, while footers are absent. Consult *Comparative Studies in Society and History* by Cambridge University Press for a representative example.

Design articles also make use of smaller pages with single columns of text and variable line lengths. Paragraphs are indented, but added leading between them varies, as does leading before and after headings. Text is justified and headers and footers are present, with headers showing a recto/verso orientation. Use of font family for body text varies, as does type-family contrast. A notable example is *Design and Culture* published by Bloomsbury Press.

Communication articles are found to make use of smaller page sizes, single columns of text, and variable line lengths. Division between paragraphs are shown by the use of indents without added leading. Added leading precedes headings, body text is justified, and font-family use varies. Footers are often absent, but headers are presented in recto/verso format. Refer to *Discourse & Communication* by Sage for an attractive example.

Physics articles are presented in a two-column, 8.5" x 11" format with line lengths at 65 characters or less. Indents are used to show breaks between paragraphs and added leading precedes headings. Body text is justified and in serif, with variable uptake of type-family contrast. Headers are present and exhibit recto/verso orientation, while footers may or may not be absent. Have a look at *Journal of Computational Physics* published by Hindawi.

Biology articles, like those in physics, appear on letter-sized pages with line lengths at 65 characters or less in two-column layouts. Paragraphs are indented to show breaks, and headings are padded with added leading from above and below. Body text is in serif and justified. As with type-family contrast, footers are absent. Headers show verso/recto orientation. See *Acta Biomaterialia* published by Elsevier for an example.

Recommendations

CONSIDER THE READING STYLE OF YOUR AUDIENCE

Tailor your article layout to the reading style of your discipline. If readers are anticipated to read the entire article, consider the sample profile for history as a guide, as the one-column layout supports this type of deep engagement. In the case of data-laden articles, readers may prefer to scan the article quickly to consult information of interest. For this type of reader, a denser two-column layout with heavy emphasis on headings as found in biology and physics may be preferred.

PLAN YOUR WHITESPACE

Favour a planned spaciousness for your design, rejecting unnecessary distractions. Generous header and footer margins, or the absence of either a header or footer can be helpful in this regard. Omitting footers when endnotes are present will avoid unnecessary clutter and a misalignment of different types of numbering. Attempting to embellish an article is often unsuccessful: the addition of logos and lines of varying thicknesses can have a crowding effect that distracts the reader from the main text. To this end, it is also recommended that boxes around figures, tables and images be avoided if possible as they add clutter and break up the whitespace of your document.

CONSIDER YOUR LEADING

Leading can lend spaciousness and improve legibility, but must be used judiciously and consistently. Added leading is unnecessary between references and too much of it between body text and before or after headings contributes to a sparse and amateur feel. However, in the case of

text-heavy one column articles with high character counts per line, adding leading between paragraphs in lieu of paragraph indents can provide a break for the reader from a solid, overwhelming block of text.

MIND YOUR HEADINGS

Headings aid the reader in navigating the text, particularly if they are skimming. They are also an opportunity to add character and contrast to an article. Offsetting of headings into an area of whitespace in a one-column layout of text can offer a dynamic and contemporary energy to the text. In contrast, centering a heading in the text is odd in appearance and was rarely found in the sample. Use of italics for major headings lacks sufficient contrast, and incorporating a heading into the first sentence of a paragraph often gives a cluttered and dense feel. In some sample articles the leading before headings was inconsistent and disrupted the unity of the document.

BE SPARING BUT BOLD WITH CONTRAST

Adding character to a document can be achieved in many ways. Judicious accents that emphasize areas that a reader might need to reference are recommended. A suggestion in this regard would be the addition of a plain graphic box around a page number. See *Design Issues* published by MIT Press for an example. This simple graphic repetition can contribute to the unity of a document and provides a contemporary feel. When used together, font family contrast, boldface, and point size increases for headings are very effective at fending off bland article appearance. Creating whitespace and activating it sparingly with a heading or article metadata can help to build a contemporary character.

Conclusion

There appears to be no universal scholarly journal article design template. The absence of this single template does not preclude the presence of similarities and preferences observed across the sample. These include a fondness for the use of justification and the high adoption of serif fonts for body text. Furthermore, clear disciplinary preferences and practices for journal layout did emerge, and the sciences differed greatly from the rest of the sample. A limitation of this study is the restricted sample size and it would be fascinating to see how well the identified disciplinary profiles hold up against larger pools of data.

It is hypothesized that the observed differences in article layout and design across disciplines could be mapped to different modes of reading, but user testing would be required to explore and validate this reasoning. The author also notes that the results identified here speak primarily to the aesthetic. From a functional perspective, further research is needed to examine the performance of the identified designs as they intersect with adaptive technologies to offer suggestions for optimization and democratize access to research for all readers.

There was much evidence of the pre-digital in the sample as presented in the results, noted in the

lack of colour use, continuous page numbering, as well as a preference for recto-verso orientations. In light of 80% of the sample retaining attachment to print, this is not a surprising observation.

Overall, it was found that current article design adheres to suggestions found in the design literature. It is possible, however, to follow best practices in design to a particular extent but end up with a very bland and boring layout. The sample was fraught with bland layouts lacking in contrast, but a subset did exhibit very dynamic and energizing specimens. In this respect, David Solomon's advice for considering article design makes sense. It is indeed worthwhile to examine layouts within a particular discipline as a basis for one's own design, as the preferences of the discipline will likely be encoded within the consulted sample. It is the author's hope that the recommendations presented in this paper create a framework that will aid editors and readers to evaluate an article design with respect to typography and layout, and that in exposing the complexities of article design, inspire a level of appreciation for a craft that is recognized as most successful when rendered invisible.

References

- Butterick, M. (2010). *Butterick's practical typography*. Retrieved from <http://practicaltypography.com/>
- Dyson, M. C. (2004). How physical text layout affects reading from screen. *Behaviour & Information Technology*, 23(6), 377-393.
- Frascara, J. (2004). *Communication design: Principles, methods, and practice*. New York: Allworth Press.
- Gaalen, A. v. (2010). *Never use more than two different typefaces: And 50 other ridiculous typography rules*. Amsterdam, The Netherlands: BIS Publishers.
- Hall, G. (2008). *Digitize this book!: The politics of new media, or why we need open access now*. Minneapolis: University of Minnesota Press.
- Hartley, J., & Sydes, M. (1996). Which layout do you prefer? An analysis of readers' preferences for different typographic layouts of structured abstracts. *Journal of Information Science*, 22(1), 27-37.
- Middlestadt, S. and Barnhurst K. (1999). The influence of layout on the perceived tone of newspaper articles. *Journalism and Mass Communication Quarterly*, 76(2), 264-276.
- Morris, S. (2013). *The handbook of journal publishing*. New York: Cambridge University Press.
- Solomon, D. J. (2008). *Developing open access journals: A practical guide*. Oxford, England: Chandos Publishing.
- Ulrichsweb advanced search. (2014). Retrieved from <http://ulrichsweb.serialssolutions.com/>
- Walsh, M. (2006). The 'textual shift': Examining the reading process with print, visual and multimodal texts. *Australian Journal of Language and Literacy*, 29(1), 24-37.
- White, A. W. (2011). *The elements of graphic design: Space, unity, page architecture, and type* (Second Edition). New York: Allworth Press.
- Williams, R. (1994). *The non-designer's design book: Design and typographic principles for the visual novice*. Berkeley, CA: Peachpit Press.
- Xerox Corporation. (1988). *Xerox publishing standards: A manual of style and design*. New York: Watson-Guptill.