Journal Content Accessibility: Considerations & Best Practices

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I n Fall 2023, *portal: Libraries and the Academy* formed an accessibility guidelines work-ing group as part of our overall journal efforts to better address diversity, equity, inclusion, accessibility, and transparency within our manuscript submission and editorial processes. These accessibility guidelines help prospective *portal* authors ad-dress common accessibility features in manuscript submissions. In addition to reviewing minimum requirements for article accessibility, the working group also explored broader issues and best practices related to academic journal accessibility practices.

While this editorial describes the best practices for journal accessibility, we recognize that there is a tension between best practice and the options available from individual journal publishing platforms. Journals often have layers of mediation before we see the final issue: from the formatting of an author's article, to the manipulation of the article and its metadata by the journal publisher, to the indexing of the final published article within an external database. Each platform also likely has different accessibility stan-dards. At *portal*, our accessibility practices are guided by the options provided by our publisher, Johns Hopkins University Press (JHUP), and we monitor the field for new advances and best practices. In this article, we will describe journal accessibility best practices, what we are doing in this realm at *portal*, and where we hope to advance in the future. We also hope that by providing a road map to common accessibility pitfalls, we can shine a light for prospective *portal* authors on how to make a better experience for online readers of scholarly content.

Accessibility 101

When the Americans with Disabilities Act (ADA) passed in 1990, it did not explicitly include websites; however, the Department of Justice has consistently interpreted Title III, which addresses public accommodation, to include web content.[1] As more and more content is primarily published electronically, online accessibility is even more critical. Academic journals are no exception. The Web Accessibility Initiative from W3C sets

the international standards for accessibility on the internet. They describe web accessibility as "websites, tools, and technologies [that] are designed and developed so that people with disabilities can use them."[2] While they have a web focus, many of the W3C standards translate to any digital medium.

Most journals are likely accessible enough to meet legal requirements, which often means that a screen reader (software that reads aloud what is on a screen) can simply access the text on a webpage. However, there is a difference between minimum requirements and best practices. For example, think of a scanned article PDF. By applying optical character recognition (OCR), we can make this text readable; the software translates images of words to text that a program like a screen reader can access. If you can highlight text on a scanned PDF, it's had OCR applied. Technically, someone using a screen reader can read this document. Without proper tagging of the document's structure (e.g. headings, subheadings etc.), however, the screen reader is forced to read top to bottom. Instead of being able to jump to a specific section, the screen reader would start at the top of the document and work its way down. Imagine trying to do a literature review without being able to skim the initial research. In this case, best practice would entail proper tagging of the PDF document in addition to OCR, so a user could easily navigate and access all content.

This example applies mostly to older articles that were scanned instead of more recent works that were likely born digital. The good news is that since web accessibility is accepted practice at this point, most major journals and publishing tools are probably already minimally ADA accessible. Born digital articles don't require OCR. Word processing software like Microsoft Word or Google Docs includes accessibility features, such as alternative (alt) text to describe images in words and heading labels to indicate sections of a document. Some accessibility features happen automatically while others need to be intentionally applied like alt text.

One note about applying these concepts: While PDFs are editable for accessibility, it is easier to do it first in the word processing software before turning it into a PDF. Since authors use a variety of word processing software programs, we will not provide specifics on how to apply these accessibility practices. In general, information on specific software accessibility features are available by reviewing the interface's help menu or via a web search. For example, WebAIM has a helpful article on accessibility and Microsoft Word . Many of these software programs also have accessibility checkers, which are a great place to start for those new to addressing accessibility within written and/or web-based works. WAVE by WebAIM is a checker that is useful for assessing a website's accessibility (see https://webaim.org/techniques/word/).

Common Accessibility Needs Within Scholarly Works

Online scholarly journals have layers of accessibility requirements, within the article text, the accompanying figures and images, and more. The website that hosts the content often has its own set of accessibility requirements as well. This section of the editorial recommends common accessibility practices at the article level.

Audio & Video

Provide transcripts or captions. If autogenerated, ensure both captions and transcript are edited. Captions should align well with the action of the video (for example, they shouldn't lag or go too fast).

Color & Contrast

portal prints in grayscale. Depending on how a user accesses *portal*, images may or may not be in color (for example, if they print an article out to read). Color might not be as much of an issue as contrast is. The color ratio for text and line graphs needs to be at least 4.5:1 (which is the perceived brightness difference between two colors), and large text and charts needs to be at least 3:1[3] (for more of an explanation about color accessibility, see WebAIM: Contrast and Color Accessibility—Understanding WCAG 2 Contrast and Color Requirements[4]). Color alone should not be used to convey meaning.[5]

A common issue involves article charts or graphs in colors that do not convert well to shades of gray. To remedy this, authors should ensure that accompanying charts and/or graphs should have appropriate contrast or pattern fill if possible.

In Figure 1, "Example Chart Color," there are blue and green shades (series 1 and series 3). The contrast ratio between these two is 1.05:1 which means that they are hard to differentiate for people who do not see color very well and would be nearly impossible to differentiate in grayscale. Compare that to the "Example Chart Pattern Fill" in Figure 2, which relies on contrasting pattern fill to differentiate categories.
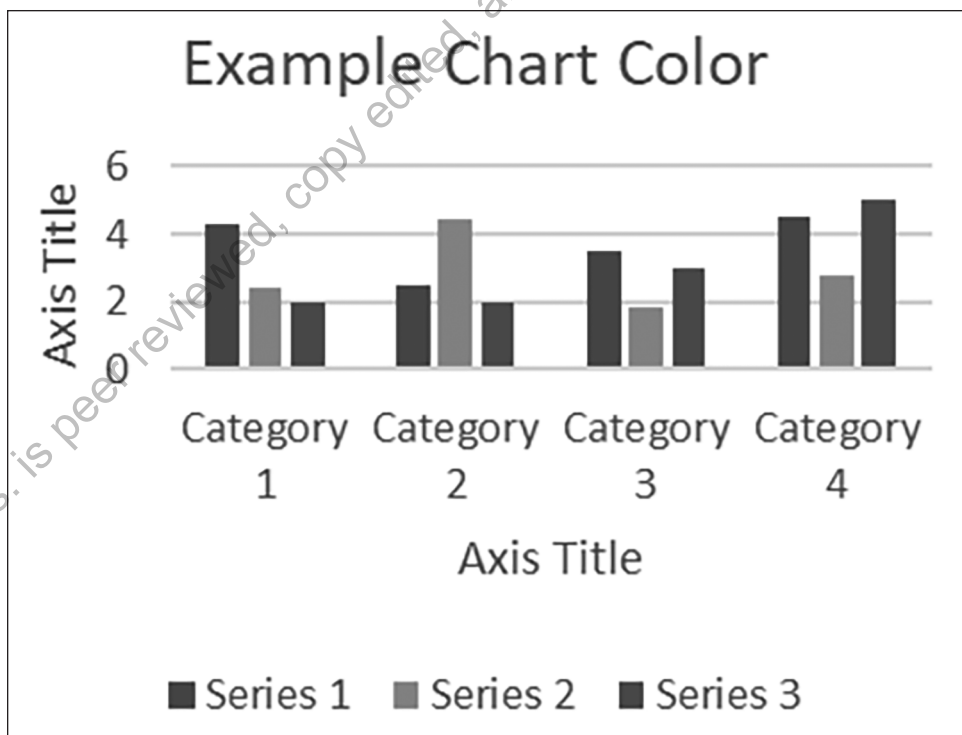

Figure 1. Example bar chart using color. If printed in grayscale, all of the bars would appear to be similar shades.
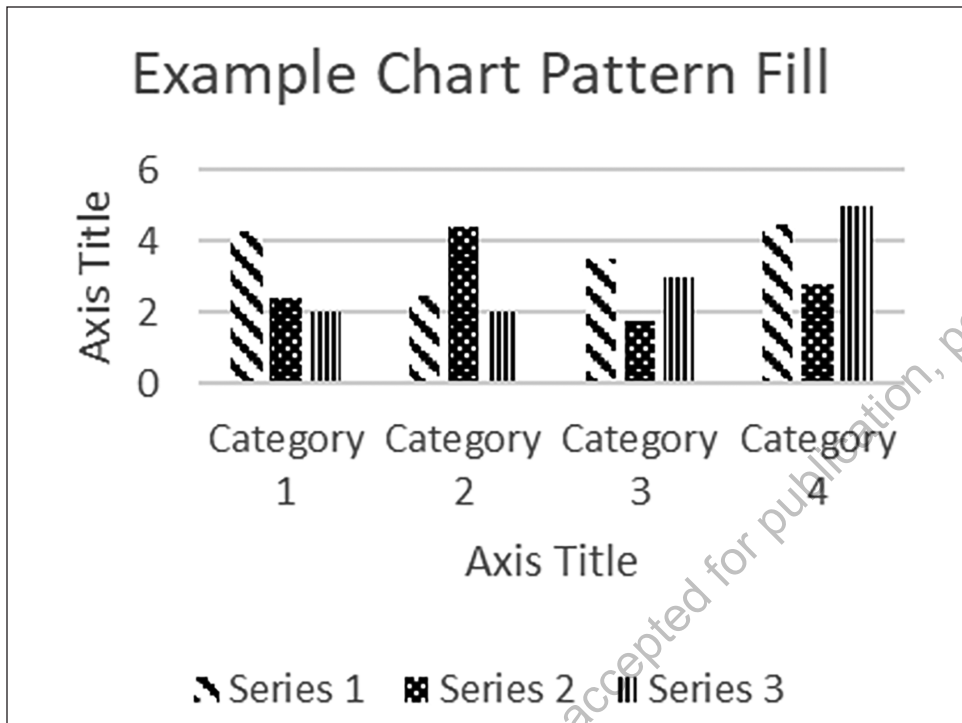
Example Chart Pattern Fill

Figure 2. Example bar chart in black and white using pattern fill.

An easy way to check the contrast is to look at the document within your word processor in in print preview grayscale. For a more definitive way to find the contrast, take a screenshot of the colors, and use a program like Microsoft Paint or Adobe Photoshop to get the hex code (use the eyedropper tool). Then, enter it into a website like WhoCanUse (see https://www.whocanuse.com/) or WebAIM: Contrast Checker (see https://webaim.org/resources/contrastchecker/) to assess the contrast.

Images

Article images need to have alt text or a caption, which concisely describes the image. When writing alt text, convey the important parts of the image, but there is no need to describe everything. Less significant images (for example a journal logo) need to be marked as decorative. Avoid images of text.[6] If that's not possible, include the text in the caption or alt text. Figure 3 offers an example:

Figure 3. CC0-licensed photograph by Wilfredor, obtained through Wikimedia Commons.

The alt text for this image might read: "Profile of a young woman looking distressed." For this image, it's important to convey her expression but not as important to convey her earring or the color of her shirt. Ineffective alt text for this image would be "Image of girl." One doesn't need to indicate it's an image because the software has already done that, and "girl" lacks key context about what the image expresses.

portal currently uses captions as image descriptions since alt text is not available through our publishing platform. Published images and captions should be able to stand alone and be understood. This strategy may be helpful for other journals publishing print and electronic versions, as text may be easier to access than images in some cases. For example, Figure 4 shows a line graph depicting item checkouts by media type over the last four years.

A caption for this figure could be "Line graph depicting book, magazine, and video circulation trends 2020-2023." This caption does not explain what the lines are doing. That part of the description should already be in the article text. Note that the axes are labelled, and each line does not solely rely on color to differentiate. An ineffective caption would be "Line graph with orange line depicting magazines, blue line depicting books, and green line depicting videos."

Links

In their print versions, journals often include full URLs in the text. Accessibility guidelines for URLs in online publications, however, differ. If a journal is only online, or in a digital-only version, consider embedding links using descriptive language rather than providing the full URL. As an example of descriptive language, if linking to portal's webpage, one
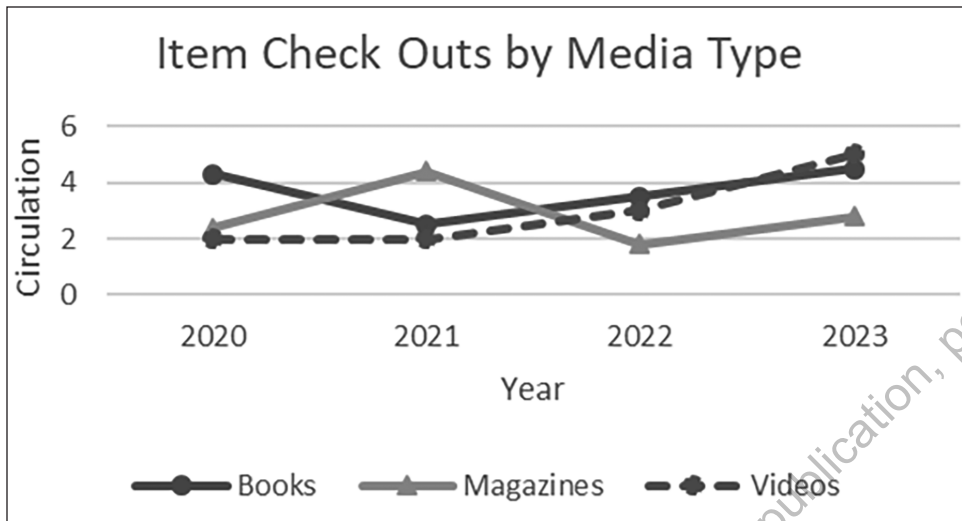
Figure 4. Item Check Outs by Media Type.

would link with the text "*portal* journal homepage" rather than "click here." This serves two purposes: 1) to easily identify where the link goes and 2) to avoid having to read URLs out loud with a screen reader.[7] Screen readers can pull URLs out of context, so the link text should have information about where the link's relationship with the text.

Headings

Headings are used to organize the paper's sections and are descriptive of each section's content.[8] Headings for accessibility work similarly to headings in APA style, and there is specific coding that gets applied to them so the screen reader can interpret the level. Headings have different levels and should be tagged as such. H1 is used only for the title of the paper. H2 is for sections like introduction, methods, results etc. H3 for subsections within these sections, and so on. To indicate heading level, select the heading and use the heading function on your word processor. For more information and examples on page structure including headings, please visit W3C's *Page Structure Tutorial*.[9] At *portal*, heading level labels are added by editorial staff, during the copyediting phase of the publishing process. Authors do not need to add heading tags to manuscript submissions.

Tables

In general, keep tables simple by avoiding merged cells, split cells, or nested tables. Indicate the table header row. In the case of Table 1, it's the top row that indicates what the columns are. Add alt text or captions to tables as well to further describe the content. Like charts and graphs, put any important information in the article text. Tables should not be images.

Table 1.
Example table of gadgets and their color, shape, and weight.

	Color	Shape	Weight
Gadget 1	Blue	Circle	1.5
Gadget 2	Green	Square	.75
Gadget 3	Purple	Triangle	3

Accessibility Guidelines and the Editorial Process

At *portal*, accessibility is influenced by a few different factors. Accessibility-related legal requirements and standards are monitored and implemented by JHUP. In the Press's online "Accessibility Statement of Intent," they share their commitment to comply with current standards and guidelines.[10] JHUP is not the only entity with influence into *portal's* accessibility; Project MUSE, the platform which hosts the *portal's* online content, determines the extent to which the content is accessible. While all minimum requirements are always met, whether one can go above and beyond to provide elements such as alt text depends on the platform's capabilities. Finally, the *portal* editorial board – working within the parameters set by the press and Project MUSE – establishes publications guidelines that fully promote accessibility of our content.

In October of 2023, the *portal* editorial board convened a working group dedicated to scanning the current environment around accessibility in relation to the journal's author guidelines. This group worked to identify common pitfalls for our authors--as seen in the editorial review process--as well as to consider what improvements our own editorial staff could make to our guidelines and practice to elevate accessibility of our content. This group undertook an environmental scan of other journals' accessibility policies and guidelines, and conducted research into what common accessibility practices are currently supported by JHUP and Project MUSE. As a result of this work, *portal* released an updated set of author guidelines, available on portal's website (see https://www.press.jhu.edu/journals/portal-libraries-and-academy), which incorporated new require-ments for submission of tables, figures, and illustrations that support best practices in content accessibility.

These guidelines consider that the journal is published online in color and in print in grayscale. Most notably, authors are asked to submit tables in Word rather than Excel; create high-quality graphics; and ensure that all figures are understandable in grayscale, using a patterned fill where appropriate. Authors are also provided with advice on us-ing an online contrast checker. Finally, the guidelines related to labeling and captioning visual elements have been updated for clarity in support of the author, editorial staff, and ultimately the reader. As mentioned, captions can present a pitfall for authors. When read by screen reader software, they should make clear what the figure or image is depicting, relative to the article's topic and the contextual writing. While adding alt text to images

is not supported by the publisher, should that capability become available, *portal* will incorporate it into its guidelines and editing practices too. *portal* will also continue to monitor the potential for audio-visual elements, such as embedded videos, to be added to journal publications; this is not currently supported.

In the months since *portal's* author guidelines were updated, authors have been incorporating more accessible figures and data visualizations, as well as captions, on the first submission of their articles. It's apparent that the guidelines are helping authors address accessibility requirements early in the manuscript submission process. In addition to improving the accessibility and clarity of *portal's* content, the new publication guidelines increase transparency in our editorial process and offer authors the opportunity to create accessible content from the start, rather than having to revise visual elements later, which can prove difficult. Authors can submit visual elements and captions that better support readers and ultimately lead to more accessible publications for all readers.

Conclusion

As the landscape around accessible content evolves, the *portal* editorial board will continue to work with JHUP and Project MUSE to enable our authors to produce content that can be easily read by anyone. In addition, we promise to work with authors on accessibility measures that we know will translate well when it is published, like color contrast for images and clear captions. Finally, it is important to note that as neither author of this editorial uses screen reading software, we invite feedback about any of our suggestions. Please let us know if you see any errors or omissions. We also welcome your feedback on *portal's* accessibility guidelines.

Acknowledgement

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Notes

1. "Americans with Disabilities Act Title III Regulations," ADA.gov, Americans with Disabilities Act Title III Regulations, March 8, 2012, https://www.ada.gov/law-and-regs/regulations/title-iii-regulations/.
2. W3C, "Introduction to Web Accessibility," Web Accessibility Initiative (WAI), March 7, 2024, https://www.w3.org/WAI/fundamentals/accessibility-intro/.
3. W3C, *Web Content Accessibility Guidelines (WCAG) 2.2*; "Success Criterion 1.4.3 Contrast (Minimum)," October 5, 2023, https://www.w3.org/TR/WCAG22/.
4. WebAIM, "Contrast and Color Accessibility - Understanding WCAG 2 Contrast and Color Requirements," 2024, https://webaim.org/articles/contrast/#ratio.
5. W3C, *Web Content*, 1.4.1.
6. W3C, *Web Content*, 1.4.9.
7. W3C, *Web Content*, 2.4.4.
8. W3C, *Web Content*, 2.4.6.
9. W3C, "Page Structure Tutorial," Web Accessibility Initiative (WAI), April 27, 2018, https://www.w3.org/WAI/tutorials/page-structure/.
10. John Hopkins University Press, "Accessibility Statement of Intent," May 2, 2023, https://www.press.jhu.edu/accessibility-statement-intent.