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Reading Between the Lines

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Reading Between the Lines

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Introduction

Maps are everywhere. Maps are in history books and curated as art in museums. Printed maps are stored in cars, while maps available on smartphones are constantly updated and ready to lead the viewer wherever they want to go. Maps, more than ever, are also utilized in the university classroom as both information sources and student projects.

Visual literacy pedagogy provides a framework to understand the maps users encounter in their daily lives. Maps can be thought of as visual representations of the physical world. It can be easy to think of maps as truthful reflections of the world we live in; however, as with all visuals, they are "never neutral."[1] Instead, they are documents created by people and often represent the worldview of their creators. While maps themselves may represent parts of the environment in a scientific manner, the act of mapmaking itself is a political process. What mapmakers decide to represent, how they represent mapped objects, people, and places, and what outcomes and decisions are made as a result of these representations can sway the map viewer in favor of a particular viewpoint. The United States (US), for example, is not the center of the world—no country is. A map placing the US in the middle of the map highlights the country; however, it makes it seem central to the viewer, and overemphasizes it in comparison to other countries, which are cut in half and less usable.

Visual literacy provides a lens through which librarians can teach students to be more critical map users and makers. For example, learners must be able to evaluate maps for bias and agenda in order to use and create maps effectively and ethically. *Bias* and *agenda*, as used in this chapter, refer to the different ways in which prejudice can affect a mapmaker's judgment. *Bias* is implicit, while *agenda* refers to explicit purpose.
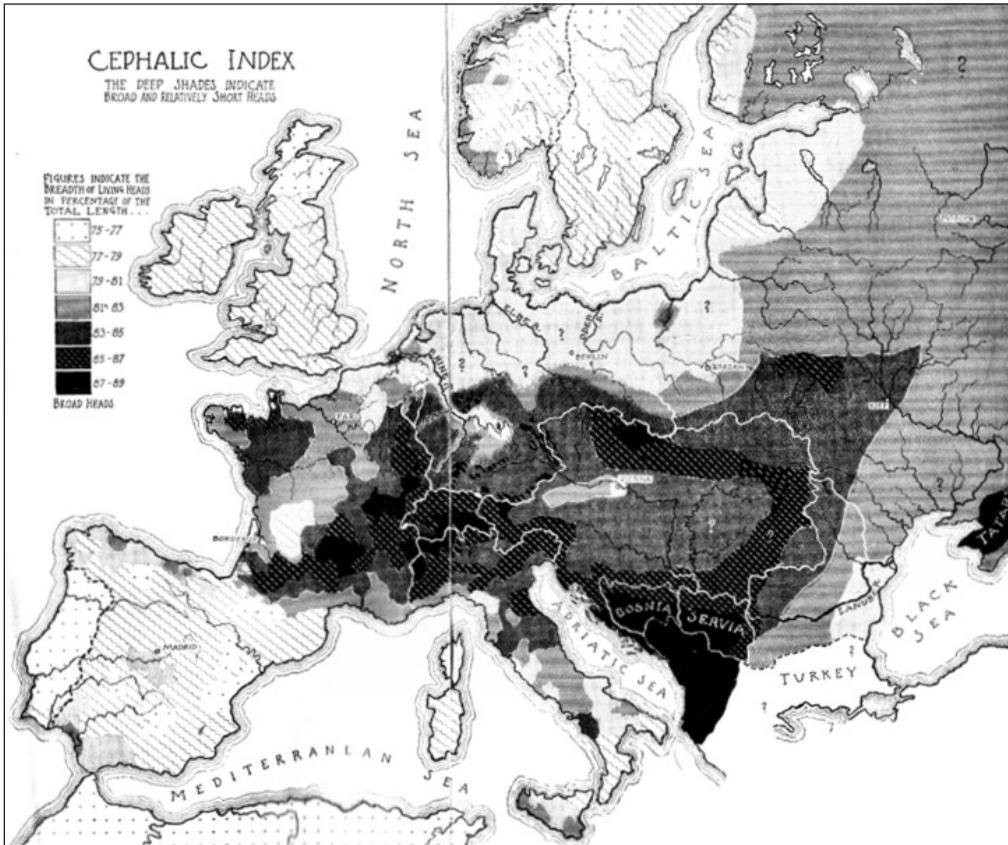
Figure 20.1

The cephalic index of European populations, map by William Z. Ripley, 1899. Image from the David Rumsey Map Collection, David Rumsey Map Center, Stanford Libraries.

Creating a map that purposefully minimizes the legacy of an Indigenous community is agenda, for example, while a mapmaker who *forgets* to include Indigenous contributions is bias.

Evaluation is crucial because it allows the user to assess the map's purpose and reliability, which allows them to determine if it is suitable for academic use. Academic sources should be credible and as unbiased as possible; and careful scrutinization of the choices made in a document's creation is how a user sources for such flaws. When users understand how bias and agenda affect mapmaking, then they are ready to engage in mapmaking themselves. Librarians, as experienced information evaluation professionals, are therefore uniquely suited to instruct students and faculty members on these evaluation strategies, which will be outlined in the chapter.

Mapping History

To understand the relationship between maps and bias, it is helpful to have a basic understanding of the history of maps. Maps are unique and sometimes contradictory resources; they are sometimes artistic renditions of space or the product of scientific examination of the environment. Maps can also be factual information sources, or they can be tools of political machinations.

Since the late Middle Ages, the goal of cartography has been to produce a truthful document. Later in the 1950s, cartography became a scientific pursuit, thanks to new tools that allowed cartographers to create more precise maps. In the late twentieth century, the goal of cartography shifted from producing the most faithful rendering possible to producing the most useful rendering to the map user. Cartography sought to create documents with what became known as 'map effectiveness"—maps that portray data in such a way that the user can interpret them easily.[2] As a result, mapmaking has become a conversation between the mapmaker and the map viewer.

More recently, scholars have discussed how the process of mapmaking is *creating* documents—not just simply *revealing* information to a user. As mapmakers make decisions about the map's appearance and purpose, maps become a product of the values of the mapmaker.[3] Acknowledging this process is the first step to becoming an information-savvy skeptic and being able to effectively evaluate any map encountered.

Power

Maps are more than just informational representations. They have also been used as tools to further the agendas of those in power, who have control over the production and dissemination of knowledge. Cartographers, for example, do not create space but create knowledge *about* space by "identifying, naming, categorizing, excluding, and ordering."[4] By creating this knowledge, a mapmaker can craft a story that reflects their worldview, which may unfairly favor one group over another.

One famous example of bias in mapping is the work of W. Z. Ripley, an early twentieth century anthropogeographer. Ripley utilized mapping to perpetuate and legitimize his ideas of race. To do this, he classified particular traits, including stature, pigmentation, and cephalic index, as characteristics of different racial groups (figure 20.1). Ripley then mapped groups of people with these characteristics to different parts of Europe and the US. This racial mapping was flawed and biased in that it sought to reinforce the racial notions that were pervasive during this time period, such as the idea that specific groups of people belonged in certain places—and not in others.[5] Equally problematic was the fact that Ripley also used his maps to explain social trends. In his work *The Races of Europe,* he mapped divorce and suicide rates alongside his "racial traits," creating a narrative that certain races were morally inferior.[6] Of course, these correlations are not causations, but Ripley's maps reflected his agenda and desire to reinforce the idea of

otherness and to blame certain racial groups for society's failings. These maps were used to fuel anti-immigrant racist thinking in the US.[7]

More recently, traditionally marginalized communities have begun using maps to reclaim their histories and spaces. When communities create their own maps, they're able to tell the stories that resonate with their experiences. One such example is the Mapping Police Violence project, available at https://mappingpoliceviolence.org/. This project shows instances of police violence, injuries, and killings across the US, which visually communicates the urgency and scale of police brutality.[8]

Technology

With the advent of digital technology, mapping and cartography have changed dramatically. Geographic information systems (GIS) are one such innovation. GIS is, at its core, simply a database. In GIS databases, unlike other databases, information is linked to spatial coordinates, which allows for the manipulation of data as it pertains to real-world locations. In GIS, data is visualized as different layers of data, placed on top of one another, which showcases how the points of data related to spatial coordinates. Many different programs can be used to create GIS maps, from powerful, industry-standard programs such as Esri's ArcGIS, to commonly used web applications such as Google Earth.

Map technology hasn't just made the process of mapmaking more accurate and accessible; it is also "undisciplined" in the field of cartography. Cartography is no longer dominated by industry elites—anyone can access and use Google Earth, for example.[9] GIS itself is now a participatory field, which has the capability to make maps more equitable by allowing more people to participate in the mapping process. Visual materials such as maps are created, distributed, housed, and consumed in a digital environment. As maps cycle through these digital experiences, they are changed by those who use them.[10] By participating in such an inherently political process—mapping itself—communities are socially empowered. Indigenous mapmakers, for example, can use maps to tell stories of the places they inhabit. See figure 20.2 for an example of the power of reclaiming land via Indigenous mapmaking. In this map, we see Canada through the eyes of Indigenous mapmakers.

Mapping Discrimination

What does the presence of bias in mapping mean for students, faculty, and librarians who use maps? Map evaluation is more than just an information evaluation best practice. It is a way to engage with social justice and a way to empower diverse information creators. By choosing *not* to accept politicized information at face value, and by engaging in thoughtful skepticism, map users grant space and opportunity for others to engage in mapmaking. As *The Framework for Visual Literacy in Higher Education*: Companion

Document to the *Framework for Information Literacy for Higher Education* (VL Framework) states, "pursuing social justice through visual creation, sharing, use, remix, and attribution takes continual effort and education."[11] Learning to evaluate both maps as resources and self-created maps for bias and agenda are an important part of that continual effort and education.

Agenda

Maps can be biased because they reflect the mapmaker's agenda as a direct reflection of their worldview. Mapmakers make many choices when creating maps: What should be included, and what should be omitted? What should be emphasized? Making these choices can, either purposefully or inadvertently, emphasize one viewpoint over another.

One example of maps reflecting the agendas of their creators concerns the use of GIS at the Bureau of Indian Affairs (BIA). As this United States government agency worked to implement GIS mapping technology in reservations in the 1990s, the layers and data captured in the maps reflected the resources the BIA was invested in (e.g., timber, mineral, water). While these maps also had an "archeology and culture" layer, little data reflected various tribes' spiritual sites for food or medicine gathering.[12] The BIA use mapping to further its colonial agenda, and its maps reflect that agenda in the information that is—and isn't—represented. As a result, these maps don't represent the experiences of the Indigenous peoples who inhabited the lands.

Accessibility

Maps can also be biased in that they are not accessible to certain users, especially users with any degree of visual impairment. Users who are blind or visually impaired use web resources, including traditionally visual information such as maps, with the assistance of technology such as assistive software screen readers. Screen readers scan web pages for information that then prints as Braille code or reads aloud as audio for the user. Text content is easily adapted to screen readers, but sometimes visual content—including images such as maps—can be left inaccessible.[13] In addition, complex, busy maps are particularly challenging to describe and use, especially for those users with learning disabilities. By creating additional descriptions of an image or map through the use of metadata in HTML, mapmakers can ensure that their maps can be accessed and used by whoever encounters them. These descriptions can include a title, date, or a short summary of the image's contents—whatever is needed to help a user understand the visual information that the image conveys. Utilizing accessibility strategies is an important hallmark of the VL Framework, which states that accessibility standards "can enrich the experience of visuals for all users."[14] Accessible visual information is a form of social justice because it provides equitable access to information and the role of scholar. If you can use visual information, you can say something new about it.

Metadata can be used within HTML, or HyperText Markup Language, to promote web accessibility for images. HTML is the coding language used to add images to websites and other digital environments. By utilizing different HTML attributes, users can add a variety of different kinds of descriptions about their images so that they can be used by everyone. One common way to promote accessibility for digital images is through *alt text*. Alt text is also known as alternative text. It is text added to the image's metadata that describes why the image is being used. Alt text allows screen readers to read the image's contents out loud. See the HTML code snippet below for an example:

```
<img src="map.png"
```
- ```alt="Map of Belmont University">```

Some images—like a stock image of rose in an article about gardening—will generally require minimal, if any, alt text. If the image isn't adding important information to the text, it can be considered decorative. Maps, however, are considered complex images—they are not purely decorative and contain a lot of information that cannot be easily summarized in a couple of words. In order to adequately describe maps, the mapmaker will usually need to provide a short description and a long description. The short description identifies the map, while the long description serves as "a textual representation of the essential information conveyed" by the map.[15] Take, for example, the following short and long descriptions of a map:

- Short description: Map of the new 2022 congressional districts of Tennessee
- Long description: This map shows the proposed 2022 congressional districts for the state of Tennessee. One of the most notable changes is that Davidson County, where the capital city of Nashville is located, and which has long been its own congressional district, has been split into three districts. All these new districts contain several rural counties in addition to part of Davidson County.

For maps displayed as images, use the *alt* and/or *longdesc* HTML attributes to provide an accessible text description. The alt tag can store the short description, while the longdesc attribute can contain a link to a simple page with the long description. A link is advisable for the long description, as it might be too cumbersome and lengthy to contain within the attribute tag itself. See the HTML code snippet below for an example:

```
<img src="map.png"
```
- ```alt="Map of the congressional districts of Tennessee"```
- ```longdesc="TN-congressional-districts.html">```

This approach can be modified as needed—the mapmaker could include a link to the long description as a caption underneath the image, for example.

Color choice is another easily overlooked barrier to accessibility. For instance, 1 in 12 males and 1 in 200 females of Northern European descent experience red-green color blindness.[16] This means that maps that utilize the colors red and green might not be usable to people experiencing color blindness. Luckily, this issue is easily fixed by the accessibility-minded mapmaker who values the experience of visual information for all viewers.[17] Using value, or color intensity, instead of hue, or different colors, would make different areas more easily distinguishable on a map.

Teaching Maps

How can librarians help users become effective and ethical consumers of maps? One method is to teach students to evaluate maps before they use them. Another is to ensure that students, faculty, and other members of their institutions have adequate access to map software[18] and projects that represent a variety of perspectives or tell the stories of diverse populations.

Visual Literacy Instruction

Instruction, either through a one-off library instruction lesson in the classroom or through a more in-depth classroom partnership, is one of the main avenues many librarians use to educate students on information literacy topics. Maps are a form of visual information, and as students and faculty use and create maps more frequently in the classroom, librarians may need to talk about information evaluation for maps. As a visual practice, mapmaking involves the "creation and consumption of visuals for the purpose of transmitting and building knowledge."[19] By consistently considering factors related to diversity and equity when using maps as well as through the process of making maps, scholars can promote social justice in their work.

One drawback to map evaluation is that maps (and other forms of visual information) need context before they can be evaluated appropriately. For example, users need to find the map's metadata before using it. This can present a problem, as images are often shared, remixed, and reposted multiple times before they make their way to a user through Google Images search or social media. Social media and search algorithms can "reflect commercial interests and reinforce existing social dynamics" by promoting or shielding certain kinds of image results.[20] Look for captions or accompanying descriptions. Is there any nearby text that offers clues about the map's origin? Students and faculty can also use Google Images search to find where the image may have been first posted.

What metadata should be found to effectively evaluate maps? It is not always possible to find everything, but the more information, the more effectively the user will be able to evaluate the map. Below is a list of suggested information to seek out.

- creators, such as an individual cartographer, a group of people, or an organization
- date

- title or description

Once the map has been reunited with its metadata, it is the librarian's job to help the user decipher the mapmaker's intent and any possible biases. Map evaluation, like any form of information evaluation, is an involved process. There is no one way to describe what a biased map might look like; users will instead need to consider a variety of things to make an evaluative judgment, such as debating a map's possible agendas and flaws as a class. Working through an example as a group can demonstrate why it's vital to become critical information consumers of visual resources, such as maps.

Here are some suggested questions that librarians can use to spark discussion and debate on bias and agenda in a map:

- Who created this map? Why did they create it? What story were they trying to tell?
- When was the map created? What was the political landscape at the time of this map's creation, and how might that have affected the creation of this map?
- What is included on this map? What did the mapmaker emphasize through size, text, color, or other design choices? What do I notice first? How does this make me feel?
- What has been excluded from this map? Can you compare it with other maps to see what may be missing?

Librarians may also be called upon to help students and faculty create maps. While librarians cannot be expected to master every piece of software, it is still helpful to stay abreast of the latest tools so faculty and students can be directed to the best resources for their needs. The actual act of creating a map, through software or other means, is only one small part of the mapmaking process, just as writing is only one part of the process to create a research paper. Mapmakers need to figure out the purpose of their map creation, collect the necessary data, visualize and draft how that data can serve that research purpose, and *then* they can create the map.[21]

Librarians and educators can assist students in thinking through their own map creations in all steps of mapmaking. Here are some suggested questions:

- Who is going to be using or looking at this map? How are they going to access this map?
- What information did I purposefully exclude and why? Why did I consider that information irrelevant to the map's purpose?
- What is the purpose of this map? What story am I trying to tell? How does this map contribute to that narrative?
- Where am *I* in this map? How has my perspective shaped the mapmaking process?

Collection Development

Librarians and educators can also empower diverse mapmakers by improving their institution's access to maps that represent a variety of experiences. By promoting diverse cartographers, librarians are promoting diverse worldviews—literally. Access to diverse

mapping can mean a variety of different things: in this instance, shared links on course pages or library guides and websites, or programs and class sessions that utilize a variety of maps.

Below are some exciting map projects and cartographers that represent a variety of diverse perspectives.

- Indigenous Mapping Workshop, available at https://www.indigenousmaps.com/. This organization promotes Indigenous rights and interests by promoting access to geospatial programs and resources for Indigenous community members, focusing on the "generation and dissemination of decolonized resources."[22] Resources can be accessed through a paid membership.
- Livingmaps Network, available at https://www.livingmaps.org. Its activities include publications, conferences, and programs led by a collective of research-ers and community members interested in using mapping for social justice. It is based out of London, in the United Kingdom.
- American Panorama, available at https://dsl.richmond.edu/panorama/. This atlas project covers various parts of US history from the University of Richmond. American Panorama covers different segments of American history, several of which tell the stories of diverse American populations, including "Mapping Inequality: Redlining in New Deal America."
- Dr. Margaret Wickens Pearce is an award-winning cartographer and enrolled member of the Citizen Potawatomi Nation who writes about and maps the Indigenous experience. One example of her work is the map, "Coming Home to Indigenous Place Names in Canada," published by the Canadian-American Center at the University of Maine.

Mapping the Future

As this chapter has discussed, maps and mapmaking are not static fields of knowledge. Technology will surely continue to change mapmaking. Big data is one such opportunity in cartography. Geospatial big data is a societal opportunity to make fundamental changes that could solve a variety of different problems. Big data can be used, for example, to generate a route that reduces a vehicle's consumption of gas by avoiding traffic and idling.[23]

As students participate more and more frequently in mapping projects, there may be an opportunity for academic institutions to work to solve these big problems. Social justice is also becoming a bigger part of the conversation in all aspects of academia. Today's scholars are exploring a variety of research topics from perspectives that haven't been traditionally valued by the academic community. Mapping has the potential to serve as a valuable tool in that conversation—if only we learn to read between the lines of these complex visual resources.

Notes

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