Article

Leveraging Critical Information Literacy to Develop Social Justice-Minded Data Literacy Competencies

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ABSTRACT

Librarians who interact with data in different contexts can come together in a community of practice – leveraging each other's perspectives to collectively engage with critical librarianship and reimagine social justice-related learning outcomes for information and data literacy programming. Specifically, this paper explores the overlapping goals of different critical literacies (such as critical information literacy and QuantCrit), showcasing that synergies exist between social justice-oriented librarians with distinctive roles and responsibilities. By leveraging a community of practice as a vehicle for continuing education in inclusive pedagogy, librarians can empower their patrons, students, and colleagues to challenge and act upon surrounding data ecosystems that continue to marginalize and harm. Conversations surrounding social justice perspectives in data literacy also open opportunities for librarians to confront systematic forces within librarianship itself (tensions between different librarian roles, DEIA barriers, and unequal distribution of resources).

Author-Generated Keywords: Data literacy, Critical information literacy, QuatCrit, Community of practice, Data librarianship

INTRODUCTION

Expectation of teaching is oftentimes embedded in the roles of librarians who work with digital collections or data. Whether librarians build collections, remediate data, or embed themselves in data literacy efforts, they can all build a shared understanding of how the information and data landscape is fueled by systemic pressures that harm and marginalize. This work is possible through communities of practice (CoP) which are "collaborative, informal networks that support professional practitioners in their efforts to develop shared understandings and engage in work-relevant knowledge building."[1] CoPs in an academic library workplace setting can create synergies between different concepts/frameworks (i.e., critical data literacy, QuanCrit, etc.) while being mindful of how context *informs* these concepts/frameworks in practice and real world application (i.e., the types of patrons/audience a specific library serves, available resources or lack thereof, etc.). A practical initial task for these CoPs tied to data literacy and social justice-related objectives is to leverage synergies between various literacies, highlighting meaningful work that has already been done.

Facilitating continuing education in pedagogy for librarians who teach is not a new concept.[2] However, collectively thinking through learning outcomes is particularly necessary when teaching *critical* information and data literacy (including cultural heritage collections as data) because it requires interrogating *status quo* frameworks, perspectives, and approaches—this can feel daunting without supportive insight and opportunities to brainstorm. Also, opportunities are missed if librarians in digital scholarship do not interact with others who predominantly occupy information literacy or cultural heritage digital libraries spaces.

Now is a good time to collectively engage with critical librarianship (critlib), think through how it can inform social justice-related goals and outcomes for information and data literacy programming, and work together to dispel organizational and praxis norms grounded in white supremacy and systematic racism. Over the last decade, critlib has entered the mainstream. Broadly speaking, critlib takes ethical and justice-minded approaches to librarianship, using critical theory to interrogate the systemic, historical or social assumptions that underlie our practice.[3] Through conferences, a slew of scholarship publications, and social media outlets, the critical librarian has become more front-facing than before—recognizing, however, that critlib rests upon decades of progress made by librarians of color. The last decade has also seen a rise in librarians

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[1] Noriko Hara, *Communities of Practice*, vol. 13, Information Science and Knowledge Management (Berlin, Heidelberg: Springer Berlin Heidelberg, 2009), 3.

[2] Jennifer Osborn, "Librarians as Teachers: Forming a Learning and Teaching Community of Practice," *Journal of the Australian Library and Information Association* 66, no. 2 (2017): 162–69, https://doi.org/10.1080/24750158.2017.1328633; Malia Willey, "Library Instructor Development and Cultivating a Community of Practice," in *Management and Leadership Innovations: Advances in Librarianship*, ed. Anne Woodsworth and W. David Penniman (Emerald Publishing, 2014), 83–100.

[3] Accardi, M. T., Drabinski, E., & Kumbier, A. (2010). *Critical Library Instruction: Theories and Methods*. Duluth, MN: Library Juice Press

involved in data literacy training. In this brief review paper, we start by summarizing the existing state of critlib and data literacy. Next, we present areas of opportunity where librarians in different (albeit synergetic) roles can collaborate and learn from one another in CoPs related to critical data literacy–especially when there are many literacies and perspectives that share similar definitions, concepts, and goals. We recognize, however, that a shared understanding of critical approaches to data and information literacy is only the first step towards truly challenging systems that dictate the very fabric of our workplace norms and assets.

THE CASE FOR A SHARED UNDERSTANDING OF DATA LITERACY
Libraries should not silo their professionals into data literacy and information literacy. Rather, instruction-focused data, digital, and information literacy librarians should work together to build a shared understanding of learner competencies, and professionals who provide collections as data should work with instruction-focused librarians to better understand user needs. Moreover, librarians should recognize that students can be "participants in scholarly conversations" by reframing the act of research beyond just collecting information—students also construct meaning.[4] In these scholarly conversations, librarians, researchers, and students in higher education can work together to interrogate the social, economic, and political context of the production and consumption of information and data.

Of course, the degree to which an individual librarian is positioned to engage in such conversations depends on their job description, and the inclusion of data literacy duties in library roles varies greatly depending on workplace environments. Data literacy encompasses a specific set of skills that vary depending on field and audience much like how it is being contextualized in STEM fields, the social sciences, and digital humanities.[5] Although often referred to by other names, data literacy has a place beyond the

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[4] Michelle Holschuh Simmons, "Librarians as Disciplinary Discourse Mediators: Using Genre Theory to Move Toward Critical Information Literacy," *Portal: Libraries and the Academy* 5, no. 3 (2005): 299, https://doi.org/10.1353/pla.2005.0041.

[5] Jake R. Carlson et al., "Determining Data Information Literacy Needs: A Study of Students and Research Faculty," *Portal: Libraries and the Academy* 11, no. 2 (2011): 629–57, https://doi.org/10.1353/pla.2011.0022; John Cook, Daniel Bedford, and Scott Mandia, "Raising Climate Literacy Through Addressing Misinformation: Case Studies in Agnotology-Based Learning," *Journal of Geoscience Education*, July 9, 2018, https://doi.org/10.5408/13-071.1; Catherine D'Ignazio and Lauren F. Klein, *Data Feminism*, Strong Ideas Series (Cambridge, Massachusetts: The MIT Press, 2020); Tibor Koltay, "Data Literacy: In Search of a Name and Identity," *Journal of Documentation* 71, no. 2 (2015): 401–15, https://doi.org/10.1108/JD-02-2014-0026; René Schneider, "Research Data Literacy," in *Worldwide Commonalities and Challenges in Information Literacy Research and Practice*, ed. Serap Kurbanoğlu et al., vol. 397, Communications in Computer and Information Science (Cham: Springer International Publishing, 2013), 134–40, https://doi.org/10.1007/978-3-319-03919-0_16; Annika Wolff et al., "Creating an Understanding of Data Literacy for a Data-Driven Society," *The Journal of Community Informatics* 12, no. 3 (2016): 9–26, https://doi.org/10.15353/joci.v12i3.3275.

academy, with public libraries and local data intermediaries all playing a role in training the public.[6] Despite the rise in recognition and awareness, core competencies and responsibilities for the data librarian role (i.e., metadata librarian, data services librarian, geospatial/GIS librarian, etc.) are still a work in progress.[7] If the data librarian role continues to evolve with instruction remaining a core duty, then the community may greatly benefit from core data literacy competencies that are widely adopted and normalized in practice.[8]

As data literacy continues to evolve as a concept, it is imperative that librarians who provide and instruct with data be vigilant in critical approaches. This both helps to stay relevant as these concepts mature, but also centers the library's role as a provider of ethical (and justice minded) literacy training. A partnership among data and instruction librarians can be a truly symbiotic relationship where each can leverage the other's CoPs to give students a richer perspective on the complexities of the modern data landscape with all of its relevant idiosyncrasies, trends and biases.

Internally, the library can also benefit from this approach. The collections as data movement makes it explicit that library resources can serve as datasets in their own right.[9] Catalogers, digital collection managers, and other analysts all have critical

[6] Horng-Ji Lai, "Information Literacy Training in Public Libraries: A Case from Canada," *Journal of Educational Technology & Society* 14, no. 2 (2011): 81–88, https://doi.org/10.1115/1.802977.paper218; Kathryn L. S. Pettit and Maia Woluchem, "Empowering the Public and Nonprofit Sectors with Data and Technology," Urban Institute, May 31, 2017, https://www.urban.org/research/publication/empowering-public-and-nonprofit-sectors-data-and-technology; Jacquie Widdowson and Darren Smart, "Information Literacy in Public Libraries," *Journal of Information Literacy* 7, no. 2 (2013): 160–62, https://doi.org/10.11645/7.2.1863;
[7] Hammad Khan and Yunfei Du, "What Is a Data Librarian?: A Content Analysis of Job Advertisements for Data Librarians in the United States Academic Libraries" (IFLA World Library and Information Congress, Kuala Lumpur, Malaysia, 2018), 1–9, https://digital.library.unt.edu/ark:/67531/metadc1225772/; Lisa Federer, "Defining Data Librarianship: A Survey of Competencies, Skills, and Training," *Journal of the Medical Library Association* 106, no. 3 (2018): 294–303, https://doi.org/10.5195/JMLA.2018.306.
[8] For example, the IMLS funded Visualizing the Future initiative aims to create a literacy-based instructional and research agenda to build upon a shared vision of understanding of data visualization as a form of expression and research byproduct: Negeen Aghassibake, Justin Joque, and Matthew L. Sisk, "Supporting Data Visualization Services in Academic Libraries," *The Journal of Interactive Technology and Pedagogy* 18 (2020), https://jitp.commons.gc.cuny.edu/supporting-data-visualization-services-in-academic-libraries.
[9] Always Already Computational: Collections as Data. "The Santa Barbara Statement on Collections as Data." Accessed November 15, 2021. https://collectionsasdata.github.io/statement/.

approaches to working with and teaching others to use these data.[10] A shared understanding of how librarians with a variety of specialities can critically engage with data makes it easier to embed these approaches holistically in the library organization. A first step might involve finding synergies between the different literacies and how these can help shape our understanding of how we can collectively interrogate information ecosystems and the role of reparations in social justice efforts.

The Association for College & Research Libraries (ACRL) defines information as "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning."[11] The Framework of Information for Higher Education identifies six concepts that assist learners to become information literate;[12] the way that the document is presented and constructed leaves room for flexibility, allowing space for adaptation and interpretation. There are many commonalities between these working definitions of information literacy and the concept of data literacy, including the need to train students to critically assess data and its provenance.

Although some researchers see data literacy as a more quantitative sub-domain of the overarching info lit framework, in most settings, data (and statistical) literacy are key components of a robust information literacy.[13] Firm definitions of data literacy are thus somewhat variable across the literature. Some focus on the ability to effectively make decisions using data, placing the importance on understanding the questions a particular dataset will let a researcher address.[14] Others more directly articulate the specific methods by which this is accomplished, stressing the need for skills related to finding, processing, and sorting datasets (and often centering the similarities and overlap between data and statistical literacies).[15] Still, others take the further step of highlighting the need in data literacy to think outside of the specifics of individual datasets and

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[10] Lae'l Hughes-Watkins "Moving Toward a Reparative Archive: A Roadmap for a Holistic Approach to Disrupting Homogenous Histories in Academic Repositories and Creating Inclusive Spaces for Marginalized Voices," *Journal of Contemporary Archival Studies* 5, no. 6 (2018), https://elischolar.library.yale.edu/jcas/vol5/iss1/6

[11] ALA "Framework for Information Literacy for Higher Education," American Library Association, accessed November 1, 2021, http://www.ala.org/acrl/standards/ilframework.

[12] American Library Association: The six frames are "Authority Is Constructed and Contextual," "Information Creation as a Process," "Information Has Value," "Research as Inquiry," "Scholarship as Conversation," and "Searching as Strategic Exploration."

[13] Schield, "Information Literacy, Statistical Literacy and Data Literacy."

[14] Ellen B. Mandinach and Edith S. Gummer, "A Systemic View of Implementing Data Literacy in Educator Preparation," *Educational Researcher* 42, no. 1 (2013): 30–37, https://doi.org/10.3102/0013189X12459803.

[15] Milo Schield, "Information Literacy, Statistical Literacy and Data Literacy," *IASSIST Quarterly* 28, no. 2/3 (2004): 6–11, https://doi.org/10.29173/iq790.

address and focus on ethical provenance and citation as well as structural and other biases.[16]

Interrogating Systems

Some librarians treat information literacy instruction as a neutral exercise, opting instead to teach students how to evaluate information based on rudimentary checklists related to authority, relevancy (i.e., "was the work published recently?"), underlying intent or goal of the piece, etc. The CRAAP test, developed by Sarah Blakeslee, is a common example template.[17] An acronym for Currency, Relevance, Authority, Accuracy, and Purpose, CRAAP's intent is to check the objective reliability of information sources. Although checklists may help with the initial identification of elements that make up knowledge creation processes, they generally fail to open conversations that interrogate power structures.[18] Librarians and students can discuss the peer-review process as a way to vet scholarly publications, but there remains a real messiness underneath the facade. Implicit biases, studies that have been retracted, demographic makeup of peer reviewers and scholars of a particular field, and other factors can all affect the quality of a publication. An analysis of college student artifacts (specifically, written responses from activity sheets) revealed that the vast majority of participants deemed resources discovered through a library catalog or database to be trustworthy, signaling the "need to reorient library instruction sessions from peer reviewed article instruction to what could more accurately be considered information literacy instruction"; that is, considering information beyond what is available in scholarly journals.[19]

The most important aspect of data literacy is the ability to, as Bhargava and colleagues write, "constructively engage in society through or about data."[20] In particular, they suggest that data literacy is not solely grounded in data analysis, but also in how individuals engage with and interrogate social structures. This ability serves as a natural place to explore the similarities among different types of critical literacies. One such "critical literacy" in librarianship that explicitly centers itself around interrogating systems

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[16] Javier Calzada-Prado and Miguel Ángel Marzal, "Incorporating Data Literacy into Information Literacy Programs: Core Competencies and Contents," *Libri* 63, no. 2 (2013), https://doi.org/10.1515/libri-2013-0010; Ina Sander, "What Is Critical Big Data Literacy and How Can It Be Implemented?," *Internet Policy Review* 9, no. 2 (2020), https://doi.org/10.14763/2020.2.1479; Catherine D'Ignazio, "Creative Data Literacy: Bridging the Gap between the Data-Haves and Data-Have Nots," *Information Design Journal* 23, no. 1 (2017): 6–18, https://doi.org/10.1075/idj.23.1.03dig.
[17] Sarah Blakeslee, "The CRAAP Test," *LOEX Quarterly* 31, no. 3 (2004), https://commons.emich.edu/loexquarterly/vol31/iss3/4.
[18] Pashia, "Examining Structural Oppression as a Component of Information Literacy."
[19] Katelyn Angell and Eamon Tewell, "Teaching and Un-Teaching Source Evaluation: Questioning Authority in Information Literacy Instruction," *Comminfolit* 11, no. 1 (2017): 111, https://doi.org/10.15760/comminfolit.2017.11.1.37.
[20] Rahul Bhargava et al., "Beyond Data Literacy: Reinventing Community Engagement and Empowerment in the Age of Data," September 2015, https://dspace.mit.edu/handle/1721.1/123471.

is Critical Information Literacy.

Critical Information Literacy (CIL) largely dispenses with neutrality and instead directly acknowledges power differentials that dictate what information is produced and how it gets accessed. The approach relies on a variety of perspectives and pedagogies that encourages theoretically informed practice, acknowledging that the breadth of information, learners, and instructors are socially situated entities.[21] CIL stresses the idea that "the existing information system mirrors the larger social and political order, which is characterized by a radically asymmetrical distribution of power, and is shot through, systematically and structurally, by racism, sexism, homophobia, militarism, and class oppression."[22] In order for librarians to faithfully interrogate the role of power in information dissemination, they must acknowledge that libraries and the academy are historically white—wrangling with the idea that libraries rest on a discriminatory past and are inherently white-dominated spaces (i.e., staffing, information classification systems, etc.).

There are a handful of methods and strategies to apply critical information literacy within data literacy contexts. An instructor can facilitate a student-centered learning environment by removing themselves from a position of authority—instead opting to center and privilege student voices. Troy Swanson suggests a problem-posing method where librarians "pose questions and create assignments that make implicit beliefs more explicit," thereby allowing students to challenge the implications and origins of these beliefs.[23] Annie Downey recommends incorporating real-world problems as conversation starters because they generally encourage students to incorporate their lived experiences into the classroom.[24] By deconstructing the teacher and student dichotomy, librarians are then able to invite their learners to co-create knowledge – only then can we collectively "understand how libraries participate in systems of oppression and find ways for librarians and students to act upon these systems."[25]

The case for introducing the concept of reparations when teaching data literacy can best be represented by the intersections of Critical Race Theory (CRT) and quantitative data analysis under the "CritQuant" and "QuantCrit" labels. In political and

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[21] Angela Pashia, "Examining Structural Oppression as a Component of Information Literacy: A Call for Librarians to Support #BlackLivesMatter through Our Teaching," *Journal of Information Literacy* 11, no. 2 (2017): 86, https://doi.org/10.11645/11.2.2245.

[22] Ian Beilin, "Beyond the Threshold: Conformity, Resistance, and the ACRL Information Literacy Framework for Higher Education," *In the Library with the Lead Pipe*, February 5, 2015, http://www.inthelibrarywiththeleadpipe.org/2015/beyond-the-threshold-conformity-resistance-and-the-aclr-information-literacy-framework-for-higher-education/.

[23] Troy Swanson, "Information Is Personal: Critical Information Literacy and Personal Epistemology," in *Critical Library Instruction: Theories and Methods*, ed. Emily Drabinski, Alana Kumbier, and Maria Accardi (Duluth, MN: Library Juice Press, LLC, 2010), 274.

[24] Annie Downey, *Critical Information Literacy: Foundations, Inspiration, and Ideas* (Sacramento, CA: Library Juice Press, 2016).

[25] Tewell, "The Practice and Promise of Critical Information Literacy: Academic Librarians' Involvement in Critical Library Instruction."

public discourse, reparations can be defined as any effort that intends to compensate or remediate, therefore attempting to "make right" some historical wrong against specific groups.[26] Within librarianship, scholars have repeatedly demonstrated that we must recognize that classification systems such as Library of Congress subject headings are inherently biased, thereby perpetuating harm (i.e., racist underpinnings, eugenicist discourse, etc.).[27] Given this reality, librarians can use the classroom space to empower their learners to locate the need and possibilities for reparations – for example, interrogating historic census data or vendor-supplied metadata in proprietary databases.

The harmful nature of data collection and representation can be presented through Earnestyne Sullivan and colleagues' unpacking of the "CritQuant" concept under two tenets: permanence of racism and critique of liberalism.[28] David Gillborn *et al.* expands upon "CritQuant" by relying on CRT for guidance and scope, resulting in the "QuantCrit" approach; they make clear that, "QuantCrit" is not an off-shoot movement of CRT, but rather, a framework that emphasizes the need to apply a CRT lens when interrogating quantitative data in research, policy, practice, and other contexts.[29]

QuantCrit's origins can be traced back to over a century ago. Sociologist W.E.B. Du Bois' seminal work, *The Philadelphia Negro*, is regarded as one the the first multi-method studies that challenged the deracialization of statistics. In particular, Du Bois confronted eugenist assumptions that characterized Black communities as self-destructive and inferior compared to White counterparts.[30] Lessons learned from Du

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[26] Taurean J. Webb, "Reparations," in *Encyclopedia of Diversity and Social Justice*, ed. Sherwood Thompson (Lanham, MD: Rowman & Littlefield Publishers, 2014).
[27] Melissa Adler and Joseph T. Tennis, "Toward a Taxonomy of Harm in Knowledge Organization Systems," *Knowledge Organization* 40 (2013): 266-72, https://ssrn.com/abstract=2880948; Melanie Feinberg, "Hidden Bias to Responsible Bias: An Approach to Information Systems Based on Haraway's Situated Knowledges," *Information Research* 12 (2007): 1-13, http://informationr.net/ir/12-4/colis/colis07.html; Jens-Erik Mai, "Classification in a Social World: Bias and Trust," *Journal of Documentation* 66 (2010): 627-42, https://doi.org/10.1108/00220411011066763.
[28] Earnestyne Lashonne Sullivan, "A Critical Policy Analysis: The Impact of Zero Tolerance on Out-of-School Suspensions and Expulsions of Students of Color in the State of Texas by Gender and School Level" (Unpublished dissertation, Texas A&M University, 2007), http://oaktrust.library.tamu.edu/bitstream/handle/1969.1/ETD-TAMU-1484/SULLIVAN-DISSERTATION.pdf?sequence=1; Earnesytne Sullivan, Patricia J. Larke, and Gwendolyn Webb-Hasan, "Using Critical Policy and Critical Race Theory to Examine Texas' School Disciplinary Policies," *Race, Gender & Class* 17, no. 2 (2010): 77.
[29] David Gillborn, Paul Warmington, and Sean Demack, "QuantCrit: Education, Policy, 'Big Data' and Principles for a Critical Race Theory of Statistics," *Race Ethnicity and Education* 21, no. 2 (2017): 158–79, https://doi.org/10.1080/13613324.2017.1377417.
[30] Tukufu Zuberi, *Thicker than Blood: How Racial Statistics Lie* (Minneapolis: University of Minnesota Press, 2001); Nichole M. Garcia, Nancy López, and Verónica N. Vélez, "QuantCrit: Rectifying Quantitative Methods through Critical Race Theory," *Race Ethnicity and Education* 21, no. 2 (2018): 149–57, https://doi.org/10.1080/13613324.2017.1377675.

Bois generations ago are still incredibly relevant; fostering productive dialogue on the dangers of decontextualized and ahistorical misuses of quantitative research methods allows us to envision how research tools can be developed or repurposed for restorative and transformational social justice work.

Much like Du Bois, Tukufu Zuberi sees statistics as a tool for racial liberation. By decoupling eugenics logic from statistical modeling norms, Zuberi encourages researchers to consider the axiologies and ontologies of racial statistics.[31] Zuberi's invitation inspired many types of scholarship ranging from: 1) critical race transformative convergent mixed methods;[32] 2) race-gender-class dynamics in higher education data and economic performance measures.[33] These diverse perspectives and discussions challenge us to rethink and reimagine common practices in quantitative reasoning and in doing so, allows us to begin the process of engaging with inequities in our data and collections.

OVERLAPPING GOALS
We believe that robust discussions about data and information literacy goals with an eye towards justice/ethics are possible in a CoP composed of librarians who supply data and librarians who use data in instructional contexts. We will now highlight three potential literacy-focused topics that can be discussed and contextualized in a CoP setting: Racism, Neutrality, and Categories and Deficit Mindsets. We then frame these topics around the work of data instructors and data suppliers, demonstrating how the immersion and awareness in critical literacies can help librarians embed social justice-oriented teaching efforts within respective roles. The goal of the following demonstrations and scenarios is not to propose new frameworks or concepts; rather, the objective is to illuminate existing possibilities on *what* to teach and *how* to teach. We also recognize that teaching responsibilities can vary greatly depending on library positions; for example, some digital collections librarians may have more responsibilities related to instruction at one institution compared to another.

RACISM: ITS INFLUENCE ON PEDAGOGY AND INSTRUCTIONAL CONTENT
QuanCrit emphasizes that the culture, economics, history, etc. surrounding race dictate how numbers in relation to race are prone to misuse.[34] Thus, an interrogation of the collection, analysis, and representation of statistical outputs is necessary to uncover biases that are keen on preserving racial status quo. Critical Information Literacy tends to

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[31] Zuberi, *Thicker than Blood*.

[32] Nichole M. Garcia and Oscar J. Mayorga, "The Threat of Unexamined Secondary Data: A Critical Race Transformative Convergent Mixed Methods," *Race Ethnicity and Education* 21, no. 2 (2018): 231–52, https://doi.org/10.1080/13613324.2017.1377415.

[33] Lindsay Pérez-Huber, Verónica N. Vélez, and Daniel Solórzano, "More than 'Papelitos:' A QuantCrit Counterstory to Critique Latina/o Degree Value and Occupational Prestige," *Race Ethnicity and Education* 21, no. 2 (2018): 208–30, https://doi.org/10.1080/13613324.2017.1377416;

[34] Marvin Lynn and Adrienne D. Dixson, eds., *Handbook of Critical Race Theory in Education* (New York: Routledge, 2013).

be more explicit on how the library itself must wrangle with its roots in hegemony and white supremacy. In a hypothetical CoP, it is then possible to not only discuss problematic numbers in the overarching information landscape, but also critically compare, contrast, and examine open source and proprietary data sources that librarians rely upon for teaching and research support.

Given that our hypothetical CoP works in library spaces, it is important for all involved to wrangle with discriminatory ordering of information within our library retrieval systems. Safiya Noble in *Algorithms of Oppression* (2018), and Ruha Benjamin in *Race After Technology* (2019) discuss the repercussions when complacent with systems/algorithms tasked to make collections/information findable.[35] Noble talks about the social implications of bias embedded in library algorithms. Noble's focus is not only on Google Search but how knowledge discovery systems and search engines baked in libraries inherently reinforce racism. Noble also notes that the discriminatory effects of systems is not only tied to how they limit access to information but also how search results returned from queries shape attitudes.

It would not be all too surprising to recognize that the CoP can lean on in-house library collections for instruction purposes (i.e., deriving statistics or visualizations from quantitative metadata, demonstrating text mining workflows, etc.). However, "historic and contemporary biases in collection development activity manifest as corpora that overrepresent dominant communities and underrepresent marginalized communities."[36] Addressing problematic course/instructional content head-on requires advocacy for collaborations with community groups that have ties to collections, subject experts, and reference.

Moreover, decisions to not develop a digital collection in libraries due to concerns raised by respective communities should be treated positively when developing digital collections. The CoP can work together to figure out how to best invite their community to hold the library accountable and redress power imbalances. In a New Zealand context, this can mean seeing Māori as key experts and leaders in record-keeping of their cultural heritage. Although questions concerning the ownership of government records involving Māori information continue to evolve, having Māori voices present and amplified is necessary for reasserting their rights and reclaiming the past.[37]

NEUTRALITY
Critical Information Literacy refutes the neutrality of traditional information literacy

[35] Safiya Umoja Noble, *Algorithms of Oppression: How Search Engines Reinforce Racism* (New York: New York University Press, 2018); Ruha Benjamin, *Race after Technology: Abolitionist Tools for the New Jim Code* (Medford, MA: Polity, 2019).
[36] Thomas Padilla and OCLC, *Responsible Operations: Data Science, Machine Learning, and AI in Libraries*, 2019, 16, https://doi.org/10.25333/xk7z-9g97.
[37] Evelyn Wareham, "'Our Own Identity, Our Own Taonga, Our Own Self Coming Back': Indigenous Voices in New Zealand Record-Keeping," *Archivaria* 52 (2001): 26–46, https://archivaria.ca/index.php/archivaria/article/view/12813.

instruction and instead encourages library educators to actively engage with the political and social dimensions of information including production, dissemination, and reception.[38] QuanCrit retains a similar stance on neutrality: statisticians are prone to ascertain that all quantitative data represents the truth and prescribes a legitimate understanding of the world. This belief stems from the assumption that technology is separate from sentimentality and politicization.[39] White supremacy and eurocentrism is safeguarded if race is removed from discussion of existing technologies, tools, and the processes surrounding scholarly communication.

A rich CoP discussion on strategies to disengage from neutrality narratives can be enhanced by comparing and contrasting perspectives on both digital scholarship workshops and course-integrated information literacy instruction. Public facing librarians have historically been taught how to conduct a reference interview, but generally do not further discuss the justification behind a chosen technique or approach (the way a digital scholarship librarian might), thereby replicating "proven" strategies instead of unpacking worth.[40] How do "best practices" narratives affect how we produce data visualization or choose a particular statistical test? Ultimately, the classroom can be a space for unpacking how the "politics over who can speak, who can represent, who can access" intersects with library holdings."[41]

Specific and tangible community needs should be the driving force behind data development rather than neutral-leaning "all for one" pitches. One of the principles of The Santa Barbara Statement on Collections as Data suggests that "Collections as data designed for everyone serve no one."[42] Cultural heritage institutions need to think about ways to lower barriers to use for specific communities instead of gravitating towards imaginary needs. Diverse approaches to data development and access are encouraged while taking into account available resources. In a hypothetical scenario, a robust discussion on the intersections between the CARE Principles for Indigenous Data Governance and "collections as data" in which libraries' mission in making their open

[38] Eamon Tewell, "Putting Critical Information Literacy into Context: How and Why Librarians Adopt Critical Practices in Their Teaching," *In the Library with the Lead Pipe*, October 12, 2016, http://www.inthelibrarywiththeleadpipe.org/2016/putting-critical-information-literacy-into-context-how-and-why-librarians-adopt-critical-practices-in-their-teaching/.

[39] Gillborn, Warmington, and Demack, "QuantCrit," 171.

[40] Jennifer Brown et al., "We Here: Speaking Our Truth," *Library Trends* 67, no. 1 (2018): 167, https://doi.org/10.1353/lib.2018.0031.

[41] Jane Anderson, Access and Control of Indigenous Knowledge in Libraries and Archives: Ownership and Future Use (The MacArthur Foundation and the American Library Association, 2005), 22.

[42] "The Santa Barbara Statement on Collections as Data," Always Already Computational: Collections as Data, accessed November 15, 2021, https://collectionsasdata.github.io/statement/.

collections findable, accessible, interoperable, and reusable can oftentimes conflict with indigenous data sovereignty.[43]

CATEGORIES AND DEFICIT MINDSETS
Assumed deficits of minority groups shift attention away from the systems that oppress in the first place.[44] QuantCrit is concerned about research design and its intersection with the fundamental consequences of re/presentation. Questions concerning the availability and the operationalization of variables and categories ultimately inform a study's methodology and interpretation. QuantCrit recognizes that the idea of race has carried the inherent threat of racist assumptions and actions. BIPOC students in higher education, for example, are often viewed through a deficit lens by academics and teachers. Although both QuantCrit and Critical Information Literacy schools of thought interrogate collection, categorization, and analysis of data and information, Critical Information Literacy is generally more upfront on taking a critical pedagogical stance. For example, a librarian who fostered an environment grounded in asset-based teaching for BIPOC students found that attending to students' cultural context made for a more useful and valuable information literacy education experience.[45] The critlib community has thought much about deficit models in higher education and can provide profound insights when contextualizing data branded initiatives and programming.[46] As Catherine D'Ignazio and Lauren F. Klein ask us: "Who benefits from data science and who is overlooked?"[47]

D'Ignazio and Klein's work, *Data Feminism,* encourages us to crosswalk concepts that interrogate the data landscape.[48] We can shift the narrative away from "data ethics"

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[43] "CARE Principles for Indigenous Data Governance," Global Indigenous Data Alliance, accessed November 15, 2021, https://www.gida-global.org/care.
[44] Michael Omi and Howard Winant, "On the Theoretical Concept of Race," in *Race, Identity, and Representation in Education*, ed. Cameron McCarthy et al. (New York: Routledge, 1993), 3–10; Zeus Leonardo, "The Story of Schooling: Critical Race Theory and the Educational Racial Contract," *Discourse: Studies in the Cultural Politics of Education* 34, no. 4 (2013): 599–610, https://doi.org/10.1080/01596306.2013.822624.
[45] Kim L. Morrison, "Informed Asset-Based Pedagogy: Coming Correct, Counter-Stories from an Information Literacy Classroom," *Library Trends* 66, no. 2 (2017): 212, https://doi.org/10.1353/lib.2017.0034.
[46] Chelsea Heinbach et al., "Dismantling Deficit Thinking: A Strengths-Based Inquiry Into the Experiences of Transfer Students In and Out of Academic Libraries," *In the Library with the Lead Pipe*, February 6, 2019, http://www.inthelibrarywiththeleadpipe.org/2019/dismantling-deficit-thinking/; Eamon Tewell, "The Practice and Promise of Critical Information Literacy: Academic Librarians' Involvement in Critical Library Instruction," *College & Research Libraries* 79, no. 1 (January 2018), https://doi.org/10.5860/crl.79.1.10; Sebastian Krutkowski, "A Strengths-Based Approach to Widening Participation Students in Higher Education," *Reference Services Review* 45, no. 2 (2017): 227–41, https://doi.org/10.1108/RSR-10-2016-0070.
[47] D'Ignazio and Klein, *Data Feminism*, 34.
[48] D'Ignazio and Klein, *Data Feminism*, 60.

and, instead, strive for "data justice." Concepts like ethics, bias, and transparency allow us to locate sources of power, but only go so far when individuals or technical systems continue to retain power. Alternatively, concepts that *challenge* power include shifting the focus from bias to oppression, ethics to justice, and transparency to reflexivity. We are encouraged to probe context and histories surrounding systems, instead of simply questioning the inner workings of algorithms. "These concepts all have legacies in intersectional feminist activism, collective organizing, and critical thought, and they are unabashedly explicit in how they work toward justice."[49]

CHALLENGES MOVING FORWARD

INEQUITIES WITHIN THE FIELD
Libraries love to categorize. Consequently, librarianship is notorious for organizing its various services (i.e., technical services, public services, administration, etc.) into distinct silos, often with a specific internal or external orientation. Key functional areas have existed to meet the needs of any given library's work and mission, but consequently resulting in isolation between rigid and defensive walls.[50] The silo mentality finds distinct groups competing against one another towards achieving common goals. Although CoPs can help a library's staff expand general ideas, passions, and skill sets, some libraries may need to first address existing inequalities that have widened the gap between silos. In libraries, many of these inequalities are based on gender.

First and foremost, our proposed CoP model must be mindful of institutional contexts. Many roles in librarianship interact with data in different ways; we supply data (metadata librarians, digital collections librarians, archivists, etc.) and use data to analyze and/or teach (data services librarians, information literacy librarians, etc.). In a similar vein, many data-centric librarians have different teaching responsibilities depending on assigned roles/responsibilities and organizational priorities. As such, the goals and outcomes of teaching-oriented CoP instances must take into consideration existing in-house expertise and a way to practice and integrate actionable items; doing so will ensure that different practitioners can benefit and contribute to the CoPs.

Data and collections librarians who provide instruction find themselves aligning with conflicting academic libraries' roles: data is often tied to innovation and is thereby inherently masculine, whereas teaching constitutes emotional labor that is often considered unskilled and feminine. Information literacy continues to be misunderstood and unrecognized outside of librarianship, yet information is still valued within the neoliberal knowledge economy that commodifies information as part of contemporary

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[49] D'Ignazio and Klein, *Data Feminism*, 60-61.
[50] Meghan Kowalski, "Breaking Down Silo Walls: Successful Collaboration Across Library Departments," *Library and Leadership Management* 31, no. 2 (2017): 1–15.

capitalism.[51] For example, efforts to foster information literacy in classrooms are shortchanged by the need to constantly negotiate opportunities to engage in pedagogies that facilitate the interrogation of information and its systems, rather than solely demoing vendor-curated databases and library catalogs.[52] Feminist critics note that the prevelance of capitalist-inspired entrepreneurialism is the new norm at the academy, allowing for old masculinities to take a foothole in prolonging hegemonic male advantage.[53] Roy Tennant argues that most growth in libraries falls within the areas of digital services (i.e., digital repository managers, digital collections management roles, digital scholarship) and that it seems that this is the space that attracts and houses male librarians.[54]

Although stratification of privilege between different roles is multifaceted, the persistent "librarians-as-service-provider" narrative rings to this day for librarianship collectively, and this identity resonates the most with librarians who operate under "an extension of the domestic sphere" to do "shadow labor."[55] The toll on emotional labor has resulted in burn-out among librarians; in particular, instruction librarians who interact with non-library faculty more than other library colleagues.[56] Whether or not academic librarians hold faculty rankings, they continue to be identified as administrative or support workers and not necessarily scholars or professionals—this is ironic given that knowledge production is central to what librarians do. For example, even when the digital humanities space is claimed by libraries at various institutions, digital projects typically get managed and funded under traditional academic-labor hierarchies where

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[51] Cathy Eisenhower and Dolsy Smith, "The Library as 'Stuck Place': Critical Pedagogy in the Corporate University," in *Critical Library Instruction: Theories and Methods*, ed. Emily Drabinski, Alana Kumbier, and Maria Accardi (Duluth, MN: Library Juice Press, LLC, 2010), 308.

[52] Eisenhower and Smith, "The Library as 'Stuck Place': Critical Pedagogy in the Corporate University," 315-316.

[53] Bernie Grummell, Dympna Devine, and Kathleen Lynch, "The Care-less Manager: Gender, Care and New Managerialism in Higher Education," *Gender and Education* 21, no. 2 (2009): 192, https://doi.org/10.1080/09540250802392273.

[54] Roy Tennant, "Digital Libraries: The Gender Gap," *Library Journal*, August 15, 2006, http://lj.libraryjournal.com/2006/08/ljarchives/digital-libraries-the-gender-gap.

[55] Lisa Sloniowski, "Affective Labor, Resistance, and the Academic Librarian," *Library Trends* 64, no. 4 (2016): 645–66, https://doi.org/10.1353/lib.2016.0013; Roxanne Shirazi, "Reproducing the Academy: Librarians and the Question of Service in the Digital Humanities," July 15, 2014, https://roxanneshirazi.com/2014/07/15/reproducing-the-academy-librarians-and-the-question-of-service-in-the-digital-humanities/.

[56] Mary Ann Affleck, "Burnout among Bibliographic Instruction Librarians," *Library & Information Science Research* 18, no. 2 (1996): 165–83, https://doi.org/10.1016/S0740-8188(96)90018-3; Deborah F. Sheesley, "Burnout and the Academic Teaching Librarian: An Examination of the Problem and Suggested Solutions," *The Journal of Academic Librarianship* 27, no. 6 (2001): 447–51, https://doi.org/10.1016/S0099-1333(01)00264-6.

professors direct the world of librarians, which devalue intellectual contributions and label the labor as either service work or work under the guise of project management.[57]

REDRESSING POWER IMBALANCES
The work of amplifying marginalized voices translates to hard conversations because, at its core, it is all about redressing power imbalances; this is oftentimes in conflict with librarianship's legacy of whiteness. Put in another way, diversity can, itself be interpreted as problematic for majority audiences because it is perceived as burdensome. Intentionally denying diversity and social justice as a core value is the disengagement from systematic and institutional-level racism. Derrick Bell, the forefather of Critical Race Theory (CRT), argues that diversity efforts thrive when there are benefits to be reaped by White actors; as such, diversity can then become a tool used to preserve White racial domination rather than a step towards meaningful change.[58] Although the opportunities to embed critical librarianship in data librarianship exist, there are differences between interrogating power and privilege in efforts towards dismantling structural inequalities versus embedding critical pedagogy opportunistically. Ultimately, for the BIPOC community, the ongoing prevalence of critical librarianship veers towards performative.[59]

Given that CoPs are composed of groups of individuals with a shared understanding of a particular set of concerns, it is crucial that diverse voices have a seat at the table to avoid duplicating recurring problematic demographics in librarianship. Conversations related to structural oppression in libraries can be unwelcoming because the critlib movement "regularly highlights the work of white librarians without recognizing that librarians of color have been doing this work without calling it 'theory.'"[60] Without at least being critical of missing voices, a CoP centered around critical approaches to data and information literacy would subjugate meaningful knowledge and perspective. These issues also apply to *who* the library collections are about. Indigenous sovereignty, community voices and their intersections with the ownership and management of library collections are crucial issues to be addressed. Subjected knowledge "describes the form of knowledge that has been pushed out of the mainstream institutions and the conversations they encourage."[61] For example, Patricia Hill Collins notes how Black women have historically relied on literature, music, daily conversations and daily behavior as reactionary from being shut out of social institutions controlled by white men—this includes institutions of higher education.[62]

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[57] Sloniowski, "Affective Labor, Resistance, and the Academic Librarian."
[58] Sara Ahmed, *On Being Included: Racism and Diversity in Institutional Life* (Durham ; London: Duke University Press, 2012).
[59] Brown et al., "We Here: Speaking Our Truth."
[60] Brown et al., "We Here: Speaking Our Truth," 173.
[61] D'Ignazio and Klein, *Data Feminism*, 163.
[62] Patricia Hill Collins, "Gender, Black Feminism, and Black Political Economy," *The ANNALS of the American Academy of Political and Social Science* 568, no. 1 (2000): 41–53, https://doi.org/10.1177/000271620056800105.

CoPs centered around social justice need to actively recognize how effective integration of diversity, equity, and inclusion is contextual. They must not make the assumption that there is a "one size fits all" approach. In particular, there are different implications for librarians who provide or create data focused on vulnerable communities than there are for librarians who use that data to teach students who may be members of such marginalized communities themselves. Both these kinds of librarians are wrangling with power imbalances and must determine how to effectively amplify marginalized voices that have been hidden or oppressed in collections and data. But the best methods to redress these imbalances might look slightly different. Those that build datasets and collections can proactively interrogate their own workflows and procedures. In the classroom space, we can encourage our students to interrogate systems that are embedded in our profession (i.e., problematic metadata, algorithmic bias, etc.), but how can we invite them to be part of actual change and action? A first step might be to not underestimate the collective power of engaged students.[63]

A successful CoP surrounding diversity, equity, inclusion, and accessibility explores how we teach data and information literacy. This requires recognizing that critical librarianship is not new. Rather, this work rests on decades of progress made by librarians of color before the critlib movement has grown within the last several years. A CoP surrounding instruction opens opportunities to not only critically engage with the work libraries do, but should also turn a critical eye upon itself.[64] For example: How does the profession replicate structures of white supremacy in the cultures of information literacy and digital scholarship silos?

CONCLUSION

Our recommendation is not necessarily novel on paper: We suggest that different librarians with overlapping responsibilities related to teaching, collections, and data work should come together to build a shared understanding of how the information and data landscape is fueled by systemic pressures that harm and marginalize. We also recognize that systemic forces prevent such collaboration to reach its fullest potential: 1) tensions between different librarian roles despite synergetic responsibilities related to teaching (i.e., feminized labor associated with information literacy positions); 2) incentives to embed DEIA perspectives in instructional activities veer towards opportunism and lip service; 3) unequal distribution of resources (data literacy digital humanities, and sometimes collections as data are usually under the purview of better funded digital scholarship programs or are more dependent on grant funding).

A CoP can help librarianships create a shared understanding of how different justice-oriented literacies compare and contrast with one another but it is important to

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[63] Rich Murray, "Metadata for Everyone: Inclusive Description at the Duke University Libraries," *Signal Boost: Tales from Technical Services* (blog), November 23, 2020, https://blogs.library.duke.edu/signalboost/2020/11/23/metadata-for-everyone-inclusive-description-at-the-duke-university-libraries/.

[64] Brown et al., "We Here: Speaking Our Truth."

recognize that the real work happens through action. Lee Anne Bell defines social justice in the following:

> Social justice is both a goal and a process. The goal of social justice is full and equitable participation of people from all social identity groups in a society that is mutually shaped to meet their needs. The process for attaining the goal of social justice should also be democratic and participatory, respectful of human diversity and group differences, and inclusive and affirming of human agency and capacity for working collaboratively with others to create change.[65]

Although it is possible to build a shared understanding of hybrid QuantCrit and critical information literacy goals through CoP meetings and discussions, the social justice process is fully realized in instructional settings—especially when we identify learners as co-creators of knowledge. Since critical approaches to data and information literacy naturally invites librarians to challenge systems that they themselves must navigate around (i.e., the library catalog, personnel, the digital spaces, etc.), an added bonus of justice-oriented CoPs is to foster dialogue on how we can collectively deconstruct existing workplace silos, call out inequities in our practice and collections, and envision a better tomorrow.

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[65] Lee Anne Bell, "Theoretical Foundations for Social Justice Education," in *Teaching for Diversity and Social Justice*, ed. Maurianne Adams, Lee Anne Bell, and Pat Griffin (Routledge/Taylor & Francis Group, 2016), 3.

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