



Science Librarianship and Social Justice: Part Four Capstone Concepts

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Introduction

This is the fourth and final column of this [special series of columns](#) focused on science librarianship and social justice. At each level, we have offered social justice concepts beginning from a foundational level scaffolded up to this current capstone level and partnered each concept with examples based in academic libraries and the sciences.

As a final reminder, the concepts covered within these columns are a representative sample and are not exhaustive of all of the possible definitions, especially those that have definitions or uses outside of social justice or equity-related discourse. We are cognizant that the list is not comprehensive, but a snapshot of concepts within current institutional and societal climates in the United States. We also recognize that some concepts' definitions have evolved beyond their original purpose or definition, and specific understandings/uses may vary per region in the United States. The nuances

have been noted where appropriate to help guide readers. Additionally, our examples are a mix of real and fictitious scenarios, sometimes offering a solution and other times, a narrative of the issue in action.

We have written these four columns with the following goals

- To engage readers in meaningful and intentional conversations around justice, equity, diversity, and inclusion (JEDI) and ask them to reflect on their own practices
- To expose readers to scaffolded social justice concepts as pertinent to serving and teaching people of diverse backgrounds
- To demonstrate the relevance of social justice concepts by using examples that intersect with science librarianship

We have added J (Justice) to EDI to increase the emphasis on Justice work alongside the work of equity, diversity, and inclusion and to acknowledge that social justice work and words are evolving.

As a group of five librarians from different institutions, there is no single positionality statement that could cover all of us. That said, the work behind these columns is driven at least in part because of our identities and lived experiences including non-binary, Latina, Black, white, queer, and autistic librarians. We have come together as a group to bring conversations about justice to the forefront of science librarianship. Our work has necessarily been influenced by the sociopolitical context through which we are living, especially the recent increase in professional and institutional investment in racial equity as a result of prominence and popularity of the Black Lives Matter movement, the cultural and ideological backlash against Critical Race Theory as a representative of these racial equity gains, and the global COVID-19 pandemic.

We also realized that as we dug deeper into our work and understanding, we wanted to engage other scholars in the field for clarity and refining. In this column, we have invited more consultants than the previous column, and you will see their names listed in our acknowledgements. We appreciate their willingness to continue to engage with us all as we tackle some of the challenging concepts, especially as we try to present them as clearly and completely as we can.

It is likely that this work has pushed some of our readers outside of their comfort zones. We encourage our readers to continue to study and reflect on the ways in which expanding your understanding of social justice in science librarianship challenges you both personally and professionally, and we also hope you find or make spaces where you can have productive conversations about these concepts with colleagues and community. But this work cannot only stay at the reflection and discussion level. We must all take steps to improve our actions, remembering that the impact of what we do is more important than our intentions.

Capstone Concepts

Change Theories

Change theories represent models and theories about how and why change happens. They are instrumental in altering organizational systems and structures that recognize the patterns of human behavior that lead to a change or a series of change events. These theories can be used during the initial planning stages of a project to attempt to manage and/or foresee different outcomes as the project moves forward. In this way, change theories help to inform similarly named theories of change, which are specific to a given project and its design, administration, and measurement. Thus, the theory of change is a process statement of how and why a specific change is happening and may rely on a broader change theory as its theoretical foundation ([Reinholz & Andrews, 2020](#)).

Library Example: The Associate Dean of Equity, Diversity, and Inclusion used relational cultural theory as their change theory when they were considering creating affinity groups. This tactic of creating safe space for similarly self-identified folks to learn and discuss anti-racist matters was employed because relational cultural theory acknowledges and aspires to disentangle the structures and systems of oppression that an individual can hold when engaging with other people, and it provides guidance on how to foster mutual empathy and well-being. ([Arellano Douglas, 2020](#)).

Science Example: In order to better understand how new ideas take hold within her discipline, Syen, a physicist, decided to use the Everett Rogers Innovation Diffusion change theory, defined as knowledge → persuasion → decision → implementation → confirmation, as her theoretical foundation. More specifically she wanted to test her theory of change hypothesis that during the persuasion step, ideas communicated through conference presentations are more persuasive, i.e. are more likely to move on to the implementation step than those that are primarily communicated through journal articles ([Rogers, 2003](#)).

Critical Race Theory

Critical Race Theory (CRT) was developed in the 1970s by United States legal scholars who were interested in the ways in which racism was enshrined in the law, particularly as a strategy to roll back the gains of the civil rights movement. CRT builds on previous theoretical frameworks, including critical legal studies and radical feminism, and incorporates more contemporary concepts such as intersectionality. Notable scholars of critical race theory include but are not limited to Derrick Bell (widely considered to be the “father” of the movement), Alan Freeman, Kimberlé Crenshaw, Angela Harris, and Cheryl Harris. Furthermore, scholars in many fields of study have applied CRT to their disciplines. Critical race theory has been purposefully mischaracterized in the past and present for politically motivated reasons as part of a strategy to undermine the influence of racial justice concepts on policy and popular opinion. Anti-critical race theory discourse demonizes and denounces CRT and is rarely based on a sound understanding of the theory itself.

Critical race theorists’ tenets include:

- *Counter-Storytelling or Counter-Narrative.* The vast majority of stories and narratives that exist within any culture center the experiences, beliefs, and biases of that culture's dominant group, including stories about non-dominant groups. In the United States, this means that majoritarian narratives and stories are infected with the racism and white supremacy endemic to the nation. To counteract endemic racism, new and different stories told by members of minoritized [Black, Indigenous, People of Color \(BIPOC\)](#) communities must be integrated into the dominant narratives.
- *Critique of Liberalism.* Individualism and the "bootstrap mentality," ideas that are integral to the United States norms and laws, create the illusion that if a person just tries hard enough they will succeed, which ignores the impacts of racism and its outcomes.
- *Intersectionality.* [see [Level 3 definition and examples](#)]
- *Interest Convergence.* Since racism materially and psychologically benefits large segments of white people, there is little incentive for it to be eradicated unless the interests of white people and BIPOC converge.
- *Permanence of Racism.* Essentially, racism is ordinary, common, and built into the way society normally operates, and not an aberration or an outlier.
- *Whiteness as Property.* The legal regime of chattel slavery of African peoples and the genocide of Indigenous people empowered [whiteness](#) to become a commodity that provided those who possess it rights that were not given to non-dominant groups, such as: the right to use and enjoy, the right of ownership and transfer, and the right to exclude ([Leung & López-McKnight, 2021](#)).

Library Example: As a result of learning about Critical Race Theory as part of their robust racial justice professional development program, librarians at a mid-sized public university were inspired to take meaningful action toward racial equity at their institution. They decided to embark upon the [University Libraries 21-Day Racial Equity Challenge](#) developed at the University of North Carolina at Chapel Hill. The syllabus challenged them to confront institutional racism by taking actions such as: acknowledging that libraries are not, cannot be, and never were neutral, honoring and centering the realities of BIPOC within the institution, creating a culture of accountability, and denaturalizing whiteness as the de facto standard for professionalism in their library.

Science Example: Engineering Education researchers, Dr. Joel Alejandro Mejia, Dr. Renata A. Revelo, and Dr. Alice L. Pawley ([2020](#)), wrote about applying critical race theory in changing the culture of their courses. They based their ideas for institutional change on the tenets of CRT and Eduardo Bonilla-Silva's color-blind racism theory as explicated in his book, *Racism without Racists*. Engineering educators should interrupt [unconscious and conscious bias](#) in interactions with BIPOC students and faculty, realize that many students have multiple issues to deal with outside the classroom, and not depoliticize viewpoints in courses ([Mejia et al., 2020](#)).

Cultural Wealth and Cultural Taxation

Cultural wealth is the vast variety of unique knowledge, skills, talents, experiences, creations, etc., of a marginalized community that can be undervalued, denigrated,

ignored, or stolen/appropriated by the dominant culture. Instead of viewing all [marginalized](#) persons as lacking the advantages inherent in [whiteness](#), the cultural wealth framework recognizes that [BIPOC's lived experiences](#) and cultural/community creations hold inherent value and should not be viewed as a deficit or as commodities.

The following assets allow BIPOC to prevail despite the [dominant culture's](#) persistent oppression:

- Aspiration - dreaming of a different future despite the barriers that exist to prevent this future from coming true.
- Language - the capability to easily [code switch](#) between languages and communication modes provides the ability to communicate more easily and deeply with a wide range of people.
- Family - actual relatives or “adopted” families can provide the history of the community as well as provide ways to survive in the world.
- Social - the networks of friends or acquaintances who can assist in combating negative encounters in the dominant culture.
- Navigation - the methods and skills that allow individuals, with the help of their familial and social networks, to navigate social institutions that are set up to actively or passively exclude BIPOC communities.
- Resistance - learning about and presenting strong persona and affirmations that will allow BIPOC to resist negative messaging and challenge inequality ([Yosso, 2005](#)).

Cultural taxation can occur when the line between celebration and exploitation is crossed, and those with power within the organization abdicate their responsibility for making space for systemic change. For instance, cultural taxation occurs when BIPOC are asked to “serv[e] on an affirmative action committee or task force that culminates in the rehashing of many of the same recommendations that we have seen in the past with little real structural change ever taking place” ([Padilla, 1994, p. 26](#)).

Library Example: An urban university has long been identified as an HSI (Hispanic serving institution); however, not one of their librarians have ever been from this population. In developing the new librarian position that would draw someone from this community, the librarians decided to revise their process to be more inclusive of Latinx lived experiences and cultural wealth. In order to accomplish this goal, the library had to evaluate the composition of their search committees, job description, the marketing strategy of job ads, and the way that they engaged with applicants at every step of the search process from initiating to offering. Furthermore, they were aware that the post-hiring process should incorporate unique, specialized mentoring in order to build community, a sense of belonging, and combat inherent isolation brought on by being a solo member of the Latinx community within a department, and to avoid cultural taxation.

Science Example 1: When a young black mathematician was hired for a tenure-track faculty position at a large predominantly white doctoral degree granting institution, she was quickly offered a number of positions on equity, diversity, and inclusion (EDI) related committees within the university, including the chair role for the Mathematics

EDI council. She was also told that one of the main reasons she was hired was due to her large, culturally diverse following on social media where she communicated mathematics to the public. When she went up for tenure, though, the tenure committee denied her candidacy, citing as one of their reasons that the mathematician did not fulfill the service requirement. The department's tenure policies only considered service to the mathematical community and did not place any value on EDI work. They also referred to her poor research publication record, completely dismissing as not scholarly her continued public scholarship on social media. This was despite the fact that she had more than doubled her following and told the story of mathematics, including her own research, in an understandable and engaging way to the public through the use of multiple modalities from illustrations to memes to viral dance challenges.

Science Example 2: Braun, Gormally, and Clark ([2017](#)) explored scientific research mentorships where the mentee was D/deaf. Their study administered a survey that included an examination of Deaf cultural wealth. The least effective pairing of mentor-mentee involved mentors who viewed their mentees through a deficit lens. These mentors were not aware of the value of American Sign Language (ASL) as language capital and did not facilitate the students' ability to access accommodations (navigational capital). Successful pairings happened when the mentor, regardless of hearing status, had experience working with the Deaf community and strongly encouraged the mentee to participate in the community.

Decolonization

Decolonization is the process of disassembling the structures and systems of colonial power and returning sovereignty, self-determination, land, and power to the people dispossessed through colonialism. When this term is mis-used in a metaphorical sense in a way that does not lead to meaningful decolonial acts, it can help the colonial powers by enabling what Tuck and Yang ([2012](#)) call "settler moves to innocence." 'Settler,' in this usage, refers to North American [settler colonialism](#), which describes an invasive and ongoing presence of settlers and originated with the European invasion. These invaders violently severed Indigenous people from their lifeways, epistemologies, identities, and land. After which, the settlers enforced their Eurocentric way of life, including the forced transatlantic displacement of stolen and enslaved African peoples and their descendants ([Garba & Sorentino, 2020](#)).

Decolonization work encompasses purposeful actions including the rematriation of land, the return of stolen cultural artifacts, the right to autonomous rule, and reparations for Black and Indigenous people, but also extends well past land, material goods, and political power. Additionally, decolonization works to recognize, elevate, and restore the Indigenous lifeways, epistemologies, science, and spiritual beliefs that colonial powers, colonizers, and settlers have oppressed or attempted to destroy. Importantly, it is not up to the colonial powers how this rematriation and revitalization appears or is managed ([Klymiuk, 2021](#)).

Library Example 1: After attending a decolonizing medicine workshop, a health sciences librarian and health sciences professor decided to collaborate in decolonizing a course on the history of medicine. They revised the curriculum to include significantly more

content on Indigenous, native, and aboriginal medicinal knowledge. They also added modules that asked critical questions such as, “What is science?” and “How is scientific knowledge created?” that questioned the preeminence of Western ways of producing science, medicine, and knowledge. The librarian, in particular, collected and provided access to a variety of Indigenous sources in addition to teaching information literacy sessions on how to find these materials and how to evaluate them in the context of culture and authority.

Library Example 2: New Zealand academic librarians, Feekery and Jeffrey ([2019](#)), collaborated with Indigenous (Māori) scholars to develop an information evaluation framework ([Rauru Whakarare Evaluation Framework](#)) that centers Indigenous knowledge and epistemologies in order to guide students through deeper thinking about information and its interrelatedness as well as its various connections to the world or community around it. The authors state, “The rauru whakarare pattern is made up of smaller parts that can connect to make a unique pattern. It signifies interconnectedness, with jagged edges to emphasise that the process is not always smooth; the pattern only makes sense when all parts are considered together” ([p. 5-6](#)). The evaluation criteria incorporate the tribe’s language and knowledge to elevate the value of tribal perspectives. *Orokohanga* (origins) examines where the information comes from. *Whakapapa* (background) acknowledges that there are layers of connected understanding within and around the information source. *Mana* (authority) considers the reputation of the source within its community. *Maramatanga* (content) requires that the information have a positive impact on understanding within a community. *Aronga* (lens) reflects on the purpose and focus of the information source. This framework is now being used in information literacy instruction sessions across the disciplines at Massey University and is also being considered for adoption by the National Library of New Zealand.

Library Example 3: When Cordelia Hooee ([Society of American Archivists, 2021](#)) first started working for the Pueblo of Zuni, the governor and council asked her to digitize a large number of tribal records. In order to accomplish this, she needed a platform that would allow her to implement access privileges that were consistent with her tribal lifeways. Cordelia decided to use [Mukurtu](#), a content management system designed specifically to manage Indigenous cultural heritage. One of the major differences of Mukurtu over traditional CMS systems is a multilayered set of cultural protocols that allow for fine grained control over content in a way that provides access in a culturally relevant and appropriate manner. For example, it allowed Cordelia to limit access of tribal stories to only members of the Zuni pueblo, and then further limit access of some stories that are gender and seasonally restricted.

Science Example: For over 100 years of ever-increasing death and damage from wildfires, the United States has attempted to control fire through policies of fire suppression. These policies not only do not control the burns, they also disconnect many Indigenous tribes from cultural practices of controlled burns that help manage wildfires, encourage local food growth and are intimately tied to many tribes' connection with their land. In 2013, after many years of activism and hard work, members of the Yurok tribe in California were granted permission to do a prescribed burn on their ancestral lands ([Buono, 2020](#)). This small fire led to the creation of the Cultural Fire Management

Council that developed a fire training program that has brought together Indigenous and settler-colonial fire practitioners and hosted a number of controlled burns in the years since it was created. This collaboration then led to the founding of the [Indigenous Peoples Burning Network](#) that includes tribes from California, Nevada, Oregon, Minnesota, and Texas and pueblos in New Mexico.

Epistemic Violence and Epistemic Injustice

Epistemic violence, which comes from a colonial analysis by Gayatri Chakravorty Spivak, highlights how those who are positioned as “Other” by colonial powers have their ability to speak for and about themselves and to make knowledge claims subjugated ([Spivak, 1988](#)). This violence against and through knowledge results in “the marginalization of specific groups through laws and discourse” ([Brichta, 2021, para. 1](#)). Epistemic violence also plays an equal role in the domination and exploitation of others through political, economic, and military violence. This is because it is “the construction of epistemic frameworks that legitimise and enshrine those practices of domination” ([Galván-Álvarez, 2010, p. 12](#)).

Even when an episteme is not being used for violence, it may have injustice inherent in it. Thus, epistemic injustice is the silencing, distrusting, misrepresentation, and subordination of the knowledge and ways of knowing of minoritized, marginalized, and other non-dominant groups. Though it was Miranda Fricker ([2007](#)) who coined this term, the ideas behind it have been understood for over a century. For example, Anna Julia Cooper wrote about the suppression of Black women’s ideas in 1892 and Sojourner Truth spoke about Black women being denied the identity of being knowers due to racism and sexism in 1867 ([May, 2014](#)). Fricker ([2007](#)) identified the two main forms of epistemic injustice as: testimonial injustice and hermeneutical injustice. Testimonial injustice refers to when people or groups are mistrusted due to their non-dominant group identities. Hermeneutical injustice refers to the inability to understand the lived experiences of people in non-dominant groups, by both themselves and members of other groups. This is due to those experiences not having even been conceptualized since those who have experienced them are excluded from taking part in the cultural discourse that creates language and concepts ([Kidd et al., 2017](#)).

While epistemic violence and epistemic injustice are two distinct concepts divided by a very fine line, these two phrases are at times misunderstood and used interchangeably.

Library Example: While updating their collection development policies, a librarian, Charlie, realized their library was not collecting the full range of materials on the subjects they were the selector for, and in fact had excluded the voices of marginalized and minoritized people. Charlie modified their collection statements to include non-traditional scholarly works such as zines, blogs, mixtapes, and comics used to communicate knowledge by non-dominant groups. However, when Charlie turned in these new statements, they were rejected by their library for not meeting the academic rigor requirement for the library’s collections. They were further told that while collecting a few important non-scholarly works would be ok, doing it in a systematic manner would lower the trustworthiness and authority of the library and its collection.

Science Example 1: Rankin, Thomas, and Erete ([2021](#)) presented and wrote about the epistemic violence that Black women encounter throughout their computer science educational experiences in K-12 schools, predominantly white colleges and institutions, and internships. In their study, they interviewed 18 Black women in computer science regarding their educational experiences. The findings offered many examples of epistemic violence against these Black women, including one Black woman's experience of the white male students (her project teammates) dismissing her coding ability by refusing her ideas and help even after their own continued failures. When it became clear they were never going to work together she did all the work herself and came back to them with a completed project. They expressed astonishment that she was able to solve their problem and then claimed their ideas were behind her work. Another Black woman described, "getting stared at for wearing my hair unprocessed or...just being a Black woman. And it wasn't even just the institution where I was interning" ([p. 806](#)). There were also the constant comments she received regarding her very presence in the surrounding community that ranged from shock at her being a member of the lab to people questioning her right to even exist in that community. Ultimately, the authors confirmed that Black women experience persistent, ongoing epistemic violence. They propose intersectional computing in order to "provide CS education with the necessary vocabulary and tools (including theories and methods that have yet to be developed) for examining how power plays out in the field of Computing so that it can be identified, understood, and, ultimately, redistributed to those who have been disenfranchised" ([p. 803](#)).

Science Example 2: While working on a research program aimed at unifying an area of mathematical category theory known as Topos theory, Olivia Caramello, an early career mathematician, published a series of proofs for theorems that had never been publicly proven before. After her work was published however, some senior category theorists began to claim this work was unoriginal and part of the commonly known folk knowledge of category theory. They made these claims even though a leading researcher in the field had argued that one of the theorems was false before Caramello published a proof that it was not. Caramello ([n.d.](#)) wrote about her experience on her website and described the main reason these mathematicians gave her for their criticism was that she was being "arrogant and unrespectful towards the experts of the old generation" ([para. 7](#)). This use of power by established category theorists to impugn Caramello led to her having articles rejected, collaboration proposals turned down, and needing to leave her position at Cambridge University.

Healing Centered and Trauma-Informed Approaches and Practices

A set of principles that inform and guide practitioners to acknowledge the impact of harm and trauma (deficit framing) and the impact of individual and collective healing (asset framing). Being trauma-informed means being aware of the different kinds of trauma that exist, how the trauma can be exacerbated in an institutional setting, and how those effects can be mitigated. When using trauma-informed approaches, a practitioner presumes that histories of trauma will be present in any group of people and shapes their practice in ways that avoid re-traumatizing or tokenizing individuals. Trauma-informed practices have become widespread in response to recognizing many people bear the weight of traumatic lived experiences.

However, trauma-informed practices are primarily focused on individuals who have been harmed without addressing the larger social and cultural issues at play and centers trauma to the exclusion of the possibility of wellbeing. In response to this critique, practitioners have argued for applying a healing centered approach that is culturally informed and focuses on collective wellbeing ([Ginwright, 2020](#)). Being healing centered means being focused not only on the impact of trauma on individual people, but also on fostering community well-being, and creating a culture of care and restoration. When using healing centered approaches, a practitioner operates from a holistic view of healing with cultural and spiritual sensitivity, values shared experiences and a sense of belonging, and places a focus on well-being instead of repressing symptoms of trauma, as well as creating a space where people can visualize a better future.

Library Example: A third generation Hmong-American student from Minnesota with a personal history of racialized trauma went to the reference desk to ask for a translation dictionary to help with their assignment. Answering the question, the library worker said that the library did not have any English to Korean translation dictionaries. Oblivious to the harm done to this student by incorrectly assuming their ethnicity and spoken language(s), the library worker turned their head to continue to work on their computer without completing the reference interview in a way that met the student's information needs. After being made aware of this behavior, the library administration placed the worker on probation and the library's DEIA office created a Healing Centered Practices training that featured an anonymized version of this interaction as an example of what not to do. In the training, they covered ways to practice [cultural humility](#), center collective wellbeing, and avoid [microaggressions](#) and other harm. The training also modeled how the interaction should have gone: the library worker should have asked the student what languages they were interested in, conducted a Google/OCLC search for suitable items, and inquired about how often the student finds the library to be insufficient in their research needs and invited them to share how the library can better meet the needs of all students, including those who are marginalized.

Science Example: During course development, Dr. Austin, a data science professor, was planning to provide examples of visualizations in her lecture for an undergraduate class, such as Florence Nightingale using information from [mortality charts](#) of British troops in the Crimean War to creating [coxcomb graphs](#). Originally, Dr. Austin wanted to also show different graphs that were created for the COVID-19 pandemic as a current relevant topic and ask students to use this as the starting point for the final project: a visualization of the infection rates of COVID-19 in a specific location for over a period of four months. However, during a collaborative syllabus review session with her graduate students, Dr. Austin was informed that this focus on COVID-19 might be traumatizing for many of the students no matter the intent. Using resources from Mays Imad and Karen Costa, Dr. Austin redeveloped the lesson to use data from the 2009 Swine Flu epidemic in the US, as well as developing a content warning to inform students who may have been impacted by an epidemic or pandemic and an alternate assignment if they were unable to engage with the topic ([Costa, n.d.](#); [Imad, 2021](#); [Stachowiak & Imad, 2020](#)).

Liberation

The political and social framework that shifts the power structures towards more equitable and compassionate conditions for all humans, especially those who have been disenfranchised from their rights in current systems. Liberation involves the abolition of current systems and structures to create better and more humane world. Hence, liberation tactics diverge from anti-oppressive tactics in that the latter is about working within existing structures to make them more equitable and just but the existing structure remains, whereas the former requires dismantling those structures and reimagining new ones. Many have argued that liberation is not simply a philosophy or a framework but an active practice in and of itself, such as Paulo Freire (1970) in his book *Pedagogy of the Oppressed*, "Liberation is a praxis: the action and reflection of [people] upon their world in order to transform it" (p. 79).

Liberation and abolition are often envisioned through the arts, poetry, and theology of various communities. For example, [Africanfuturism](#) and Afrofuturism, as literary art forms that synthesize the past and present, imagine a future where descendants of the Black Diaspora are free from the oppressive systems and structures that keep them from reaching their full potential and dreams. Similarly, Latin American Liberation Theology worked to push the Catholic Church toward a more progressive platform for workers and the poor during Vatican II ([Singer, n.d.](#)).

Library Example: In 2014, OlaRonke Akinmowo placed 100 books written by Black women on the steps of a brownstone in Brooklyn, starting The Free Black Women's Library ([Adams, 2019](#)). At first, it was a trading library, but over the past 7 years, the collection has grown to over 1,000 books and Akinmowo is now able to give books away. She welcomes people to return them, but it is not required. The Free Black Women's Library is also much more than just a collection of books for Akinmowo, it is a way to facilitate conversations and build community, "I wanted it to be a Black feminist space – and to me that means anti-racist, anti-sexist, and anti-capitalist" ([para. 15](#)). Relying entirely on donations, all things related to the library are free for all: from the books to the author events to the always available snacks. Everything about The Free Black Women's Library is thought through and intentional, such as how Akinmowo has recently aimed to include more authors from the Black Diaspora so that the library can encompass the global nature of Blackness. Also intentional is the library's focus on Black Women authors, "I wanted to do something that explored our realities from a different standpoint: a place where we're more empowered, and where it's not people talking about us, but it's us talking about ourselves. Where the voice is our voice" ([Weber, 2018, para. 4](#)).

Science Example: While pre-tenure, ecology Professor Annalise Page conducted many research projects in the community surrounding her campus. Each time she attempted to include members of the community as partners in her research, the University refused to allow these community partnerships as they did not see the time and effort the community wanted to spend on reclamation and remediation as aligned with the University's goal for pre-tenure faculty of producing scholarly outputs. Professor Page believed this approach of viewing the community as subjects for scholarly study instead of partners to work alongside to be inequitable and racist, especially given the

predominantly white population of the University and the predominantly BIPOC population of the local community. However, she hoped that once her tenure was secured that she would finally be able to engage in meaningful community partnerships. Then, during the planning for her first post-tenure research project studying the long term effects the many dilapidated mid-century manufacturing plants less than a mile from campus had on soil, the University raised yet other objections to community partnerships. Annalise decided right then and there that she had to leave the academy to liberate her work. She deepened her relationships with the community members and partnered with them to create a series of local projects on ecological topics where the needs and interests of the community were front and center.

Neoliberalism

A political and economic policy model that aims to transfer economic control to the private sector and away from the public sector, prioritizes free market capitalism and corporate freedom as the solution to all social problems, and aims to limit government spending, regulation, and oversight as well as public ownership. The governments of Margaret Thatcher in the United Kingdom and Ronald Reagan in the United States during the 1980s as well as contemporary austerity movements and attempts to dismantle the social safety net are examples of neoliberal ideology in action. Since then, neoliberalism in practice in the United States has led to large scale governmental deregulation of many sectors like banking and the environment, defunding of public education, and the privatization of many areas such as: health care, transportation, the carceral system, and even national defense. Neoliberalism manifests in higher education through the chronic defunding of public colleges and universities through reduced state and federal budget lines as well as an emphasis on developing private and corporate funders, the financial reliance on self-support and entrepreneurial programs, administrators acting as “CEOs,” and treating students as customers and the degree as the product.

Library Example: Year after year, the library materials budget is held flat while subscription prices continue to rise and students clamor for access to more online resources. Faculty demand that the library purchase materials in which they are published, and tight budgets require that purchase decisions be prioritized based on what is assigned in classes. Meanwhile, the university views the library as a money sink that doesn’t produce anything and insists that the library should be run like a business, using money more efficiently and cutting costs despite rising inflation rates and increased subscription costs. These attitudes force the library to present the resources and services they provide primarily in the context of their return on investment. As a result, the purchasing decisions made by the library become tied to the “knowledge economy,” leaving scant opportunity for the library to center the values at the core of our profession, such as supporting democracy, social responsibility, equity, and the public good.

Science Example: In the early 1980s, researchers at Harvard University announced the invention of the OncoMouse, the first ever transgenic mouse which was designed to have a gene that made it more susceptible to develop cancer. These groundbreaking mice had the chance to dramatically accelerate cancer research, until 1988 when

Harvard received the first ever patent on a mammal. There were two big changes that led to this happening. First was a 1987 deregulatory change in US Patent Office policy that allowed patenting higher life forms. Second was the passage of the Bayh-Dole Act that changed the rules for federally funded research so that universities were uniformly permitted to retain patent and commercialization rights for research products that were funded with federal dollars, instead of the previous standard where many patents were held by the federal government for the public good unless a waiver was granted. This patent may not have been a large issue if not for two things: one, the patent was much broader than just mice modified with the specific OncoMouse transgenic method, instead it covered all mice modified transgenically for cancer research, and two, Harvard had received private money to further fund the OncoMouse work from the DuPont corporation, who in exchange for their money received the sole right for commercialization of the research. This meant that labs that had been raising OncoMice now had to pay \$50 per mouse to DuPont and that any other lab that had or were developing their own transgenic mice for cancer research were targets of DuPont's legal team. Many scientists did not stop raising OncoMice or developing their own transgenic mice, even though this did mean they were in violation of US patent law and could be liable for hefty fines. This fight started to calm down in 1998 when the U.S. National Institute of Health managed to negotiate an agreement with DuPont such that researchers with federal funding could use OncoMice. While Harvard's patent then expired in 2005, by which time new technology had bypassed transgenic mice, the amount of research lost by the lack of ability to experiment freely with transgenic mice without risk of legal action for at least a decade cannot be calculated ([Pedrick & Drago, n.d.](#)).

Social Constructs

A social construct is a cultural or group concept that is created, established, and accepted as true without requiring a grounding in fact or empirical observations. Social constructs persist only through overwhelming mutual agreement by members of the society in which they exist. Examples include race, gender, money, national borders, and language. As beliefs within a society change, so do its social constructs, such as the evolution of the understanding of gender in the United States over the last few decades from a binary construction to a spectrum that includes transgender, fluid, non-conforming, and agender people.

Furthermore, social constructs as collective assumptions are usually unspoken and viewed as "common sense." Their development is theorized in the social sciences through social constructionism. Social constructionism disputes the idea that concepts such as gender, race, and disability are biologically determined, instead positing that cultures develop these categories in order to make sense of the world. It also asserts that social categories are inherently political in nature, rather than objective observations of intrinsic truth.

Library Example: Library classification systems, such as the Dewey Decimal System and the Library of Congress Classification System, sort titles into categories based on the Western, Christian value system of the 1800s. They skew heavily toward European literature, for instance, providing barely any space for the literatures of Africa or South America. They rely on the social constructs of race and gender, for example, as they

were understood in the United States at the time. The priorities held within these classification systems can cause cognitive dissonance in contemporary users as our understanding of those constructs have changed.

Science Example: In most science textbooks up to undergraduate level in the United States, it is taken for granted that the path to scientific truth is via what is known as “The Scientific Method.” This ignores and attempts to invalidate the many different ways in which science is conducted by many non-European cultures, not to mention how science was done in the millennia before the scientific method was formalized in Europe in the 1800s.

Social Justice Pedagogies

Educators have developed many pedagogical approaches that incorporate a [social justice](#) lens or ethos, through the use of student-centered approaches such as inclusive pedagogy, culturally-relevant pedagogy, trauma-informed pedagogy, and asset-based pedagogy and the use of critical theory such as [critical pedagogy](#), queer pedagogy, and feminist pedagogy. These pedagogies are meant to acknowledge and/or resist the oppressive nature of traditional educational systems and provide learners with the tools to critically examine and contextualize their learning. Most of these pedagogies also emphasize the learner’s agency, thoughtfulness, and ability to contextualize information in time and place, using methods such as active learning or syllabus co-construction, and insist on student-centered and, in some cases, student-led curricula. Educators must be prepared to encounter student resistance to new ways of teaching and learning as well as widespread push-back against perceived threats to the educational status quo from those with a vested interest in maintaining it, such as administrators, alumni, parents, other instructors, etc.

Library Example: Librarians at a small private university in the Pacific Northwest were developing curricula to introduce students to primary sources about the history of their university. In order to historically contextualize these sources and interrupt the potentially unquestioned transmission of the white supremacist, misogynist, and homophobic ideologies of the time, librarians collaborated with their archivist to outline lessons that situated archival documents about the university’s founding within the larger sociopolitical history of the time. Students were invited to co-create the specific outcomes of the lessons. They were also encouraged to investigate local history as well as any actions the university has taken since then. Students created zines highlighting the largely invisibilized labor and creative contributions of Indigenous and Asian and Pacific Islander people to the success of the university.

Science Example: A group of young graduate assistants (GAs) want to incorporate feminist and social justice pedagogical practices in their introductory chemistry class based on the work of Lasker and Simcox ([2020](#)). The GAs empower everyone to participate fully, especially women students and students who are historically [untapped](#) in their field. They speak about the obstacles that women students can encounter in their future careers and encourage them to build a support system now by joining groups on campus. The GAs also teach the students to think critically and socially by asking them to bring in an article about [environmental justice](#) and write a

reflection on how it applies to the day's class experiment, considering the ecological and human effects of manufacturing.

Universal Design

When a service, a space (physical or virtual), an educational experience, a tool, etc. is designed to be [accessible](#) to all from the start and thus limiting the need for future adaptation. The process of universal design aims to be preemptively inclusive rather than providing reactive, minimally responsive accommodations and to decenter "normal" in the design process. Universal design goes beyond simply considering physical disabilities, it also incorporates cultural diversity, neurodiversity, learning styles, and many other things.

Library Example: A university library redesigns their website to be accessible to as many people as possible. To do this, they follow guidelines for website accessibility, such as the [W3C](#) and ADA Website Accessibility Standards, and they address any additional access needs specifically mentioned in responses to a survey they sent to their community about the website redesign. They also incorporated the universal design principle of flexibility, through extensibility and manipulability by users, into their new website so users who have access needs that the library has not anticipated can still use the site.

Science Example: Chemistry professors, Daniel K. Miller and Patricia L. Lang ([2016](#)), at Ball State University in Indiana wrote about how they used universal design principles, specifically those related to Universal Design for Learning (UDL), to reduce stress for science students and increase their opportunities to learn and be successful in chemistry classes. The professors revised their course by adapting their laboratory curriculum to incorporate open-mindedness, supportive communication, and the results of their curriculum UDL analysis with *all* students in mind. The latter of these means considering accessibility to laboratory space and tools, a variety of delivery methods of learning content, and multiple assessment pathways.

White Supremacy

A system based in the ideology of [whiteness](#) and the belief that white people are superior to all other ethnicities/races of people, especially Black and Indigenous people. This system defaults to, privileges, weaponizes, and perpetuates "whiteness" and its ways of being as the standard by which all others are measured and compared. Through the use of power, religion, cultural media, finance, and institutions such as the state (colonial and imperial), white supremacy has been used by white people, primarily of European extraction, to exploit, oppress, and dominate the continents and nations of all people they do not classify as "belonging to the white race." The system of white supremacy continuously functions in all aspects of the societies it infects, whether or not white people are present. Likewise, a conscious rejection of the white supremacist ideology on the part of individuals does not mean one can exist outside of, or without complicity in, its effects, and therefore, individuals themselves cannot be neutral.

The lack of reckoning with the white supremacy inherent in the founding history of the United States, explicitly slavery, colonial Indigenous genocide, and participation in global ethnic cleansing movements and antisemitism, has reified white supremacy in the country's culture. This white supremacy culture is often invisibilized as it operates by making "normal" the ways in which people from white cultures behave, know, and think. This means that BIPOC cultural traditions, behaviors, and ways of knowing are perceived as "other" unless, or until, white people [appropriate](#) them at which point they become mainstream and, therefore, associated with whiteness. Tema Okun and Kenneth Jones ([dRworks, 2021](#)) identified 14 characteristics of white supremacy culture, such as worship of the written word, individualism, and the binary.

Library Example 1: The [neutrality](#) of the library space is a fantasy, according to Latina librarian author Michele R. Santamaria ([2020](#)). In her article, she examines library awe, library nostalgia, and library trespass as "affective economies" that keep white supremacy embedded within library culture, clear and evident. The author suggests that those ways of being are in direct contradiction with the people that use the library, specifically the notion of who belongs within the library and who does not. For example, Santamaria ([2020](#)) mentions library lobbies that prominently feature their donors and namesakes in ways that make "white bodies normative" ([p. 434](#)). She then goes on to question the fantasy of the library worthy of awe: "towards books, toward silence, and toward the library space itself" ([p. 437](#)), which then leads to the policing of spaces, silence, and other things deemed "inappropriate" for libraries, e.g. "noisy" immigrants or "aggressive" Black librarians ([p. 438, 443](#)).

Library Example 2: April Hathcock, a Black woman librarian, ran to become a member of the American Library Association (ALA) Council because she, and a number of other BIPOC library workers, were escorted by a group of white women out of a council meeting they said was closed even though it was listed on the ALA annual schedule as open. After six years and two terms on the council, she decided not only to not run for a third term but to also leave ALA. Among the reasons she listed for leaving are: the priority given to those who are patient and quiet instead of those who fight for the rights of those oppressed; the exploitation of underpaid staff while using exorbitant dues and conference registrations to maintain relationships with vendors and governments; a code of conduct that focuses on tone policing those who speak out against ALA instead of addressing the [aggressions](#) that happen in ALA spaces; ALA claiming a commitment to EDI values without holding itself and its actions in any way accountable to those values; and, the use of EDI working groups and task forces as a cover for a lack of any real interest in organizational change. Hathcock ([2021](#)) states she is, "more convinced than ever that ALA has always been and will always be centered on promoting the 'neutrality' of white supremacy and capitalism" ([para. 5](#)).

Science Example 1: Authors ([Alang et al., 2021](#)) of "White supremacy and the core functions of public health" in the *American Journal of Public Health*, discuss how the lack of acknowledgement of white supremacy in public health has perpetuated both [systemic](#) and systematic racism in the care of black patients and the development of practitioners. In the recently revised Essential Public Health Services (EPHS) framework, racism is an oppression that should be addressed, which in turn means that

equitable policies, assessments, and assurances need to be addressed also to dismantle white supremacy and the centering of whiteness in health systems.

Science Example 2: A study into over one million scientific dissertations written in the United States from 1977-2015 showed a higher rate of innovation and production of novel results by Black, Indigenous, and [Latine](#) PhD students. The study also found that this more highly innovative and novel work was discounted when it came to academic position hiring and careers. In particular, these systemic biases mean Black, Indigenous, and Latine PhD students must produce much more innovative research than white scientists to have equivalent scientific careers ([Hofstra et al., 2020](#)).

Authors' Reflections on the Work

Gr Keer

Resisting hegemonic injustice is at the core of my personal and professional ethics, so when I was invited to join this project to develop a glossary of social justice concepts for STEM librarians, I was excited about the opportunity for praxis. I was a little nervous about being the only non-STEM librarian in the group but it turned out to be a really positive experience. I think at first I was supposed to be a sort of consultant, sharing my understanding of the concepts we covered from a social sciences/humanities/activism perspective and I did do some of that. But I also ended up becoming really engaged in our quest to figure out how we could support STEM librarians in making clear and intentional connections between science librarianship and the sociopolitical context of that work.

Ultimately, I learned a lot from my co-authors about how STEM librarians think, what they value, and how to reach past jargon into the meat of important ideas. I really value having had the opportunity to work with my co-authors to dig in and start building such an important bridge. It helped that each of them is fun to talk to, smart, accomplished, and persistent. Our weekly meetings helped to ground me during the first pandemic lockdowns, and while sometimes it felt like this project would never end, I'm very grateful for the time we've spent learning and writing together.

Nastasha Johnson

Never before have I felt so seen on a project as when I meet weekly with this team. I did not realize that that was what I was missing in my own sense of belonging in this profession, a safe and brave space to disentangle my own understanding and awareness of the library world and the freedom to build something new. That is not to say that we have not had our own unique set of challenges and tense moments, but we stuck together. We were just as committed to the written work as we were to being present, listening and leaning into understanding so that we can translate for our readers. That is rare and perhaps may never happen again.

What is so ironic is that we did not really know each other until we began this project. We just showed up and did the work of leaving our mark. Dare I even say that we are even fond of each other after this project. Undoubtedly, we have all grown and

stretched more than we could have ever guessed, especially before and during a pandemic. But I am proud of the work and the friends that I have gained, full of inside jokes, quirks, and giggles. We probably have a boatload of organizational secrets, too. But the secrets are all safely held in the team vaults because we had to do some unpacking, understandably. I hope that readers are able to feel the transparency and care in this work, because we had to work on ourselves along the way to create it.

Samuel Hansen

When I think back on the time I have spent working with Jeffra, Nastasha, Gr, and Isabel, I of course think of all I have learned about social justice through their lived experiences, knowledge, and wisdom, but I spend much more time thinking about how much they have helped transform me as a librarian and a person. As we say in our introductions, we are a group of librarians with a wide range of identities and positionalities. As you can imagine we came into this work with very different perspectives, expectations, and styles of work. This was not easy, we had to work together to develop methods of collaboration that could accommodate all of our work styles and expectations while allowing for all our perspectives to be heard and incorporated into the work. And that group work was easy compared to my internal work. I had to learn to have uncomfortable conversations and realize when my own ideas were limited, or just plain wrong. I had to leave my comfort zone, struggle to be open to things that did not feel right to me as an individual, and to cultivate my ability to communicate in a way which could help me bring others to understand my way of knowing. The work of these past four columns, with the help and patience of my collaborators, has made me a more open and humble collaborator, a more capable and supportive librarian, and just a flat out better person. Not to mention how important it was to have weekly meetings with my wonderful collaborators, who have become dear friends. During our pandemic years the meetings were a steady point on the horizon to focus on when everything around me felt out of focus and out of control. While I am in no way saying that everyone should go find a group of people with positionalities that are not their own and define their own social justice concepts for science librarians (that work has already been done, after all, though we would love for others to continue this work), I am saying that anyone who has the opportunity to do work with a group of colleagues that is just on the edge of uncomfortable should say yes because that is where I now know the truly transformative lives.

Isabel Altamirano

This writing group started working on the concepts in early 2019, when a Zoom meeting was still a novelty. During the COVID shutdown in the Spring of 2020, it was the only Zoom meeting that I looked forward to attending. In addition, we helped each other to continue this work despite difficulties with work and personal lives.

I have learned a lot during this wonderful collaboration and enjoyed the viewpoints of interesting lived experiences. I also feel that I have contributed in expressing the viewpoints of a mostly culturally ignored part of the United States: The Deep South. I was able to demonstrate that the South is able to learn from lessons of the past and improve the present.

Environmental justice is one of the terms that really struck a chord with me. I grew up near one of the edges of the Cancer Alley. I've known about the work that local activists have been trying to achieve for decades. And I also keep learning about this topic. I recently discovered that Dr. Robert Bullard is the "Father of Environmental Justice." I wish that I had known about his work before we published the environmental justice definition. I would have talked about his groundbreaking book, *Dumping in Dixie* and his work for BIPOC people affected by pollution.

I am very honored to have worked with such wise librarians, and I hope that their future careers will continue to flourish.

Jeffra Bussmann

At the STELLA (Science, Technology, and Engineering Library Leaders in Action) unconference meeting in 2018, social justice and EDI subjects were among the most popular of the sessions that we collectively created. While participating in these sessions, it was clear that many of us were either novices to the concepts themselves or to how they were, are, or could be applied in the sciences and by extension, science librarianship. I observed there was a gap, a space that could be filled in to help us grow and understand these concepts better, especially in our science librarianship context. I began thinking that we needed a glossary of sorts to at least ground us in some basic knowledge and understanding, ideally designed specifically with science librarians in mind. It was indeed a very daunting project and yet, the need was so obvious for myself and others that it was a burden, compulsion, that I had to do something about it. A year passed before I could get the project off the ground but once I found the willing collaborators, the work began.

It has not been easy work, but I believe it has been joyful work. What has challenged me the most about this work was/is my ignorance (willful or not) and my complicity (willful or not). For many concepts, I had only a surface (or worse yet, misguided) knowledge or a peripheral experience of them. Additionally, for many concepts, I had to own up to the fact that I have been a perpetrator in social injustice. As a white and cis-gender woman, I did a lot of reading and a lot of listening. I often came into this work with a huge dosage of humility and flexibility and eager ears to really listen to my colleagues about their experiences, their understandings and knowledge related to these concepts. There were times of serious, upsetting, but necessary personal reflection. I wanted and I want to learn and to grow, to correct my view and my actions that come from my whiteness and place of privilege. They need a lot of radical changing and revising.

The joy came from the collaborative development of the definitions and examples, which was an invaluable (critical) process to fleshing out the concepts for the articles and for me, personally. It is my great hope that you, dear reader, will take this work further: create projects, policies, research, case studies, presentations, and so much more that will bring these concepts to life in your libraries and the greater science world.

A Call to Action

The five of us began our journey of writing these definitions and examples with the intention of helping science librarians develop a better understanding of a wide range of social justice concepts. If there is anything we learned during this time though, it is that impact matters so much more than intent. With that in mind, rather than a conclusion, we want to end our final column with a call to action, a call for all of you to go beyond intent and have a positive impact by using your new understanding of social justice for the good of all of those you interact with, especially those who have less privilege than you. We know this sounds hard, but we promise that you can start small. Select a single concept and gather together a group of fellow travelers in your library to discuss how it is impacting your communities and how you can change that impact. Start to put up signs for the bathrooms that are accessible, gender neutral, or contain menstrual products. Look over your next newsletter and make it inclusive of all the different non-dominant groups who are a part of your library's vibrant community. You can even begin, as a few people have told us they have done, by sharing the column in your library's article club so that everyone has a common starting point in order to do the work. All of that said, we think it is important to say that just because we wrote these and you read them that does not mean our path to social justice knowledge is complete. There is always more to learn, always more nuances to understand, and always more hegemonic social constructions to unlearn. No matter our intentions, the work of justice is never done, but we can all work to have impact today, tomorrow, and forever.

Reflection Questions

1. Are any of our definitions different from your understanding of the concepts, and if so, how?
2. Considering your own background, identity, and experiences, what concepts did you find the most challenging and why?
3. How has your self-concept as a person and as a librarian changed while internalizing the concepts from our four columns?
4. What concrete action will you take toward incorporating these concepts into your work/personal life?

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