

Critical is not political: the need to (re)politicize data literacy

Fieke Jansen

Data Justice Lab, Cardiff University

Email: jansenf@cardiff.ac.uk

Abstract

Data literacy is slowly becoming a more prominent feature of contemporary societies, advanced on the premise of empowerment it aims to increase the learners ability to grapple with the negative externalities of datafication. Literacy as such is seen as a social emancipatory process that should enable people to make informed choices about their data environment and increase their ability to actively participate in the discussion that determines the socio-technical systems that will impact their lives. If we accept the notion that data literacy is a key social response to datafication we need to reflect on the politics embedded within the practice, as such I will argue that the mere act of centring data in a literacy approach is political and value ridden. This demands critical reflection on the conceptualization of the learner, the perceived competencies needed to actively participate in a data society and the seemingly 'neutrality' of the practice in itself, which I refer to as the (re)politicization of data literacy. To conclude, this act requires those active in the field to reflect on their own practices and learn from other disciplines who have a more bottom-up approach to dismantling power structures, understanding inequality and promoting political participation.

Keywords: big data, data literacy, surveillance, privacy, discrimination, justice, critical social studies, critical data studies

Introduction

The introduction of the internet, mobile communication and cloud infrastructures have allowed for unprecedented extraction and processing of data about people and objects. While datafication is hailed by some as revolutionary (Brynjolfsson & McAfee, 2014), a growing number of voices raise concerns about its implications for people's position in society and social justice concerns more broadly. Critics argue it has given rise to an economy which is no longer organized around labour and capital, but increasingly around data extraction, profiling, prediction, and modification of people's behaviour for economic gain (Cohen, 2019; Mayer-Schönberger & Cukier, 2013). Often referred to as information or surveillance capitalism (Cohen, 2019; Zuboff, 2015), this new economic paradigm is characterized by a centralization of knowledge, power and wealth in the hands of a new capitalist class (Hardy, 2014; Sadowski, 2019), whose continuous ambitions towards more robust data extraction processes are deteriorating the ability of individuals to define, understand and control their data environment (Brunton & Nissenbaum, 2015; Schneier, 2015). Simultaneously, data has given rise to new forms of algorithmic governance that aim to detect, pre-empt and manage social problems (Amoore, 2020; Dencik et al., 2019; Katzenbach & Ulbricht, 2019). Here, the state's enthusiasm to engage with data-driven practices works to intensify surveillance systems that disproportionately impact those individuals and communities most reliant on public services; in effect further institutionalizing "long-standing binaries of 'deserving' and 'undeserving' citizens" (Redden, 2018). In light of these developments, data literacy emerged as a field of enquiry.

The advent of information capitalism has been the subject of much controversy, pointing to the power dynamics at play and the role data plays in shaping life chances of individuals and communities. To date, the main legal, technical and social responses to datafication relate to notions of individual privacy and data protection. For example, one can think of Europe's General Data Protection Regulation, privacy protecting technologies and educational campaigns. This article builds on Pangrazio and Sefton-Green's (2020) argument that the traditional responses to deal with externalities of datafication, namely regulatory, tactical and educational responses, rely on data literacy as "an important part of a strategy in democratic societies to come to terms with living in a digital world" (Pangrazio & Sefton-Green, 2020, p. 209). I argue that, if we accept the notion that data literacy is associated to individual and collective agency we must critically engage with what it means to centre data in a literacy approach. As such, this article will first explore different theoretical approaches to data literacy, after which I will reflect on its actual practice to argue that to further embrace the empowerment pedagogy embedded within data literacy concepts we need to offer the learner more thoughtful and actionable pathways forward. This requires a more holistic understanding of the who of the learners, the what of data literacy and the how of the practice; i.e. the competencies needed in a data society and a critical reflection on the 'neutrality' of the practice itself to ensure that it will not entrench and perpetuate stereotypes and inequality. To conclude, that the practice of

data literacy should be (re)politicized and more profoundly engagement with decades of work on issues of power, inequality, discrimination and civic participation.

Data literacy a response to the emergent datafication of society

Alongside the emergence of a critical discourse on the societal implications of datafication there has been a renewed sense of urgency for individuals to obtain the knowledge and skills needed to navigate the complexities of contemporary societies. Here, the field of data literacy offers an entry point into building these competencies. To begin, I want to reflect on the term literacy. Conceptualized as a pedagogical approach that allows for continual processes of learning, literacy is considered both central to the operation and critique of capitalism (Pangrazio & Sefton-Green, 2020). Economically, literacy is associated with the up-skilling of the labour force, as such, in the context of datafication an emphasis is placed on learning general computer- and data-skills needed to become an economically productive member of society. Socially, literacy is seen as the emancipatory process of understanding and critically engaging with one's context (Golden, 2017; Špiranec et al., 2019; Tygel & Kirsch, 2016). In other words, literacy is more than learning how to read and write, it is about economic resilience and agency, about a person's ability to economically and socially participate in society. Inspired by Paulo Freire's (1970; 2018) pedagogy of the oppressed, which connects education to empowerment, most data literacy approaches tend to focus on the social, aiming to develop competencies needed to control and act within datafied societies (Markham, 2020; Pangrazio & Sefton-Green, 2020; Špiranec et al., 2019). In this emerging field, Golden (2017) draws our attention to the idea that data literacy is not a singular concept but encompasses a range of literacy practices that build on top of broader media and digital literacy traditions, suggesting that we should speak about data literacies in the plural. Therefore, I will start to outline different data literacy concepts, engaging with their emancipatory angle and audiences before moving on to explore the tensions that emerge from explicitly centring data in literacy efforts.

At its inception, data literacy focusses on competencies for economic resilience, for instance learning how to process, visualize and interpret data. Recently, more critical data literacy approaches have emerged that connect literacy to the emancipatory ideology of learning, building competencies that allow individuals to respond to the multiplicity of ways they are affected by data. This shift in data literacy from an economy to an empowerment approach is seen in Crusoe's (2016) argument to expand the concept of data literacy beyond a focus on proficiency in the use of data to include knowledge needed to make informed decisions about privacy and security. He argues that a person is primarily a user of digital services, a data subject whose data has become a market commodity, a governance subject who is subjected to data-driven decision-making, and only in a small number of cases a data processor. To account for these different power relationships, data

literacy needs to be redefined to encompass “knowledge of what data are, how they are collected, analyzed, visualized and shared, and [...] the understanding of how data are applied for benefit or detriment, within the cultural context of security and privacy” (Crusoe, 2016, p. 38). His empowerment angle associates literacy with increased ability to control one’s privacy and security in the data environment.

D’Ignazio’s (2017) approach to data literacy differs from this, where she sees empowerment as people building competencies that will allow them to co-create the data infrastructures that shape their lives. Her concept of creative data literacy starts from the premise that education should offer “pathways for non-technical learners to ‘speak data’” (D’Ignazio, 2017, p. 15). Engaging learners with didactic resources that do not come from the technical field should allow them to develop skills, knowledge and vocabularies needed to engage in conversations about the technology. Like others in the field of data literacy, she explicitly builds on Paulo Freire’s (1970) popular education model that connects education to empowerment, arguing that it is not enough to focus on the acquisition of specific skills, but that education must increase people’s ability to understand and engage with their political, social and economic surroundings. The concept of creative digital literacy translates this idea into an approach that privileges skills and vocabulary needed for a non-technical learner to ‘have a seat at the table’ and become part of the technical discussion that shape their lives without having to up-skill their technical capabilities.

Another distinct entry point into data literacy for empowerment is that of data infrastructure literacy (Gray et al., 2018), here the authors argue that the conceptualization of data literacy should be expanded to account for the infrastructures that enable the datafication of society. Data infrastructure literacy as such will allow the learner “to account for, intervene around and participate in the wider socio-technical infrastructures through which data is created, stored and analysed” (Gray et al., 2018, p. 8). If one draws a comparison between this concept of infrastructure literacy and Rafi Santo’s (2011) concept of hacker literacies, the notion of malleability emerges. A proposition is made that with increased knowledge of the intricacies of infrastructural arrangement, a critical mindset, and the belief that one can exert agency, the datafied society can become malleable. Gray, Gerlitz and Bounegru (2018) conclude their paper by encouraging a critical engagement with data infrastructure choices as mechanisms that can enable or restrain participation and deliberation. They refer to the trend whereby public authorities and education institutions are outsourcing their data infrastructures to commercial entities which limits the learners’ choices when it comes to managing their data environment and entrenches “a dependency on an economic model that perpetuates the circulation of data accumulation” (Dencik, 2021). Thus foregrounding a clear tension in data literacy practices, where promoting the concept of informed decision-making conflicts with educational solutions that continuously narrow infrastructure space towards a specific economic model.

A final entry point into data literacy as empowerment is that of personal data literacies

(Pangrazio & Selwyn, 2019) and critical data literacy (Sander, 2020a, 2020b). Like Crusoe (2016), these theories build on the idea that the increased reliance on data for economic, political and social gains requires individuals to have an awareness and understanding of the risks and benefits of it. These two concepts depart from Crusoe's (2016) conceptualization of data literacy when it comes to their understanding of the risks of datafication, here learning how to critically engage with personal data should allow the learner to move beyond questions of technology, privacy and security and engage with its broader social implications. Or as Sander (2020b) argues, critical data literacy is directed to "enable them to question and scrutinise the socio-technical systems of big data practices, to weigh the evidence, to build informed opinions on current debates around data analytics as well as to allow them to make informed decisions on personal choices such as which data to share or which services to use" (Sander, 2020b, p. 5). As such, agency is seen as more than individual actions in relation to their data environment as argues by Crusoe (2016), D'Ignazio (2017) and Gray, Gerlitz and Bounegru (2018), it also involves engaging in the political realm through public deliberation and debate.

In response to the datafication of society we see ongoing efforts to redefine data literacy to account for the myriad ways it is impacting people's lives. In this emerging field, I argue, it is time to reflect on the question of literacy, asking toward what end these approaches aim to build critically informed users or critically informed citizens? When we centre data in educational approaches, whose literacy practices are then valued and made visible? This article will build on the discussions around redefining data literacy as empowerment through reflecting on a decade of work as an NGO practitioner in which I, along with other colleagues, have debated and created a range of guides, materials and training approaches that have been conceptualized by others as critical data literacy tools (Sander, 2020a) or folk pedagogies of data (Pangrazio & Sefton-Green, 2020). These products include, amongst other things, the Digital First Aid Kit, Me and My Shadow, the Data Detox Kit, Totem, and the Low Tech Canvas Against High Tech Surveillance. For this reflection I draw on my work as a practitioner, conversations with critical race scholars and political activists, and localization workshops aimed at making some of these resources better suited to the needs of a more general audience. From this perspective, I will engage with data literacy theory to advance the argument that in order to take into account the externalities that emerge from centring data in literacy efforts we need to (re)politicize the practice. On the one hand, by advancing the idea of politicizing the learner, who, next to the knowledge of the risks and opportunities associated to data, will need to gain competencies to be able to influence political processes and challenge existing power structures. On the other hand, I argue that the practice of data literacy in itself needs to be politicized, by critically reflecting on its blind spots related to structural inequality and power.

The absence of political competencies in data literacy

The categorization of data literacy tools points to a wide range of resources created both within and outside of educational institutions (Pangrazio & Sefton-Green, 2020; Sander, 2020a). My reflection in this article relates specifically to those resources that have been created within the third sector, and are aimed at increasing literacy of human rights defenders, civil society organizations, journalists and activists on issues related to surveillance, digital security and data profiling. From the outset, data literacy resources in the third sector primarily focused on teaching people new skills in relation to the security of their computer and email communication. For example, how to use alternative operating systems, specific encryption tools and password managers. Since then, a lot has changed, we have witnessed an increase in corporate and state surveillance practices, growing diversity of communication tools and the rise of monopolistic American technology platforms. Accordingly, the third sector is confronted with a myriad of new risks and challenges which requires those working on data literacy resources to expand their approach beyond tools and include strategies and tactics that strengthens the target audience's ability to make informed decisions about their technology, protect their identity and networks, and demand certain changes from politicians and technology providers. Below, I will first explore the rationale for centring data at the heart of these literacy resources, arguing that when these are used for a more general audience, they need to be adapted to include non-data competencies.

Throughout the years, a number of principles and best practices have informed how the civil society training community approaches data literacy, specifically when engaging with questions around data, surveillance, digital security and profiling. First and foremost, most interventions start from a do-no-harm approach (Higson et al., 2016, p. 152), where the community believes that all interventions have consequences, both positive and negative. As such, data literacy interventions should be aimed at increasing the positive impact while reducing the negative. It is an explicit choice not to scare people into action. Experience has shown that stress and fear are not conducive for learning, this is especially pertinent when working with actors who operate in volatile and hostile political environments, as scare tactics can reinforce existing stress and trauma and can lead to a clear loss of trust in the educator. The second important principle is that these resources have been created for adult learning purposes (Level Up, 2016). Building on the assumption that adults learn differently than children, these resources are designed to be problem-oriented, experiential, actionable and relevant to the learners' context; for example, engaging with ways to protect the identity of sources and activist networks, and threats that emerge from the learners specific (geo)political context. The learning objectives as such relate to empowering the learner through building knowledge, skills and attitudes around issues of data, surveillance, digital security, and profiling. An integral part of this learning process

relates to (re)politicizing abstract issues into the social, political and economic context of datafication. The third consideration is about the content, focusing on its tone and design. Here, providing independent, accessible and practical content, in a neutral and non-patronizing tone, is considered a best practice. Often this is reflected in the design choices that shy away from ‘the matrix’ like images, locks or other popular ‘tech’ images, and offer more playful, colourful, friendly and informal visuals.

Pangrazio and Sefton-Green (2020, pp. 216–217) refer to the above mentioned data literacy resources as personal and folk pedagogies of data; approaches that aim to offer individuals control in their everyday digital practices and raise awareness on the externalities of the data economy. Considering the ever increasing asymmetry in knowledge and power between economic and government surveillers and the individual (Andrejevic, 2014), these authors raise a crucial point of whether or not these data literacy approaches can do more than encourage reflection on datafication. Bringing this paper back to the question of literacy to what end? To more clearly articulate the gaps in current data literacy concepts, this article draws on Viljoen’s (2020a, 2020b) critique on contemporary data governance frameworks. She argues that ascribing rights and controls to the individual will never be a comprehensive response to the complexity of datafication, as this requires an institutional response to the population-level interests at stake in data production (Viljoen, 2020b). In her work, she argues that scholars and legislators are too preoccupied with the vertical relationship between the state and market actors who collect and process data from the individual. This neglects the horizontal relationship of data collection in which individual rights become less relevant now that technology companies are increasingly interested in data extraction to derive “population-level insight from data subject for population-level applications” (Viljoen, 2020b, p. 1). This horizontal relationship, where people are increasingly exposed to decisions based on population-level insight, impacts even those who have a critical relationship with data. Here, we need to recognize that literacy approaches that primarily engage with the vertical data relationship will reinforce the notion that the learner is responsible to protect themselves against digital exploitation and oppression, Kazansky (2015) has positioned this as the responsabilization of the user. Such an approach runs the risk of leaving the learner feeling frustrated and resigned as it does not offer adequate pathways forward. As such, when data literacy is associated with empowerment, the externalities of the horizontal data relationships should become an integral component of it.

The focus on the vertical data relationship in current data literacy resources brings me to the question of audience. The above mentioned resources were developed with a specific audience in mind, i.e., human rights defenders, activists and investigative journalists, who are expected to have a certain proficiency when it comes to capitalist critique and political participation. In this context, unpacking data in all its complexities should allow the learner to keep themselves and their networks safer and more secure, and expand their toolbox of action to include an analyses of how data and data infrastructure are

transforming and perpetuating historic and ongoing struggles over how society is organized. A clear tension emerges when these resources are reused in different literacy contexts. At face value a different audience might miss intrinsic motivation to engage with certain privacy enhancing practices that will make their digital experience more cumbersome. More importantly, while these resources will increase their literacy around the opportunities and risks associated with data, a more general audience might lack the competencies needed to intervene in, engage with, and challenge broader power structures, i.e., community organizing, campaigning, lobbying and influencing, advocacy, collective action and policy-making. Building on D'Ignazio's (2017) approach to creative data literacy, which promotes non-technical competencies and vocabularies that allow learners to have a seat at the 'technology table' without having to learn how to code, I argue that when data literacies are aimed at a more general public, they need to be (re)politicized. People need to learn how to 'speak politics' to be able to participation in political and social structures that enable and constrain datafication. Here, data literacy efforts can learn from and engage with those pedagogical approaches that build competencies around democratic engagement, dismantling power structures, policy reform and activism.

(Re)politicizing the practice of critical data literacy

In this second part of my article, I will advance the argument that the practice of data literacy itself needs to be (re)politicized. In the emerging field of data literacy there is a lack of research that engages with the relationship between literacy and power. Janks (2009) draws our attention to the notion that the 'how' of literacy is political in itself, it is not a neutral practice and should be considered "central to social processes that systematically include or exclude people" (Golden, 2017, p. 377). Data literacy approaches that do not explicitly engage with questions of power run the risk of perpetuating historical and ongoing systems of inequality and oppression. For example, literacy towards what end becomes an important point of contention when we reflect on the use of data harms borne by some in society for the learning of others. Ground-breaking academic analysis and critique have foregrounded how data and algorithms are contributing to the perpetuation of racism and social inequalities in society (Benjamin, 2020; Buolamwini & Gebru, 2018; Eubanks, 2017; Noble, 2018; Perez, 2019). Current data literacy resources engage with these data harms by including examples such as the Propublica investigations into Facebook's exclusion of specific ethnic and religious groups from seeing job and housing-related advertisements (Gillum & Tobin, 2019) and their work on the recidivism risk scoring tool COMPAS that hard-wired racial biases into the criminal justice system (Angwin et al., 2016). These examples offer an entry point into talking about the impact of datafication on society and assume that even if this form of discrimination would not directly apply to the learner it might create friction with their values and as such make

them more inclined to engage in certain privacy-preserving practices or public discussion on these topics (Sander, 2020b). However, reducing data harms to a mere illustration in itself will not offer the learners the ability to unpack complex racial and social justice issues nor provide pathways forward for dismantling power structures that perpetuate injustices. It is imperative for data literacy approaches to reflect on the instrumentalization of data harms experienced by black and brown, gendered and under-resourced communities as this can be considered an extractive and oppressive practice. (Re)politicizing data literacy practices does not mean shying away from social and racial injustices, but requires a more profound engagement with decades worth of work on issues of power, inequality and racism to create a more rigorous and thoughtful approach.

Carmi and Yates' (2020) work on digital inclusion and digital divides foreground another dimension of the relationship between literacy and power. They argue that digital inequality comprises of layers stacked up, "one over the other, so depending on your starting point in society, be it age, gender, socio-economic status, ability and education - you will have to break through more or less layers of challenges" (Carmi & Yates, 2020, p. 8). This raises the question of how existing data literacy approaches engage with the existing and interrelated social, political and economic inequalities and disparities of their audiences. In their work on data infrastructure literacy Gray, Gerlitz and Bounegru (2018) argue that it is important to make space for collective inquiry, yet do not elaborate on who this collective is or who should be included in these infrastructural debates. Likewise, in her creative data literacy concept D'Ignazio (2017) also fails to clearly articulate the composition of her non-technical audience, and as such does not fully engage with the implicit power dynamics that emerge when a non-technical learner, especially from a less privileged community, sits at the 'technology table'. In Sanders (2020b) research, she provides a detailed explanation of the sample of learners for her experiment but does not articulate an audience for her critical data literacy concept, nor how their standing in society might impact their ability to learn and take action. As a result, these data literacy approaches create a homogeneous understanding of the learner and their needs, which runs the risk of invisibilizing the inequalities and disparities amongst them. (Re)politicizing the practice of data literacy as such also means explicit engagement with the idea that learners will differ from each other in language, age, gender, ethnicity, education level, (learning) disabilities.

My final point about the relationship between literacy and power is about the language, metaphors and words used to convey knowledge and understanding of datafication in literacy resources. Sally Wyatt (2021) reminds us of the importance of the words that are used to describe a phenomenon. She argues that "metaphors are not only descriptive. They also carry normative dimensions. Lakoff and Johnson (1980) express this clearly when they write that metaphors 'have the power to define reality. . . . [W]hether in national politics or everyday interaction, people in power get to impose their metaphors' (p. 157)" (Wyatt, 2021, p. 409). In the practice of critical data literacy, it is common to both unpack

specific problematic metaphors like 'the cloud' and at the same time use other problematic concepts to draw attention to specific issues. Take for example the popular reference to surveillance capitalism, which is used to describe a new logic of accumulation but in itself privileges a critical understanding of surveillance issues over that of capitalism (Sadowski & Ongweso, 2021). The word bias in relation to algorithms privileges a technological centric perspective to inequality over more social and historic approaches that engage with long-standing issues of discrimination and injustice. Word choices become particularly pertinent when we reflect on the function of metaphors and concepts in literacy, which are presumed to shape not only the learners' understanding of specific issues, but also which (alternative) futures can be imagined (Mager & Katzenbach, 2021). Ultimately, politicizing the practice of data literacy will require a careful examination of the languages and metaphors used to convey the learning to prevent the perpetuation of the dominant socio-technical imaginaries that offer limited pathways to address structural challenges.

Conclusion

Against the backdrop of datafication, a new field of literacy emerged that associated knowledge, skills and understanding of data and data infrastructures as indispensable competencies to navigate contemporary society. Reflecting on the different data literacy approaches it becomes clear that they build on literacy traditions that see education as empowerment, a learning process which should enable people to understand and critically engage with one's context. While these literacy approaches critically engage with the negative externalities that emerge from the datafication of society, there is less reflection on the politics embedded within the practice. If we accept that data literacy is prominent in the societal responses to datafication, the relationship between the practice and power becomes more pertinent, and requires us to ask the question, literacy towards what end? Which literacies are valued and privileged? At the moment, data literacy concepts and practices embed assumptions about the prominence of data (infrastructures) in shaping learner's life chances, the pathways that will lead to empowerment, notions about the abilities and needs of the learners and the neutrality of the practice, which run the risk of discounting the power structures that enable and perpetuate systemic inequalities. Therefore, I argue that centring data in literacy efforts is a political act in its own rights that needs to be unpacked and scrutinized. Throughout this article I advance the argument that data literacy needs to be (re)politicized, both in terms of the perceived competencies learners need to acquire and the practice itself to account for the externalities that emerge from centring data in literacy efforts.

How then do we (re)politicize data literacy? To account for the horizontal relationship of datafication I draw on Peña Gangadharan and Niklas' (2019) concept of decentering technology. Here, the authors argue that in the dominant discourse around technology and discrimination, the process of decentring can "bring nuance into the debate about its role

and place in the production of social inequalities” (Peña Gangadharan & Niklas, 2019). As such, I want to encourage future lines of inquiries in the field of data literacy to engage with critical literacy and racial and social justice theories and practices to allow for more thorough analysis of power structures and inequality and offer different pathways towards social political participation.

Acknowledgements

Research for this article is part of a large multi-year project called ‘Data Justice: Understanding datafication in relation to social justice’ (DATAJUSTICE) funded by an ERC Starting Grant (no. 759903).

References

- Amoore, L. (2020). *Cloud ethics: Algorithms and the attributes of ourselves and others*. Duke University Press.
- Andrejevic, M. (2014). The Big Data Divide. *International Journal of Communication* 8, 1673–1689.
- Angwin, J., Larson, J., Mattu, S., & Kirchner, L. (2016, May 23). Machine Bias. *ProPublica*. <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>
- Benjamin, R. (2020). Race After Technology: Abolitionist Tools for the New Jim Code. *Social Forces*, 98(4), 1–3. <https://doi.org/10.1093/sf/soz162>
- Brunton, F., & Nissenbaum, H. (2015). *Obfuscation: A user’s guide for privacy and protest*. Mit Press. <https://doi.org/10.7551/mitpress/9780262029735.001.0001>
- Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. WW Norton & Company.
- Buolamwini, J., & Gebru, T. (2018). Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification. *Conference on Fairness, Accountability and Transparency*, 77–91.
- Carmi, E., & Yates, S. J. (2020). What do digital inclusion and data literacy mean today? *Internet Policy Review*, 9(2). <https://doi.org/10.14763/2020.2.1474>
- Cohen, J. E. (2019). *Between Truth and Power*. Oxford University Press. <https://doi.org/10.1093/oso/9780190246693.001.0001>
- Crusoe, D. (2016). Data Literacy defined pro populo: To read this article, please provide a

little information. *The Journal of Community Informatics*, 12(3).

<https://doi.org/10.15353/joci.v12i3.3276>

Dencik, L. (2021). The Datafied Welfare State: A Perspective from the UK. In A. Hepp, J. Jarke, & L. Kramp (Eds.), *The Ambivalences of Data Power: New perspectives in critical data studies*. Palgrave Macmillan.

Dencik, L., Redden, J., Hintz, A., & Warne, H. (2019). The “golden view”: Data-driven governance in the scoring society. *Internet Policy Review*, 8(2), 1–24.

<https://doi.org/10.14763/2019.2.1413>

D’Ignazio, C. (2017). Creative data literacy: Bridging the gap between the data-haves and data-have nots. *Information Design Journal*, 23(1), 6–18.

<https://doi.org/10.1075/idj.23.1.03dig>

Eubanks, V. (2017). *Automating Inequality: How high-tech tools profile, police, and punish the poor*. St. Martin’s Press.

Freire, P. (1970). *Pedagogy of the Oppressed*. Seabury Press.

Freire, Paulo. (2018). *Pedagogy of the Oppressed: 50th Anniversary Edition*. Bloomsbury Publishing USA.

Gillum, J., & Tobin, A. (2019, March 19). Facebook Won’t Let Employers, Landlords or Lenders Discriminate in Ads Anymore. *ProPublica*.

<https://www.propublica.org/article/facebook-ads-discrimination-settlement-housing-employment-credit>

Golden, N. A. (2017). Critical digital literacies across scales and beneath the screen. *Educational Media International*, 54(4), 373–387.

<https://doi.org/10.1080/09523987.2017.1391523>

Gray, J., Gerlitz, C., & Bounegru, L. (2018). Data infrastructure literacy. *Big Data & Society*, 5(2), 1–13. <https://doi.org/10.1177/2053951718786316>

Hardy, J. (2014). *Critical Political Economy of the Media: An Introduction*. Routledge.

<https://doi.org/10.4324/9780203136225>

Higson, C., Cluanaigh, D. Ó., Ravi, A., G., & Steudtner, P. (2016). *Holistic security: A Strategic Manual for Human Rights Defenders*. <https://holistic-security.tacticaltech.org/chapters/strategise/3-6-security-and-the-do-no-harm-approach.html>

Janks, H. (2009). *Literacy and power*. Routledge.

<https://doi.org/10.4324/9780203869956>

Critical is not political: the need to (re)politicize data literacy

- Katzenbach, C., & Ulbricht, L. (2019). Algorithmic governance. *Internet Policy Review*, 8(4), 1–18. <https://doi.org/10.14763/2019.4.1424>
- Kazansky, B. (2015). FCJ-195 Privacy, Responsibility, and Human Rights Activism. *The Fibreculture Journal* : 26. <https://twentysix.fibreculturejournal.org/fcj-195-privacy-responsibility-and-human-rights-activism/>
- Level Up. (2016). *LevelUp's Approach to Adult Learning*. <https://level-up.cc/before-an-event/levelups-approach-to-adult-learning/>
- Mager, A., & Katzenbach, C. (2021). Future imaginaries in the making and governing of digital technology: Multiple, contested, commodified. *New Media & Society*, 23(2), 223–236. <https://doi.org/10.1177/1461444820929321>
- Markham, A. N. (2020). Taking Data Literacy to the Streets: Critical Pedagogy in the Public Sphere. *Qualitative Inquiry*, 26(2), 227–237. <https://doi.org/10.1177/1077800419859024>
- Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work and think*. Murray.
- Noble, S. U. (2018). *Algorithms of Oppression: How Search Engines Reinforce Racism*. NYU Press. <https://doi.org/10.2307/j.ctt1pwt9w5>
- Pangrazio, L., & Sefton-Green, J. (2020). The social utility of 'data literacy.' *Learning, Media and Technology*, 45(2), 208–220. <https://doi.org/10.1080/17439884.2020.1707223>
- Pangrazio, L., & Selwyn, N. (2019). 'Personal data literacies': A critical literacies approach to enhancing understandings of personal digital data. *New Media & Society*, 21(2), 419–437. <https://doi.org/10.1177/1461444818799523>
- Peña Gangadharan, S., & Niklas, J. (2019). Decentering technology in discourse on discrimination. *Information, Communication & Society*, 22(7), 882–899. <https://doi.org/10.1080/1369118X.2019.1593484>
- Perez, C. C. (2019). *Invisible Women: Exposing Data Bias in a World Designed for Men*. Random House.
- Redden, J. (2018, January 11). The Harm That Data Do. *Scientific American*. <https://www.scientificamerican.com/article/the-harm-that-data-do/>
- Sadowski, J. (2019). When data is capital: Datafication, accumulation, and extraction. *Big Data & Society*, 6(1), 1-12. <https://doi.org/10.1177/2053951718820549>

Sadowski, J., & Ongweso, E. J. W. (2021, February 18). 44. *How to Think About Data* (ft. Salomé Viljoen). <https://soundcloud.com/thismachinekillspod/44-how-to-think-about-data-ft-salome-viljoen>

Sander, I. (2020a). Critical big data literacy tools—Engaging citizens and promoting empowered internet usage. *Data & Policy*, 2, e5. <https://doi.org/10.1017/dap.2020.5>

Sander, I. (2020b). What is critical big data literacy and how can it be implemented? *Internet Policy Review*, 9(2). <https://doi.org/10.14763/2020.2.1479>

Santo, R. (2011). Hacker literacies: Synthesizing critical and participatory media literacy frameworks. *International Journal of Learning and Media*, 3(3). https://doi.org/10.1162/IJLM_a_00075

Schneier, B. (2015). *Data and Goliath: The Hidden Battles to Collect Your Data and Control Your World*. W. W. Norton & Company.

Špiranec, S., Kos, D., & George, M. (2019). Searching for critical dimensions in data literacy. *Proceedings of the Tenth International Conference on Conceptions of Library and Information Science*, 24. <http://informationr.net/ir/24-4/colis/colis1922.html>

Tygel, A. F., & Kirsch, R. (2016). Contributions of Paulo Freire for a critical data literacy: A popular education approach. *The Journal of Community Informatics*, 12(3). <https://doi.org/10.15353/joci.v12i3.3279>

Viljoen, S. (2020a, October 16). *Data as Property?* | Salomé Viljoen. Phenomenal World. <https://phenomenalworld.org/analysis/data-as-property>

Viljoen, S. (2020b). *Democratic Data: A Relational Theory For Data Governance* (SSRN Scholarly Paper ID 3727562). Social Science Research Network. <https://doi.org/10.2139/ssrn.3727562>

Wyatt, S. (2021). Metaphors in critical Internet and digital media studies. *New Media & Society*, 23(2), 406–416. <https://doi.org/10.1177/1461444820929324>

Zuboff, S. (2015). Big other: Surveillance Capitalism and the Prospects of an Information Civilization. *Journal of Information Technology*, 30(1), 75–89. <https://doi.org/10.1057/jit.2015.5>