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DOI:

[10.5117/9789463727679_ch14](https://doi.org/10.5117/9789463727679_ch14)

[10.5117/9789463727679](https://doi.org/10.5117/9789463727679)

Document Version

Publisher's PDF, also known as Version of record

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Gray, J. W. Y. (2024). Speculative Data Infrastructures : Prototyping a Public Database on Corporate Tax Avoidance. In M. T. Schäfer, K. van Es, & T. Lauriault (Eds.), *Collaborative Research in the Datafied Society: Methods and Practices for Investigation and Interventio* (pp. 205-218). Amsterdam University Press. https://doi.org/10.5117/9789463727679_ch14, <https://doi.org/10.5117/9789463727679>

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13. Speculative Data Infrastructures: Prototyping a Public Database on Corporate Tax Avoidance

Jonathan W. Y. Gray

Abstract

This chapter examines and reflects on three ways of workshopping ‘data in the making’ – redesigning, prototyping, and interfacing – drawing on activities leading towards a collaborative public database on the economic activities and tax contributions of multinational corporations. It examines how prototyping data infrastructures may serve as a method to engage with organizations, groups, and communities who are concerned with or affected by an issue, in order to materialize problems and to support learning which may go on to inform advocacy, policy, and reporting activities. It draws on ‘engaged research-led teaching’ activities with King’s College London, the Public Data Lab, and the Tax Justice Network to consider formats for critically engaging with data as a medium for issue articulation.

Keywords: Data studies; Participatory design; Engaged teaching; Tax justice

Introduction

How much tax do multinational corporations really pay? How much are they avoiding? What difference could it make if national and international rules were strengthened in order to tackle multinational tax avoidance? Since the turn of the millennium, tax justice advocates have argued for Country-by-Country Reporting (CBCR) standards that would disclose how corporations

avoid tax, including through profit-shifting and other mechanisms (Kohonen and Mestrum 2008; Leaman and Waris 2013; Tax Justice Network 2015; Seabrooke and Wigan 2015b). Although earlier proposals were initially widely critiqued and rejected by many accountancy professionals, CBCR has subsequently made it into law and policymaking around the world, including at transnational bodies such as the OECD and the European Union (EU).¹ Most multinational firms do not yet have to publish CBCR data, but some of them do – particularly those operating in sectors where there are CBCR rules, such as extractive industry companies in the United States and financial institutions with operations in the EU.²

This chapter explores some of the things we have learned from an overlapping series of projects and activities exploring and critically engaging with CBCR data over a five-year period (2016–2021). It focuses on a series of workshops with CBCR data undertaken with members of the Tax Justice Network and the Open Data for Tax Justice initiative, as well as students and researchers at King’s College London and the Public Data Lab.³ Social and humanities researchers are used to ‘workshop’ texts. But what kinds of formats, we should ask, might be used to workshop data? Furthermore, how might one workshop data when there is not already a dataset or data collection to hand around, but where data is scattered, partial, not-yet-completed, or “in the making” (Latour 1988)? Thinking along with recent work on formats such as the “data sprint” and the “technocultural workshop” to support encounters with digital data, methods, and devices (Munk, Meunier, and Venturini 2019; Venturini, Munk, and Meunier 2018; Berry et al. 2015; Côté and Pybus 2016), the following sections explore three ways of workshoping data-in-the-making: redesigning, prototyping, and interfacing.

In alignment with work on data feminism (D’Ignazio and Klein 2020), situated data analysis (Rettberg 2020), data hermeneutics (Acker 2015; Gerbaudo 2016; Poirier 2021), and participatory data design (Jensen et al. 2021), these

1 See, for example, OECD BEPS Action 13 <https://www.oecd.org/tax/beps/beps-actions/action13/> and EU CBCR rules pertaining to multinationals, extractive and logging industries: https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/public-country-country-reporting_en.

2 This includes, for example, Section 1504 of the Dodd Frank Act in the United States, and the EU Capital Requirements Directive IV (CRD IV).

3 Thanks to Liliana Bounegru, Alex Cobham, Javier Garcia-Bernardo, Cristina Fernandez, Franki Hackett, Petr Janský, Danny Lämmerhirt, Anna Powell-Smith, Stephen Abbott Pugh, our data journalism students at the Department of Digital Humanities, King’s College London, colleagues at the Public Data Lab, and all who took time to advise, support and be involved in these workshops in various ways. For more information, see <https://publicdatalab.org/projects/corporate-tax-data/>.

approaches are intended to support critical engagements with the question of what role data may play in relation to societal issues – engagements that are grounded in social and cultural research as well as in collaborations with activist, civil society, and community groups.

Who and What Is Data For? Redesigning Data Infrastructures

We started with a series of smaller workshops with researchers and activists on the prospects of a public database dedicated to the economic activities and tax contributions of multinationals. These workshops took place against a background of research on the politics of public data that emphasizes the ‘opening up’ of existing institutional data, towards experiments in citizen and civil society data gathering and engagements (Gray 2016; Gray, Lämmerhirt, and Bounegru 2016; Gray 2018) as well as what we have called “data infrastructure literacy” which is “not just competencies in reading and working with datasets but also the ability to account for, intervene around and participate in the wider socio-technical infrastructures through which data is created, stored and analysed” (Gray, Gerlitz, and Bounegru 2018, 1).

Rather than starting with datasets and exploring what can be done with them – the premise of many hackdays, hackathons, challenges, and fellowships – we started with an approach that sought to prioritize *communities, issues and questions*. The aspiration was to be community-centered, issue-centered and question-centered rather than data-centered. Engaging with civil society groups, nonprofits, and researchers, we sought to elicit pressing questions as well as the contexts in which these questions arose. An overview of the lines of inquiries and approaches from these workshops is included in Table 13.1.

Community snowballing with workshops, conversations, and online materials were used to gather a network of people who were interested in using public data on corporate tax avoidance in their work, which later became the Open Data for Tax Justice initiative.⁴ With this broader group we could gather questions that related to their work: Which companies are avoiding tax in my country? How much profit is declared by mining and petroleum companies in countries where resources are extracted? In other countries? In tax havens? Workshop participants collectively drafted ‘user stories’ as a way to understand more about the contexts

4 See <https://datafortaxjustice.net/>.

Table 13.1 Workshopping approaches for mapping communities, questions, circumstances, data proposals, and existing data

Lines of inquiry	Workshopping approaches
Which communities are concerned with and affected by the issue?	Community snowballing with workshops, interviews, online materials.
What questions do these communities have about the issue?	Developing lists of questions across workshops and sharing to elicit further input.
How, for whom, and in which circumstances might data help to address these questions?	Collective user story exercises to elicit more situated account of contexts in which questions arise and where data could help.
What data is proposed in order to make these questions addressable?	Mapping and comparing proposed data models and data standards, further developing proposals with materials above and soliciting for further input.
How does existing data compare with desired data?	Mapping existing data, the contexts in which it is produced, and assessing this against proposals above to surface gaps and differences.

in which these questions mattered. For example: “As a [X] I need/want/expect to [Y] so that [Z].” While user stories can be used to abstract and fix interests for the purposes of making software or products, for our data workshops they were also a way to situate and pluralize concerns – and to be alive to many kinds of interests, issues, and settings that brought communities to care.⁵

These communities, questions, and circumstances then served as a starting point from which to assess data proposals as well as existing data – and in the process to surface gaps, differences, shortcomings, misalignments, unaddressed concerns, and unanswerable questions (figure 13.1). This workshopping process also drew attention to the varied contexts of data fields and what they depended upon (e.g., thresholds, definitions), as well as whose concerns were better represented and whose were missing.

The results of these initial workshops and mapping activities were published in a report with the Tax Justice Network (Cobham, Gray, and Murphy 2017). Collaborators at the Tax Justice Network have said that learning from this collaboration has shaped their advocacy activities and thinking around the role of public data in addressing tax justice, including key contributions

5 This mode of working with user stories has been written about in collaborative design research drawing on science and technology studies (Poderi et al. 2020).

Activity

Civil society proposal	OECD CBCR	CRD IV	Dodd Frank	Canada	EITI	EJ
Third party sales	✓	✗	✗	✗	✗	✗
Turnover	✓	✓	✗	✗	✗	✗
Number of employees FTE	✓	✓	✗	✗	✗	✗
Total employee pay	✗	✗	✗	✗	✗	✗
Assets?	✗	✗	✗	✗	✗	✗

Figure 13.1. Table showing which data elements were missing from which data proposals. Source: Open Data for Tax Justice.

to the Global Reporting Initiative’s tax standard. The approach was also used to workshop data with other communities, such as public housing campaigners.

How Could a Database Work? Testing Transparency and Prototyping Collaborative Data Infrastructures

Further workshops were dedicated to exploring how a corporate tax database could work in practice. These workshops were undertaken in the context of “engaged research-led teaching” activities, involving researchers, students, and civil society actors such as activists and journalists as co-inquirers in a way which cared for their various perspectives, needs, and concerns (Gray et al. 2022). Several workshops took place as part of a data journalism module at King’s College London, for which the main text was *The Data Journalism Handbook: Towards a Critical Data Practice*, which sought to encourage “a relational perspective on data journalism as a kind of curatorial craft, assembling and working with diverse materials, communities and infrastructures to generate different ways of knowing, narrating and seeing the world at different scales and temporalities” (Bounegru and Gray 2021). The book highlighted how journalists not only used existing datasets but were increasingly assembling their own data.

One of the options for student group projects was to work together to prototype a collaborative data infrastructure for learning about corporate tax avoidance. The idea was to take data that was available in principle through

a patchwork of different rules (e.g., EU Capital Requirements Directive IV) but often scattered in corporate websites and PDFs, and to explore how different actors could work together to assemble and use it while also being able to trace where it had come from and assess the many issues associated with it. Several research groups had compiled subsets of this data (Janský 2020), but it was felt that these efforts had been somewhat ad hoc: further work was needed to improve the coordination and documentation of what was there and what was missing, beyond and across projects.

In 2016 we had a daylong workshop with members of the Tax Justice Network and data journalists who were present for the duration. By 2021, being mindful of the limited time of our collaborators, we had packages of materials and documentation that researchers and students could work with independently across half-day workshops, receiving input and feedback at key moments. These events involved multiple smaller groups working on and coordinating around different aspects of assembling data – making lists of companies who had to comply with rules, gathering and publicly archiving copies of PDF reports, making guides to finding CBCR data, assessing and trying out PDF transcription tools, extracting data tables from PDF reports, assessing and trying out database tools which could be used for a collaborative database, assessing and trying out tools and interfaces to support distributed collaboration around the data such as transcription, micro-tasking, and forums (figure 13.2).

In the context of a data journalism course grounded in critical data studies, science and technology studies, and associated fields, it was important for our students' learning that these tasks were not just instrumental actions but also opportunities for "critical proximity" (Birkbak, Petersen, and Elgaard Jensen 2015); here we drew on class readings on information infrastructures, classification and standards, histories and sociologies of quantification, "statactivism" and data activism (e.g., Bowker and Star 2000; Espeland and Stevens 2008; Rottenburg, Merry, Park, and Mugler 2015; Lampland and Star 2009; Bruno, Jany-Catrice, and Touchelay 2016; Desrosières 2002; Merry 2016; Bruno, Didier, and Vitale 2014; Milan and van der Velden 2016).⁶ The students' challenge was to look at how these readings might become salient in engagements with data, including in advocacy and policy concerned with the making of data. These workshops and activities resulted in packages of materials with prototypes, documentation, and options for next steps for a collaborative data infrastructure. The workshops emphasized not

6 For additional example readings see https://www.zotero.org/groups/sociology_of_quantification and https://www.zotero.org/groups/data_journalism_research.

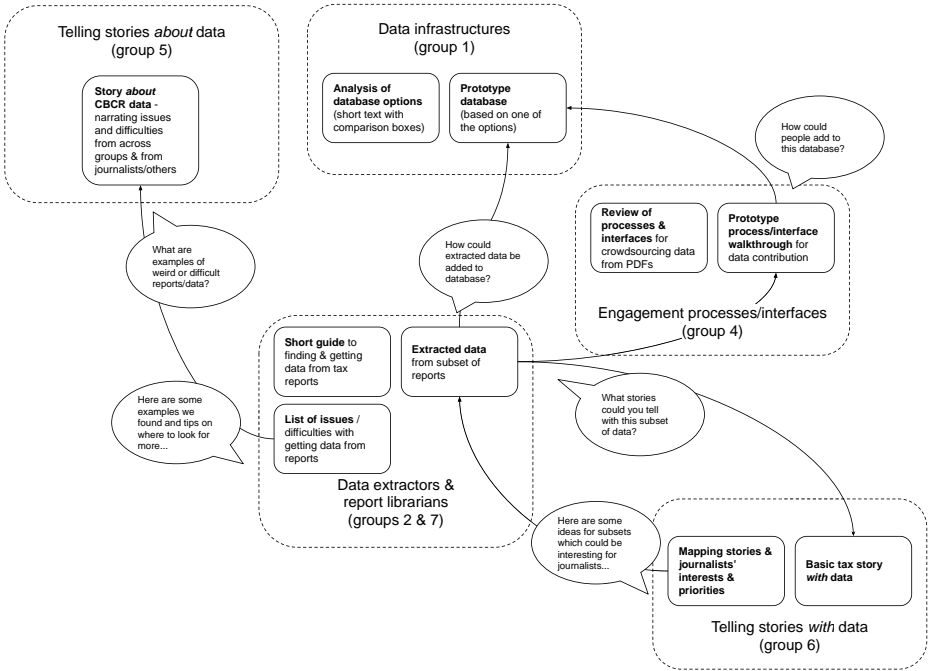


Figure 13.2. Group projects on assembling tax data at King’s College London. Source: Data journalism class of 2021, King’s College London.

only technical and statistical literacy but also relational perspectives on data infrastructures and the social lives of data. Included here were data issues and data frictions (Edwards et al. 2011) that had been identified throughout the workshops, such as broken links, missing documents, missing fields, inconsistent units, divergent accounting practices, and rejected FOI requests.⁷

By having multiple projects take different prototyping approaches, participants were able to learn from one another and identify considerations for future work grounded in various kinds of hands-on engagements – such as querying, scraping, transcribing, archiving and interpreting reports. Workshopping data through prototyping involved the testing and empirical re-specification of transparency measures and their effects – often surfacing scattered, heterogeneous materials rather than revealing a clearer, bigger

7 A student FOI request aiming to establish which corporations fell under CBCR rules led to a government response that multinationals were considered ‘persons’ and therefore this could not be disclosed, which an activist collaborator described as a “shocking” rolling back of previous transparency commitments.

picture on corporate tax avoidance.⁸ Tax Justice Network collaborators commented that these workshops represented the “single biggest contribution” to work in this area since the report mentioned in the previous section.

How Could It Be Meaningful? Outlining Interfaces and Data Stories

What could be done with CBCR data? A third format for workshoping data involved the outlining of experimental interfaces and data storytelling approaches. Researchers have drawn attention to the role of formats such as benchmarks and indices in tax justice advocacy (Seabrooke and Wigan 2015a). What kinds of formats for displaying, exploring, and making sense of data could be appropriate given what had been learned about its problems, partiality, provisionality, and incompleteness?

These data workshops took their cue from “challenges for critical data practice” in the *Data Journalism Handbook*, including the following questions:

How can data journalism projects tell stories both with and about data including the various actors, processes, institutions, infrastructures and forms of knowledge through which data is made? [...] How can data journalism projects tell stories about big issues at scale (e.g., climate change, inequality, multinational taxation, migration) while also affirming the provisionality and acknowledging the models, assumptions and uncertainty involved in the production of numbers? [...] How can data journalism projects cultivate their own ways of making things intelligible, meaningful and relatable through data, without simply uncritically advancing the ways of knowing “baked into” data from dominant institutions, infrastructures and practices? (Bounegru and Gray 2021)

These workshops drew on projects and practices such as Mona Chalabi’s approach to data sketching (Chalabi and Gray 2021), a Public Data Lab collaboration exploring the visual representation of uncertainty in offshore finance,⁹ and design practices to mock-up interfaces for not-yet-existent data infrastructures.

8 Commensurate with what other researchers and investigators have found with transparency initiatives in other areas, e.g., <https://blog.okfn.org/2011/03/08/a-kafkaesque-data-trail-the-hunt-for-europes-hidden-billions/>.

9 See <https://publicdatalab.org/projects/fog-of-finance/> and <https://offshoreatlas.publicdatalab.org/>.

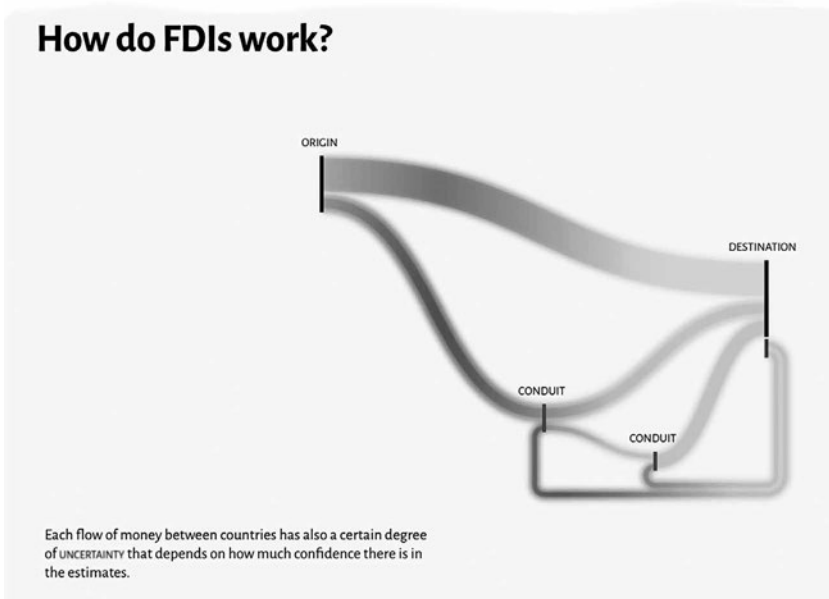


Figure 13.3. Exploring the visualization of uncertainty with the “Fog of Finance” project. Source: Public Data Lab.

In these workshops, participants outlined storytelling approaches and possible interfaces, visuals, and other materials which could be used to make sense of corporate tax data. This activity often started by longlisting stories where there were big questions (such as those in the “What Do They Pay?” report) that they discovered could not be answered. Some groups explored the visual display of possible indicators of tax avoidance – such as data visualizations of ratios of profits to employees for each jurisdiction of each corporate group to identify outliers (corporate entities with high ratios of profits to employees may indicate avoidance). These projects proceeded by identifying meaningful and doable subsets to tell stories about – such as top corporate entities in particular sector by size. Other groups sketched interfaces for making games with data or inviting involvement in gathering it.

Along with such approaches to telling stories and making things ‘with data’, other groups looked at telling stories ‘about data.’ Inspired by Helen Verran’s chapter in the *Data Journalism Handbook* “Narrating a Number and Staying With the Trouble of Value” (Verran 2021) and by readings on the politics of data and quantification, workshopping data became not just an opportunity to regard data as material for stories about the entities within it (corporations, transactions, jurisdictions) but as an invitation to take

data as an entry point for telling stories about the codification of concern, expert knowledge cultures, accounting, the emergence of the corporate form, identifiers and thresholds, problematization and answerability, data imaginaries, data politics, and data-in-the-making. Rather than taking data as background work for the making of portable facts, numbers, claims, and evidence, such stories could re-animate data as a site of struggle and contestation around the making and ordering of economic life and collective futures.

Conclusion

The three forms of workshopping data-in-the-making presented above suggest ways of organizing collaborations with data beyond a focus on capacities that may be conventionally desired or expected for its effective manipulation (e.g., data science, programming). They indicate other kinds of collective learning – including situating how and for whom data infrastructures matter, surfacing frictions and considerations for collaborative infrastructures, and sketching outlines for alternative interfaces and data storytelling approaches.

In the case of corporate tax avoidance, they helped to foment encounters between researchers, teachers, students, and activists around the role that data may play in relation to materializing and addressing corporate tax avoidance, surfacing who and what is missing from proposals as well as the messiness of data and accounting practices, and unveiling alternative approaches for telling stories – provisional, partial, and incomplete, but nevertheless revealing. These kinds of data workshops can be a generative format for collective learning and interpretation, shaping expectations and orienting activities (de Mourat, Ricci, and Latour 2020), not just a means for producing outcomes or outputs which are known in advance.

Workshop formats have their own politics, and their conventions can embody problematic defaults which shape, silence, and order involvement – foregrounding and marginalizing, distributing work unfairly, making visible certain kinds of voices, concerns, and experiences while making other kinds invisible (Salesses 2021; Pierre et al. 2021). If data workshop formats are to be inclusive, meaningful, and equitable, they should be considered, documented, and cared for, in order to assess whether they are working for those involved and affected.

References

- Acker, Amelia. 2015. "Toward a Hermeneutics of Data." *IEEE Annals of the History of Computing* 37 (3): 70–75. <https://doi.org/10.1109/MAHC.2015.68>.
- Berry, David M., Erik Borra, Anne Helmond, Jean-Christophe Plantin, and Jill Walker Rettberg. 2015. "The Data Sprint Approach: Exploring the Field of Digital Humanities through Amazon's Application Programming Interface." *Digital Humanities Quarterly* 9 (3).
- Birkbak, Andreas, Morten Krogh Petersen, and Torben Elgaard Jensen. 2015. "Critical Proximity as a Methodological Move in Techno-Anthropology." *Techné: Research in Philosophy and Technology* 19 (2): 266–290. <https://doi.org/10.5840/techn201591138>.
- Bounegru, Liliana, and Jonathan Gray, eds. 2021. *The Data Journalism Handbook: Towards a Critical Data Practice*. Amsterdam: Amsterdam University Press. <https://www.aup.nl/en/book/9789462989511/the-data-journalism-handbook>.
- Bowker, Geoffrey C., and Susan Leigh Star. 2000. *Sorting Things Out: Classification and Its Consequences*. Cambridge, MA: MIT Press.
- Bruno, Isabelle, Emmanuel Didier, and Tommaso Vitale. 2014. "Statactivism: Forms of Action Between Disclosure and Affirmation." *Partecipazione e Conflitto – Participation and Conflict* 7 (2): 198–220.
- Bruno, Isabelle, Florence Jany-Catrice, and Béatrice Touchelay (eds). 2016. *The Social Sciences of Quantification: From Politics of Large Numbers to Target-Driven Policies*. New York, NY: Springer.
- Chalabi, Mona, and Jonathan Gray. 2021. "Sketching with Data." In *The Data Journalism Handbook: Towards a Critical Data Practice*, edited by Liliana Bounegru and Jonathan Gray, 174–181. Amsterdam: Amsterdam University Press. <https://www.aup.nl/en/book/9789462989511/the-data-journalism-handbook>.
- Cobham, Alex, Jonathan Gray, and Richard Murphy. 2017. "What Do They Pay? Towards a Public Database to Account for the Economic Activities and Tax Contributions of Multinational Corporations." January 2017. CIYPERC Working Paper Series. London: City University. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3049857.
- Coté, Mark, and Jennifer Pybus. 2016. "Simondon on Datafication. A Techno-Cultural Method." *Digital Culture & Society* 2 (2): 75–92. <https://doi.org/10.14361/dcs-2016-0206>.
- D'Ignazio, Catherine, and Lauren Klein. 2020. *Data Feminism*. Cambridge, MA: MIT Press.
- Desrosières, Alain. 2002. *The Politics of Large Numbers: A History of Statistical Reasoning*, translated by Camille Naish. Cambridge, MA: Harvard University Press.

- Edwards, Paul N., Matthew S. Mayernik, Archer L. Batcheller, Geoffrey C. Bowker, and Christine L. Borgman. 2011. "Science Friction: Data, Metadata, and Collaboration." *Social Studies of Science* 41 (5): 667–90. <https://doi.org/10.1177/0306312711413314>.
- Espeland, Wendy Nelson, and Mitchell L. Stevens. 2008. "A Sociology of Quantification." *European Journal of Sociology / Archives Européennes de Sociologie* 49 (3): 401–436.
- Gerbaudo, Paolo. 2016. "From Data Analytics to Data Hermeneutics. Online Political Discussions, Digital Methods and the Continuing Relevance of Interpretive Approaches." *Digital Culture & Society* 2 (2): 95–112. <https://doi.org/10.14361/dcs-2016-0207>.
- Gray, Jonathan. 2016. "Datafication and Democracy: Recalibrating Digital Information Systems to Address Societal Interests." *Juncture* 23 (3): 197–201. <https://doi.org/10.1111/newe.12013>.
- Gray, Jonathan. 2018. "Three Aspects of Data Worlds." *Krisis: Journal for Contemporary Philosophy*, no. 1. <https://archive.krisis.eu/three-aspects-of-data-worlds/>.
- Gray, Jonathan, Liliana Bounegru, Richard Rogers, Tommaso Venturini, Donato Ricci, Axel Meunier, Sabine Niederer, Natalia Sánchez Querubín, Marc Tuters, Lucy Kimbell, and Anders Kristian Munk. 2022. "Composing Collective Inquiry with Digital Methods and Data." *Digital Culture & Education (DCE)* 14 (3): 55–86.
- Gray, Jonathan, Carolin Gerlitz, and Liliana Bounegru. 2018. "Data Infrastructure Literacy." *Big Data & Society* 5 (2): 1–13. <https://doi.org/10.1177/2053951718786316>.
- Gray, Jonathan, Danny Lämmerhirt, and Liliana Bounegru. 2016. "Changing What Counts: How Can Citizen-Generated and Civil Society Data Be Used as an Advocacy Tool to Change Official Data Collection?" CIVICUS and Open Knowledge International. <http://papers.ssrn.com/abstract=2742871>.
- Janský, Petr. 2020. "European Banks and Tax Havens: Evidence from Country-by-Country Reporting." *Applied Economics* 52 (54): 5967–5985. <https://doi.org/10.1080/00036846.2020.1781773>.
- Jensen, Torben Elgaard, Andreas Birkbak, Anders Koed Madsen, and Anders Kristian Munk. 2021. "Participatory Data Design: Acting in a Digital World." In *Making & Doing: Activating STS through Knowledge Expression and Travel*, edited by Gary Lee Downey and Teun Zuiderent-Jerak, 117–136. Cambridge, MA: MIT Press. <https://doi.org/10.7551/mitpress/11310.001.0001>.
- Kohonen, Matti, and Francine Mestrum, eds. 2008. *Tax Justice: Putting Global Inequality on the Agenda*. London: Pluto Press.
- Lampland, Martha, and Star, Susan Leigh. 2009. *Standards and Their Stories: How Quantifying, Classifying, and Formalizing Practices Shape Everyday Life*. Ithaca, NY: Cornell University Press.
- Latour, Bruno. 1988. *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge, MA: Harvard University Press.

- Leaman, Jeremy, and Attiya Waris, eds. 2013. *Tax Justice and the Political Economy of Global Capitalism, 1945 to the Present*. New York, NY: Berghahn Books.
- Merry, Sally Engle. 2016. *The Seductions of Quantification: Measuring Human Rights, Gender Violence, and Sex Trafficking*. Chicago, IL: University of Chicago Press.
- Milan, Stefania, and Lonneke van der Velden. 2016. "The Alternative Epistemologies of Data Activism." *Digital Culture & Society* 2 (2): 57–74.
- Mourat, Robin de, Donato Ricci, and Bruno Latour. 2020. "How Does a Format Make a Public?" In *Reassembling Scholarly Communications: Histories, Infrastructures, and Global Politics of Open Access*, edited by Martin Paul Eve and Jonathan Gray, 103–112. Cambridge, MA: MIT Press.
- Munk, Anders Kristian, Axel Meunier, and Tommaso Venturini. 2019. "Data Sprints: A Collaborative Format in Digital Controversy Mapping." In *DigitalSTS: A Field Guide for Science and Technology Studies*, edited by Janet Vertesi and David Ribes, 472–496. Princeton, NJ: Princeton University Press.
- Pierre, Jennifer, Roderic Crooks, Morgan Currie, Britt Paris, and Irene Pasquetto. 2021. "Getting Ourselves Together: Data-Centered Participatory Design Research & Epistemic Burden." In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–11. CHI '21. New York, NY: Association for Computing Machinery. <https://doi.org/10.1145/3411764.3445103>.
- Poderi, Giacomo, Hanna Hasselqvist, Andrea Capaccioli, Cristian Bogdan, and Vincenzo D'Andrea. 2020. "Matters of Concerns and User Stories: Ontological and Methodological Considerations for Collaborative Design Processes." *CoDesign* 16 (3): 220–232. <https://doi.org/10.1080/15710882.2018.1557694>.
- Poirier, Lindsay. 2021. "Reading Datasets: Strategies for Interpreting the Politics of Data Signification." *Big Data & Society* 8 (2): 20539517211029320. <https://doi.org/10.1177/20539517211029322>.
- Retberg, Jill Walker. 2020. "Situated Data Analysis: A New Method for Analysing Encoded Power Relationships in Social Media Platforms and Apps." *Humanities and Social Sciences Communications* 7 (1): 1–13. <https://doi.org/10.1057/s41599-020-0495-3>.
- Rottenburg, Richard, Sally E. Merry, Sung-Joon Park, and Johanna Mugler, eds. 2015. *The World of Indicators: The Making of Governmental Knowledge through Quantification*. Cambridge: Cambridge University Press.
- Salesses, Matthew. 2021. *Craft in the Real World: Rethinking Fiction Writing and Workshopping*. New York, NY: Catapult.
- Seabrooke, Leonard, and Duncan Wigan. 2015a. "How Activists Use Benchmarks: Reformist and Revolutionary Benchmarks for Global Economic Justice." *Review of International Studies* 41 (5): 887–904. <https://doi.org/10.1017/S0260210515000376>.
- Seabrooke, Leonard, and Duncan Wigan. 2015b. "Powering Ideas through Expertise: Professionals in Global Tax Battles." *Journal of European Public Policy* 23 (3): 357–374. <https://doi.org/10.1080/13501763.2015.1115536>.

- Tax Justice Network. 2015. *The Greatest Invention: Tax and the Campaign for a Just Society*. Margate: Commonwealth Publishing.
- Venturini, Tommaso, Anders Munk, and Axel Meunier. 2018. "Data-Sprinting: A Public Approach to Digital Research." In *Handbook of Interdisciplinary Research Methods*, edited by Celia Lury, Rachel Fensham, Alexandra Heller-Nicholas, Sybille Lammes, Angela Last, Mike Michael, and Emma Uprichard. London: Routledge.
- Verran, Helen. 2021. "Narrating a Number and Staying With the Trouble of Value." In *The Data Journalism Handbook: Towards A Critical Data Practice*, edited by Liliana Bounegru and Jonathan Gray, 55–64. Amsterdam: Amsterdam University Press. <https://doi.org/10.2307/j.ctv1qr6smr.11>.

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