New Perspectives in Critical Data Studies: The Ambivalences of Data Power—An Introduction

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INTRODUCTION

We live in a time of increasing global, national, and local insecurity. Despite the promises of an ever more connected world enabled through digital platforms and infrastructures, conflict zones are spreading, displacing millions of people that feel forgotten and disregarded by the rest of the world. Despite an increasing amount of concrete data about the causes and

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consequences of climate change, policy actions have become less reliable, and the political will seems even less convincing. New analytic technologies promise a world in which practices become more personalised, yet the social world experiences newly formed inequalities, increasing the insecurity of different social actors. The idea of openness in the form of open government and open science is spreading globally, promising increased transparency, accountability, and participation, yet we see an unequal distribution of data ownership, published data sets, and civil society actors that actually engage with these data.

With increasingly globalised digital infrastructures and a global digital political economy, we face new concentrations of power, leading to new inequalities and insecurities with respect to data ownership, data geographies, and different forms of data-related practices. It is not only a concentration of power by a few corporations, but also a concentration of the availability in data on individual regions of the world. This includes (exerting) power over data (infra)structures and the processes of data creation, data collection, data access, data processing, data interpretation, data storing, and data visualisations.

Yet, data power is a highly ambivalent phenomenon. On the one hand—and this explains its "appeal"—digital data produces knowledge about society and social processes. For example, it is widely believed that digital data on urban mobility, energy consumption, and online shopping can help uncover patterns in human practice in order to make social processes "more sustainable", "more efficient", and "more reasonable". With such strident positivity, it is not only the utopia of the "Californian ideology" (Barbrook & Cameron, 1996, p. 44; Turner, 2006, p. 25) that resonates, according to which the use of digital technologies will "inevitably" (Kelly, 2016, p. 1) lead to a "better" life for all, digital data will allow for new ways of structuring social processes on the basis of self-organisation. On the other hand, we increasingly see the problems thrown up by digital data: It is used for surveillance (Andrejevic & Gates, 2014), on its basis new forms of capitalism become reality which are much more closely interwoven with everyday practices than earlier forms or stages of capitalism (Couldry & Mejias, 2019b; Zuboff, 2019), and inequalities and everyday racisms are reproduced in digital data (Eubanks, 2017; Noble, 2018), to name just a few of the most important points of discussion. The ambivalence of digital data can hardly be resolved, which is why we want to bring an argument to the fore with this book: It is crucial for critical data studies scholars and practitioners to address precisely such

ambivalences if they want to develop new perspectives for their own research and a credible critique of data power.

In this edited volume, authors attend to these ambivalences in three areas and in so doing provide new perspectives in and for critical data studies: First, the *ambivalences between global infrastructures and local invisibilities*. These contributions challenge the grand narrative of the ephemeral nature of a global data infrastructure and instead make visible the local working and living conditions, resources, and arrangements required to operate and run them. Second is the *ambivalences between the state and data justice*. These contributions consider data justice vis-à-vis state surveillance and data capitalism and reflect the incongruities between an "entrepreneurial state" and a "welfare state". Third is the *ambivalences of everyday practices and collective action*, in which civil society groups, communities, and movements try to position the interests of people against the "big players" in the tech industry. It is such ambivalences from which the contributions in this volume develop future perspectives for critical data studies. With this introduction, we want to make this argument of seeing data power in terms of its irreducible ambivalences in a pointed way to provide an orientation to the chapters of this book. To this end, we first give a brief outline of the development of critical data studies. As part of this outline we also want to situate the series of data power conferences, the most recent of which this volume is based on. This will then serve as a basis for taking a closer look at three areas of data power's ambivalences.

CRITICAL DATA STUDIES AS A FIELD: FROM BIG DATA TO THE COMPLEXITY OF DIGITAL DATA AND DATA INFRASTRUCTURES

The "transdisciplinary field" (Burns et al., 2019, p. 657) now called critical data studies has its origins in various disciplines of research on digital media and related infrastructures. In an incomplete list these include, among others, geography, media and communication studies, political science, science and technology studies, and sociology. The starting point for the emergence of critical data studies was the discussion about "big data": It was danah boyd and Kate Crawford (2012, p. 661) who raised critical questions against the increasing spread of sociotechnical imaginaries related to big data—imaginaries associated with a new "capacity to search, aggregate, and cross-reference large data sets". In their seminal article

they drew attention to how big data is changing our understanding of knowledge, how misleading understandings of objectivity might be spread by big data, the quality issues big data can have, and why neglecting the context surrounding such data can lead to critical consequences. A broad discussion around these questions began to emerge across the disciplines mentioned above. This involved epistemological questions (Crawford et al., 2014), questions of the corporate interests of data production (Couldry & Turow, 2014), the forms of governance that filter through such data (Elmer, Langlois, & Redden, 2015b), and the role of infrastructures in generating these data (Mosco, 2014; Kitchin, 2014), as well as the myths that circulate around the subject of big data (Puschmann & Burgess, 2014). In essence, this discussion can be summed up as a critique of the implicit assumptions around big data in parts of the economy (i.e. Anderson, 2008): By contrast to what is said in public discourse and the economy, big data are not simply the "new oil" that just has to be extracted, it is neither "raw data" (Gitelman & Jackson, 2013, p. 1) nor in any other way just given. Rather, such data are always "cooked" (Bowker, 2005, p. xx), meaning that data processing always takes place through certain power structures (Beer, 2016).

In this wider context, it was Craig Dalton and Jim Thatcher (2014) who coined the term "critical data studies" in their online article "What Does a Critical Data Studies Look Like, and Why Do We Care?". Their aim was to make clear that technology is never something "neutral" and is the reason for their calling to avoid anything even approaching "technological determinism" and developing a critical attitude toward expectations around big data. The term "critical data studies" was quickly taken up in the same year by Rob Kitchin and Tracey Lauriault (2014), among others, who added important arguments to the original proclamatory call for a critical perspective on big data. In particular, they asked for an enhanced theoretical anchoring of the field of critical data studies: "Rather than produce an extensive list of questions, we want to conclude by calling for greater conceptual work and empirical research to underpin and flesh out critical data studies" (Kitchin & Lauriault, 2014, p. 14).

Looking at the discussion with the benefit of hindsight, there were two concepts in particular that were important for the theoretical foundation of critical data studies: Coming more sharply from geography as well as science and technology studies, the concept of *data assemblage*; and coming, again, more forthrightly from media and communication studies as well as sociology, that of *datafication*. It is worth taking a look at both

concepts here to understand today's broad theoretical anchoring of critical data studies.

As an analytical term, assemblage was introduced by Gilles Deleuze and Felix Guattari to describe "complexes of lines" that build a "territoriality" (Deleuze & Guattari, 2004, p. 587). Assemblages in this sense are "wholes" characterised by the relations of exteriority. In terms that are closer at home in the social sciences, "social assemblage" refers to a "set of human bodies properly oriented (physically or psychologically) towards each other" (DeLanda, 2006, p. 12). As a concept, assemblage is widely used in actor-network theory, ultimately to capture the coming together of people and things in actor networks (i.e. Latour, 2007, pp. 16–17). It is against this broader context that the idea of *data assemblage* must be seen, a term that Kitchin (2014, pp. 24–26) in particular brought to the discussion and further developed with Tracey Lauriault. In essence, a "data assemblage" is defined as encompassing "technological, political, social and economic apparatuses and elements that constitutes and frames the generation, circulation and deployment of data" (Kitchin & Lauriault, 2014, p. 1). These include systems of thought, forms of knowledge, finance, political economy, governmentalities, and legalities, materialities and infrastructures, practices, organisations and institutions, subjectivities and communities, and (market-)places.

While data assemblage is a concept for describing certain sociotechnical relationships around data, *datafication* has not only a different origin, but also a different objective: It is about examining the processes associated with the rise and permeation of big data (logics). Critically reflecting on Mayer-Schönberger and Cukier's (2013) original arguments, José van Dijck (2014, p. 198) defined datafication as "the transformation of social action into online quantified data, thus allowing for real-time tracking and predictive analysis". This quote resonates with the double character of datafication's processuality. On the one hand, it is about the situated process of transformation, that is, about "translations" that take place when social processes are represented in data. These are complex, interest-driven processes that cannot be described simply as "digital reproduction" but, rather, as the sociomaterial construction of "data doubles" (Haggerty & Ericson, 2000; Ruppert, 2011) which must be understood as interest-driven technical articulations and not as 1:1 representations of people and their practices. Data do not provide a window on the social world and represent independently existing phenomena, the relationship with the social world they are meant to represent is recursive (see, e.g. Jarke &

Breiter, 2019). This recursivity may produce "new" and reproduce "old" inequalities or surveillance regimes but may also afford greater transparency and participation (Eubanks, 2017; Noble, 2018; D'Ignazio & Klein, 2020). On the other hand, then, datafication is about the transformation of society, how society changes when "online quantified data" become increasingly widespread (i.e. Iliadis, 2018, p. 219; Sadowski, 2019, p. 2). At this point, there exists a close connection with the discussion into the "deep mediatization" (Couldry & Hepp, 2017; Hepp, 2020) of society, an approach that critically describes the transformation of society with the increasing saturation by digital media and their infrastructures.

Anchored by both concepts—data assemblage and datafication—critical data studies is much more than just a reflection of the discourse around big data. Ultimately, critical data studies is concerned with the significance (and power) of digital data in contemporary society and how it relates to societal transformation. We can see this field of research as a response to the increasing spread of digital data and data infrastructures for decision- and meaning-making in various social domains. The fledgling history of critical data studies, then, is one of a broadening view—from big data in particular to digital data in general—and with it, the development of a sensitivity to the complexities and invisibilities of the sociomaterial figurations that operate global data infrastructures. This can be seen as the connecting line between the various current definitions of the field. Craig Dalton, Linnet Taylor, and Jim Thatcher argue that critical data studies "calls attention to subject formation within […] data regimes, for a critical examination of where the interpellation of the individual emerges in algorithmic culture" (Dalton et al., 2016, p. 1). Annika Richterich (2018, p. 2) points out that research in critical data studies "deals with the societal embeddedness and constructedness of data", while Andrew Iliadis and Federica Russo (2016, p. 2) argue that critical data studies helps "define the questions that inform epistemological frameworks around social issues related to data" and are a "formal attempt at naming the types of research that interrogate all forms of potentially depoliticized data science and to track the ways in which data are generated, curated, and how they permeate and exert power on all manner of forms of life".

Ever since critical data studies emerged as a transdisciplinary field, the methodological reflection on *how* to critically examine data power was key. Stemming from its various disciplinary roots, critical data studies has by now developed and appropriated a rich body of methods for researching and challenging data power. Precisely because of their critical orientation,

critical data studies have from the beginning opposed the naïve positivist methodology of many, especially commercial, data analyses (Couldry et al., 2016; Iliadis & Russo, 2016, p. 1). The idea was to set against such positivism a reflection of the epistemology behind it and a detailed description of people's data practices. In this sense, critical data studies called "for ethnographic and discursive work, for the thick description of data and the cultures around it, just as much as it relies on algorithmic analysis" (Dalton et al., 2016, p. 7). However, we would shorten the methodological discussion if we equated critical data studies with a particularly qualitative approach that positions itself "against" the quantifying idea of much "social analytics". At this point, it is well worth revisiting the original statement by Craig Dalton and Jim Thatcher (2014), because they already provided some insightful thoughts. In regard to the field of critical data studies, they argued for mixed methods approaches in which "big" and "small" data are "utilised in concert" (Dalton & Thatcher, 2014, p. 6). Even in this early reflection, it is not a question of positioning different methods against each other (Hepp et al., 2021) but, rather, of reflecting in an integrative way on which methods can contribute to a better, critical understanding of the construction of sociality by means of digital data. In addition to traditional qualitative research sensitivities, the roots of critical data studies in geography mean that many scholars brought their profound experience in analysing data relation to space along with critical approaches to spatial analysis such as counter-mapping (Dalton et al., 2016). Unsurprisingly, counter-mapping is also one of the examples that D'Ignazio and Klein (2020) provide in their book *Data Feminism*. Here, counter-mapping makes the *lack* of data on certain phenomena and groups of people visible and in so doing challenges dominant socio-political discourses.

Such a broad methodological orientation is also associated with adoption of "digital methods" (Rogers, 2013) and "computational social science" (Lazer et al., 2009) in critical data studies. Increasingly, it is a question of researching not only the social situatedness of data and data processing by means of qualitative methods, but also "digital traces" (Hedman et al., 2013) and digital data themselves. In doing so, critical data studies started to focus on the software and code, which is why so-called software studies (Fuller, 2008, p. 1) began to play an important role. Here a growing body of work builds on studies that explore how "software and code connect people, things, systems, places and events in a pervasive and sinuous fabric" (Mackenzie, 2013, p. 392). Scholars

investigate "digital code and software from a wide range of perspectives—power, subjectivity, governmentality, urban life, surveillance and control, biopolitics or neoliberal capitalism" (Mackenzie & Vurdubakis, 2011, p. 3). The characteristic of critical data studies, however, remained one of scepticism and reflexivity towards a naïve implementation of the computational turn within social sciences research—their attitude remains one of "tool criticism" (van Es et al., 2021, p. 46) against the digital tools we use for research. In doing so, many of the arguments in favour of "putting digital traces in context" (Breiter & Hepp, 2018, p. 387) were anticipated: The aim was not to see digital traces and data generated online beyond or outside their contexts, but to triangulate methods in a critical analysis in such a way that the social bondage of the digital becomes accessible. Among all of these concerns, critical data studies have always had a connection to what is called "action research" (Bradbury-Huang, 2010; Wagemans & Witschge, 2019): Their proponents have not been completely outside the domains of their research, but have always been involved with people affected by digital data collection and processing. This is the point where methodological reflections are important in regard to how to communicate critical research back to the actors within the field of data science, or even—as Gina Neff et al. (2017) suggest—to integrate them into joint research.

The *Data Power Conferences*—the last of which this volume is based on—and the publications associated with them were fundamental to the emergence of critical data studies outlined so far. In contrast to conferences funded by big tech, the first Data Power Conference[1] in 2015 provided a physical space for the emerging interdisciplinary community to meet and critically discuss questions about the kinds of power that are "enacted when data are employed by governments and security agencies to monitor populations or by private corporations to accumulate knowledge about consumers".[2] They observed that emerging forms of data mining and data analytics allowed for "new, unaccountable and opaque forms of population management in a growing range of social realms" and argued that this required critical scholars to investigate data power in relation to control, discrimination, and social sorting. The conference resulted

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[1] The first Data Power Conference was by Helen Kennedy, Jo Bates, and Ysabell Gerrard and hosted at the University of Sheffield (UK).

[2] The way the organisers described the conference can be seen at: http://datapowerconference.org/data-power-2015/about/ (accessed: 31.3.3021).

in a special issue of *Television and New Media* on *Data Power in Material Contexts* (Kennedy & Bates, 2017) that brought together media and communications scholarship concerned with datafication. The special issue featured five empirical studies that "ground the study of data power in specific, material contexts" and contributed to the overall aim of the first conference of bringing "together papers which analyze the operations of data power across a range of real-world domains" (ibid., p. 702). The research of the material contexts and everyday practices would allow for the questioning of social justice in a datafied world, data studies' "next phase", as the authors argued.

And indeed, the second Data Power Conference[3] in 2017 moved from a (stock-taking) analysis of increasing data power to questions about how agency and autonomy may be reclaimed in regimes of data power, how data may be mobilised for the common good.[4] The conference resulted in two special issues (Gerrard & Bates, 2019; Lauriault & Lim, 2019). Gerrard and Bates' collection attended to *tactics* for the opposition of data power (Lee, 2019; Currie et al., 2019), *access* to public data infrastructures for often marginalised social groups (Jarke, 2019; Scassa, 2019), and the social *shaping*, or *moulding*, of data (infrastructures) (Andrews, 2019; Iliadis, 2019; Mitchell, 2019). Lauriault and Lim's special issue followed the conference theme and focused on "the social and cultural consequences of data becoming increasingly pervasive in our lives" (Lauriault & Lim, 2019, p. 315), in particular on the "implications, biases, risks, and inequalities, as well as the counter-potential, of data practices and systems in various contexts" (ibid., p. 316).

In 2019, the third Data Power Conference took place at the University of Bremen.[5] The thematic focus of the conferences shifted again and considered the "global in/securities" of an ever-increasing data power.

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[3] The second Data Power Conference was organised by Tracey P. Lauriault and Merlyna Lim in Ottawa, at Carleton University (Canada) in 2017 in collaboration with the previous organisers, Ganaele Langlois, Scott Dobson-Mitchell, and Jessi Ring. http://datapowerconference.org/data-power-2017/about/ (accessed: 31.3.3021).

[4] Again, see the conference website for this: http://datapowerconference.org/data-power-2017/about/ (accessed: 31.3.3021).

[5] The third Data Power Conference was organised by the editors of this volume at the ZeMKI, University of Bremen, in collaboration with Andreas Breiter, Monika Halkort, and the organisers from the conferences at Sheffield (Kennedy, Bates, Gerrard) and Ottawa (Lauriault, Lim). For more information, see http://datapowerconference.org/data-power-2019/about/ (accessed: 31.3.3021).

Dealing with in/securities focus on the above-mentioned ambivalences of data power: On the one hand, the availability of data seems to open up new securities, not only for companies and state authorities, but also for individuals. The desire for such social security through digital data and the associated phantasies and myths of accessibility, knowledge, and controllability was made apparent by the COVID-19 pandemic in 2020 and 2021. The course of the pandemic was presented to all of us in public discourse through "dashboards" with automatically updated data on the spread of the virus or later the vaccination programs that followed; digital tools such as the various tracking apps or sales platforms were hailed as a great hope in managing the pandemic. Again, with the benefit of hindsight, we can see that these ideas of security were imaginary. On the other hand, therefore, during the pandemic data power was always also associated with insecurities: Who has control over the data? How secure is it? Are ethical expectations regarding the handling of one's own data fulfilled? The scepticism about various forms of data visualisation in data journalism on the pandemic or the scepticism held by many against the various corona tracing apps can be understood as an expression of these insecurities at the individual level.

The joint work on this book made it clear that behind the question of global in/securities lies a larger theme which has now given the present volume its subtitle: *The ambivalences of data power*. Digital data and infrastructures may open up many potentials that can be emancipative; at the same time, however, this data power has many negative elements that should not go unnoticed. To put it succinctly, the main thesis that emerged throughout the conference and in the subsequent discussion with and among the authors is that, if we want to develop new perspectives for critical data studies, it would probably be expedient to realise them starting from the fundamental ambivalences of data power.

Perspectives in Critical Data Studies: The Ambivalences of Data Power

There are three particular areas of data power's ambivalences, which are not always easy to grasp, with which we are currently confronted. These are, first, the ambivalences that exist in the area of global infrastructures and local invisibilities, second, the ambivalences that emerge in the area of the state and data justice, and, third, the ambivalences that take rise in the

area of individual everyday practices and collective action. Taking these ambivalences seriously opens up comprehensive perspectives for critical data studies.

The ambivalences in *global infrastructures and local invisibilities* are ultimately already embedded in the departure of big data as a social phenomenon. The kind of digital data we are dealing with today would not exist in its present form without the extensive engagement of the Big Five in Western companies (Amazon, Apple, Facebook, Google, Microsoft) or similar engagement by companies like Alibaba and Baidu in Asian countries (van Dijck et al., 2018, pp. 26–30; Hepp, 2020, pp. 19–30). For years, supported by an "entrepreneurial state" (Mazzucato, 2013)—which is itself interested in digital data for state surveillance (Greenwald, 2014; Lee, 2019)—these and other companies have built a globalised data infrastructure along their vested interests, serving a condition of "surveillance capitalism" (Zuboff, 2019) and "data colonialism" (Couldry & Mejias, 2019a). While these large companies are globally visible as "brands" and highly committed to emphasising their performance in building such a data infrastructure and the possibilities of exploiting this data for the "common good" of humanity (Webster, 2017), the local aspects of these infrastructures are sometimes decidedly invisible (i.e. Parks & Starosielski, 2015; Crawford, 2021). For example, Crawford and Joler's (2018) *Anatomy of an AI System* provides a detailed "anatomical map" of the human labour, data, and planetary resources required for the smooth operation of Amazon's Echo system. In her recent book, Crawford (2021) traces these networks or data assemblages in detail. Others have, likewise, pointed to the invisibility of the many workers in the Global South who operate global data infrastructures (Atanasoski & Vora, 2019; Gray & Suri, 2019; Qiu, 2016) and have argued how this invisibility increases the harms that the data industry inflicts upon them. In addition, scholars have argued the need to consider other invisibilities in the grand, global data infrastructure narrative: Namely, small businesses and initiatives that enable a connection to the globalised infrastructure (Arora, 2019), and the various local communities and forms of data activism (Chenou & Cepeda-Másmela, 2019). We are dealing with ambivalences of enablement through a global infrastructure, on the one hand, and the local invisibility, not only of relevant actors, but also of data power associated with this infrastructure on the other. These ambivalences can only be grasped beyond "data universalism" (Milan & Treré, 2019, pp. 319–322), that is, the assumption that digital data and infrastructures would be structured in

an identical way throughout the world and could, therefore, also be recorded scientifically as such. Contributing to these, new perspectives in critical data studies, this volume also comprises stories of invisible labour in (the shadows of) data power.

In Part I of this book, contributors examine a variety of new perspectives on critical data studies that arise from these ambivalences. "Data Power and Counter-Power with Chinese Characteristics" by Jack Linchuan Qiu discusses the ambivalences of data power and counter-power with Chinese characteristics. Starting with China's internal conflicts and its relations with the external world, this chapter argues for a more holistic and historicising approach to critical data studies. Making some of the hidden labour (and counter-power) in the Chinese data power narrative visible, he recounts the dire working conditions in the emerging Chinese digital market which drive suicides among workers (996.ICU, anti-iSlave). This chapter is followed by "Transnational Networks of Influence: The Organisational Elites of the Quantified Self and Maker Movements on Twitter" by Anne Schmitz, Heiko Kirschner, and Andreas Hepp on the pioneer communities of the Maker and Quantified Self movements. Drawing on a Twitter analysis, they are able to show how an organisational elite based in Silicon Valley curates these apparently grassroots movements across countries—and in the course of doing so promotes certain imaginaries of data power, some of which are close to the Californian ideology. In "The Power of Data Science Ontogeny: Thick Data Studies on the Indian IT Skill Tutoring Microcosm", Nimmi Rangaswamy and Haripriya Narasimhan use an ethnographic approach to investigate the "Indian IT skill tutoring microcosm". This chapter emphasises the importance of a "thick" ethnographic description for the future development of critical data studies: Only through such an analysis can the invisibility of various actors in the Global South be overcome in favour of a more differentiated understanding of the globalised conditions of data power. They report from India's growing data science work force and describe the data economy's possibilities for upward mobility. Data science here is understood as enabling and facilitating livelihood. Jonathan Bonneau, Laurence Grondin-Robillard, Marc Ménard and André Mondoux's chapter "Fighting the 'System': A Pilot Project on the Opacity of Algorithms in Political Communication" reflects on the interrelations between algorithmic governmentality, identity, and political speech. The legitimacy of election processes and social media's contribution to the public sphere are now being questioned and it is important to document and analyse these

new dynamics of political communication. In particular, they argue for the need to consider the role played by the automation of the production and circulation of political messages through the use of algorithms and artificial intelligence. Their chapter sets out a possible conceptual basis for such research. This first part of our book is concluded with "Indigenous Peoples, Data, and the Coloniality of Surveillance" by Donna Cormack and Tahu Kukutai examinig the relation of indigenous peoples, data, and the coloniality of surveillance. The authors explore the contemporary invisibilities of data colonialism from *within* indigenous frameworks of collective self-determination and collective rights. This includes, for example, resistance to surveillance through envisioning "data relations and data practices that are anti-colonial, relational and collective".

Part II of this book deals with the ambivalences of the *state and data justice*. As we have already seen, state or state agencies are in and of themselves highly ambivalent. It was the "entrepreneurial state" that made today's "surveillance capitalism" and "data colonialism" possible in the first place, and it has a vested state interest in digital data for surveillance purposes that only serve for their advancement. The Snowden affair in particular has shown how deeply involved the state is in current advances of surveillance (Greenwald, 2014; Lyon, 2014). On the other hand, the state also stands for the safeguarding of welfare, the balancing of interests, and public media, which, in the best-case scenario, can be a counterpart to the data power of globally operating technology corporations and a reference point for digital citizenship (Hintz et al., 2019). In such cases, the important questions surround the extent to which the state can secure and promote data justice as we move from the "entrepreneurial state" (in which neoliberal ideologies have a very contradictory position) to the "welfare state" and the new challenges it faces when it comes to data power (Dencik & Kaun, 2020).

Part II opens with "The Datafied Welfare State: A Perspective from the UK" by Lina Dencik which focuses on datafication and the welfare state. She advocates for a two-part argument about the ways in which data infrastructures are transforming state-citizen relations: On the one hand, by advancing an actuarial logic based on personalised risk and the individualisation of social problems (responsibilisation), and, on the other, by entrenching a dependency on an economic model that perpetuates the circulation of data accumulation (rentierism). In "The Value Dynamics of Data Capitalism: Cultural Production and Consumption in a Datafied World", Göran Bolin reflects on the value dynamics in data capitalism. He

sees a need for analytical models to understand the ambivalent complexity, scale, and dynamics behind the datafication of social life. In so doing, he offers a perspective that focuses on data as a value and he presents an analytical model to study the dynamics of data capitalism as part of the process of datafication. This is followed by "Mapping Data Justice as a Multidimensional Concept Through Feminist and Legal Perspectives" by Claude Draude, Gerrit Hornung, and Goda Klumbytė on operationalising data justice in information systems. Here the authors contribute to new perspectives in critical data studies by showing that data justice can provide a multidimensional, conceptual ground that serves both the needs of legal formalisation and feminist imperatives of contextualisation and specificity. In chapter "Reconfiguring Education Through Data: How Data Practices Reconfigure Teacher Professionalism and Curriculum", Lyndsay Grant argues that in-depth explorations of how educational data practices work "on the ground" are needed to understand the ambivalences around how data power works in education. Lotje Siffels, David van den Berg, Mirko Tobias Schäfer, and Iris Muis in their chapter "Public Values and Technological Change: Mapping How Municipalities Grapple with Data Ethics" turn their attention to "action research" as discussed in the last section of this introduction, in their case realised in cooperation with public authorities. They developed DEDA, a tool that allows civil servants to critically reflect and engage with the ethical dimensions of a datafied public sector. "Welfare Data Society? Critical Evaluation of the Possibilities of Developing Data Infrastructure Literacy from User Data Workshops to Public Service Media" by Jenni Hokka brings us back to questions of data power and the welfare state, but in this case with a special focus on public service media. Her endeavour is to take part in finding solutions for the ambivalences surrounding datafication as discussed across the chapters in the second part of the book. She presents a study from Finland in which public service media improved the data literacy of citizens and in so doing increased digital equality.

Part III of this edited volume deals with the ambivalences of *everyday practices and collective action*. Datafication has a lot to do with everyday life: It is the quotidian use of digital media through which people leave online traces that then constitute comprehensive data sets that companies draw upon (Elmer, Langlois, & Redden, 2015a; Amoore & Piotukuh, 2016). But it is also everyday practices through which globalised data infrastructures and digital media are appropriated. On the one hand, there is an emancipatory potential here for people in their everyday

lives—opportunities exist for individual empowerment through (self-generated) data (e.g. Gerhard & Hepp, 2018; Lupton, 2016; Neff & Nafus, 2016) or collective empowerment through open (government) data (e.g. Milan, 2017; Rajão & Jarke, 2018). On the other hand, these everyday practices are often associated with "resignation" (Draper & Turow, 2019, p. 1824), which results from the fact that the use of digital media is inevitably linked to the fact that companies and state authorities can use the data generated for their own purposes and that users can barely do anything about it. This resignation is not inevitable, however, because forms of "collective action" (Dolata & Schrape, 2015, p. 1) can emerge with reference to one's own everyday practices, which are directed against the hegemonic actors in the field such as "data activism", for example (Milan, 2017; Kennedy, 2018). The third and final part of this book deals with these ambivalences of individual everyday practices and collective action in relation to data power.

Part III opens with a contribution ("(Not) Safe to Use: Insecurities in Everyday Data Practices with Period-Tracking Apps") by Katrin Amelang on insecurities in intimate data practices relating to the everyday use of menstrual cycle apps. The ambivalence of this specific everyday data practice relates first to insecurities deriving from an endeavour to understand menstruating bodies with and through data (such as the trustworthiness of predictions). Second, the protection and privacy of data collected by period tracking apps are often insecure and wide open for third-party use. Amelang discusses the question of what "agential possibilities" datafication offers for people who menstruate from an everyday perspective. In their chapter, "Community Rankings and Affective Discipline: The Case of Fandometrics", Elena Maris and Nancy Baym argue that with platforms' increasing concentration of data power, critical data studies must attend to community-driven models of data and metrics. The fandom metrics phenomenon reflects larger anxieties about value, relevance, and power in increasingly metrified online spaces. Irina Zakharova, Juliane Jarke, and Andreas Breiter in "Affinity Spaces as an Analytical Lens for Attending to Temporality in Critical Data Studies: The Case of COVID-19-Related, Educational Twitter Communication", examine education-related Twitter communication during the COVID-19 pandemic through a hashtag predominantly used by German educators. They propose "affinity spaces" (Gee, 2005) as an analytical lens through which to attend to temporality in the analysis of Twitter communication. By following the changes of the affinity space in time, they are able to identify shifts in

topics and actors central to the affinity space (and the associated collective) and trace the practices through which these shifts unfold. Rather than understanding Twitter as a site for content redistribution and stable data assemblage, they follow the dynamics of problematisation in times of crisis by attending to the reconfigurations of an affinity space that allow for collective action.

While such studies analyse the everyday level of datafication and outline perspectives of critical data studies in exploring the complexities involved, the following chapters emphasise the need for a differentiated engagement with collective action in relation to data and datafication. Sigrid Kannengießer, in her chapter "'Party Like It's December 31, 1983': Supporting Data Literacy at CryptoParties" examines how civil society initiatives such as CryptoParties provide revealing insights into how different actors critically reflect on the challenges of datafication and how they try to shape datafication. Through reconstructing the perspective of the actors involved, we not only learn about the challenges of datafication, such as different privacy risks in online communication, but we can also (critically) reflect on solutions that are developed and practised with the aim to create a more "data just" society. Robin Steedman, Helen Kennedy, and Rhianne Jones, in their chapter, "Researching Public Trust in Datafication: Reflections on the Deliberative Citizen Jury as Method" are interested in questions of public trust in data-driven systems through deliberative citizen juries. Through this example, they call for greater reflection into methods in the field of critical data studies. Jo Bates, Alessandro Checco, and Elli Gerakopoulou in, "Worker Perspectives on Designs for a Crowdwork Co-operative" draw attention to the labour of workers from crowdwork platforms and illuminate "structures of labour exploitation that many contemporary AI systems are dependent upon, and ask—with workers—how might these labour conditions be improved". The authors propose the idea of a crowdwork co-operative which would make workers more visible and collectively enforce better working conditions. This last part of the book concludes with "Counting, Debunking, Making, Witnessing, Shielding: What Critical Data Studies Can Learn from Data Activism During the Pandemic" by Stefania Milan on data activism in the post-COVID-19 world. This chapter explores data activism as a counterforce to the predominant state of data power, takes stock of its most recent evolutions, and identifies pathways for critical data studies in a post-pandemic world. It singles out three challenges for data

activism in this world, namely the question of infrastructure, the diffusion of data poverty, and the scarcity of digital literacy.

As we have seen, issues of data power are highly ambivalent. They can open up opportunities, but they can also limit others; they are characterised by inequality, exclusion, and even exploitation. At its core, critical data studies is about addressing the ambivalences of data power in order to arrive at a better understanding of the role played by digital data and infrastructures in our societies today. The transdisciplinarity and openness of the field is certainly not a limitation but, rather, a great opportunity: It is precisely in this way that critical data studies can consistently succeed in integrating necessary knowledge from very different disciplines into critical engagement with digital data. In this way, critical data studies provides an extremely important contribution to the current social science discussion on today's transformation of society. We hope that with this volume we will be able to contribute to the continuation of this discussion.

* * *

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