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Published online: 28 Feb 2024.

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Who cares about data? Data care arrangements in everyday organisational practice

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ABSTRACT

The increasing datafication of social life has led to a growing body of research on data work which focusses on new data practices like self-tracking, new professions like data analysts or new occupational roles. In these new types of data work, people develop strong affective relations to data, and caring for data (quality) is key. This attention to 'spectacular' data work however leads to an important oversight: Much of the data work in everyday organisational practice is done by workers 'somehow', in addition to and alongside their existing tasks. This article sets out to better understand this mundane data work. It asks: *Why and how do people in organisations care for data?* Based on two qualitative case studies, we present the concept of *data care arrangements*. Data care arrangements are configured through the ascription of values to (specific) data sets *and* the work of generating, maintaining, and repairing data. This data care work is not necessarily homogeneous in organised settings but can become stabilised in data care arrangements. Thus, the notion of data care arrangements underlines that data in everyday organisational practice are not an object of care per se, but that data care is an accomplishment.

Introduction

In this article, we introduce the concept of *data care arrangements*. We conceptualise data care arrangements as sociomaterial configurations of different members of an organisation, technical infrastructures, organisational routines, and practices around common matters of data-related care work. In doing so, we present an approach to data work that attends to its mundane nature and acknowledges the often conflicting and heterogeneous care obligations in datafied organisations. We demonstrate that recognising the constitution and differences of data care arrangements is crucial for understanding the challenges of everyday data work. Rethinking data work in this

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way, is an important step towards 'demystifying how digital data is constituted in situ' (Pink et al., 2018, p. 1), towards acknowledging that 'all data are local' (Loukissas, 2019).

With our paper, we contribute to existing research about *data work* in organisations that emphasises the often invisible, undervalued or underestimated labour involved in making data-based technologies work (e.g., Beaulieu, 2022 Pine & Bossen, 2020; Pink et al., 2022; Ruppert & Scheel, 2021). In this literature, scholars study work practices related to the creation, collection, management, curation, analysis, interpretation and communication of data–hence all 'practices and processes involved in making data useful and meaningful so that organisational aims of becoming 'data-driven' or 'data-informed' can become real' (Pine et al., 2022, p. 1). While data work was originally understood as the work of specialised professionals such as data scientists (e.g., MacKenzie, 2013), this work is increasingly carried out by people who are not specifically trained for working with data. In some fields, scholars have noted the emergence of new data-related occupations. For example, in healthcare a new profession of medical scribes takes over data work related to electronic health records (Bossen et al., 2019). In most other cases, data work is added to existing responsibilities and tasks of members of an organisation. This work happens in instances of 'everyday automation' of workplaces and in the 'ordinary mundane realities' of people's encounters with data and digital technologies at work (Pink et al., 2022).

In feminist STS, an interesting body of scholarship has extended research on *care work* (e.g., Tronto, 2013) and evolved conceptually around care as an ethico-political obligation and a sociomaterial practice. Here, care as an *ethico-political obligation* is understood as a vital human disposition to make the world as good to live in as possible (Puig de La Bellacasa, 2011, 2012, 2017). However, scholars have also noted the 'dark sides' of care (Martin et al., 2015). For example, care may be perceived as paternalistic or controlling (Held, 2018; Khader, 2011). Care as a *sociomaterial practice* can be understood as 'persistent tinkering' in a world full of ambivalences and shifting tensions (et al., 2010, p. 14). 'Good care' can then be understood as both a bodily practice and the configuration of *sociomaterial care arrangements* in which care work is distributed amongst human and non-human entities (Criado & Rodríguez-Giralt 2016). Caring alongside and through technologies involves the adaptation and adjustment of practices to find 'a suitable arrangement (material, emotional, relational)' (Winance, 2010: 111).

In this article, we develop the concept of data care arrangements by drawing on both, the literature on data work as well as the literature on care arrangements. We ask: *Why and how do people in organisations care for data?* We demonstrate that while the concept of data work offers an umbrella term for data-related practices, data care arrangements sensitise us to the *heterogeneous*, situated, and reoccurring ways in which data get produced and tailored. In so doing, we understand the care for data as an *accomplishment*, as something that cannot be taken for granted, and argue that different data care arrangements in organisations evolve because social actors producing and processing data *ascribe different values* to data. In this process, data may become matters of care.

The paper is structured as follows. First, we review the current literature on data work in organisations and present our concept of data care arrangements. This includes a presentation of different kinds of values that people may ascribe to data and that guide their orientation towards data and the data work required of them. Subsequently, we present two case studies that demonstrate how – in the context of organisations – managers aim

to configure data care arrangements so that those 'working on the ground' produce high quality data that serve specific organisational purposes. The first case study in youth welfare services reconstructs different data care arrangements evolving around the expectation of social workers producing evaluation data. In the aggregated form that is accessible to the management, the differences in data work become black-boxed; the only visible indication is the low data quality of the dataset, i.e., highly fragmented data. In contrast, the second case study about data work in secondary education shows a data care arrangement that leads to less fragmented data, being composed of two interlocking and stable data care arrangements that are connected to each other and secure a reliable stream of data between school and ministry.

Our case studies counter the widespread perception that data are a by-product of organisational work that are produced 'anyway' which is – amongst others – fuelled by narratives about data as a resource that simply needs to be harvested or extracted for further use and value creation (Stark & Hoffmann, 2019). Rather, our case studies demonstrate the mundane and heterogeneous arrangements of everyday automation. We close with a discussion on the contribution of data care arrangements to the existing literature. Overall, we argue that data care arrangements are important to understanding everyday organisational life in a datafied world. Data care arrangements are configured through the ascription of values to (specific) data sets *and* the work of generating, maintaining, and repairing data. This data care work is not necessarily homogeneous in organised settings but can become stabilised in data care arrangements. Thus, the notion of data care arrangements underlines that data in everyday organisational practice are not a matter of care per se, but that data care is an accomplishment.

Literature review

Data work in organisation

The transformation of many workplaces towards a substantial reliance and embedding of digital technologies was something that Shoshana Zuboff pointedly analysed in 1988 in her ground-breaking book 'In the age of the smart machine: The future of work and power'. In the book, she examined the ways in which information and communication technologies (ICTs) were and would continue to transform work practices and professional identities across industries and domains. A public domain, in which the resulting tensions of this 'informating' of the workplace could be found relatively early was healthcare. Here the 'messy' and 'ad hoc' nature of health care work stood (and stands) in stark contrast with the 'formal, standardized and 'rational' nature of IT systems' (Berg, 1999, p. 87). Studies on the datafication of health (Hoeyer & Wadmann, 2020 Ruckenstein & Schüll, 2017) showed that especially with the increased interest in open or secondary uses of data, data work comes with high expectations on innovating work practices.

In recent years, the *datafication of social life* has further accelerated the 'entanglement' (Orlikowski & Scott, 2008) of data-driven technologies and work practices in organisations. The concept of data work allows researchers to pay attention to the often invisible or underestimated role of labour involved in making data-based technologies work (Beaulieu, 2022 Pine & Bossen, 2020; Pink et al., 2018; Ruppert & Scheel, 2021). Studies

in the health sector showed that instead of outsourcing data work, organisations like hospitals face internal increases in data work that come with electronic patient records and an increase in using patient data for secondary uses. For example, in many hospitals, doctors and nurses experience an increase in 'meaningless work' (Hoeyer & Wadmann, 2020) due to rising expectations to produce data. However, some organisations decide to provide extra staff, like medical scribes whose work centres around the synchronisation of data and their quality. Such evolving new data-based professions assume the responsibility for data care as part of their professional identity (Bossen et al., 2019). Besides introducing new supportive and often low-status professions, another strategy for organising data work is specialisation. Here high-status data workers overtake advanced data analysis, often in their own departments (Dorschel, 2021). These studies provide important insights into the heterogeneity of constellations in which data work is accomplished in organisations. However, how the everyday and mundane data work in many types of organisations is carried out is still poorly understood.

To address this, we need a realistic perspective on how data work happens 'on the ground'. We need to study typical, less 'spectacular' settings (Pink et al., 2022, p. 1) – settings that are ordinary for many people working in organisations: Having to deal with increasing expectations to data work while at the same time, neither being exclusively hired to deal with data nor being equipped with additional resources or being involved in scientific careers. In contrast to scientists in laboratories or specialised professionals in other types of organisations, who develop strong emotional and attentional engagements in caring for data (Pinel et al., 2020), a large workforce is confronted with expectations to care for data (quality) without an actual incentive.

Data valences for everyday automation and data care

In line with the call for *interpretative work* done by everyday encounters with data (Saifer & Dacin, 2021), members of an organisation have to attribute *meaning and value* to their data work. They need to care *about* data in order to care *for* data. Therefore, *data care and the values ascribed to data* constitute each other: by *doing* data care work, 'data are made meaningful and valuable' (Pinel et al., 2020, p. 192).

Hence, values ascribed to data play a crucial role for how people relate to data. These values are important to how workers become 'enrolled' (Callon, 1984) in data care arrangements and how their data work comes to be stabilised in data care arrangements. It is important to note that the valorisation of data alone is a necessary but insufficient element of data care work. In the analysis of how people relate to data by ascribing value to them, the concept of data valences introduced by Fiore-Gartland and Neff (2015) and Medina Perea (2021) sensitises us to the broad spectrum of meaning-making about data as a matter of care. Fiore-Gartland and Neff introduced the notion of *data valences* to characterise expectations towards 'data`s function and performance in different social settings and for different communities' (Fiore-Gartland & Neff, 2015, p. 1480). They reconstruct six such data valences:

- self-evidence: data are premade and understanding data is effortless,
- actionability: data drives something or sets of actions,
- connection: data as fostering conversations,

- transparency: benefit-oriented understanding of sharing data,
- truthiness: truth is affectedly assigned to quantitative data, and
- discovery: data generate hypotheses and allow theory testing.

Medina Perea ([2021](#)) showed that vanguard, the possibility to self-identify and position oneself as vanguard through data work, is an additional common expectation towards data. In line with these authors, we understand data valences as an open concept, sensitising us to the heterogeneous meaning makings about data as a matter of care.

Building on the works of Puig de La Bellacasa ([2017](#)) and Mol ([2008](#)), we propose the concept of *data care arrangements* to understand how ambivalent – and oftentimes conflicting – mundane data work is enacted, challenged and stabilised in organisational settings. Because of the *distributed* nature of care work *typical tensions* are likely to occur in mundane data work in organisations: driven by the division of labour in organisations, conflicts about which matters are deserving of care are not surprising. In addition to this horizontal differentiation, hierarchical tensions arise: those who plan ambitious data uses do not necessarily care about its production nor necessarily have knowledge about the complexities of data generation (Schildt, [2020](#)). Additionally, asymmetric relations between organisations, e.g., inspection, can become relevant when data is expected to flow between organisations (Jarke et al., [2022](#)).

In the two case studies we present below, doing data work is a common and reoccurring task. However, for making sense of the heterogenous ways in which data work is done in both cases, we needed a more differentiated way of describing differences in mundane data work. In an iterative process of analysing our empirical data in terms of forms of and motivations for reoccurring data work, we developed the notion of data care arrangements to describe why and how people in organisations do mundane data work. The notion of data care arrangements allows us to 'zoom in' (Nicolini, [2009](#)) on the plurality of everyday organisational data work and gain access to the different ways of relating to data as a matter of care while facing competing care obligations.

Zooming into mundane data work: data care arrangements in youth welfare services and schools

To explore data care work in everyday organising, we present different configurations of *data care arrangements* through two case studies of public sector organisations. In the first case study, a new evaluation tool is introduced in a youth welfare service. This leads to *evolving and diverse practices* of data care within *multiple data care arrangements*. The second case study is situated in the education domain. It presents *two stabilised data care arrangements* that secure a reliable stream of data on lesson cancellation between schools and ministries of education. In both cases, the data care work of frontline workers is guided by data valences. However, the differences in the values ascribed to data and their alignment with organisational goals play a key role for how data care arrangements come to be configured.

The empirical insights of the first case study stem from the ethnographic study 'Digital Cases'. The data was generated in a multi-sited ethnography over the course of 11 months from 2020 to 2022 in a youth welfare service in a major German city with regional services sharing information and case-processing software: IMPACT.[1] Fieldwork included

ethnographic visits to multiple regional teams and frontline workers using IMPACT, visits to in-house teaching about IMPACT, and participation in a leadership workshop on IMPACT data. The empirical insights of the second case study stem from the project 'DATAFIED - Data For and In EDucation', which conducted a qualitative study on the digital transformation of the organisation of teaching and learning between 2018 and 2022.[2] It included interviews with school managers, secretaries, timetable planners and teachers in eight German secondary schools, as well as interviews with developers of school information systems and school inspectors in four federal ministries of education. In addition, the project team analysed software documentation and organisational documents such as educational data infrastructure maps and legal documents.

Case study 1: heterogeneous and coexistent data care arrangements: evaluative data about the efficacy of youth welfare service

In this case study, anticipations about the potential of the datafication of social work are articulated through the introduction of a new tool: IMPACT[3], an instrument integrated into the existing IT infrastructure to evaluate the impact of the services provided by social workers. The related data work to produce and process these data piles up directly at the frontline. Social workers have to respond to the managerial expectations of intensifying their data work without the opportunity to delegate proportions of this work to other members of the organisation (e.g., secretariats). The introduction of IMPACT was of high political importance, as the costs of providing youth welfare services increased within the last years in nearly every municipality in Germany (Fendrich et al., 2018). Nevertheless, when IMPACT was introduced and made mandatory, how the data about social work was to be used was not specified. However, the expectations towards IMPACT data on the managerial level were high. In the following, we describe the heterogeneous data care work that emerged with the introduction of the system. The differences resulted in multiple data care arrangements that coexist among frontline workers without being officially acknowledged on the managerial level.

Data valences on the managerial level

Although frontline workers participated in IMPACT's design, the tool's initiative was political, aiming to 'open the black box' of social work. In Germany, social support and assistance can be provided for parents and young people if it is needed and appropriate for a young person's upbringing (Witte et al., 2019). Frontline workers therefore, assess each case individually in consultation with parents and young persons and develop a Care Plan ('Hilfeplan') – a roadmap that states the problems that are going to be addressed, the aims of the chosen social support, its duration and the provider that delivers the service (Hitzler & Messmer, 2010). In this process social workers have considerable discretion about the definition of problems, needs and forms of support. The latter can range from rather expensive measures like a permanent placement in institutional care to cheaper forms like family counselling for 4 hours per week for up to three months. It is at the discretion of every municipality to decide upon their spending. IMPACT was however an initiative driven at the federal level.

The managerial level ascribed the valences of *discovery, truthiness* and *actionability* to IMPACT data. In our fieldwork, this became (amongst others) articulated in a small and

informal leadership workshop that included a statistician, a leader of a local youth welfare service and a leader of the IMPACT initiative. In the group discussion, all three participants agreed on the valences of discovery and truthiness, referring to data as a representation of (effective) social care measures. By using IMPACT data, one could finally 'see what kind of social support [for families and children] actually works' (statistician in leadership workshop). All three ascribed valences are strongly related to the continuous challenge of the social work domain to prove its effectiveness to policymakers and the public. The anticipated datafied proof through IMPACT was seen as a possibility to legitimise and defend the rising costs of social work:

> Of course, we are monitored, especially by the financial administration. They do have a point when they say: 'Well, if you have trouble with your data, then we might introduce impact-driven budgeting'. They do push us with their calculations, and they have a fair point. That's why we have to engage in making our data basis viable and good.

> (statistician in leadership workshop)

In addition to this general push towards (more) data-driven decision making in the social service domain, IMPACT data was also perceived as a means to demonstrate *being in the vanguard of innovative data use*. In contrast to the majority of social workers, the leader of a local youth welfare service underlined that the managerial level was already aware of the growing importance of extended data analysis. IMPACT was seen as a way to realise innovate ways of using data and to overcome the current inferiority of data use in the social services and its reliance on 'prose' (statistician in leadership workshop).

However, the clarity and enthusiasm for the values which the management ascribes to IMPACT was in stark contrast to the relatively little attention it devoted to the actual required data work by frontline workers. The leader of a local youth welfare service explained:

> [I]t was somehow clear that, at the end of the day, the caseworker will enter the data – but what resources he can use or who is actually doing the final assessment [in IMPACT], who is filling out the form, who is sending the form out [to the parents, the child, and the social worker], who is doing the entries of their replies … also, when the forms come back, they have to be digitised again. All these questions are still open; they are not on the agenda at the moment.

Hence, the data work to produce the data required for IMPACT was of little priority to the management and merely considered as 'petty aspects' (*Kleinklein*) of the overall endeavour.

Multiple data care arrangements on the ground

This undervaluing and neglecting of the 'petty aspects' (a.k.a. who is actually taking care that the required data is produced in 'good enough' quality and through which means) was mirrored in the way IMPACT was introduced at the frontline. Although IMPACT became integrated *technically* into the digital infrastructure of the social workers, no formal instructions of exactly *how* the data work was to be done were provided. The values of discovery, truthiness and actionability clearly assigned to IMPACT data at the managerial level were scarcely recognised at the frontline. A social worker who engaged in

peer teaching about IMPACT asserted: '[w]ith IMPACT data, we want to make visible that our work actually makes a difference'. Several participating social workers reacted annoyed as they saw the increasing workload related to IMPACT in the context of already high formal demands to documentation ('another time-consuming procedure'). The management's demand to care about and for (ever more) data hence stood in conflict with other obligations of case work.

In the following, we present how different and incommensurable data care arrangements emerged. In each of them, selections and prioritisations at the frontline level that weighed the care obligations for IMPACT data with competing matters of care can be traced. A common arrangement was a selective and pragmatic approach to IMPACT data. In this arrangement, only data that is ready at hand is entered into the system. In most of the cases, this is simply the evaluation of the social worker, the fields for the perspectives of the client, parents and the actual providers of social help are often left blank. Here, caring about and for data is restricted to what is *feasible* vis-à-vis other (and more established) care work.

A second data care arrangement towards IMPACT is extensive but, at the same time, protects (cares for) a specific core interaction of social work: the Care Planning Conference. This arrangement ensures that IMPACT data is produced while also protecting the fragile setting of Care Planning Conferences. To do so, every stakeholder needs to submit their data (in print) prior to the Care Planning Conference. In the first step, the social worker announces the questionnaire to each participant before sending it by post so that it does not arrive unexpectedly or is overlooked. Social workers have to keep track of the return of the questionnaires and issue reminders in order to collect all questionnaires in time.[4] In this extensive and protective data care arrangement, much effort is devoted to *not* asking the participants *in* the Care Planning Conference to fill out the evaluation. The reason for this resource-intensive workaround is that social workers avoid the addition of a highly controversial topic to an event already charged with tensions. Care Planning Conferences are not sociable or routine interactions, especially for parents and young people they pose rare possibilities to jointly meet with all relevant support workers. Sensitive and often contentious family and individual problems are negotiated here, with many latencies, unequal articulation competencies and differing viewpoints on the success and progress of the case (Hitzler & Messmer, 2010). Thus many social workers consider the integration of IMPACT data work in this setting as highly inappropriate, counterproductive and careless.

In a third common way social workers deprioritise IMPACT data and distance themselves. Here no data care arrangement emerges, IMPACT data is simply not entered, often because the openness of use is perceived as a devaluation of frontline workers' scarce time resources. Interestingly, this informal practice of not caring for IMPACT data did *not* imply that data was overall a little matter of care. Case workers that rejected the engagement with IMPACT data indeed engaged in data care that was perceived as closer to their actual professional core, for example, when new assessments of a case had to be made, and the care plans had to be adjusted.

Data quality and data care practices around impact
Overall, the valences attributed to data on the managerial level anticipated IMPACT data as 'a given' rather than an accomplishment that has to be created and maintained by

someone under conditions of competing obligations, time pressures and scarcity of attentional resources. However, at the end of the rather enthusiastic exchange about the values associated with IMPACT data during the leadership workshop, the problem of data quality arose: The quality of IMPACT data was characterised as 'Swiss cheese' (leader of a local youth welfare service) because in less than 50% of the cases, data was provided at all and in many cases, data points were missing. This 'problematic data quality' was rooted in the different data care arrangements on the ground. However, the differences in how social workers relate to data, the values that they ascribe to data and how this subsequently informs their everyday data work are invisible in the final dataset. It is hence not sufficient to ascribe values to data in order to ensure data quality. For data care arrangements to deliver 'good enough data', care needs to be given to the so-called 'petty aspects' of everyday, mundane data work.

Case study 2: interlocking data care arrangements about lesson cancellation data in education

In contrast to the heterogenous data work described in case study 1, the second case study illustrates data work within two interlocking data care arrangements that secure a reliable stream of data on lesson cancellation between schools and ministries of education.

Educational data on lesson cancellation

In Germany, K-12 education is under the authority of the federal states' ministries of education (MoEs). In each of the 16 federal states the MoEs operate their own school management information systems (SMIS). These are usually developed in-house and provide interfaces to other educational technologies such as learning management systems (e.g., itslearning, Moodle) or timetable planning (e.g., Untis). These systems are not only meant to facilitate the organisation of teaching and learning in schools but are an instrument for school governance. Federal ministries of education receive data about school performance which inform their actions. However, far from being a by-product of organisational processes, a substantial amount of additional labour is required to produce the data the MoEs request.

For the purpose of this paper, we focus on data about lesson cancellation. The process of producing, processing, and using data about lesson cancellation is particularly interesting because it involves a wide variety of actors and levels in the individual schools (teachers, secretariats, school management), in the authorities (statistics departments, school inspectorates), but also policymakers and the media. Furthermore, the significance of data concerning lesson cancellations in the education system has been growing, with increasing political implications. The media and the public consider it the state's responsibility to provide for the education of pupils, which essentially includes the provision of sufficient subject-specific teaching. In light of the growing focus on output performance, the relation between lesson cancellation and poor evaluations of learning outcomes has become ever more important. Policy makers are accountable for the use of public tax money, and state governments regularly have to justify cases of high lesson cancellation numbers. In addition, pressure is also exerted by parents and guardians who have a particularly strong interest in ensuring that their children receive a good education and reliable supervision.

Taken together, there is an explicit need by ministries of education to receive reliable and high-quality data about lesson cancellation. How this plays out in each of the federal states that we researched differs however in relation to what counts as lesson cancellation (e.g., substitution by pedagogical employee rather than teacher), the ways in which the ministries of education receive data (e.g., data format), and the frequency in which data are provided (e.g., weekly, monthly or biannually) (for more on these differences, see Jarke et al., 2023)

Data valences and data care arrangements for lesson cancellation data

In the following, we describe two relatively stable data care arrangements that co-exist within and across schools and their ministries of education. Each data care arrangement is constituted through its own set of data valences which guide the data work of school actors: one as part of data work associated with timetable planning and one around the provision of cancellation data to the ministries of education. An important aspect of these two data care arrangements is that the data used by ministries of education is by no means a mere by-product of the activities of timetable planning but requires dedicated translation by school management. In the following, we demonstrate how different data valences are guiding the respective data work and configure data as a matter of care.

Data care arrangements of timetable planning

Within the data care arrangement of timetable planning, data about lesson cancellation are understood as *self-evident*. If a teacher is inhibited from giving a lesson (e.g., because of sickness or other commitments), the person responsible for timetable planning seeks a substitute and documents any changes in the timetable system. These timetable changes used to be displayed in written form on public display. More recently digital solutions are used that inform pupils and their guardians about any changes before they leave their houses in the morning. Here data derive their value from being understood as self-evident: the timetable planner seeks to inform pupils and guardians early about any changes. In addition, there are two further values ascribed to data which guide the way in which data work is performed: data's *action-ability* and *discovery*:

> And now we have recently introduced that the children also have access [to the digital time-table tool]. However, they have very little access. That means they only see the timetable of their class, not even which teachers are teaching it. That was important for data protection reasons so that the children can't see all the teachers' absences and teaching times. That means they see 'Sport, Thursday, first block cancelled' and then they can stay at home. That means we don't do phone chains or anything like that anymore.
>
> Timetable planner, federal state 2

The reason for carefully pseudonymising this data is that it would otherwise provide information about teachers' absences. The affordance of data to *discover* was used by parents to *act upon* data and – for example – complain about specific teachers. School actors (in particular timetable planners and school management) assumed the responsibility to configure the school's data entries in a way that only a limited set of actions is

possible. Hence the data valences of actionability and discovery shape the data work of timetable planners into carefully administering how data are displayed for guardians.

Data care arrangements of lesson cancellation data

The second data care arrangement is configured as a data flow between the ministries of education and schools. It involves that the lesson cancellation data sent from the schools are regularly monitored; that schools with unusually high lesson cancellations are contacted promptly and that the data is eventually made public. However, this stability rests upon the fact that data sent to the ministry are carefully prepared. In federal state 3, data about lesson cancellation are sent weekly to the school ministry. A school manager from this state reports that before they send off data, they always discuss it within the management board in anticipation of an incoming call. If the data represent a high number of cancelled lessons, schools are contacted by the ministry.

> And lesson cancellation: Every Friday, we have to press the button on our program and report the cancellation numbers to the authorities, and if they are bad, we get a call a few days later, and then they ask: Why are so many lessons cancelled? So there is very close control.
>
> (School management, federal state 3)

Similar to the first data care arrangement, data about lesson cancellation are understood to be *self-evident*, allow for *discovery, connection* and *actionability*. How these values are perceived to cohere is encapsulated in the quote of a project manager in the ministry:

> At the end of the day, it is the job of the [department] to see what distinguishes schools that are doing well from schools that are not doing so well. That is the idea behind it. And yes, of course, we already provide a lot of data for that.
>
> (Project manager ministry, federal state 2)

The managing director of a commercial partner company, which works in cooperation with several federal states, considers how data enable educational actors to measure educational 'quality' and subsequently act upon those measures:

> At the end of the day, you need some kind of metrics that can measure the quality you currently have. It doesn't matter if it's good or bad, but you need something measurable. And then I can start working to improve the quality. But especially when I think of quality in relation to schools, it's really directly measuring what does quality mean at school? So in reality it is relatively low-threshold, yes, that I have such data, but then at least I have data with which I can work. And that is what is quite simply interesting for authorities and then for politicians.
>
> (Managing director of a partner company, in the context of federal state 2)

This quote encapsulates the idea that data about schooling allow ministries of education and policy makers *to act upon* data. As D'Ignazio and Klein (2020:, p. 97) argue: 'what gets counted counts'. Or as the head of department in the ministry of education in federal state 1 argues:

> They (the department of quality assurance) issued the quality framework and will have thought long and hard about why they took these quality areas with this data in particular, in order to then recognise how the school should be further developed.

In this line of argument, data need to be produced and processed in a way that allows for desired actionability to unfold (e.g., policy responses) while at the same time suppressing undesired actions (e.g., parents tracking teachers' absences). Eventually, the publication on data portals is connected to yet another data valence: *truthiness*. With this valence, 'people expect data to comprise a single, objective representation of a measurable reality' (Fiore-Gartland & Neff, 2015) which subsequently allows for *discovery*.

Competing values and their stabilisation in data care arrangements

The data work described above, can be considered as embedded in data care arrangements that encourage school actors to care for specific qualities of their data. This data work can be considered as care(ful) in a double sense: (1) it aligns with values ascribed to data and demonstrates an 'ethico-political commitment' (e.g., Puig de La Bellacasa, 2011, 2017) of educational actors, and (2) it can be understood as a situated material practice that involves 'practical tinkering' or 'attentive experimentation' (et al., 2010) (e.g., the ways in which timetable planner make cancellation data available to students and their guardians or the ways in which the school management prepares their cancellation data for the ministries of education) in order to achieve suitable data care arrangements (e.g., serving the needs of students to know about cancelled lessons while at the same time protecting the privacy of teachers).

Hence both data care arrangements can be considered as (1) sites of continuous tinkering and reconfiguration and (2) as articulations of normative care dispositions through their assigned data valences. For example, in the first arrangement of timetable planners, teachers, a digital timetable software, pupils, and their guardians, data about lesson cancellation are understood as self-evident while at the same time, certain actions (e.g., parents tracking teachers' absences) are undesired. In order to ensure that the data care arrangement respects both, *local tailoring* is necessary. The timetable planner carefully produces and processes data in order to ensure that parents and pupils only see a pseudonymised version. In the second data care arrangement which builds on top of the first, schools are carefully translating their data before providing data about lesson cancellation to the ministries.

Discussion: on the importance of attending to mundane data work

Both case studies demonstrate the increasing datafication of everyday organisational work that is based on data valences such as *self-evidence*, *discovery*, and *actionability*. While much research on datafication has so far focussed on the implications of the increasing surveillance and monitoring, the interest in our paper is on the ways in which those working 'on the ground' create and prepare data in the first place. In other words, we are in interested in how seemingly mundane data work is actually carried out in organisations vis-à-vis increasing expectations by managers and decision makers.

The first case study (social work) demonstrates that it does not suffice if the management of an organisation ascribes certain values to data leaving the 'petty aspects' aside. Even if data valences are shared between management and frontline workers, new data work assignments are still confronted with existing care obligations, e.g., to handle the normal workload and to *protect* vulnerable interactional settings like Care Planning

Conferences. Hence even if data valences are shared, the associated data work stands in competition with other care obligations. This competition is resolved in the first case study in various ways, from pragmatic data care work to extensive workarounds and rejections of data care, leading overall to a problematic data quality. The case study demonstrates the burden of the increasing obligation to perform data work without additional resources, specialised expertise or immediate rewards for one's own work practice.

To complement our analysis of *data care arrangements*, the second case study describes two stabilised data care arrangements in which 'petty aspects' (like checking that the data prepared for the ministries of education is correct) have become embedded in and aligned with other organisational routines and practices. We consciously decided not to frame this case study as 'successful', as success implies giving preference to a particular intended way of caring for data instead of being aware of the typical multiplicities of 'betterment' that coexist in and between organisations.

Together the two case studies demonstrate that data care arrangements are always situated in diverse organisational practices and contingent matters of care. As stated in the introduction, data care arrangements evolve as configurations of members of an organisation with technical infrastructures, organisational goals and routines. When labour around data production and processing intensifies in organisations and results in new or additional tasks, the attentional and affective relations to data do not simply emerge naturally, but have to be created, configured and stabilised in data care arrangements. Re-configurations of data care arrangements can be the result of explicit negotiations amongst professionals and with managers or rather invisible as individual ways of coping.

In both cases, our analysis shows that workers do not relate to digital data in general, but to specific *data sets* like lesson cancellation data or IMPACT data. Accordingly, we doubt that trying to secure a *generally* good data quality in light of the mundane realities of data work is a realistic goal. Because data work becomes embedded in already dense working environments, a dialogue is needed between the multiple departments, hierarchies and professions about prioritisation and the work behind requirements for 'more' and 'better' data. Hence, data care arrangements (aka co-constitutive relations of technical infrastructures, organisational goals and routines) are reconfigured, tinkered with or repaired when social actors ascribe different valences to data and negotiate what constitutes 'good enough' data.

Conclusion

In this paper, we were interested in mundane data work that takes place as part of everyday organisational practices. We asked *why and how people in organisations care for data.* On the basis of two case studies, we have demonstrated that *by ascribing values to data, data become a matter of care*. This is a mandatory but not sufficient condition for the configuration and stabilisation of data care arrangements. At the managerial level, data valences are mainly mobilised to make frontline workers comply with care demands towards data in order to pursue specific organisational or policy goals (e.g., to ensure efficient use of limited social work resources or to ensure good education). Similarly, frontline workers ascribe values to data that are in line with their main (and potentially

competing) care obligations. Importantly, these care obligations are not isolated but organisationally situated in everyday work practices. While their values may align with overall organisational strategies or policies, the ways in which the work is actually performed may differ. This is why it is important to consider how data care arrangements are configured and performed in the everyday of organisational work.

Whereas the concept of *data work* offers an umbrella term for data-related practices of work, data care arrangements sensitise us to the *heterogeneous*, locally *stabilised*, and reoccurring ways in which data get produced and tailored. They alert us to the *multiple and often conflicting views of betterment, especially of (datafied) optimisation in organisations*.

Hence, the concept of data care arrangements may inspire future studies to reflect upon the structural embedding and constellations in which data work gets done by whom and why. As data work happens in different such arrangements – starting from the mundane ones illustrated here to data work of experts and scientists – it seems promising to study conflicts, negotiations, and alignments between those arrangements in complex organisations such as university hospitals or public administration bodies and between those organisations. Data care arrangements might also inspire researchers to develop participatory strategies for making the matters of care of those 'on the ground' visible and valued for data governance strategies.

The paper hence demonstrates that it is of key importance how visible and valued data care work is to other members of an organisation and to society more generally. We have demonstrated that the invisibility and devaluation of care labour often goes hand in hand with the invisibility and devaluation of additional data labour. These ecologies of (in-)visibilities play an important role in understanding data care arrangements in their sociotechnical contexts. Suchman (2007) prompts us to attend to the work it takes to configure sociomaterial arrangements. This configuration work produces 'modes of representation that systematically foreground certain sites, bodies, and agencies while placing others offstage'. (Suchman, 2007, S. 283). Data care work, especially when assigned to staff whose main focus of work does not revolve around data (quality), constitutes a core element of configuring datafied organisation. At the same time, it tends to be backgrounded and assumed as a given, effortlessly produced alongside ongoing organisational work. In face of the growing demands towards more data, calling for a 'balance' between data care work and non-data related care work might not suffice as an answer.

Notes

1. The project "Digital Cases" was funded by the VolkswagenStiftung between 2019 and 2025.
2. The project "DATAFIED" was funded by the Bundesministerium für Bildung und Forschung between 2018 and 2022.
3. As the study is undertaken anonymously, IMPACT is a pseudonym.
4. The social workers cannot rely on scanning services or secretaries in the office. Additional dedicated organisational roles for data work, such as typists, no longer exist.

Disclosure statement

Funding

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