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Experiments with a data-public: Moving digital methods into critical proximity with political practice

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Abstract

Making publics visible through digital traces has recently generated interest by practitioners of public engagement and scholars within the field of digital methods. This paper presents an experiment in moving such methods into critical proximity with political practice and discusses how digital visualizations of topical debates become appropriated by actors and hardwired into existing ecologies of publics and politics. Through an experiment in rendering a specific data-public visible, it shows how the interplay between diverse conceptions of the public as well as the specific platforms and data invoked, resulted in a situated affordance-space that allowed specific renderings take shape, while disadvantaging others. Furthermore, it argues that several accepted tropes in the literatures of digital methods ended up being problematic guidelines in this space. Among these is the prescription to shown heterogeneity by pushing back at established media logics.

Keywords

Digital methods, public engagement, pragmatism, controversy-mapping, critical proximity, multiplicity

Introduction

The past 15 years have seen increasing attention paid to the ways in which public debates can be visualized through the digital traces they leave online (Latour et al., 2012; Madsen, 2012; Marres and Moats, 2015; Marres and Rogers, 2008; Munk, 2014; Rogers and Marres, 2000; Venturini, 2012). While most of this work on digital "issue mapping" (Marres, 2015) or "controversy mapping" (Venturini, 2012) has focused on the collection and analysis of online discussions—using web data to get an overview of what actors say and do in what Michel Callon (1998) has called "hot situations"—less energy has so far been devoted to the hopes and ambitions invested in the analysis and visualization of "issue publics" (Marres, 2005) by their implicated parties. The concept is here used as a reference to the Deweyan idea (Dewey, 1927) that a public cannot be defined and demarcated in abstraction from the situation or issue that "sparks it into being" (Marres, 2005). On this account, "the public" is not a reference to the general electorate, but rather to the people who feel sufficiently affected by a problem to start doing inquiry into its components.

Indeed, when matters of public concern are increasingly datafied, and thus more easily amenable to various representational techniques, it begs the question what stakes the protagonists of an issue have in its visualization? In this paper we discuss what happens when digital methods for issue mapping move into "critical proximity" (Birkbak et al., 2015; Latour, 2003) of the political processes they investigate. Bruno Latour argues that critique done solely at a safe distance from its object risks ignoring that critical proximity is a state of affairs; something that must be achieved by acquiring a stake in the issues at hand

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and attempting to *do* them in new ways. There is, as he puts it, a difference between a position from which you can ''feel critical'' and a position from which you can ''induce criticality'' (Latour, 2003: 8). We have attempted the latter by joining a team of consultants hired by a Danish municipality to find new ways of facilitating and visualizing the proceedings of a data-public on Facebook in relation to a controversy about school reform.

We define data-publics as an emergent ensemble of actors, called into being by a collective matter of concern, that, knowingly or not, make their process of inquiry available as data. This typically happens as a result of digital mediation, for example because the debate takes place on Twitter or is reported on by bloggers. We say that inquiry is *datafied,* when interactions are translated into a form that allows them to be systematically recorded, analyzed, and reorganized (Mayer-Schönberger and Cukier, 2013). When, for instance, a vague phenomenon such as approval is operationalized as a 'like', it can be aggregated, moved from one context to another and manipulated in various ways. Recent contributions to the present journal convincingly argue that the public thus acquires a stake in its own datafication. Specific techniques for data collection and analysis matter to the kind of agency a public has at its disposal (Poell et al., 2015) and these techniques are thus not only interesting as tools for others to map issue publics, but as tools for issue publics to map themselves (Kennedy and Moss, 2015). Ultimately, when we talk about a data-public here we are talking about the visualizations that emerge as the result of activities of operationalization and data curation and that can ultimately intervene in the formation of the issue public leaving traces in the first place. A data-public is not ''out there'' to be discovered or ''data-mined''—it is a phenomenon that must be actively rendered visible.

Accordingly, we think of data-publics as a specific form of issue-publics and we set out to do our experimental intervention with inspiration from the literature on issue mapping. A key characteristic of this literature is a strong devotion to the re-appropriation of digital media to support what a pragmatic take on democratic politics would consider productive inquiry (Madsen, 2012; Marres and Gerlitz, 2016). However, such questions about datafication and democratic representation is clearly not only of academic interest, but of potentially acute importance to the actors themselves. It is therefore relevant to ask how a specific notion of publics imported to the field of issue mapping and digital methods from pragmatist political philosophy co-exists alongside other notions of the public that are native to the situations in which we, as digital methods researchers, intervene.

Indeed, from a pragmatist perspective, the practical and material circumstances through which actors become capable of representing and intervening in the world is always the central object of inquiry. This should apply no less to the practical and material circumstances of data work in a digital methods project and the ways in which these circumstance support, transform or frustrate the ability of those with a stake in the issue to represent themselves as a public. Following recent discussions about intervention in science and technology studies (STS) research (Law, 2009; Munk and Abrahamsson, 2012; Zuiderent-Jerak, 2015) we thus ask how our visualizations of topical debates become appropriated by actors and hardwired into existing imaginaries of what a public is supposed to be and do?

As stated earlier, we seek to answer this question by placing ourselves and our methods in critical proximity with a citizen engagement project initiated by a Danish municipality in the aftermath of a controversy about the future of their public schooling system. The ambition of the project was to convene a public on Facebook and we were invited to take part as researchers responsible for ''inscribing'' (Latour, 1986) this data-public.

We use this experience to discuss how the interplay between platform conventions, data tools, and different ideas about the democratic public, support specific ways of ''seeing'' a data-public, while disadvantaging others. We draw on the work of the pragmatic perceptual theorist, James Gibson (1986) to argue that inscriptions of data-publics, like other devices of the public (Marres and Lezaun, 2011), are conditioned by the socio-material and situated *affordance-spaces* that render some operationalizations and distinctions possible while ruling out others (Madsen, 2015a, 2015b). Ultimately, we will use our interventionist experiment as an opportunity to discuss—and critically reflect upon—some accepted tropes in the literatures of digital methods. Among these is the prescription to show heterogeneity by pushing back at established media logics.

A school for and by the people

The Danish municipal primary and lower secondary school system, known as Folkeskolen (The People's School), is a core institution of the modern welfare state. As such, Folkeskolen is a recurrent matter of public concern. Through consecutive reforms it has been the hotbed for a range of issues spanning from didactics and pedagogy to citizenship and democracy, all of which have found a testing ground in the practical shaping of the school.

When a new center-left government took office in 2011 it was with a stated ambition to re-involve

teachers after a decade of political attempts to centrally manage the curriculum. It came as a surprise when a major national school reform was announced in 2012. From the perspective of the Danish Union of Teachers this was not a reform grown locally among practitioners, but a further attempt at centralizing how Folkeskolen was going to operate. The reform was to take effect from the beginning of term in August 2014 and it befell municipal administrations, and eventually individual school boards, to reconcile it with local practice and garner the necessary local support.

In the municipality of Aalborg, it was the Alderman in the Department of education who faced this task. Being a political leader in a country where participation has become part of the political DNA (Horst and Irwin, 2010), she saw a process of collective inquiry as the preferred way forward. The Alderman decided to set in motion a five-month long "vision process" where everybody with a stake in the future shape of the schooling system were invited to participate. The process was meant to provide guidelines for budget priorities over the coming years. The Department of Education issued a call for tenders for an external partner to organize and execute the vision process. It was a key stipulation that the successful bid should involve social media as a vehicle for public engagement. Conscious of the fact that traditional town hall meetings were losing their following and that busy parents needed to be engaged where they were already having discussions about the school, the Department of Education had decided to use its own Facebook page, where parents, teachers, pedagogues, and school managers were used to receive and exchange information, as a venue for public engagement.

In search of critical proximity

In July 2014, we thus received a call from a consultancy interested in winning the contract for the vision process. Given our research on digital methods, social media and controversy analysis, the consultancy, which specialized in citizen engagement and organizational change, saw the use in having us on board. For our part, it naturally prompted some reflection. It has become every day for STS to be invited into projects and policy contexts where researchers are expected to make some kind of practical difference (Jensen, 2012). However, it is rare that STS researchers attain a position where they have the ear of a government or local authority in the sense that we were positioned to have.

Also, it seemed that the interest in having us onboard was less linked to our pragmatist theories of public debate, but mostly related to a set of technical skills related to digital methods. Would we be seen as engineers more than social scientists in the process? If yes, would that entail that the use and interpretation of our visualizations would be harder to follow and potentially criticize? From an STS perspective these were important questions since the specific nature of the invitation meant that we had to contribute to a public deliberation exercise—a format which has been widely criticized as reinforcing positions of power rather than supporting bottom-up democracy (Goven, 2003; Kerr et al., 2007; Stirling, 2008). Furthermore, the commissioning party was not a marginal group of concerned citizens, but a branch of municipal management, a fact which evoked cautions about "managerialism" and the dangers of "studying up" (see especially the papers collected in Law, 1991).

It is thus a sensible question to ask: why engage at all? A series of normative commitments to pragmatist political philosophy are habitually mobilized as virtues in digital issue mapping. However, these commitments have for the most part been formulated at a distance, i.e. at a time when it was still largely untested what affordances such maps and methods would have in the everyday settings of their presumed stakeholders. When we accepted the invitation to be part of the vision process in Aalborg we were, again, in search of a position in "critical proximity" (Latour, 2003) of our object of study. Following recent attempts to do data together with issue-professionals in so-called "data sprints" (Munk et al., 2019; Venturini et al., 2018), we wanted to learn about digital methods in a setting where we were decidedly and unequivocally complicit. We wanted to put the virtues of digital issue mapping at risk in a political situation where there was a pre-existing will to experiment with online discussion as a legitimate input to decision making.

The vision process as empirical material

The vision process was rolled out over a period of four months in Autumn 2014 during which the consultancy conducted a range of workshops with school stakeholders, prompting them to take the debate to the Facebook page of the municipal school administration. Being responsible for translating the debate into visual inscriptions, we naturally had meetings with both the consultancy and the school administration during this period. In the consultancy, we were primarily referring to one person. He served as a bridge between our suggested visualizations and the rest of the consultancy team, who were responsible for arranging physical meetings with stakeholders interested in the school and get them interested in contributing to the vision process on Facebook. In the school administration, we had two points of reference. First, we worked directly under the Alderman and the director of the school board, who were politically responsible for the process.

At the end of the day, they had to translate the process—and our visualizations—into political decisions about future budgets and prioritizations. Secondly, we worked with the communication team of the school administration, who had detailed knowledge about the usual discussions taking place on the Facebook page of the school administration.

During the four-month vision-period, we had running discussions about how the debate could be visualized and made sense of. A number of visual prototypes were developed and discussed with the consultancy, the school administration, and the engaged public. For instance, we continuously released little videos explaining the method and results of unfinished analyses and encouraged people to comment on them. In January 2015, the process reached a climax when 1600 teachers, pedagogues, school leaders, students, and other stakeholders convened in a sports arena for a day to review maps of their online debate so far and produce a new wave of Facebook posts in response to more focused questions about visions for the future school budget. During this meeting we presented our visualizations for the audience, who used them as reference points in group conversations.

The empirical material we draw upon in this paper stems from our work as participant observers. During the process we have continuously discussed and noted down our experiences. Furthermore, we conducted an interview with our consultancy-partner halfway through the process and a follow-up interview with the Alderman and the director after the process was finished and the important political decisions were taken. Our empirical ground is thus a combination of participant observation, interviews, and the digital data stemming from the debate occurring on Facebook.

Theorizing the data-public: Affordances and invariants

We propose to understand data-publics as something that is actively inscribed—they are the result of a process aimed at producing a specific way of *seeing* something that nobody knew how to see. Rather than thinking of a data-public as something ''out there'' to be discovered, we think of it as the result of active operationalizations on available material in a specific situation. Re-phrasing Pierce's (1878) pragmatic maxim, we can say that the meaning of the data-public called for by the school administration ends up being intimately linked to the way it is made tangible through specific data experiments. Accordingly, specifying the conditions under which such tangible effects was produced in our experiment, becomes key to understanding how data-publics can emerge as sensible references in political processes.

In order to do this specification, we turn to James Gibson (1986)—a pragmatist theorist of perception who conceptualized the act of seeing as a practice conditioned by the socio-material makeup of the situation in which it takes place. To make this point, Gibson introduced the concepts of ''affordances'' and ''invariants'', which are both useful for unpacking how data-publics became tangible and sensible references in our experiment.

Arguably, the concept of ''affordances'' has a troubled history in STS, where it has both been suggested as a remedy against an overly discursive and anti-essentialist philosophy of technology (Hutchby, 2001) and critisized for prematurely closing down debates with arbitrary references to technological properties (Rappert, 2003). When we use the concept here, we think of it as related to *actions* and *operationalizations*. Rather than seeing affordances as properties of technologies, we will speak of ''affordance-spaces'' as socio-technical relations that enable specific ways of producing the tangible effects through which data-publics can achieve their meaning.

Translated to our experiment an important material element were the conditions on data transformations set by the platforms and software enrolled. For instance, we had to work with Facebook's API, that already organizes the world into specific categories like open and closed groups (Lomborg and Bechmann, 2014; Rieder, 2013) and promote specific metrics, such as likes, to evaluate the popularity of content (Gerlitz and Helmond, 2013). While these constraints did not determine our production of data-publics, we certainly did not find ourselves in a highly flexible space when it came to the acts of operationalization and visualization. Besides such material constraints our flexibility was also diminished by the organizational situation. For instance, the Alderman and the director had specific ideas about what constitutes a proper policy-process.

One of the main challenges in our experiment was to construct invariants that would enable us to do useful discriminations in the fluctuating data from Facebook. For instance, we needed to construct invariants that enabled us to make distinctions between different themes brought up in the discussions on social media (e.g. are there *distinct* thematic discussions at play around the topic of physical activity in class?) and we needed invariants for making comparisons between the contours of the data-public at different times in the vision process (e.g. does the discussion about physical activity in class *change* its thematic composition over time?). Gibson argues that an affordance-space is

characterized by the kinds of invariants it makes possible. As will be clear, our discrimination work happened in an affordance-space that did not provide unlimited operational and interpretational flexibility in this regard. Furthermore, when it seemed flexible enough to accommodate our theoretical inclinations, we were sometimes surprised by the practical consequences of our choices. This becomes clear if we start the analysis from a more detailed description of the guidelines that originally guided our intervention and subsequently identify the challenges we encountered in realizing them throughout the process.

Our ambitions of a Deweyan public

Our role in the experimental situation was far from neutral. We entered the process with specific ideas about how to inscribe a data-public. Many of our intuitions had their roots in the Deweyan "issue-publics" defined in the introduction. A main motivation for our engagement with the experiment was to test whether we could help re-envision public participation on a digital and Deweyan basis and thereby facilitate data-driven inquiry and learning on the part of the involved actors.

More specifically, our initial approach to meet this ambition was shaped by two specific normative guidelines from writings on digital methods within the field of Science and Technology Studies. The first of these is the prescription to *map the heterogeneity of debates from the bottom up*. This is a guideline that have been consistently rephrased in the literature since Richard Rogers and Noortje Marres—in one of the first papers in the field—imbued the technique of web-crawling with the potential to circumvent prevalent and powerful categorizations. Their argument was that the "open logic" of the web could help identify relevant social groups and debate participants in ways that were not determined by an agenda setter. It would help create what they called a "neo-pluralist forum" (Rogers and Marres, 2000). As formulated in a later paper by Marres, the goal would be "to minimize ontological assumptions, arguing that controversy in digital settings is heterogeneously composed in ways that can't, and shouldn't, be predetermined by the analyst" (Marres, 2015).

Mapping from the bottom up ideally entails a cross platform approach because restricting data-collection to a predefined platform would entail imposing a platform ontology top-down. In fact, early digital methods projects, like MACOSPOL, explicitly suggested a need for building so-called "atlases" of controversies (Venturini, 2012), that would often entail bringing data from various platforms—such as Wikipedia, Facebook, and blogs—to the same controversy-website. Similarly Marres has emphasized that digital methods allow "[...] us to analyze public disputes across 'heterogeneous' domains, such as science and the media, or governmental and civil society sources" (Marres, 2015).

The second guideline that we brought with us from the literature on digital methods was the prescription to *push back against dominant media-logics* when choosing the metrics for the mapping. Such push-backs have recently been suggested to be a core aspect of an ongoing critical reflection on the role of dominant platform-logics in digital methods (Marres and Gerlitz, 2016). Whereas most writings in the field have theoretically accepted that visualizations are produced through specific inscription-devices, it was not a priority for early projects like MACOSPOL to inquire into the details of the API's and algorithms used to produce good Atlases.

Such questions have more prominence in recent calls to think of digital methods as "web-visions" (Madsen, 2012, 2015a) or "interface methods" (Marres and Gerlitz, 2016) that inevitably involve some redistribution of research design to, for instance, commercial platforms like Facebook. This means that overlaps between the logics of such platforms and the analysts normative assumptions about the public must be scrutinized anew in every project. As put by Marres (2015), we can no longer just "follow the media" and its logics (as suggested by Rogers, 2009). If the platform's operationalization of what counts as an issue or a position in a given debate run counter to our normative assumptions about the good inquiring public, then we need to creatively "push back" against these operationalizations (Marres, 2015). For instance, when faced with frequency-based logics such as Facebook's priority of the most "liked" content, practitioners of digital methods need to remediate the digital traces of the platform.

Furthermore, it is often emphasized that this remediation should be done with roots in a relational ontology (Marres and Weltevrede, 2013). As a consequence it has been a priority for STS-researchers to build visualizations like a network of posts connected by shared user activity instead of simple lists of the most liked or shared content. This ambition is also seen materialized in Figure 1, which is one of the central outputs of our experiment. Here, the data-public is operationalized as a network of co-occurrences between hashtags in the posts left on the Facebook page of the municipality. Each node is a hashtag, and two hashtags are connected if they appear inside the same post (Jacomy et al., 2014). The colors represent clusters of hashtags that can be interpreted as themes in the debate. For

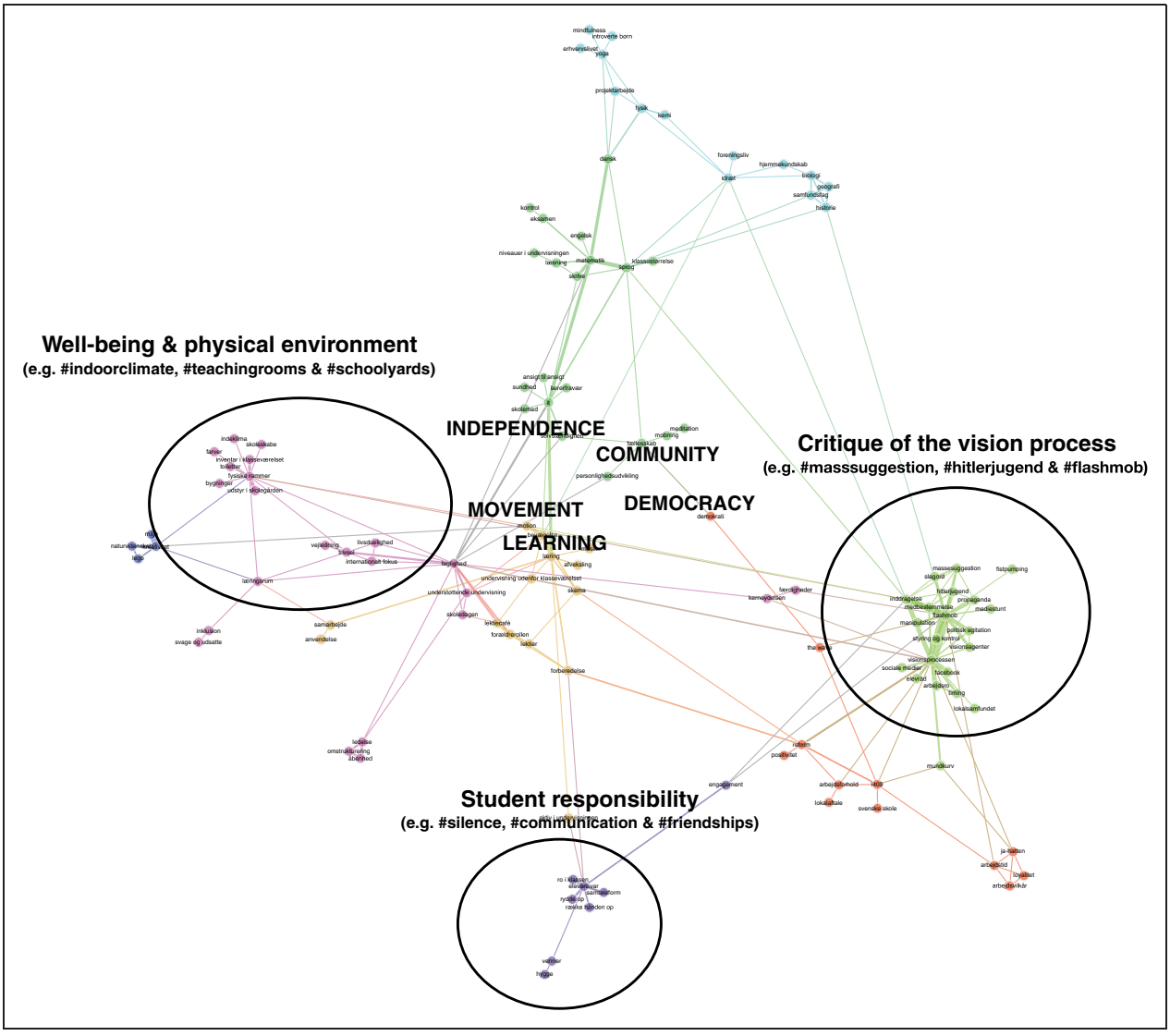

Figure 1. Network visualisation providing a thematic overview of the Facebook debate. Nodes represent hashtags and two hashtags are close to each other if they are often used in the same post. Nodes with the same color indicates a mathematical cluster that can be interpreted as a theme.

instance, the pink cluster to the left addresses the connection between wellbeing and physical environments, the purple below points to student responsibility for good teaching situations, whereas the bright green cluster to the right is very critical of the vision process (we will return to this later).

This relational depiction of the data-public was one of our alternatives to just counting the most used hashtags and it deliberately leaves individual citizens and their distributions of likes in the background. Instead of making lists of influential debaters or popular content, the map reflects a priority to make relations between thematic clusters visible. Some clusters in the map could be the result of more prolonged discussions than others—some may ignite far more likes and comments. The map gives less priority to make this visible than to pinpoint the diversity of clusters.

Native conceptions of the data-public

However, our Deweyan ambitions were not the only conceptions of the public present in the field. In the language employed by ethnographers, we could make a distinction between the data-public as a vernacular concept used by our informants (emic) and as a theoretical concept imported by us to the field (etic). Even though the network mapping above can be justified as a translation from our initial theoretical inclinations to

an inscription of a datapublic, this is not the full story. It was also heavily shaped by emic notions of the public—and its possible manifestations on social media—formulated by the Alderman and the director. More specifically, we gradually realized through the experimental process that that our affordance-space included four ''native'' versions of what new forms of data could to for public engagement. As will be evident from the descriptions below, these versions cannot be attributed to individuals in the sense that, e.g. the Alderman had one conception and the director another. Also they were each developed and matured in conversation with the visual prototypes. Rather than entering the process with clear positions on what a data-public was, everyone continuously attempted to make sense of the concept with reference to their existing intuitions about what constitutes good public debate as well as our emerging insights into how such debates were already taking place on Facebook.

The public as caring / Facebook as mobiliser

In our conversations with the Alderman, the notion of the public became inseparably intertwined with the notion of the good school. Having herself attended a free school where parents were expected to voice their opinion and take active part, she defined a good school by its passionate users. A school should not, to her mind, be thought of and evaluated as the educational service of the municipality, but as a shared responsibility. From this perspective, the ideal school is a school with a caring public that takes responsibility for the development of the school. This was also echoed in one of our conversations with the director in the beginning of the process:

The users of the school should start taking each other into account instead of the board of education making statements. We don't want it to be us against them, but rather more diversified. We should not always be the ones explaining and defending things. It should not be black and white.

Being visible in a place where everyday exchanges about the school were already happening was thus a priority for the vision process. This could in principle be on the school intranet where teachers and parents were having their daily communication, if it was not for two drawbacks. Firstly, the school intranet is compartmentalized into classrooms, enabling parents and teachers of the same class to have a conversation, but offering little or no visibility for conversations across classes (much less schools). Although messages can of course be dispatched to all parents, parents can normally only message other parents in the same class or the teachers of that class. Secondly, and perhaps more importantly, the notion of the caring public extends beyond the immediate teaching situation and thus beyond parents and teachers. It also called for local sports clubs, employers, and indeed citizens more generally to accept a stake in the school.

The Facebook page of the municipal school board, which had already built up a good following and become a venue for conversations about everything from teaching plans and facilities to cancelled lectures or lunch boxes, was thus, from the perspective of a caring public, seen as a good place to convene the vision process. The data-public was to be found on Facebook because this was the platform that—in this specific situation—had a reach that satisfied the ideal of public engagement voiced by the alderman. Furthermore, it was a source of data which we had detailed knowledge of through the communication team, which meant it was trusted by the organization.

There are obvious theoretical affinities between this idea of a caring public and the pragmatist notion of the issue public that we brought with us to the field (as developed by Marres, 2005). Indeed, one could summarize the alderman's position by asserting that the good school sparks a public into being. Facebook is valued for its qualities as a social network here, assuming that its capacity for mobilising users around issues will act as a vehicle for making people care about the school. In contrast to a more representative model where the primary role of the public would be to elect competent spokespersons, the benefit of a data-public here seems to be that concerns are diversified rather than aggregated.

The public public / Facebook as virtual town hall

The Facebook page of the school board also had qualities which turned out to suit a different conception of the public that we encountered in our conversations with the Director of the School Board. We can simply call it the *public public*. Closely connected to the expectations about engaged stakeholder groups, this is a more general philosophy of democracy. A central element in this philosophy is a sceptical attitude towards the political relevance of privately held opinions, which was explicated in one of the meetings when the director stated that ''an opinion uttered in a closed [private] space doesn't count as an opinion—that's just pointless and pathetic''

This indicates that the administration expected citizens to ''step up on the soapbox'' and voice their opinion. Knowing that the public no longer showed up for town hall meetings let to the conclusion that proper public dialogue had to take place in untraditional venues. To the school board it seemed obvious that their already existing Facebook page could serve as a new ''virtual town hall'', where people risked their

opinions in front of each other. As we shall see below, arguments could be mobilized to question whether a public Facebook page would support a constructive vision process, but from the perspective of "the public public", the openness and public visibility of the forum was exactly the qualities to look for. Something that the director still believed when he reflected on the process in the interview conducted after its end:

> The most important part about being on Facebook was to dare talk about the school. It should never be a conversation you stow away behind closed doors at each school. [With Facebook] we have reached people we never thought we'd reach and been places where nobody would ever listen to a politician or a civil servant.

On this backdrop, we had to decide if we wanted to insist on the cross-media approach that we originally brought to the experiment. For instance, our plan to harvest data from both Twitter and diverse forums on Facebook ran up against ambitions articulated in ideal of *the public public*. The reason being that both of these platforms beg the question how one can be said to have risked an opinion in front of a relevant audience? On Twitter your attention is directed by the handles you follow, the hashtags you are interested in, the algorithms composing your feed, etc., but the infrastructure does not ensure that you risk your opinion in front of a relevant public. Similarly, Facebook—as a platform—is compartmentalized into pages (which are by default public), groups (which can either be open or closed), and private profiles (which can be set to various degrees of openness). In that sense, harvesting data across platforms and groups jeopardize the central normative ideal of the public public.

However, as a vehicle for the virtual town hall, the specific Facebook page of the school board offers some distinct advantages. It is both public (it does not require approval by an administrator to post or follow content), and already a place which attracts an audience concerned about the Aalborg schools (the issue public knows where to find it). Accordingly, staying on the Facebook page of the school board aligned much better with the affordance-space than any cross-media atlas. It made it possible to argue that voicing an opinion here is to risk it in front of a relevant group of peers, which the technical configuration of, e.g. a hashtag on Twitter did not. Entering the affordance-space with an ambition to map the issue from the bottom up thus quickly turned into an ambition to map from Facebook up, and, indeed, from a Facebook page up.

The page-centered approach also coheres with the conception of "the caring public". Here the challenge to the cross-media approach is different, but the solution is somewhat similar. The main goal is to engage local stakeholders in an ongoing discussion about the school, but whether it happens in open or closed forums is only of importance to the extent that an open forum might reach further. Neither is it imperative that it happens on one page rather than across profiles, pages, and groups. What is imperative is that the people engaged are not arbitrary opinion makers or issue professionals with no stake in the local schools. Moving beyond the Facebook Page of the municipality risked turning a local debate about prioritizations in local schools into a national debate being hijacked by professionalized debaters. Again, our original intention of a cross-media controversy map was challenged by the native conceptions of good democratic debate brought to the table by people in the municipality.

The resourceful public / Facebook as notebook

The two first native conceptions of the data-public focus on *procedures* for good democratic dialogue, and Facebook is a preferred infrastructure to the extent that it can underpin such procedures. However, the administration also voiced more substantial reasons for enacting a data-public. From the point of view of what we will call the *resourceful public*, it is not just a democratic value to have engaged citizens. The engagement is valuable also because people who have a close and passionate relation to the school will know about and care for the solutions that can improve the school. The public thus figures as a valuable resource of tacit, situated knowledge that will be instrumental in ensuring a smooth transition to a new system in Aalborg.

This rendering was particularly visible in the part of the vision process dedicated to move existing debates onto Facebook. Support for datafying mundane comments was underpinned by physical meetings held by the consultancy as well as communication on relevant intranets. Through these channels, stakeholders in the school were given the possibility to add #'s to the discussions they found relevant to be included in the vision process. The accompanying text on the hashtags was up to the stakeholder to decide. People contributing could write anything from #morephysicalactivity to #badvisionprocess. As long as it included a hashtag it would be considered data relevant to the vision process.

In relation to "the resourceful public", this infrastructure of information had one core function—to promote histories from practice; stuff that worked; experiences worth sharing. Here the public is assumed to already be there, as a resource, that has not yet been

properly tapped into; not yet been hardwired into the policymaking. Facebook is simply used as a notebook in these meetings and thereby functions as a container for making these practices travel.

The public as collectively intelligent / Facebook as aggregator

The fourth version of the public is related to the resourceful public, but it is focused on hunches and intuitions rather than tried and tested practices. The underlying assumption – what we will call the collectively intelligent public – is that everyone who have day-to-day encounters with the school will have relevant, although not robustly articulated or evidence-based, hunches to share. The Alderman used herself as an example when making this point in one of our first conversations:

> ''People will ask me, how I can have an opinion, when I'm not educated within that field. But I do, and that's the way it is. We're not all stupid . . . If many people share an opinion it can't be all wrong.''

The idea is that multiple opinions, even if vague and unsubstantiated, can, when aggregated, be as legitimate as the opinions held by a few experts. In this rendering of the data-public, Facebook becomes a networked infrastructure that makes it possible to see emergent patterns in lay opinions and thereby condense intuitions into more qualified opinions. The possibility to see such patterns fits the administration's resistance towards prioritizing expert-driven debates on welfare goods like the schooling system. From this perspective the interesting data is the aggregated metrics of Facebook, which becomes a valuation device that is able to sum up what is important.

During the experimentation we found that our preference for ''pushing back'' on media-logics aligned surprisingly well with this conceptions of the public. It occurred to us that what the Alderman thought of as relevant hunches did not necessarily correspond to the most liked content in Facebook debates. For example, the specific controversy about the school was of such a nature that unions and other powerful spokespersons would generate content with more interaction and likes than lay persons. This meant that non-expert hunches risked drowning in metrics focused on the frequency of such data points. A visualization like the one in Figure 1 deliberately downplays such metrics in favor of more relational measures that render more diverse content visible. Accordingly, it was a good fit for a democratic vision emphasizing the ''wisdom of crows'' over a more meritocratic philosophy of good governance.

The affordance-space as constraining invariants

The ideals, theories, dreams, and technologies discussed in the previous sections constitute the affordance-space within which our experiment was situated. Figure 2 is an attempt to outline this space. It can be read as a radar image of the landscape we had to navigate when trying to translate our initial ambitions into concrete inscriptions of the data-public. The outer ring of the radar represents the five normative conceptions about the good data-public that was brought to the experiment by the municipality and ourselves. The text inside the dotted lines indicates the role that data was intended to play in the digital realization of these respective publics. Finally, the center of the figure is the material aspect of the situation. It lists the technological constraints that set the boundaries for what was possible in the experiment.

As mentioned earlier, this radar should not be read as clearly separated visions of the public that can be clearly ascribed to distinct participants in the process. Rather they represent resources for data-analysis and sense-making that different participants drew on in different ways throughout the process.

It illustrates the constraints we had to work with in when deciding on invariants to produce the distinctions that would help us organize the data-environment and develop the discriminatory skills needed to draw the contours of the data-public. In order to have a life in the situation we experimented in, these invariants had to be possible within the constraints set by the platforms and data technologies and make sense in relation to the kind of publics invoked throughout the process (Madsen, 2015a).

The sections above have outlined the different coherences and incoherences that emerged during the process in relation to ensuring such a fit. For instance, it was clear that the cross-platform approach we originally envisioned ran into troubles with various aspects of the outer circle in Figure 2, whereas the prescription to push back against media logics ended up being a surprisingly coherent fit with others. Ultimately, we ended up deciding on four core invariants as the constants around which distinctions in the debate were to be understood.

The first was to stick to the open *Facebook page of the school* as the entry point for data and the second was to take *hashtags* as a consistent signifier of vision-relevance and thematic content. The consequence of this choice was that any change in the composition of the debate in time would be interpreted as a change in the concerns of the public—not a change in Facebook as a discussion space or the genre of hashtagging. For reasons already discussed above, the school's own page

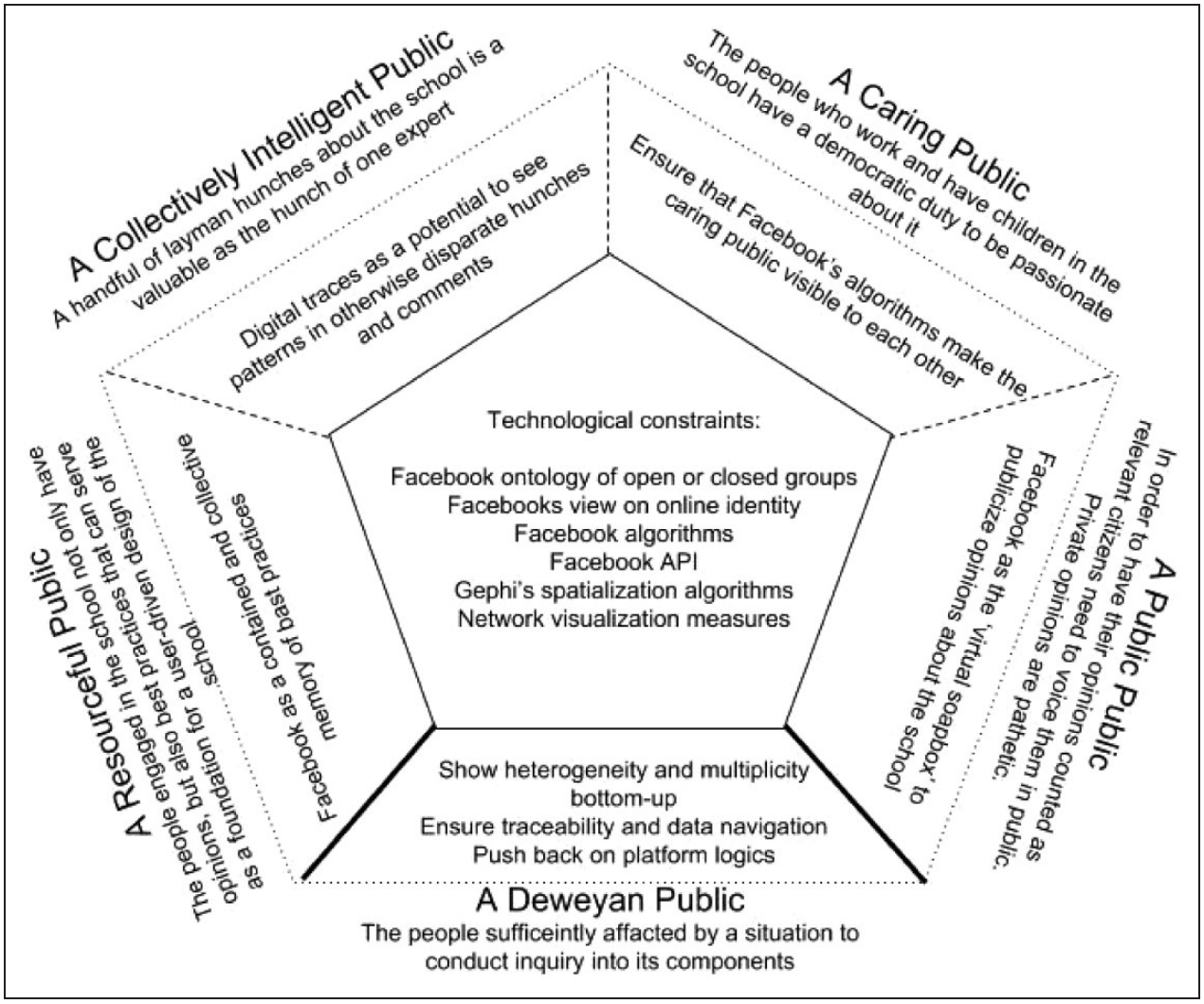

Figure 2. The affordance-space of the school project.

and the hashtag became important constants for making temporal discriminations such as claims about changes in the debate across time.

However, the page and the hashtag were not the only invariants used to make discriminations in our data. For instance, it was only possible talk about relations between hashtags, if we agreed on *the post* as the ontological entity from which to operationalize co-occurrence of hashtags (such as the ones shown in Figure 1). The practicality of working with this invariant was ultimately supported by the organization of Facebook's API, which structures data in a way that makes it possible to discriminate between data from individual posts. Without a platform ontology with a clear—and constant—distinction between posts and other text fields, we could not have used the post as a constant from which to build networks.

Furthermore, the co-occurrences between hashtags shown in Figure 1 above could only be stabilized and compared over time because we were equipped with specific software for visualizing networked graphs and doing statistics on them. For instance, we used a spatialization algorithm called *ForceAtlas 2* as a constant visual parameter across all the network visualizations we did. Similarly, we used a fixed *betweenness centrality score* to identify boundary objects across different datasets. These constants allowed us to discriminate between different discourses brought up in the debate and identifying words and concerns crossing discourses.

In short, it may be the case that the relational measures met little resistance in the outer range of the affordance-space, but the invariants that enabled us to make relational visualizations were heavily shaped by the inner part of the affordance-space in Figure 2. Accordingly, the visualization shown in Figure 1 is designed to fit both the fringes and the core of this space. It is the result of balancing specific material arrangements as well as emic and etic conceptions of

the data-public in a specific political situation at a specific time in Danish Politics. Ensuring this fit had the consequence that our visualizations were used as an active part of the budget negotiations. They continued to be relevant for the political process in ways that would have been jeopardized had we decided to ignore the constraints of the affordance-space.

Recalcitrant effects

So, we navigated an affordance-space and succeeded in building invariants that were both possible and sensible within that space. Does this mean that we are telling a story of success? Were the consequences of our design-choices in perfect alignment with our normative starting point? No! As with any other design process, the consequences of such choices only manifest themselves in practice. We will therefore end this paper with a discussion of political life of the data-public we made. That is, we will discuss what happens when prescriptions about data-publics formulated as a distance enters into critical proximity with a complex political situation.

We have already discussed how our core normative guidelines—mapping the heterogeneity of debates from the bottom up and pushing back against media-logics—fared and design-guidelines. Now we will discuss the surprising effects that the final visualizations—such as Figure 1—had in practice. We call these surprises *the recalcitrant effects* of the data-public and we argue that these effects generate specific troubles that the literature in the field of digital methods needs to attend to. In line with recent strategies in interventionist and feminist STS we suggest the need for asking—*qui bono?* (Star, 1991).

STS scholars have been accustomed to think about public engagement as something that is usually advocated for by people "on the ground"—not the political establishment. However, in our experiment the situation did not exactly fit the theoretical "knee-jerk-reaction". In fact, the relevant issue public had reluctances entering the kind of forum called for by the administration. A central reason was that many actors involved in the schooling system did not agree on the need to distinguish between state politics and municipal politics in order to appear as a competent participant.

In fact, our data bears several traces of discussions that are directly related to the state-driven reform. This is for instance the case with the bright green cluster in Figure 1, which includes quite a bit of discussion about a specific legislation—L407—that was passed by the state as part of the reform and still brought up in the debate by the teachers union. This reflects that a large chunk of the issue public was not interested in being a public on the playing field established by the municipality. We suggest conceptualizing this group as stakeholders in a kind of residual matter of concern public that had been left out of the current framing of issue. What this residual group wanted was effectively for the politicians to leave it alone and not be coerced into any kind of deliberative forum. At least not a forum where its matter of concern was framed as irrelevant.

As it turned out this group of actors came to set their mark on the data-public in a way that was not foreseen by the municipality. When the vision process kicked off with a flash-mob by the pupils of the schools, the residual group mobilized. On Facebook, it accused the administration for taking kids as political hostages and it supplemented its comments with hashtags such as #hitlerjugend, #masssuggestion and #politicagitation. This is what is visible in the bright green cluster in Figure 1.

By using hashtags the group deliberately tagged its inputs as something belonging to the vision process. While it was way out of bounds in terms of the kinds of themes the municipality wanted discussed, it nonetheless stayed within the formal conventions established for being part of the data-public. It did post on the right page, it did use hashtags, and none of the public notions in the outer fringe of Figure 2 could be mobilized to erase its contributions. The result was that its accusations of political fraud remained a tangible part of the data-public. By datafying itself (using tags) the group gained visibility, but it also made itself vulnerable to being mapped together with other voices in the discussion. By being part of the data-public its concerns became "commensurable" (Espeland and Sauder, 2007) with other concerns. However, they become so in a way that was not necessarily to its own benefit. What is troubling to the literature on digital methods is that the visualization of a heterogeneous data-public rather ended up being a tool in the hands of the already powerful.

Whereas the residual matter of concern and its associated stakeholders did make a big mark on the network visualizations, it was also quite evident from these visualizations that their concerns belonged to one specific isolated cluster of the network. Of all the clusters in the network, this was the only one heavily associated with national politics. The rest of the network contained more mundane themes—topics to be taught, modernization of playgrounds, knowledge sharing between schools, etc. This division in the map gave the impression that the political struggle of the teachers and their union was just one input among many others. It was only a sub-part of a larger public that was thought of as caring, resourceful, and intelligent.

Our visualization of the heterogeneous public thereby enabled the administration to break a deadlock

that had existed for years between the teachers' union and the political decision-makers as two antagonistic positions in the debate about the school. The visualization made it possible to treat the union's concern about the reform as one-among-many and thereby not as a group with a privileged position in the debate. Remember the words of the director when describing "the caring public": *We don't want it to be us against them, but rather more diversified.*

A further troubling insight is that our inscription of the data-public enables the municipality to "corner" the unions precisely because we insisted on substituting simple quantitative metrics with relational measures. In line with the existing digital methods literature, our normative ambition was to create metrics that made the loudest voice less visible than Facebook's own metrics (e.g. like-counts). However—as discussed in the section of the collectively intelligent public—it turned out that this was a decision that made the interest of the teachers' union—and thereby some of the residual matters of concern—less visible and more isolated.

The choice of not letting likes "count" in the visualization, but instead prioritize visualization of thematic multiplicity, made it harder for the union to gain a level of visibility that mirrored its status in the official political landscape. The reason being that the mobilization of likes is part of the way the union gains visibility and influence in the digital landscape. As a professional political actor, they work to optimize their visibility on the premises of popular platforms such as Facebook. When we decide to push back at the logic of the platform, we are also complicit in shortcutting the effectiveness of the hard work of a dedicated spokesperson for one of the central actors in the controversy—the teachers.

Concluding remarks

So, what did we learn from moving digital technologies of the public into critical proximity with political practices? First, we learned that we cannot make normative claims about good inscriptions of data-publics without understanding the situated affordance-space that make specific renderings possible while disadvantaging others. Drawing on the work of James Gibson, we have argued that an important task of the intervening digital methods scholar is to identify the specific invariants that can function as legitimate foundations for making discriminations in the political practices that one find oneself in critical proximity with. In other words, issue mapping must happen in close dialogue with Internet-studies and more ethnographic insights about the practices of the field.

However, as our experiment has also made clear, there is simply no way of settling on specific invariants without privileging certain notions of the public, and with it certain actor positions for which a subscription to these notions is beneficial. One of the more obvious solutions to this problem would be to simply accept that the choice of visual invariants is partisan in its own right and therefore afford different stakeholders the possibility to visualize the data-public in different ways. Indeed, this is what happens (for very similar reasons) when controversy mappers do "data sprints" with issue experts to acquire stakes in the controversy and adapt their maps in meaningful ways to the practices of the issue experts (Venturini et al., 2018). And yet, in the specific scenario where a group of actors in the controversy have stakes in summoning a public that can deliberate and reach political compromises (as is the case for both the Alderman and the school board) it would not be a meaningful adaptation to the practical reality of these actors if the digital issue mapping did not attempt to find common ground. For the data-public to maintain relevance, the political situation required the establishment of fixed invariants.

It was, in our opinion, particularly striking to observe how our insistence on performing the heterogeneity of the debate and our "push-back" on powerful media logics (two of the most basic instincts of the issue mapping literature) ended up jeopardizing the role of the teacher's union as a singular spokesperson for its members. As suggested by Helen Kennedy and Gilles Moss "publics exist, in part, through the way they are represented" and we should thus ask ourselves "whether data-mining practices can be used by publics to constitute themselves as more active and reflexive agents. (...) [N]ot only to be used by elites to produce known publics, but rather for the public to be more knowing of itself and to participate in the active production of itself" (Kennedy and Moss, 2015: 9). In our case, specifically we should ask ourselves if the relational re-appropriation of Facebook's metrics to make visible a data-public would have been done differently if, for instance, the teachers' union had been given a say.

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