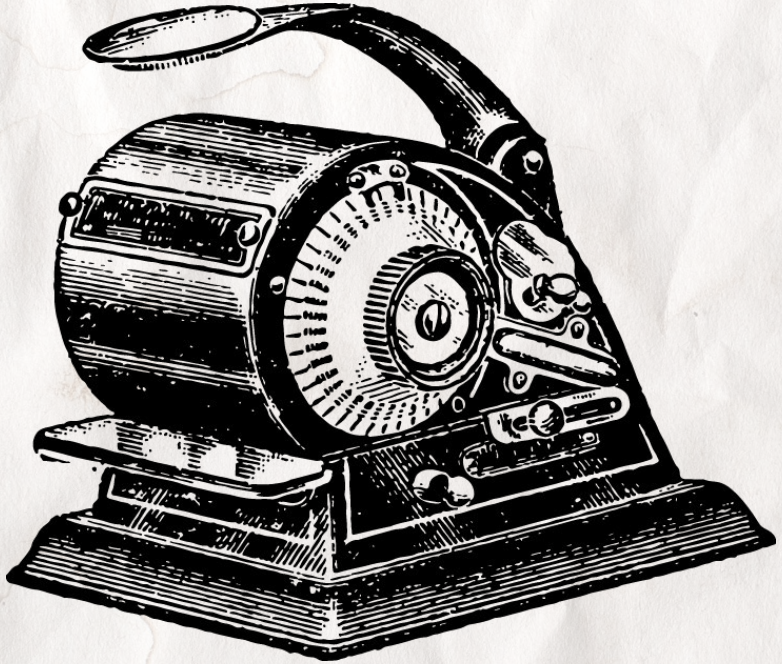
ENGAGING THE DATA MOMENT



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Commentary: Why (and how to) experiment with digital social data?

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DASTS is the primary academic association for STS in Denmark. Its purpose is to develop the quality and breadth of STS research within Denmark, while generating and developing national and international collaboration.

Abstract

Adopting Noortje Marres' important book on *Digital Sociology* as its main interlocutor, this commentary critically discusses the widespread (re-)turn to the practice and rhetoric of experimentation in the realm of digital social data, big or otherwise, drawing, in part, on personal, collaborative research experiences. In doing so, the commentary positions science and technology studies (STS) as both a valuable resource for such reflection *and* a partisan participant in wider on-going epistemic struggles and re-alignments in the digital realm. In particular, I deploy long-standing STS resources to discuss certain well-known ambiguities around 'the experiment' as a genre or device of knowledge-making, and explore how such ambiguities play out in contemporary discussions over, and aspirations for, so-cial research based on digital data. Here, while deeply sympathetic to Marres' and allied STS-based projects for digital research, the commentary also questions some of the slippages and demarcations enacted by its circumscribed re-casting of *experimental* practice. These slippages, I will show, entail their own unwarranted universalization of what it means to do intervention and, by implication, experimental intervention as part of the practice of STS-informed digital research. As an alternative, I suggest that STS may want to reflect further on, and eventually differentiate more carefully between, various deployments of the practice and rhetoric of digital experimentation, including its own, to more precisely render their divergent conditions and possibilities of epistemic felicity. In doing so, however, I will *also* suggest that, for all its plural manifestations, STS would do well to revisit earlier pragmatist arguments by, in particular, John Dewey, in order to fully appreciate what the commentary calls the meta-experimental promise of digital social research.

Keywords: digital data; experimentation; intervention; pragmatism; STS-informed digital research

The advent of big, digital, and otherwise purportedly new social data formats is accompanied everywhere across (and beyond) the social sciences by a resurgence in the practice and rhetoric of experimentation. One need only consult the journal Big Data & Society to see the words 'experiment' and 'experimenting' included in the titles of several recent articles, including one co-authored by myself (e.g. Ziewitz 2017; Blok et al. 2017; Madsen & Munk 2019). As this suggests, I arrive at this commentary's title and questions as a matter of practical urgency, having been involved over recent years in a large-scale interdisciplinary research collaboration known as the Copenhagen Networks Study (CNS), in which we similarly extoll the language of experimentation. However, and as I expand upon a little later, we do so in the CNS setting in rather different, and indeed somewhat incommensurate, ways, thereby provoking an awareness, as a research community, of the need for further interrogation and clarification of the stakes of a digital-experimental ethos.

In an important contribution along exactly these lines, and one that I adopt here as my main interlocutor throughout, science and technology studies (STS) scholar Noortje Marres both evinces and discusses such a widespread (re-)turn to experimenting with digital social data in her recent book *Digital Sociology*. Here, Marres suggests (2017: 98ff) that claims to experimentalism in digital research come in both generic and specific senses. At the generic level, digital sociology is by necessity experimental, she argues, in the sense of being committed to trying out new and hence relatively unfamiliar methods and techniques, at least as far as the social sciences go. In the language of Adrian Mackenzie and colleagues (2015: 367), digital sociology makes use of new "skills and tools, borrowed and copied from domains of statistics, software development, hacking, graphic design, audio, video, and photographic recording and predictive modelling––that is, from the media-textual environments of contemporary culture themselves".

In a more specific sense of the experiment borrowed from the history of science, however, Marres (2017: 98) suggests that whereas "sociological research tends to rely on descriptive and observational

data, recent work in digital sociology stands out for its interventionist approach". This distinction echoes the language of philosopher Ian Hacking (1983; 1992): whereas some sciences develop 'styles of reasoning' based on models, comparisons, statistics or other forms of *representation*, what Hacking calls the laboratory style, introduced in the mid-17th century, are sciences that *intervene* in the phenomena they seek to understand. Indeed, the ability to test a hypothesis or to explore new phenomena in an isolated setting by way of manipulating and controlling the conditions and processes to which the object of knowledge is subjected, has long defined the idea and ideal of the contained, controlled experiment of the *natural-physical* sciences. Correspondingly, it has long fed conversations around the philosophy and practice of the *social* sciences, either as an ideal to emulate or as a critical counterpoint for alternative conceptions of knowledge (see, for recent STS contributions, Guggenheim 2012; Lezaun et al. 2013; Zuiderant-Jerak 2015).

In this commentary, then, I want to explore and discuss how well-known ambiguities around 'the experiment' as a genre or device of knowledge-making play out in discussions over, and aspirations for, social research based on digital data. Taking Marres' work as prompt, I argue that STS is both a valuable resource for such reflection *and* a partisan participant to wider on-going epistemic struggles and re-alignments in the digital realm, with its own stakes and with clear real-world implications. Here, while deeply sympathetic to Marres' (and allied) STS-based projects for digital research, I want also to question some of the slippages and demarcations enacted by their circumscribed re-casting of experimental practice. These slippages, I show, entail their own unwarranted universalization of what it means to do intervention and, by implication, *experimental* intervention as part of the practice of STS-informed digital research.

This, in turn, puts the onus on my own practical-conceptual stakes in digital experimentation. Here, based in part on CNS experiences, my argument is twofold. First, reminiscent of kindred critical reflections around 'the laboratory' as (also) a metaphorical form (e.g. Guggenheim 2012), I suggest that STS may want to reflect further on and eventually differentiate more carefully between various deployments of the practice and rhetoric of digital experimentation, including its own, to render their divergent conditions and possibilities of epistemic felicity more precise. Second, however, I *also* suggest that, for all its plural manifestations, we would do well to revist earlier pragmatist arguments, particulalry by John Dewey (1938), to fully appreciate what I call the meta-experimental promise of digital social research.[1] In other words, I argue that Dewey's notion of experimental social inquiry helps us to tease out family resemblances between, and conditions of compatibility between, practices and devices of digital experimentation that are otherwise divergent from, and even sometimes cast as antagonistic to, each other.

This meta-experimental play of divergence, (in-)compability, and family resemblances carry direct import not least for the two genres of digital social research known respectively as computational social science and digital methods (see Veltri 2019). Hence, in making her STS-based claims around interventionist digital methods, Marres (2007) is very much aware how experimental ideals nowadays *also* influence many emerging practices in computational social science; a promissory research frontier shaped in equal measure by physicists turned human network analysts as by the more 'behavioural' parts of the social sciences (Lazer et al. 2009). In this sense, she actively partakes in new lines of articulation and demarcation, somewhat resonant with how experiments shaped epistemic struggles across psychology, economics, and parts of political science and sociology throughout the 20th century (Savransky 2016). Specifically, Marres is at pains to ward off her own digital sociology from other experimental influences. The aim of digital sociology, she asserts (2017: 102), "is *not* to mimic methodologies derived from scientific disciplines and to conduct the

[1] My choice in this context to invoke Dewey rather than his fellow and equally experiment-friendly early pragmatists, Charles Sanders Peirce and William James, stems from Dewey's (1938) more explicit articulation of the general import of experimental practices and principles for *social* as opposed to natural-physical inquiry

'controlled experiments' that laboratory science is known for". Instead, the goal is to test "the *partly unknown* methodological capacities of digital infrastructures, devices and practices to inform and advance social research". Towards such an aim, Marres suggests, controlled social-scientific experiments conducted in online environments will have little to contribute.

By implication, Marres' sense of what an interventionist approach entails differs markedly from the standard idea of the controlled experiment. She evokes the Chicago School tradition of sociological fieldwork, which framed existing social environments as themselves 'laboratories' that served to magnify and bring into focus specific social questions (Gieryn 2006). Amidst digital cultures bent on proliferating data trials––from self-monitoring and living labs to political data leaks and various sorts of digital publics––social scientists will have many opportunities, Marres suggests, for latching themselves onto and adapting such ongoing 'real-world' digital experiments for the purposes of social inquiry. In doing so, they can also try out new and more 'interactive' and participatory ways of relating methods, data, and research sites––such as using a Twittter bot to solicit and generate research material, or deploying Facebook network visualizations as narrative devices during interviews. Here, social inquiry comes to (re-)deploy a range of digital 'interface methods' (Marres & Gerlitz 2015), born and bred across platforms and disciplines, in as-yet unfamiliar, non-conventionalized, and in that sense 'experimental', trial-and-error-like ways.

Expanding, delimiting, or differentiating experimentalism in digital social research?

This agenda is important and worthwhile, in that it is largely co-extensive with various new and promising digital social research methods that have beem forged over the past 10 to 15 years. Moreover, as noted, the wider field of STS research has itself played, and continues to play, a pivotal role in these developments as it expands its own repertoire of intervention practices (see Lezaun et al. 2016). Still, I want to suggest that Marres' core conceptual manoeuvre, one redoubled in much allied digital and/or interventionist STS work (e.g. Zuiderant-Jerak 2015; Ziewitz 2017; Madsen & Munk 2019), relies on an under-justified bifurcation, of 'conventional' from 'non-conventional' senses of the experiment, when in fact the territories of experimentalism inherited from the history of science are potentially more ambiguous and interesting. Hence, whereas STS work like Marres' contributes to an ever-more expansive *conceptual* account of experimentation as a multivalent and rather unbounded genre or device of elicitation increasingly at work across the sciences, arts, economy and public life (Lezaun et al. 2016), it *also* serves to delimit how versions of this genre get deployed as *practical* resource (rather than topic) for STS research, based on less-than-obvious philosophy of science ideas (to which I return later on).

In particular, Marres' (and allied) invocations of experimentalism-as-(digital-)STS-resource may be said, I believe, to (still) echo a wider epistemic configuration stabilized, as Guggenheim shows (2012), in post-war social science. Here, sociologists of quantitative and qualitative persuasions alike would come to accept 'standard' philosophy-of-science accounts of controlled laboratory experiments as co-extensive with experimentalism writ large, all the while marking these out as mostly irrelevant to sociology. This is essentially the configuration that Marres now maps onto computational social science, marking this out as irrelevant to her own digital sociology. Meanwhile, the quite contrary ('non-conventional') sense of experimentalism *embraced* by Marres (and allies) is one in which, it seems to me, 'intervention' is given such a broad and non-circumscribed sense as to make its relation to the epistemic goals of any experimental style of reasoning somewhat strained. Here, following Hacking as well as recent STS work on social-psychological experiments (Lezaun et al. 2013), I take that style as defined by the aspiration to closely observe an object of study under conditions of its (partial) manipulability and (partial) containment, with a view to enacting (or provoking) that object in a

particularly vivid, surprising, and indeed realistic version.[2]

Hence, in short, it seems to me that Marres' commitment to interventionist digital research practices is experimentally underspecified, so to speak, to the point of risking co-extensiveness with the sense in which *all* social science practice can be seen to *inevitably* intervene in their surrounding socio-technical environments. The social sciences, as much STS has argued, are performative of socio-technical realities (e.g. Law 2009). Tellingly, in the history of social science reflection, such 'interventionist' insight is associated more strongly with hermeneutic-interpretative and constructivist sensibilities than it is with those 'post-positivist' positions for which the natural-physical experiment continues to be a gold standard for the social sciences, even when only practicable in the shape of naturally occurring 'quasi-experiments' (Kirk 1995). After all, the 'quasi-' part of social sciences' quasi-experiments refers to the *lack* of intervening capacity on the part of the researcher when it comes to assigning experimental controls on subjects (Guggenheim 2012: 108). This, of course, is another instance of the 'standard' philosophy-of-science configuration.

Downplayed here, I believe, is a more minor and more ambivalent tradition, allied to a slightly different version of the pragmatist Chicago School also invoked by Marres, where researchers found rather more compatibility (but not sameness) between certain versions of laboratory experiments and the interpretative aims of qualitative, fieldbased social science. As Guggenheim argues (2012: 108), for ethnomethodologists like Garfinkel and Cicourel in the 1960s, social sciences' laboratory experiments could be made to serve broader interpretive aims, in so far as they aimed to test the foundations of the reciprocal relations between experimenter and subject rather than take their common

[2] The famous post-second world war experiments in social psychology that Lezaun et al. (2013) analyse in terms of 'provocative containment' explicitly followed a controlled experimental format, with some becoming (in-)famous for the ethical controversies they sparked (and for good reason, I would add). Moreover, Lezaun et al. perhaps downplay the way controlled social-science experiments, also beyond social psychology, have been continuously challenged on epistemic grounds, in terms of the kinds of insights they actually warrant (Savransky 2016; Martin 2016)

assumptions for granted. Moreover, famously, Garfinkel would himself conduct so-called 'breaching experiments' on the social order, based on staging more-or-less artificial interactional situations as an "aid to a sluggish imagination" otherwise prone to taken-for-granted views of social life (see Ziewitz 2017: 4). It is this rather more ambivalent and pluralist territory of different-but-compatible social-science experimental registers that I believe could be revived, to good effect, in digital online environments and around digital social data.

Against this more fully recounted version of the history of (social) science, it is also meaningful, by extension, to ask why Marres, and the STS program she articulates, does not search for ways of appreciating more controlled forms of online experimentation on her *own* interventionist terms. After all, some such experiments––of which the 2012 study by Robert Bond and colleagues on social influence and political mobilization among 61 million Facebook users can be taken as example––might themselves be seen as social interventions whose discussion, and indeed ethical critique, may provide valuable insights into digital culture. This is the point made by Danah Boyd (2016) in the aftermath of the much-discussed 2014 Facebook 'emotional contagion' study: irrespective of the validity or otherwise of the study's findings, the discussion *surrounding* the study served to register wider and important questions of public accountability and discomfort with big data. Here, echoing Lezaun et al.'s (2013: 284) point about Milgram's (in-)famous 'obedience to authority' experiment, it certainly seems interesting for STS to analyse, and also to (experimentally) interfere with, the question of what exactly such online experiments enact.

The point of such appreciation, obviously, would not be for social-science researchers to endorse or indeed to participate in the kind of data extraction practiced by Facebook and other instances of 'surveillance capitalism' (Zuboff 2018), nor the way these companies invoke experimental commitments. Rather, to foreshadow my subsequent discussion of Dewey a little, it would be better to cast such an endeavour as committed to turning the question of what exactly 'surveillance capitalism' *is* and does into a matter (also) to be (co-)experimented

with by STS research. Analogous to Garfinkel and Cicourel, for instance, one might imagine digital research designs inspired either by (relative) containment or by staged breaching that would make the very relation between Facebook and its users, including its corporate-experimental form, the subject of careful probing beyond common assumptions (to which I would count the very idea of 'surveillance capitalism'). Work such as Phillip Brooker's (2019)––on twitter bots as hovering in-between moral panic and playful public engagement––gives some indication of what this might mean in practice.

Divergent digital-experimental registers: in search of productive confluences

Based on such reflections, I want, in what remains of this commentary, to suggest that there is value in more committed and mutually attuned critical-constructive conversations across these various and oftentimes incompatible styles of experimental social data practices, *all* of which are currently flourishing. As Marres' discussion serves valuably (if perhaps inadvertently) to highlight, there is at present little clarity––let alone agreement––as to the attendant issues of methodology, epistemology, and research ethics that arise in our present 'experimental moment' of social ('big') data. Moreover, as a reflexive endeavour itself, it seems to me that STS is both a valuable resource for more committed meta-experimental inquiry into digital social-science methodology and would stand to benefit from rendering its own digital-experimental resources more precisely defined vis-à-vis the history of social sciences.

These possibilities are already reflected, I would suggest, at the level of how the history, sociology, and philosophy of the *natural* sciences, STS included, contain within themselves not one but rather a range of possible analogies for digital social researchers, such as, for example, distinguishing laboratory from field-science styles of experimentation (Hacking 1992; Rheinberger 1994). It is also true, when broadening the scope of discussion further, that the experimental genre may be seen to engage social data in wider issues of the ethics, politics, and aesthetics of social research. This is registered in such terms as 'experiments in living' (e.g. Marres 2012), 'the experimental society' (e.g. Haworth 1960) and 'experiments in genre-crossing' (e.g. Kaiser 2012), for instance, to name some important ones. These are all relevant strands of conversation within digital social data research capacities, I would suggest, yet arguably they are still not sufficiently articulated vis-à-vis the epistemic aspirations of digital STS-as-experimentation.

One case in point is the otherwise excellent and highly interesting report by Madsen & Munk (2019) on their attempts to render a specific data-public visible as part of Danish school reform controversies by way of deploying STS-informed digital methods. While the authors talk about these efforts as 'an experiment', whether and how this experiment pertains to attendant conceptual issues (what is a public?); to specific digital-method affordances (what can in-situ data visualizations do?); to a wider sense of experimental policy learning (how can criticism be rendered relevant to power?); or, likely, to some combination of these epistemic aspirations is never quite clarified. What is problematic here, to be clear, is not the confluence of such related-but-divergent aspirations––quite the contrary, as I will argue using Dewey later on––but rather the lack of methodological specificity on what exactly would count as their various conditions of felicity, alone and together.

I arrive at these suggestions as a co-accomplice, rather than from some position of imagined distance. In the Copenhagen Centre for Social Data Science (SODAS) and the Critical Algorithms Lab (CALL) of anthropologists, sociologists, and STS researchers that I co-founded in this setting, we attempt to address such questions equally as matters of practical day-to-day research and as profound epistemological, ethical, and aesthetic challenges. Over the past years, as noted, we have worked with physicists, economists, psychologists, health scientists, philosophers and computer scientists on the CNS social data science project (known also as Social Fabric or Sensible DTU). This project deployed tailor-made smartphones as 'socio-meters' to map out the

dynamic social networks of an entire freshman class of engineering students (N=800), whilst embedding an anthropologist within the cohort for a full year of participant observation. A range of insights have been generated from this confluence of data sources, including on spatial mobility patterns, study group performance, and party sociality, amongst others.

What has become obvious from this experience, as evinced also in previous publications (Blok et al. 2017; Kristensen et al. 2017), is that collaborative data-dense projects such as ours are indeed likely to be 'experimental' in several disjunctive senses all at once. In other words, they are likely to involve overlapping yet non-identical modalities of experimenting both *with* and *on* digital data, as resource *and* topic, in order to clarify their affordances for social research (Bornakke 2017). Specifically, to illustrate this duality, our data setting was meticulously configured such that it would conform to controlled experiment-like norms of (quasi-)random assignment of participating students into study-start groups ("RUS-grupper"), allowing our economist friends, in particular, some causal leverage on 'peer effects' later on (according to their paradigmatic language). Meanwhile, in the CALL setting, we have occupied ourselves mostly with deploying the *same* data to quite *different* method-experimental effects, mostly to do with questions of how one might leverage and stitch together time-space granular digital trace data and ethnographic observations in ways that push at the limits of *both* data practices in transversal ways (Madsen et al. 2018).

Again, such a confluence of experimental impulses is not unlike existing practices in some branches of the natural sciences, such as when animal behaviour researchers mobilize field experiments in ways that "take researchers into the animals' world to find out what matters to them" (Candea 2013: 255). Considered as a field research device, our project similarly works to find out what matters to engineering students, including allowing for the shared production and cross-validation of unexpected observations across divergent epistemic commitments. This is true, for instance, when deploying standard anthropological practices amongst the students, such as 'hanging out',

come to afford new options for computationally oriented physicists to (re-)consider what they mean, in their own vernacular, by 'ground truth' (Madsen et al. 2018). It is equally true, however, when new practices of data visualization and pattern search across large-scale and granular digital datasets, as afforded in our CNS setting by the smartphone 'socio-meters', challenge standard ethnographic notions of what it entails to document a collective party ritual (Blok et al. 2017).

Rather than a weakness, we have thus come to consider a *plurality* of method tactics as inherent to what is productive about an experimental mode of inquiry, exactly because it allows one to test as-yet non-codified capacities of digital data and associated epistemic commitments. This is similar, then, to Marres' call for experimentation on the partly unknown capacities of digital infrastructures for social research. Yet, unlike Marres, it embraces rather than excludes more *specific* experimental tactics, including those allied to *some*, field-based versions of controlled-experimental ideals. Moreover, we by no means intend to practice or conceptualize this confluence in a romantic vein, glossing over the very real epistemic inequalities also at work (whereby, for instance, we are under no illustions as to the generally higher status accorded to our economist colleagues' work on the CNS data than to our own, CALL-based work on the same data). Rather, as detailed elsewhere (Madsen et al. 2018), we consider such to be part of what we describe as transversal collaboration, whereby the very encounter between otherwise rather incommensurate experimental registers may *itself* produce unexpected new possibilities, small and large.

Ultimately, this commentary hopes to engage in conversation with others from allied research experiences, where several experimental registers converge or diverge into productive confluences. Far from seeking to unify ideas and practices of social data experiments, however, it should be clear that my motivation for this commentary is rather the opposite. By exploring productive tensions and subtle differences in the sites, aims, and methodologies of experiment-informed social data inquiry, one would hope to initiate a process of collective learning on the *many* viable forms of experimentation co-inhabiting the current 'big

social data' moment and their *singular* conditions of epistemological, ethical, political, and aesthetic efficacy. It is my contention that, in spite of all the invocations of experimentalism in recent digital and/or interventionist STS, we still collectively have much to learn about the important research possibilities ahead.

Such collective learning might also help to avoid tendencies manifest in recent socio-cultural theorizing––including, as I have argued, STS––that suggest experimentation can, at best, attain a metaphorical or analogical status. These conceptual tendencies problematically proceed as if the invoked form, the experiment, was *itself* an uncontested entity (cf. Guggenheim 2012). Rather, and conversely, a suitable starting point might be to adopt a certain 'experimental' frame of mind as to what constitutes an experiment and what one might become in the realm of social data science and beyond. This calls for, as noted, a certain meta-experimental inquiry which aims to test the limits and possibilities, the distinctions and variations, and the various family resemblances contained in invocations of experimentation as a privileged route along which to pursue the promise of adequate knowledge held out by large-scale digital social data. It also calls for, as I have hinted at, more concerted engagement with previously under-appreciated strands of social science methodology, Dewey being one key example to which I turn shortly.

Reading digital STS back into pragmatist experimentalism

One arguable way of clearing some space for this is to deepen digital STS' embryonic attention to the precise ways in which STS scholars and historians of science complicate the meaning of experimentation in the *natural-physical* sciences. Ian Hacking (1983), as mentioned, provides one important account, in which he basically recasts standard assumptions about the function of experimentation. Hence, while experiments are often understood as devices for *testing theories*, from careful historical study, Hacking (ibid.: 229-30) arrives at the conclusion that experiments in physics and chemistry serve more importantly to "create, produce, refine and stabilize" new, previously unknown phenomena. Hacking, as is well known in STS, takes this view as consistent with realism about the entities in question: the artificial set-up of the experiment is needed to *isolate* objects of knowledge as discernible and regular events under definite circumstances; events that are noteworthy because the new object does *not* fit into current theoretical accounts. Here, while we may want to debate Hacking's version of realism (Latour 1990; 2003) and its so-called causal theory of reference (Resnik 1994)––whereby entities are 'real' only if they can be used to manipulate other entities––his list of experimental aims in physics and chemistry can still serve as inspiration.[3]

In related ways––although more attuned to the modern history of laboratory biology––historian of science Hans-Jörg Rheinberger (1994) coined the notion of the 'experimental system' in order to speak of the experiment as an intricately woven knowledge-generating machine. Such a machine, he suggests, combine technical, institutional, social and epistemic aspects in always site-and problem-specific ways. The experimental system, Rheinberger asserts, quivers with uncertainty, since the phenomenon under study––what he dubs 'the epistemic thing'––has not yet been stilled or domesticated by epistemological resolution. Such uncertainty as to the precise contours of the epistemic thing in question is what experimentalism feeds on. Indeed, a living experimental system, Rheinberger argues (1994: 77-8), always has "*more stories* to tell than the experimenter at a given moment is trying to tell with it". This argument certainly resonates with our own local research experiences in the CNS project. More generally, it serves to highlight the liveliness of experimental research practices, and hence the character of the experiment as what philosopher of science Isabelle Stengers (2000) calls 'an inventive event'.

In an interesting extension of Hacking's argument to the domain of laboratory-like experiments in economics, historian of science Mary S. Morgan (2005) concludes that the epistemic power of experiments,

[3] I thank an anonymous reviewer for prompting this important qualification

relative to mathematical models as a method in economics, lie in the former's ability to not just 'surprise' but to actually 'confound' the experimenter. Whereas unexpected model outcomes can always be traced back to and re-explained in terms of the model itself, a properly conducted experiment in which some degree of freedom on the part of participants is preserved, has the capacity to serve up patterns of behaviour unexplainable at that current moment. This, according to Morgan, is how Edward Chamberlain famously used his early classroom experiments in the late 1940s as a means of questioning assumptions about 'equilibrium prices', eventually replacing such market models with one of monopolistic competition. In this account, experimental manipulation and theoretical speculation thus goes hand in hand, as confounding observations in the experimental setting leads to a creative process of new theorizing.

This entire commentary is testament to the fact that there is every reason to think that the domain of digital social data, writ large, offers up many new possibilities for strengthening such an inventive experimental ethos and practice in various branches of the social sciences––as well as in wider collaborative settings, extending into contemporary art, digital activism, and beyond. In exploring such possibilities in actual research practice, however, and in trying to more precisely render the various experimental registers involved along meta-experimental lines, it might also be worth, I suggest, revisiting earlier and more fundamental debates about the possibly inherently 'experimental' character of the social sciences. In doing so, researchers in digital STS and beyond could explore whether and how experimental devices and styles of reasoning perhaps *always* warranted more prominent positions than standardly assumed, while also searching for important family resemblances among their otherwise divergent experimental registers.

I want to end this commentary with a focus on an argument by American pragmatist John Dewey, who, in the 1930s, suggested that the *logic* of social inquiry must be experimental by definition, even as its actual method practices might well be highly diverse (Dewey 1938). As we would expect from a pragmatist like Dewey, of course, this argument relied on a particular sense of the practice and value of experimentalism, one that, I would argue, holds great interest for engaging the present moment of social data. To reiterate, the point here would not be to inadvertently collapse important differences in the sites, devices, and practices making up specific social-science experimental registers. Rather, Dewey's vision of social inquiry might serve, I suggest, as an important (re-)staging of the wider meta-experimental promise of digital social research––one that avoids the pitfalls of the 'standard' social-science configuration (Guggenheim 2012) and thereby frees up new energy to search for alternative compatibilities.

Central to Dewey's thinking about social inquiry, which I can only sketch briefly here, is the fact that his approach was based on a *non-positivistic* account of the natural sciences as doing more than gath-ering pre-existing 'facts'. In natural as well as in social science, he argued, inquiry starts in a 'problematic situation', an experience of difficulty or trouble, which the inquirer turns into an obstacle to be overcome or a problem to be solved. The core of experimental logic, on this account, is that it allows for controlled and intelligent ways in which to relate research activities closely to their practical consequences. "What scientific inquirers *do*, as distinct from what they say", wrote Dewey (1938: 498), "is to execute certain operations of experimentation––which are operations of doing and making––that modify antecedently given existential conditions so that the results of the transformation are facts which are relevant and weighty in solution of a given problem". There is never any 'immediate' or context-free knowledge, then, but only inferences to be worked out in relation to a given problem, which has presented itself as being of relevance to both scientific research and its socio-technical context (or 'existential conditions').

In also suggesting the importance of such an experimental logic to the *social* sciences, Dewey (1927: 202) was quite explicit that what is at stake is exactly "a certain logic of method", a way of thinking, and "not, primarily, the carrying on of experimentation like that of

laboratories"––although it should be noted that Dewey kept the latter as an option, as did Garfinkel and Cicourel at a later stage. In the case of social inquiry, he argued, the predominance of *non-recurring* temporal sequences as well as the close involvement of associated socio-cultural factors in the operations of inquiry, makes the controlled variation of sets of conditions difficult, if not impossible. Yet, anticipating the logic of the 'quasi-experiment', Dewey (1938: 509) nonetheless saw great potential for "careful, selective, continued observation" of the conditions and consequences that follow from the introduction of social policies or other developing courses of social events. Indeed, the need to institute new "techniques of analytic observation and comparison", such that "problematic social situations may be resolved into definitely formulated problems" (ibid.: 494), was what Dewey saw as the prime challenge of the social sciences of his time. It is hard, I think, in the present context to miss the way such a call foreshadows many of the promises invested in new digital social traces.

To Dewey the pragmatist, there could be no question of assimilating his experimental logic and the call for new instrumentalities of observation to prevailing notions of any simple 'empiricism'. "All competent and authentic inquiry", he wrote (ibid.: 497), "demands that out of the complex welter of existential and potentially observable and recordable material, certain material be selected and weighted as data". In other words, Dewey was well aware that 'raw data is an oxymoron', to use contemporary language (cf. Gitelman 2013). On the other hand, he was especially critical of those dominant 'rationalist' strands of social thinking that took their own theoretical ideas as absolutist truths and sweeping universals, whether one followed the liberalism of Adam Smith or the class struggles of Karl Marx. The prime lesson to learn from the natural sciences, Dewey argued (ibid.: 505), was to stop thinking of social concepts "as *truths* already established and therefore unquestionable", and to treat them instead as "*hypotheses* to be employed in observation and ordering of phenomena". On such a view, he asserted, one would positively welcome a plurality of hypotheses for any given problem, as the existence of explicitly formulated alternatives would render inquiry more extensive, more flexible, and more cognizant of the need to revise received ideas (such as in the case of 'surveillance capitalism', as I have indicated, and its likely variations).

What is perhaps most interesting about Dewey's position, finally, is the far-reaching and perhaps counterintuitive implications he drew in relation to what Noortje Marres, whose ideas about digital sociology I sketched in the beginning, calls an interventionist approach to inquiry. Anticipating what certain STS scholars would later dub 'technical democracy' (Callon et al. 2009), Dewey suggested that, even in the case of the physical sciences, any *complete* test of their knowledge claims would eventually require taking into account the relevant consequences brought about by the material extension of such claims into the technically non-scientific public. Even more so for the social sciences, he argued (ibid.: 499), the "connection of social inquiry, as to social data and as to conceptual generalizations, with practice is intrinsic not external". In ways inherited later on by C. Wright Mills (1959), Dewey argued that social inquiry grows out of actual social tensions or 'troubles', and must orient itself to its 'existential resolution', as mediated by the way such 'troubles' manifest themselves amongst concerned democratic publics. Dewey-inspired digital social research now experimenting on new data-publics (e.g. Madsen & Munk 2019) would, I believe, stand to gain from closer articulation vis-à-vis this experimental logic of social inquiry.

While thus adopting an explicitly experimental logic, Dewey just as explicitly rejected standard notions of 'value-neutral' social science, aligning his view of social inquiry rather towards democratic theory and practice. The social sciences work, as it were, as the cognitive organs of a well-functioning democratic society, oriented to its continual and indeed experimental self-improvement (Dewey 1927; Haworth 1960). What this meant, however, was that the values and relations at stake in any given situation of social inquiry––including the plans and values adopted by the social scientist; what Dewey called an endin-view for problem resolution––was as much a part of the experimental process as anything else. In the end, the determination of social facts

via an experimental logic was thus co-terminate, to Dewey, with an understanding of their relations and significance to plans for dealing practically with troublesome social phenomena. In such a vision, the experimentalism of social inquiry is a *recursive* one: at any given moment, the social scientist must take as her starting point a problematic social situation that is, to a greater or lesser extent, *itself* the product of previous rounds of interventions and experiments driven partly by social inquiry.

Concluding remarks: redrawing STS' digital-experimental map?

To end here, and to briefly summarise, this image or vision of a recursive experimentalism of social inquiry––and the way it interlinks questions of data, instruments, theory, ethics, and public accountability in intrinsic and problem-specific rather than extrinsic ways––seems to me of great interest as one way of appreciating the current experimental moment of digital social data in STS and beyond. It is a meta-experimental vision of social science, writ large, one seen as equally committed to its possible value as an organ of credible knowledge and public intelligence as to a relentless and, indeed, 'experimental' questioning of its received conventions and ideas. Such received conventions, clearly, should include what are otherwise accepted tropes in STS discussions on digital methods (Madsen & Munk 2019), as well as ideas of what constitute 'properly' interventionist (digital) STS––ideas that, I have suggested, may be fruitfully questioned via closer and more precise attention to the tensions and compatibilities of several practical-experimental registers.

As such, and importantly for my commentary on Marres' (2017) otherwise highly inspiring and pertinent call for *Digital Sociology*, it is thus also a vision of the current social data moment that insists on the possibility of contingent cross-fertilization across otherwise distinct styles of reasoning, including those now crystallizing under the rubrics of computational social science and digital methods, respectively. Both, I believe, will have important, oftentimes distinct and disjunctive, yet occasionally mutually enriching, roles to play in forging new forms of digital social inquiry (see Veltri 2019). In years to come, I venture, scholars within and outside STS may well want to adopt a similar twin commitment: that is, to work simultaneously to appreciate *and* to critically test the plurality of ways in which data-experimental devices and practices can today be leveraged in the service of furthering the call of social knowledge.

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