Accessibility statement

This is an accessibility statement for the journal: Encounters.

Conformance status

The Web Content Accessibility Guidelines (WCAG) defines requirements for designers and developers to improve accessibility for people with disabilities. It defines three levels of conformance: Level A, Level AA, and Level AAA. This statement is relevant for volume 10, number 5, 2018 through volume 12, number 1, 2021. Encounters is partially conformant with WCAG 2.1 level AA. Partially conformant means that some parts of the content do not fully conform to the accessibility standard. Despite our best efforts to ensure accessibility, footnotes and graphs may not be accessible for screen readers at this point in time.

Feedback

We welcome your feedback on the accessibility of the journal. Please let us know if you encounter accessibility barriers. You can reach us at:

E-mail: imvko@cc.au.dk
Address: STS Center, Helsingforsgade 14, 8200 Aarhus N

Experimenting with experiments - an introduction

Andy Pickering
Professor emeritus, University of Exeter, UK

Finn Olesen
Associate professor, Department of Digital Design & Information Studies, Aarhus University

Peter Danholt
Associate professor, Department of Digital Design & Information Studies, Aarhus University

Vicky Hearne recounts how she once heard experienced experimenters advising young scientists never to work with cats. I would note, in passing, that it is also strongly discouraged, in laboratories, to work with parrots, not only because they never do anything that is asked of them but because they take advantage of their free time by destroying, with remarkable care, all of the equipment. (Despret et al., 2016: 89)

Contrary to what many think, laboratories are not controlled by brilliant scientists. They are not sites where everything goes according to the white-coated scientist's plan. Cats and parrots 'disrupt' the experiment and literally ruin the laboratory! They are places where scientists are not fully in control of what they produce knowledge about, but are thrown into the messy and risky practice of *trying* to produce knowledge. A site of material and non-human agency, where the risk is not only misbehaving animals but also that perhaps nothing happens at all. Or even worse, things actually go exactly as anticipated by the scientist, because if this is the case, it might be because the setting has been overly determined and constrained by the scientist, so nothing, but what the scientist imagined could happen. Then nothing new is learned or discovered.

This special issue is dedicated to the exploration of experiments and experimentation. It follows a PhD. course entitled "Exploring and performing experiments" that we organized at Department of Digital Design and Information Studies in spring 2019. The course was attended by 12 PhD fellows, and during the course we and the participants decided to produce a special issue based on the participants' PhD research projects. The literature for the course included a variety of texts and research articles focusing on experiments mainly from the field of Science and Technology Studies (STS). The readings included the work of Ian Hacking, Andy Pickering, Bruno Latour, Steven Shapin and Simon Schaffer, Isabelle Stengers, Shirley Strum and Brian Eno among others. In the call for papers for this issue authors were asked to draw on the literature in the field of STS in order to explore the role of experiments and experimentation in their own projects, and to consider their articles as vehicles for bringing insights from STS to their own fields. The spirit of this special issue is thus one of 'STS pollination' by bringing STS to other fields, rather than necessarily being contributions to STS itself. Hopefully it will generate novel insights and contributions and perhaps cross-pollination.

At the most basic level we might say that experiment is a way of producing knowledge about the world. A way of posing questions and getting answers. But, that said, experiments are not only a way of knowing the world, but also a way of doing in, and acting upon the world in specific ways and, as suggested by Latour in one of his seminal papers on Louis Pasteur and his development of the anthrax vaccine, a way of rearranging society and the world (Latour, 1983).

Experiments and experimentation are an essential part of science and technology development. Experiments can vary greatly from being a detailed, circumscribed practice with a well-defined objective to an open-ended exploration. Indeed, it can be argued, with reference to both Martin Heidegger's notion of being 'thrown into the world' and Alfred North Whitehead's process philosophy, that existence is experimental through and through, since existence entails ever changing circumstances and unexpected emergence.

In the philosophy of science, experiment is traditionally considered a method by which to test hypotheses about a given object in a controlled, secluded environment. Since Francis Bacon, the experimental method has been the example par excellence of reliable empirical science: Nature must be interpreted through the senses and aided by experiments 'fit and apposite' (Gooding et al., 1989; Harré, 1981; Latour, 1992; Shapin, 2017). During the scientific revolution laboratory experiment came to be a particular event in which a phenomenon could be secluded, manipulated and observed, a site of "purification" allowing for detailed scrutiny and description that paved the way for a specific scientific perception of reality. Over the years experiments and the laboratory have come to play a central role in the reproducibility

and circulation of knowledge. Given identical instrumental set-ups and procedures, experiments can be repeated and generate identical findings, thus corroborating or validating facts of nature. Laboratory experiments has on that basis gained a reputation in common thought as science in its hardest form.

Experiment as a hypothetico-deductive approach imposes a binary frame – it may either verify or falsify. But experiments can also be sites of discovery where we come to understand an object in a new way and thus expand our knowledge of it. Ideas about hard science as that which lives up to the standards of controlled and reproduceable experiments also today play a significant role in public and scientific debates around what qualifies as fac- and trustworthy science. Such discussions are actualized with the advent of public and political debates on climate changes, vaccines, various medical and health issues, immigration etc. and those debates are fueled by how information is now being circulated and mediated via internet technologies and social media. The science wars are thus still raging, it seems, and an emphasis on 'solid scientific facts' seems to be what is both in demand *and* debatable at every point.

In this issue, we do not propose to solve any of those 'big questions' or decide on what qualifies as good experiments or research. Rather, the departure is more modest. We allow ourselves to be uncertain. We propose that what an experiment is, or should be, is an open-ended question and an ongoing concern that must be invented and explored in every research project and related to basic concerns such as: what is the object of inquiry? what are its contours, boundaries and how is it demarcated? And by what means and questions is it able to make a separate account that sets it apart from the researcher? As the Belgian philosopher of science Isabelle Stengers would put it: research is a risky and interested practice that works to provide its object the ability to give an account of itself that is not determined by the researcher(Stengers, 2000, 2010).

Although the classical laboratory experiment is considered by many to be science par excellence, empirical studies of laboratory experiments and settings conducted in the field of STS have added

importantly to our understanding. Since the 1970's a performative turn has emerged, away from abstract philosophical and theoretical characteristics of experiment towards practical or pragmatic understandings. Scientific experiments can be grasped through a number of themes: e.g. instrumentation, experiments in written arguments, representations of phenomena, experimentalists versus theorists. Practice-philosophical and STS studies have shown that experiments are sites of hard work, contingency and messiness (Latour and Woolgar 1986; Hacking 1983; Pickering 1995; Knorr Cetina 1999). They are sites in which 'worlds are raised', i.e. the knowledge produced through experiments has consequences beyond the confines of the lab. The knowledge-producing capacities of experiments have multiple consequences for society and for everyday human and non-human existence, but experiments are also themselves products of political, social, economic and cultural factors. Furthermore, experiments are events in which 'dialectics of resistances and accommodation' occur (Pickering 1995). Experiments are thus incidents where things might explode and mishaps happen, objects resist and escape scrutiny, or simply be available as docile objects that lend themselves to immediate interrogation and 'discovery'. Following this, experiments can also be sites of violence, in which objects of all sorts (things, humans, animals, plants etc.) are molested, amputated and reduced 'in the name of science'. A violence and objectification that is not only a reduction of the objects of study, but also consequential for the knowledge produced, perhaps leading to ignorance rather than insight (Despret, 2006; Kleinman & Suryanarayanan, 2012; Stengers, 1997; Strum & Fedigan, 2000).

For numerous reasons, experiment is no longer confined to the laboratory but seems to pervade the world (Blok, 2020; Latour, 1987; Pickering, 2016; Pickering & Guzik, 2008). The experimental organization has become an organizational form. Experiments are part of design practices: design processes that emphasize mutual engagement between human actors and their materials are inherently experimental. One could argue that experiment is pervasive today because of a societal concern with agility and continuous adaptation coupled with a concern

for making well informed 'evidence-based' decisions and to avoid haphazard actions. And with climate changes the planetary system of Earth seems to have become a gigantic laboratory with millions of scientists, companies, lay persons and politicians debating what to make of the 'data' and how to act.

Experimental practices are embodied situated practices where humans and our conceptual and intellectual 'tools' are entangled in complex, dynamic assemblages. Also, we might argue that when we are doing research, in the field or the lab, we are enmeshed in a practice of testing and experimenting with things, phenomena, instruments, methods, concepts, existing knowledge, interpretations and their various combinations in order to produce knowledge and do stuff with what we come to know—account for it, publish it, defend and negotiate concepts, empirical material and interpretations, get grants, jobs and credentials. Experimentation is the continuous unavoidable practice of being in a world that is never stable and continues to escape our control.

Not anyone can conduct a specific experiment and replicate established facts, and even when skilled experimenters go about their business, things still go wrong: equipment and instruments fail, things explode or nothing happens, or cats refuse to do what they are supposed to and parrots – with remarkable care – destroy everything around them. When things do not go as expected, what do experimenters do? Discard some of the incidents as anomalies and mishaps? Or meticulously account for every 'nonsensical' result, every mishap, happening and unhappening as rightfully adhering to the experimental context as a good and observant scientist? Hopefully, the latter, but all those happenings rarely make a good publishable article, so some things have to be excluded, but which parts and on what grounds? And when incidents and results get excluded where does that leave us if we are firm believers in laboratory experiment as hard science and scientists as value-free neutral observers? Experiment involves the risk of making the wrong or bad seclusions and thus conducting, not science par excellence, but just poor research…

This issue is comprised of five articles that in various ways address or experiment with experiment in relation to specific fields or studies. Sanne Lisborg is concerned with the role of virtual laboratories in school teaching. Virtual labs are computer simulations of 'real experiments' which are used to teach pupils about, for instance, physics or biology. Lisborg analyses and explores how we may conceptualize the virtual laboratory by drawing on STS and pragmatism.

In his article Frederik Vejlin presents his ethnographic field work in a social robotics lab in Japan. In the lab. the roboticists experiment with how to make robots social, that is, how to design and program robots in order for them to interact with and be experienced as social by human beings. Vejlin draws on recent social anthropology and shows that how and what 'social' means is extremely difficult to define and accordingly to reproduce. However, the ambition and assumptions about the social as a specific human quality, are central to work in and around the social roboticists' lab.

Tine Friis article explores the relation between the gut and the psyche. Her article presents and discusses how patients diagnosed with gut-related diseases together explore the relations between their gut and their psyche through writing third-person stories and group exchanges. She understands 'memory work' as itself an experimental exploration of the self.

Anne Henriksen and Finn Olesen present a study of a company experimenting to develop a system based on AI and Machine Learning to be used in relation to predicting somatic patients at risk. Henriksen and Olesen draw on Latour's concept of partially existing objects and show how the system comes into being and changes in relation to organizational and design decisions made along the way. Andy Pickering's notion of 'social mangling' is used to emphasize this point.

Mikkel Rask Pedersen's article is based on his research on online peer-support forums for pedophiles who seek to live non-offending lives. He draws on, among others, Donna Haraway's 'situated knowledge', Marilyn Strathern's work on relations, hybrids and networks and Pickering's concept of 'experimenting in the wild'. And he shows

how we can understand the peer-support forum as an arena in which pedophiles experiment with becoming different subjects, and how these practices can be valuable for child sexual abuse prevention.

Acknowledgements

References

Blok, A. (2020). Why (and how to) experiment with digital social data? STS Encounters, 11(1). https://www.dasts.dk/wp-content/uploads/5_Commentary_FV_1.pdf

Cetina, K. K. (1999). Epistemic Cultures: How the Sciences Make Knowledge. Harvard University Press.

Despret, V. (2006). Sheep do have opinions. Making Things Public. Atmospheres of Democracy, 360–370.

Despret, V., Buchanan, B., & Latour, B. (2016). What would animals say if we asked the right questions? University of Minnesota Press.

Gooding, D., Pinch, T., & Schaffer, S. (Eds.). (1989). The Uses of experiment: Studies in the natural sciences. Cambridge University Press.

Hacking, I. (1983). Representing and intervening: Introductory topics in the philosophy of natural science. Cambridge University Press.

Harré, R. (1981). Great scientific experiments: 20 experiments that changed our view of the world. Phaidon.

Kleinman, D. L., & Suryanarayanan, S. (2012). Dying Bees and the Social Production of Ignorance. Science, Technology & Human Values, 38(4), 492–517. https://doi.org/10.1177/0162243912442575

Latour, B. (1983). Give Me a Laboratory and I will Raise the World. In K. Knorr-Cetina & M. Mulkay (Eds.), Science Observed – Perspectives on the Social Study of Science. SAGE.

Latour, B. (1987). Science in action: How to follow scientists and engineers through society. Harvard University Press.

Latour, B. (1992). We have never been modern ([3. print.]). Harvard Univ. Press.

Latour, B., & Woolgar, S. (1986). Laboratory Life: The Construction of Scientific Facts. Princeton University Press.

Pickering, A. (1995). The mangle of practice: Time, agency, and science. University of Chicago Press.

Pickering, A. (1999). Constructing Quarks: A Sociological History of Particle Physics. University Of Chicago Press.

Pickering, A. (2016). Art, Science and Experiment. MaHKUscript: Journal of Fine Art Research, 1(1). https://doi.org/10.5334/mjfar.2

Pickering, A., & Guzik, K. (Eds.). (2008). The mangle in practice: Science, society, and becoming. Duke University Press.

Shapin, S. (2017). Leviathan and the air-pump: Hobbes, boyle, and the experimental life. Princeton University Press.

Stengers, I. (1997). Power and Invention: Situating Science. U of Minnesota Press.

Stengers, I. (2000). The invention of modern science. University of Minnesota Press.

Stengers, I. (2010). Cosmopolitics I (R. Bononno, Trans.). Univ Of Minnesota Press.

Strum, S. C., & Fedigan, L. M. (Eds.). (2000). Primate encounters: Models of science, gender, and society. University of Chicago Press.