

Textual doppelgängers : critical issues in the study of technology

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- Abstract** The paper below is an extended version of my comments delivered as a participant in the “Digital Medias and Technologies: Cross Perspectives from Communication and STS” Roundtable part of the Technologies and Emerging Media path at the Canadian Communication Association 2012 meeting. In these notes, I provide some conceptual definitions and examples of a form of scholarship I see as satisfying a commitment to the materials of techno-science that should be a key component of both communication and STS research on digital media. This scholarly form is linked to design sensibilities and outcomes. It is facilitated by new possibilities for technical practice, e.g. the 'maker' movement, as well as by current and past attempts to link design and materiality to scholarly reflection on the co-construction of a simultaneously 'built' and 'thought' material-semiotic world.
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1. Introduction

At a conference a group builds electronics flowers, using them to explore dimensions of sharing and network technologies; (Ratto and Hoekema, 2009a) in a city, urban agriculturalists use simple robots to explore small-scale farming and automation; (DiSalvo, 2012) in their workplace, designers construct an IV bag in the shape of a teddy bear and rely on the cognitive dissonance to convey affectual sensibilities about health and childhood; (Dunn and Raby, 2001) in a company a group of designers and sales people build wearable sensors to test theories of cognitive plasticity and embodiment; (Ratto, 2010) at the university, a class of students uses arduinos and electronics to explore critical information issues; (Ratto, 2009b) and in her studio, an artist clones ten trees and places them around the world as part of a material experience-experiment on nature-nature relations (Jerimijenko, 2004)

These examples, drawn from my own work and from the work of others, serve as examples of what I frame as 'critical making', (Ratto and Hoekema, 2009a; Ratto, 2011a and 2011b), materially productive hands-on work intended to uncover and explore conceptual uncertainties, parse the world in ways that language cannot, and to disseminate the results of these explorations through embodied, material forms. The use of the term critical making, rather than related terms such as critical design, (Dunn and Raby, 2001) design thinking, (Martin, 2009) or constructionism¹ (Harel and Papert, 1991) is purposeful. Rather than focus on how more reflexive practices can improve the quality of the material world, the term critical making – like critical thinking - highlights an intention to explore how more substantial engagements with material production will improve the quality of our conceptualizations of our world. At the heart of this notion of critical making is an argument about the importance of making for understanding and intervening in the dominant modes of social life. More pragmatically, critical making frames a need to incorporate technical work alongside critical social analysis and

¹ These serve as only a few examples. Other relevant terms include adversarial design (DiSalvo, 2012), critical technical practice (Agre, 1994), and participatory design (Schuler and Namioka, 1993).

makes a claim that doing so can both extend current scholarly critiques and direct them into society in new ways. Addressing this need demonstrates a commitment to attend to the materiality of our socio-technical environments as has been well described in both the work of current STS scholars (e.g. Haraway, 1990; Latour, 1999; Shapin and Schaffer, 1986) and by past communication and media scholars as well (Innis, 1951; McLuhan, 1994; Postman, 2005).

2. Origins

I work at the University of Toronto in the Faculty of Information where my focus is on exploring the ways in which the materialities of our information environments matters (CF Hayles, 1993; Kirschenbaum, 2008; Blanchette, 2012). For the last few years I've been trying to maintain a commitment to this materiality, primarily through the study and development of research and pedagogical practices that use materially productive hands-on work to uncover and explore conceptual uncertainties, parse the world in ways that language cannot, and to disseminate the results of these explorations through embodied, material forms. My academic work did not start out this way. Instead, my PhD research and following projects relied primarily on interviews and observational practices as well as some forms of content analysis, whether of software programs and their makers (Ratto, 2005), loose networks of collaboration within health sciences (Ratto, 2006) or of epistemic cultures within archaeology (Ratto, 2009.) At some point I realized that what connected these rather diverse subjects was an emphasis on building and making things, whether operating systems, distributed health databases, or archaeological models. However, I continued to struggle with a sense that observation and interview did not capture many details of highly technical material work. Further, I increasingly felt that these missing details were somehow relevant and important for understanding the complexly interwoven nature of our socio-technical world.

I first started thinking in 2007 about the role of making as a necessary and under-utilized part of critical reflection on technology and society. Until then, I had been using the more traditional forms of academic reflection, data gathering, and writing to explore questions about structure and agency and the links between technical artifacts and social organization. However, I kept finding myself backed into reductive

corners or creating ever more complicated theories about the status and role of material objects in society. At a certain point I was reminded of the complications of the Ptolemaic system of astronomy - how ever-increasing complications of cycles and epicycles were required to keep the Earth at the centre of the universe as new evidence from scientific observation had to be factored in. I began to wonder if we needed a Copernican revolution in order to sweep away these wheels within wheels. I was assisted in my thinking on this by an increased attention to 'materiality', to objects, and to design, a 'move to the material' within STS and related fields that both excited and frustrated me. There was something quite right in this move and yet also something very wrong.

3. “textual doppelgängers”

It came to me one day while reading a fascinating (but I thought) unrelated book on art history. In his chapter addressing visibility and art, Corbett (2005) decried what he termed the use of 'textual doppelgängers' within art history, claiming that most historians first replaced the art object (painting, sculpture, whatever) with a textual description and then proceeded to carry out their analysis on this replacement. Aha! Here seemed to be the 'earth' in our current geocentric model of criticality and technology - too much of a dependency on textuality and language. I started to imagine a form of critical analysis that included material engagements with the domains being studied and soon discovered many similar forms - constructionism (a la Papert and others), various types of art and design practice, architecture, historical analyses that included the construction of material artifacts, as well as kinds of action and participatory research methods. And yet, there remained a strong disconnect between these more material forms of engagement and the conceptual work being done on technology, the built environment, and society. My sense was that creating more substantial relations between material and conceptual practices would improve the outcomes of each but that this had to be done in a way that maintained the commitments of each form of intervention - that language as a generalizing and expanding form of intervention needed to be part of the mix as did forms of technical work that allowed materiality to exceed and resist the ways in which we characterize it through language. I also quickly realized that I couldn't

'think' my way to such a practice but had to actively work to 'make' this form.

4. Failure

My initial attempt to do this failed miserably- this let me know that I was on the right track. In 2008 I was invited to give a talk at the Royal College of Art in London on the topic of distance learning and web 2.0 technologies. My sense was that this debate had stalled with critics claiming that distance education technologies lacked the sociality of face-to-face interactions, and advocates claiming that these issues had been or would be solved by higher bandwidths, new interfaces, or other novel technological developments. These arguments fell rather neatly into the two forms of reductionism noted by Latour (2004), one group claiming an unmediated and romantic concept of the 'social', while the other emphasized a strong technological determinism.

Rather than attempt to prove or disprove these positions, I instead decided to facilitate a workshop on this topic using shared making as a way of creating joint experiences. I titled it "taking things apart/making things together: critical making & discovery learning" and decided to use a robot-making practice as a way to create context for the discussion. I started the 1 1/2 hour session with a brief description and overview of the debate between advocates and denigrators of distance education, painting a conceptually clear but simplistic argument. I encouraged the participants to advocate for or against distance ed and after a brief conversation, helped the participants organize into teams. I then provided each with some small vibrating motors (typically found in pagers and cell phones), batteries, tape, glue, toothbrushes, and other craft materials. I described the notion of the 'bristlebot,' a type of robot that achieved its movement through the vibration of toothbrush bristles against a surface, and pointed each team towards online resources that would help them build one. After some encouragement, the participants began to construct individual machines, referring to both the online and offline resources. Periodically, over the following 40 minutes I interrupted the teams to ask them to reflect on the kinds of help they were getting from digital resources, what help they received from their team-mates and others in the room, and how the materials themselves informed their decisions. After finishing and showing off the results of their work, I proceeded to raise the topic of distance education and asked the

participants to reflect on how their recent experience informed their judgement or perspective. A quick review of the participants found that few of them had changed their position and that the majority of them had trouble mapping what they had just done to the critical issues involved – though that had enjoyed the experience.

Why was this? Rather than see the event just as a failure - which in certain ways it certainly was - I saw it as a data point for a more meta-level analysis involving the relations between 'making' and conceptual work. But for that analysis I would need other data points. Luckily, soon after, I found myself planning another event, this time involving a critical analysis of the Internet as a 'walled garden'.

5. Success!

For this, I was invited to contribute to a two-day conference in Amsterdam on issues related to Web 2.0 developments (virtueel platform, 2008). This event was organized by Virtueel Platform, an organization tasked by the Dutch government with facilitating cross-disciplinary discussions between media arts and design organizations. The main concern of the overall conference was the issue of so-called 'walled gardens' – did closed web 2.0 network applications such as Facebook™ constitute 'free riding' and the extraction of value from the network as a whole? The idea for our contribution, what we called the 'Flwr Pwr' workshop, was to create a shared construction exercise that could facilitate and inform discussions around the rise of proprietary and closed 'walled gardens' on the internet and provide some common ground for thinking through the social issues involved. Using pre-assembled and coded components, workshop participants constructed simple electronic agents called 'flwrs' that 'talked' and 'listened' to one another using infrared communication, and displayed the results via pre-set series of colored, blinking lights. By observing these lights, the makers of the flwrs could see how their flwr communicated to the others, and how the status and quality of these communications helped or hindered in the growth and maintenance of the garden as a whole. More over, we selected critical theories of information and exchange, such as the the idea of generalized exchange and gift economies (Mauss, 1990), the notion of the information commons (Benkler, 2006), and a concept of information "neighborhoods" extended from the work of Jacobs (1992).

We then developed specific code subroutines that metaphorically operationalized these concepts.²

Unlike the RCA event, the Amsterdam event was a rousing success. Participants actively engaged in the making process, using craft materials to construct personal flwrs and quickly becoming comfortable with the process for programming and customizing how their flwr behaved. Moreover, they soon began to make use of the conceptual language that accompanied the technical instructions, describing the signals sent by their flwrs as 'gifts' or 'commodities' (Mauss, 1990), contextualizing the flwrs' relations as the result of reciprocity and 'generalized exchange' (Mauss, 1990) and mapping such behaviors to the open and closeness of information on the internet. Unlike in the RCA event, the making work and the critical conceptual work seemed to meld, with each type of engagement supporting the other. Equally, this melding paid off – our conversations on the idea of the internet as a walled garden took a surprising turn when the flwrs themselves pushed back on our initially simplistic notions of open as good and closed as bad. As we configured the flwrs with more complex rules regarding sharing, we found that in some cases, having 'walls' between the flwrs helped maintain a more diverse and heterogenous network. Since the flwrs were somewhat unreliable and certainly did not constitute any kind of rigorous or authoritative source, this insight became a starting point, opening up the need for more conversation and conceptual work, rather than closing down and 'proving' one particular point. Here, the flwrs served to constitute the notion of the walled garden as a 'matter for concern' rather than as a 'matter of fact' (Latour, 2008).

6. Conclusion

I see the above narratives and the practices through which they were generated as heralding the opportunity for a more sustained and material engagement with important questions regarding the relations between people and technologies. Why did the RCA bristlebot group fail to link the conceptual and the material work, whereas the Walled Garden FLWR PWR group successfully linked these two aspects? What in other words allows people to bridge between technical perspectives and

² For more specifics about FLWR PWR, please see Ratto (2011). In this article I address in more detail what I mean here by 'metaphorically' linking code and concept.

material labour and critical social perspectives and conceptual labour? And why is this important? I end this short paper with a few thoughts on these issues.

First, society is increasingly digitally mediated. No longer do we 'go' to cyberspace - we live within it. This means the outright rejection of technology described by some past (romantic) scholars is not an option – if it ever truly was possible to live 'outside' technology. Even if we choose to not own cellphones or utilize online systems and resources, as individuals and as members of a society, we are interfiliated within the flows (Castells, 2000) and logics (Thrift, 2011) of digitality. We must come to terms with the systems and artifacts we build and by understanding what they do to and for us, construct them (both materially and semiotically) in more liberatory and productive ways.

Second, critical analysis of technologies is of limited usefulness if we cannot connect the results of this work to actual engagements with the technologies in question. Classic critical accounts (e.g. Ellul, 1964; Heidegger, 1977; Marcuse, 1964) have tended to focus on technology with a capital 'T', resulting in essentializing statements that are often difficult to reconcile with our lived, day-to-day experiences of digital mediation. This work remains useful and important and the insights that emerged from it are in fact often under-addressed by current generations of technology scholars³. But these insights and perspectives must be concretely connected to the practices of use and design through which people and technologies are co-constituted in order for them to have any effect.

The above examples, of bristlebots and digital flwrs, served as my initial attempts to bridge the distance between the necessary and important textual doppelgängers of critical scholarship and the objects themselves. It stating this I do not mean to claim a realist separation between the 'real world' of objects and the 'social world' of words and meanings. But I do want to emphasize how difficult it can be to maintain space within academic work for the materials of our material-semiotic world as well as how necessary it is to push back however slightly on scholarly log-

³ I would exempt from this statement the work of Andrew Feenberg and other adherents to his critical theory of technology. (Feenberg, 1991; 1999) This work is explicitly oriented towards bridging the divide between classic philosophy of technology's critical perspectives and more recent empirically focused technology studies scholarship. However, the relevance of this work is similarly limited by the logocentrism that I associate with other scholarship on technology.

centricity. I have continued by naive attempts to 'make' such opportunities as well as to think through their ramifications⁴. Figuring out ways to bring material engagements with the technologies we study is therefore of paramount importance – not just as a way of making better objects (though this will be an important outcome) but also so that we understand the objects that are made in a more concrete and comprehensive fashion.

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⁴ I continue to document these attempts on my website, <http://www.criticalmaking.com>.

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