## Research

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## RESEARCH

# Materializing Data: New Research Methods for Feminist Digital Humanities

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This paper argues that materializing data may be a useful methodology in intersectional feminist digital humanities, because it requires close attention not only to the content of data and the contexts in which it is produced, but also to the individual, situated, differing knowledges that researchers leverage in the processes of generating, analyzing, and disseminating research data. We introduce two approaches to data materialization currently used at the qCollaborative, an intersectional feminist design research lab with nodes at the University of Waterloo, Mount Royal University, and the University of Illinois, Urbana-Champaign. The outcomes of these methods, which we call "forcing connections between the digital and the material" and "dwelling with embodied data in research scenes", have included productive opportunities to: relax behavioural expectations and inhibitions; leverage tacit as well as explicit knowledges; engage in processes of vulnerable co-creation; engage in equitable co-creation of knowledge across differences in lived experience; cycle through stages of public representation, gathering, and presentation; account for the complex events, actions, and contestations that influence our processes of data-production, analysis, and remediation; generate research products that can become future research scenes for equitable data-dwelling processes; and leverage old-media tactics to intervene into harmful, normative digital cultures; and generate new conceptual paradigms; and: make explicit interventions into institutional cultures. These outcomes suggest the need for further work to develop a validated, transferable data materialization methodology for use by qCollaborative and and other digital humanities researchers.

**Keywords:** qCollaborative; feminist digital humanities; materializing data; forcing comparisons; dwelling with data; research scenes

Cet article argumente que concrétiser des données peut être une méthodologie utile dans les humanités numériques féministes intersectionnelles, parce que cela nécessite une attention particulière non seulement accordée au contenu des données et aux contextes dans lesquels elles sont produites, mais aussi accordée aux connaissances différentes situées individuelles que les chercheurs exploitent durant le processus de générer, d'analyser et de disséminer des données de recherche. Nous présentons deux approches de concrétiser des données, lesquelles approches s'utilisent actuellement à *qCollaborative*, un laboratoire de recherche stylistique féministe intersectionnelle qui a des nœuds à l'Université de Waterloo, à l'Université Mount Royal et à l'Université d'Illinois à Urbana-Champaign. Les résultats de ces méthodes, ce que nous appelons « forcer des connections entre la numérique et le matériel » et « analyser des données incorporées dans des scènes de recherche », incluent des opportunités productives pour : écarter des attentes de comportement ; pour exploiter des connaissances explicites et implicites ; pour s'engager dans des processus de co-création vulnérable ; pour s'engager dans la co-création équitable de connaissances en fonction de différences dans des expériences vécues ; pour parcourir les cycles des étapes de représentation, de rassemblement et de présentation publics ; pour justifier les évènements, les actions et les contestations complexes qui influent sur nos processus de produire, d'analyser et d'assainir des données ; pour générer des produits de recherche qui peuvent devenir des scènes de recherche futures pour des processus équitables d'analyse de données ; pour exploiter des stratégies de vieux médias pour intervenir dans des cultures numériques normatives nocives ; pour générer de nouveaux paradigmes conceptuels ; et pour effectuer des interventions explicites dans des cultures institutionnelles. Ces résultats suggèrent la nécessité de travail supplémentaire pour le développement d'une méthodologie transférable validée qui concrétise des données exploitables pour *qCollaborative* et pour d'autres chercheurs des humanités numériques.

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## Introduction

This paper introduces a central research thread of the recently founded qCollaborative (2020), a critical feminist design research lab with nodes at the University of Waterloo, Mount Royal University, and the University of Illinois Urbana-Champaign.[1] qLab is committed to challenging and changing unjust

[1] The qCollaborative came together in the fall of 2017 following what we have since termed the "inaugural feminist reading group." Books and articles that we read, and most definitely recommend,

behaviours, such as racism, colonialism, (cis)sexism, homophobia, transphobia, ableism, classism, and xenophobia wherever they occur, including in academia, in social justice movements, and in ourselves. Our projects combine performance and technology in public practice, arising from our founding convenors' longstanding commitments both to the digital humanities and to creating safer, more inclusive public spaces for marginalized and targeted communities. We are invested in how the digital humanities, as a field, is increasingly attentive to the material and embodied environments in which our creative research tools and methods are deployed. In this paper, we outline two distinct approaches we are developing to address a central question currently motivating the lab: how can we use physical materializations of qualitative and quantitative data to increase the positive impacts of digital tools and to encourage healthy interactions with them? qLab projects that take up this question, and the projects we specifically outline here, are particularly concerned with the discursive agencies of marginalized communities in social media, pedagogical, and everyday lived environments. Our projects seek to interrogate and reimagine what data can be in the context of a design research mandate oriented toward social justice.

Despite the legacy of justice- and equity-oriented work in digital humanities,[2] the field as a whole has not yet taken up the call from Moya Bailey, Anne Cong-Huyen, Alexis Lothian, and Amanda Philips (2016) to "shift the focus of digital humanities from technical processes to political ones," and in doing so, explicitly seek "a digital humanities that [centers] on the intersection of digital production

include Sara Ahmed's (2017) *Living a Feminist Life*, Joanne Barker's (2015) "Indigenous Feminisms," Judith Butler's (2015) *Notes Towards a Performative Theory of Assembly*, Kristina Llewellyn and Jennifer Llewellyn's (2015) "A Restorative Approach to Learning: Relational Theory as Feminist Pedagogy in Universities," Roxane Gay's (2014) *Bad Feminist*, and Karama Chavez's (2013) *Queer Migration Politics: Activist Rhetoric and Coalitional Possibilities*. Feminist relationality fuelled not only how we chose which texts to read, but also how we formed the commitments of our group and the kinds of projects we seek to undertake.

[2] For example, recent work by Josephs (2019) looks at DH through a Caribbean lens; Meza (2019) interrogates a specific project from the perspective of the global south; Rahul (2019) challenges the patriarchal and Eurocentric foundations of DH from a postcolonial framework; Losh and Wernimont's (2018) edited collection offers an intersectional feminist lens to DH, focused on communal care and coalition building; and Messer-Kruse (2016) provides a study of urban geography as coded racial proxies in the only daily newspaper in Toledo, Ohio.

and social transformation through research, pedagogy, and activism, and that will not be restricted to institutional academic spaces" (para. 2). The qCollaborative takes this political call seriously, specifically ensuring that principles of intersectional feminist thinking and action are at the forefront of our digital humanities research efforts. For us, this includes actively working to decenter whiteness, cis-maleness, and other manifestations of dominant culture in our understandings of data and in our research design. It also means that our projects aim to amplify the voices, ideas, and practices of those regularly left out of public discourses. One primary area of concern is the potential for computational approaches to data-production to further the dehumanization and decontextualization of the human experience, since marginalized and targeted individuals, communities, and environments are more vulnerable to practices of computational abstraction (D'Ignazio and Klein 2020). As Stephanie Blackmon (2017) has noted: "traditional research methods may not capture the nuanced nature of…online interactions" but nuance is required to address injustice (193). As a result, qLab is increasingly invested in critical feminist praxis and co-creating with others new forms of material, small-data interfaces that leverage physicality, kinesthetics, and relationship (Knight 2018). We make, think, and remake together (see, e.g., Sample 2012; Nelson 2013), with bodies, gestures, and objects, in order to explore the personal, social, and ethical questions that are obscured when people are abstracted computationally. As Geoffrey Rockwell (2003) puts it, we will "learn not by thinking in isolation but by building and looking and rebuilding and looking again" (7).

Following Pommerantz (2015), we accept that data are information that need to be processed to be meaningful; that is, data are potential information that only become informative (and therefore valuable) when they are analyzed, and hence available for application in knowledge-production processes. This means, of course, that all data are invested in the values of the systems that produce them, and hence that those systems can be oriented towards intersectional feminist aims (see, e.g., Brown, Clements, and Grundy 2006; Brown and Simpson 2013; Holland and Brown 2018). Furthermore, data need not only be understood with reference to computational systems, which privilege digital means of processing; on the contrary, any process of

manifesting ideas, information, or designs is an analytical and interpretive process that actualizes potential data (Borgman 2015). In other words, data are not unique to computational systems; framing them more broadly as concepts that can be actualized in a variety of media through both material and digital processes gives us a broader scope for leveraging their potential to do intersectional feminist work. This is not to say that data that do not manifest physically inevitably lead to or reflect unjust systems, but that encouraging supplemental and multiple modes for the analysis, use, and circulation of data contributes to more accessible, feminist, and transparent research.

To "materialize" data—bringing conceptual, digital, or other forms into physical shape—is a form of remediation that gives access to complex discursive meanings because it requires close analysis in multiple modes, including textual, visual, auditory, spatial, kinesthetic, and relational. Through remediation, we suggest that researchers, educators, and students alike are able to more fully work with and experience data in embodied ways in an effort to engage situated, individual, everyday communication practices that are crucial for making space for and thinking through our relationships to our work and the people our work will affect. Materialization is also a process of transmutation through which results are uncertain and in flux. Material data often look small and messy; whereas computational systems can be vast, closed, and tidy, material, embodied systems cannot. Given the characteristics of material systems, materializing data may add to the feminist "toolkits," to use Sara Ahmed's term (2017), available to digital humanists for intervening into environments where computational epistemologies can be harmful. Feminist and queer media studies have long acknowledged the need to develop analytical frames that move beyond big data practices of randomization, scaling, and algorithmic coding in order to better attend to queer and intersectional feminist understandings of data collection, interpretation, and remediation (see, e.g., Eichhorn 2013; Berlant 2008; Cvetkovich 2003), but little attention has so far been paid in DH to small data methods (Manovich 2011; Boyd and Crawford 2012). Some of our own past projects have attempted to fill this gap, in embodied, material ways: Milena Radzikowska's *Milking Machine* (2016) and *technoTAMPONS* (2019), and Shana MacDonald and

Brianna Wiens's *Reconstruction* (2016) and *@aesthetic.resistance* (2019-present) are four examples that we take up below. (These specific projects were chosen for analysis in this paper for their deep engagement with public audiences, their intent to bring attention to social injustices, and their focus on embodiment and materializing digital data.)

Although our work before now has been ad hoc and dispersed, at this point in our emergence as a collaborative, qLab is undertaking to develop transferable, small-data research methodologies, which attend to the emotions and micro-level practices of everyday digital media users, specifically through material making and working with embodied data. We propose that materialization can be an act, a process, and an experience of data analysis; it can be its manifestation, and it can be its outcome. In sitting with material data we suggest that bodily experiences and reactions matter, and that there should be efforts made to maintain these embodied relationships to data when they are digitized. In the discussion that follows, we report on our first steps in exploring these premises. Some questions that run through our discussion include: What happens when we allow and/or require data to take up physical, not just virtual, space? How can data materialization be a form of activism and/or empowerment? And: How can material, embodied data generate different forms of knowledge? We offer preliminary responses with reference to two methodological trajectories in our work as a collaborative, which we refer to as "forcing connections between the digital and the material"; and "dwelling with embodied data in research scenes." Each draws on different precedents in our past work, approaches data materialization in a different way, and engages with different communities of collaborators; and each suggests different avenues for further research.

## From *milking machine* to *technoTAMPONS:* Forcing connections between the digital and the material

In 2016, Milena Radzikowska's *Milking Machine* asked ten researchers to work together to intervene into the prevailing culture of computer-generated text interfaces in the digital humanities. This resulted in the material imagining of an alternative physical interface to *BubbleLines*, a digital tool for comparative search visualization that reads RSS feeds, XML files, and databases for documents

and enables users to search keywords and specific content within these multiple documents simultaneously (Giacometti, Ruecker, and Fiorentino 2012). A document was extracted from *BubbleLines*, and the physical materialization was composed of transparent vertical tubes, each filled with a different colour of sand, which together represented the locations of search terms in the document. The machine made surprising, funny, bovine noises, distinctly non-digital in their connotations, which ultimately gave *Milking Machine* its name. *Milking Machine* revealed how split the digital and material iterations of data really are, primarily because the researchers involved experienced new levels of analysis and knowledge-making in the process of choosing how to materialize digital data. Specifically, the concepts "digital" and "material" (analogous in this case to "textual" and "bovine") were experienced by researchers as a "forced connection" (Lupton 2017); "tubes, sand, and sound" did not fit easily with "textual search algorithm." This was, for the researchers participating, a paradigm-shifting experience. They concluded that "a document doesn't have the sterility of a line; a document is a patterned mess of meaning and emotion" (Roberts-Smith, Ruecker, and Radzikowska 2020). Using material construction to engage in what we normally think of as a digital process (the representation and analysis of data) is a forced connection that provides us with opportunities to generate new conceptual paradigms.

The next stage in Radzikowska's experimentation asked what might be the outcome of engaging public audiences in forced digital-material connections where pressing social issues are at stake. Students in her third-year Visualizing Information course were assigned the task of creating public displays for installation on the Mount Royal University campus, where passersby would be engaged in a process of materializing data. The following three projects were particularly notable for their attention to embodied engagements with depersonalized data and for the possibility of inciting important conversations between academic and public audiences. The first, "The Wheel of Hypersensitivity," a 2018 project created by Danielle Massee, invited passersby to use differently coloured yarn to map their areas of discursive discomfort. Massee pre-set the display with categories— feminism, religion, race, Black lives matter, abortion, mental health, cursing in public, indigenization,

politics, and others—that participants could use as "stopping points" on their path of discomfort. They were also invited to elaborate on any path by leaving explanatory notes. The display had to be reset several times due to the high volume of interaction, measured by the number of paths created and amount of yarn used. Every day, the wheel became a new object, through additional comments and paths. Among the most remarkable iterations was a back-and-forth conversation about depression that appeared to take place between several participants, through the "explanatory notes" feature (Radzikowska and Ruecker 2020). Second, in the "What Will You Change for Climate Change?" project by Briana Goucher, Mary Bevan, and Bryce Kezama (2018), passersby were asked to consider how they would change their lifestyles to minimize climate impact. This particular project, unlike the others, received a large amount of highly charged responses, a number of them critical of the Alberta NDP government that was in power at that time. Third, in 2019, the "Tampon" project, created by Kristina Lea, Rosey Eason, and Lauren Ceaser, asked the University community to reflect on the sources and types of shame experienced by those who identify as women. Community responses were gathered and visualized using "tampons" (custom-made replicas intended to avoid wasting feminine hygiene products, which are expensive and unattainable for many); coloured water, which represented different things that generate an experience of shame in women; and four pre-set display categories representing sources of that shame: society and media, men, other women, or themselves (Radzikowska and Ruecker forthcoming 2021). Passersby dipped a "tampon" into a colour and hung it in one of the display areas. Once again, this project had to be reset several times, with almost 300 "tampons" becoming data over the course of its two-week installation. All three of these projects were placed in environments where they could be encountered by people who likely had no pre-existing expectation of reflecting on mental health, climate change, or menstruation and shame when they entered those public spaces. Inviting, but not expecting participation opened space for the unexpected, "more in the spirit of Critical Design projects than…of the type of design problem solving that is guided by user-centered processes and ideologies" (Radzikowska and Ruecker forthcoming 2021). Each result had a high probability of failure or, at least, a substantial uncertainty of result, demonstrating and inviting public communal vulnerability.

Radzikowska's most recent project in this thread, *technoTAMPONS* (2020), takes up one of the themes of her students' work—the relationship between shame and menstruation—and makes it the focus of another explicit digital/material forced connection, designed to interrogate our assumptions about digital technologies themselves. In an October 2019 qLab workshop for menstruating individuals and female-identifying and non-binary participants hosted by the University of Waterloo's Games Institute, Radzikowska invited participants to articulate the connotations of each of the terms "menstruation" and "technology" separately, and then apply each term's discursive field to the other. Using a range of materials including paper, paint, jello, syrup, markers, glue, tape, and feminine hygiene products, participants then created physical objects and/or performances that either expressed "menstruation understood as a technology" or "technology understood as menstruation." The resulting artworks were shared and explained by participants to one another during the workshop, and also gathered into an exhibition that remained on display at the Games Institute for a week after the event. A similar workshop was held at Mount Royal University's Riddell Library Maker Studio in November 2019.

There have been three important outcomes to the *technoTAMPONS* workshops. The first was the range of participants, and the relationships developed among those who had not previously known one another. At Waterloo, these were marked by their diversity (since participants included students at all levels, faculty, staff, and industry professionals) as well as by their openness and vulnerability. This was manifest, for example, by a trans woman's articulation of her surprise at the sense of inclusion she felt in that space; by the significant risk taken by one participant who made an artwork using her own menstrual blood; and by the laughter and chatter that defined the soundscape of the afternoon. The second was the artworks themselves. These were messy—very messy—not just messy in their execution (which was rough and quick and suggested, rather than fully realized, concepts as they materialized), but also messy in their physicality, made of objects that are not normally allowed in public spaces full of computers: sanitary pads, liquids that looked like blood, syrupy substances that refused to dry over the course of the following week. They made a radical intervention into the Waterloo Games Institute's highly digitized environment. There, material objects tend either to express the surface-level object

of study (board games, avatar dolls) or to make the act of study possible (furniture, computers, peripherals). In this context, our exhibition was labeled: "Warning! Do not touch. Research in progress." This act of framing menstruation as a research experience marked that it was deserving of intellectual and creative attention equal to that of technology. Further, it helped to construct a space where a public, visible examination of menstruation could take place is an act of "claiming space" that is so often denied to experiences and concerns associated with the body, and particularly gendered bodies. Participants in the Mount Royal workshop generated work that similarly articulated a concern about the invisibility of and lack of access to menstrual hygiene products on the MRU campus. Their culminating design was a crane vending machine for menstrual and sexual health products, that would exist outside the seclusion of a women's washroom, alongside vending machines dispensing snacks and beverages. In this case, the forced connection between food and menstrual hygiene through the medium of a shared technology (the vending machine) resulted in a fundamental reimagining of institutional space, gendered washrooms, and gendered divides.

At Waterloo, institutional validation was not just an imaginative but an actual reconfiguring of institutional space—a third important outcome. In addition to fully funding Radzkowska's workshop, the Games Institute, which has been an active supporter of the University of Waterloo's participation in the United Nations Women's HeForShe Impact 10 × 10 × 10 campaign, also saw the exhibition as an opportunity to take a public position in support of qLab's messy feminist work. When the Institute's broader membership of non-participant students and faculty responded to the exhibition with a combination of silence and vocal dismay, the Institute sent an email to its distribution list of all members contextualizing *technoTAMPONS'* methodology using analogies familiar to the community ("thinking through making"; "objects to think with"), and inviting members to learn more by contacting Games Institute staff. This was a clear public statement situating feminist, activist data materialization as a legitimate form of research in a digitally-defined discipline, and an attempt to spark conversation between the different fields of research housed within the Games Institute.

To summarize: this trajectory of work, from *Milking Machine* to *technoTAMPONS*, suggests that since the forced connection inherent in data materialization inserts data into physical environments in unexpected ways, it can allow us to:

(1)  relax our usual behavioural expectations and inhibitions;

(2)  engage in processes of vulnerable co-creation;

(3)  cycle through stages of public representation, gathering, and presentation;

(4)  generate new conceptual paradigms; and

(5)  make explicit interventions into institutional cultures.

## From *reconstruction* to *@aesthetic.resistance*: Dwelling with embodied data in research scenes

Much of Shana MacDonald's past work (2018a, 2018b, 2018c) has explored data materialization in the context of public art installations. This trajectory of her work has resulted in a practice-based research methodology that "dwells with" data in order to frame it for public engagement through reflexive forms of mediation that call attention to our ethical and embodied relationships to the data with which we live and make meaning (2018a). Dwelling with data involves paying close attention to "the specificities of space that are overwritten by dominant perceptions and uses of it"; collecting potential data in those spaces as a "means of investigating…material vibrancy"; practicing a reflexive inquiry that "pause[s] between analysis and action… to situate…embodied experience as an index of whatever investments [we] may hold"; and remediating to signal how our research actions have framed the materials being presented (MacDonald 2018a, 279). In one application of the methodology, for example, MacDonald developed a public art piece called *Reconstruction* (2016), which built on research-creation scholarship that identifies creative practices as vital forms of knowledge production (Chapman and Sawchuk 2012) and sought to respond to scholarship advocating the importance of embodiment, interaction, and multi-modality in research processes (Nelson 2013; Barrett and Bolt 2013). The piece invited audiences at the 2016 Night/Shift festival in Kitchener, Ontario to dwell with data related to the development of Kitchener's inner city. Using coloured markers, public audiences drew their own imaginative reconceptions of Kitchener city blocks

onto 4 × 4 foot cardboard screens that showed projections of collaged archival photographic images of recognizable city blocks (MacDonald and Wiens 2019, 368). While this was an act of data-dwelling in itself, it also produced artworks that MacDonald and Brianna Wiens later moved to other spaces where they could engage in further acts of dwelling as they analyzed and remediated the screens as data, in preparation for an academic publication. MacDonald and Wiens describe each of these spaces of dwelling as a "research scene," which, because it recontextualizes data, influences our understanding of the data. Research scenes are hence not merely collections of physical objects, nor physical locations where analysis takes place, but rather are "the layered sites of events, actions, and contestations that play out at various moments in the real-time process of creative research events" (MacDonald and Wiens 2019, 369). This piece was an important step in thinking through method as dwelling and the importance of communal, embodied data creation as they turned to digital dwelling spaces.

In their most recent qLab project, MacDonald and Wiens have explored the dynamics of research scenes in a project that engaged a multi-generational group of researchers in dwelling with data that represented (to them) feminist media activism from 1960 to the present. Over a twelve-month period, the research team of MacDonald (a tenure-line faculty member), Wiens (a PhD candidate), Sid Heeg (a Master's student), and Sabrina Low and Khartiki Bhatnager (undergraduate students) collaborated on the scope and tone of an Instagram campaign, @*aesthetic.resistance*, which provided a rolling database of feminist historical and contemporary media practices, centering on work that advances the second-wave feminist slogan "the personal is the political" in aesthetic form. Each member of the research group either contributed a post to a themed week they had agreed upon or signed up for a themed week of their personal choosing that they took on entirely individually. Before each post, researchers put a written text and selected images in a Slack thread and invite peer feedback from the group. They met every two weeks to discuss the direction of the account and future themes, using queer and intersectional feminist theoretical frameworks from critical theory and media studies to scaffold their processes of content production and mobilization. The researchers' joint responsibility

for content creation required them to reflect on their own positionalities while also understanding their relationships to each other and their audiences. Since the research team is comprised of collaborators with different social locations of race, sexual orientation, age, education level, and gender, their discussions acted as a means of explicitly assessing whether the project's content was making an equitable political and social intervention into prevailing Instagram culture. They also modeled a means of knowledge production and mobilization that is inclusive, non-hierarchical, and deliberative, and that acknowledged that their lived racialized, gendered, queer, and classed based experiences and knowledges are valid. These lived experiences thus made each member the "expert" for different moments, as team members drew on each other's knowledges in different cases. Embracing and encouraging the uncertainties of these lived complicated considerations is a means of holding ourselves accountable to our digital public, and to each other.

In this project, the materialized data that researchers dwelled with consisted principally of their own bodies, gestures, and voices, as these repositories of tacit knowledges had the potential, when remediated into the @*aesthetic.resistance* repository, to "reflect new social and other realities either marginalized or not yet recognized in established social practice and discourses" (Barrett and Bolt 2012, 4). Because the team's lived experiences were so diverse, this was sometimes challenging. For instance, in June 2018 the research team for @*aesthetic.resistance* launched a month long exploration of queer icons or #queercons in honour of Pride. MacDonald brought in some key iconic figures of lesbian history from the 1990s, who in the ensuing years had become sources of tension within the LGBTQ+ community. When Low discovered this tension while doing research for the post and Wiens also voiced her apprehensions about the figure, a sustained group discussion about how to proceed included complicated conversations around the importance of knowing our queer history even when it is a flawed, and how to weigh that against our perhaps even more pressing need to actively include trans, genderqueer, and non-binary members of our digital community. In the end, the post was pulled and the queer members of the team have very recently engaged in a lengthy intergenerational conversation about the harms that would have been committed by circulating the

post and highlighting problematic figures, even when they may have at one point influenced us, and how sitting with the discomforts brought up by acknowledging connections to controversial figures, ideas, and terminologies are important learning moments. The initial conversation and the subsequent discussion have drawn attention to the need to attend to community-building not only as a methodology, but also as a disseminated outcome of research, creating inclusive scenes for future research in public spaces like Instagram's influencer culture, where white liberal feminism on social media and at large that has become so prevalent that voices from LGBTQ+, BIPOC, and other communities are systematically marginalized.

In other words, *@aesthetic.resistance* conceptualizes research scenes as inclusive environments that recognize bodies as data, and use collaborative dwelling as ways to intervene into prevailing normative cultures. Like Radzikowska's material data practices, this is small, messy, and unpredictable work, since it is invested in the details of individual lived experiences, and of the difficult and necessary conversations that arise from difference. But the vulnerability and trust required to engage in such conversations led, in the case of *@aesthetic.resistance,* to a shared confidence within the research group to resist dominant forms of social media attached to large corporate models of content production. Their small-scale intervention became an important form of culture-jamming or counter-cultural practice. This was particularly important to MacDonald, who came of age in the queer riot grrrl feminist zine spaces of the 90s. Like zines, the intention of *@aesthetic.resistance*'s feminist Instagram hack was to disseminate forms of countercultural knowledge to an interested community of interlocutors as a potential way of disengaging from the strictures of dominant media. *@aesthetic.resistance* is of course not unique in employing such tactics to interrupt, disrupt, and reshape the ways current dominant digital media tools; many other wonderful feminist Instagram hack accounts are currently circulating. What *@aesthetic.resistance* offers is a methodology and a new rationale for archiving this work for future audiences who will dwell with it in their own, more equitable and inclusive research scenes. Ultimately, the work started on Instagram has been crucial for informing the *@aesthetic.resistance* team's future actions as they continue conversations around community-building, hosting a biweekly reading

group focusing on Indigenous and Black feminisms; advancing Instagram content that focus on issues pertinent to Black, Indigenous, and other women of colour and queer, trans, and non-binary people; and committing to publishing future work that references primarily scholars with marginalized identities, with no less than 75% of citations being from BIPOC, queer, and trans scholars.

In summary, this trajectory of work, from *Reconstruction* to *@aesthetic.resistance*, suggests that when we conceptualize research scenes not only as material places where research takes place or as collections of material objects for researchers to study, but also acknowledges researchers' bodies, voices, and gestures as essential forms of material data, we can:

(1) account for the complex events, actions, and contestations that influence our processes of data-production, analysis, and remediation;

(2) leverage tacit as well as explicit knowledges;

(3) engage in equitable co-creation of knowledge across differences in lived experience;

(4) generate research products that can become future research scenes for equitable data-dwelling processes; and

(5) leverage old-media tactics to intervene into harmful, normative digital cultures.

## Conclusion

Those invested in feminist DH are well aware that current technologies and digital cultures are overflowing with forms of mediated misogyny that promote intimidation, harassment, and "alarming amounts of vitriol and violence" online (Banet-Weiser and Miltner 2016, 171). Under these conditions, digital feminists are challenging gender discrimination and promoting renewed visions of "feminist politics in the public sphere" (Keller and Ryan 2018, 1–2; Morrison 2019). Our investment in digital humanities is exactly this kind of investment in centering digital feminisms as an important site for further consideration, both because of what feminists can offer, and also because of the exclusions that can occur under their fourth-wave feminist banner (Wiens and MacDonald 2020). We believe that

at its best, feminist digital activist practices offer a communal call: one that can usefully queer even the Internet, itself a tool of the master (Lorde 1984), in order to better catalyze feminist configurations of relationships among people, technologies, and cultures—a call to gather the diverse practices and perspectives we have in our toolkits and mobilize them online and offline. At the qCollaborative, we think of materializing data as one such tool, a way of "doing feminism" collectively, emotionally, technologically, on a small scale with a large impact (Rentschler and Thrift 2014). Feminist data materialization is "more than technical skill"; rather it is a set of "embodied habits for acting and doing" that reveal producers' and consumers' embodied relationships to technology (Rentschler and Thrift 2014, 242). Its outcomes tend to be messy, creative expressions of the kind that employ formal techniques and technologies to produce recognizable and often affectively charged experiences for collective audiences.

In conclusion, while the two approaches to data materialization that the qCollaborative is exploring—forcing connections between the digital and the material, and dwelling with embodied data in research scenes—are far from validated methodologies at this stage, they do perhaps offer a basis from which the lab and other digital humanists might continue to expand our feminist toolkits in other projects. As we move forward as a collaborative, two avenues for further exploration are:

(1) exploring methodology more broadly to analyze the implications of data materialization for the intersecting contexts in which these projects are situated (i.e., intersectional feminist pedagogy and intersectional feminist research-creation); and

(2) considering methods closely as we investigate the embodied translations between material and digital data spaces (i.e., translating embodied action between physical space and digital platforms), the ways in which data change when they are translated between the digital and material, and how some data are always already both digital and material.

## Competing interest

The authors have no competing interests to declare.

## Author contributions

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Methodology: BW, SR, JRS, MR, SM

Software: n/a

Validation: n/a

Formal Analysis: n/a

Investigation: BW, MR, SM, SH, SL, KB

Resources: MR, SM, JRS

Data Curation: BW, MR, SM, SH, SL, KB

Writing – Original Draft Preparation: BW, JRS, MR, SM

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