Arts-based methods for researching digital life

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Abstract

This paper provides an overview of the use of arts-based methods for undertaking research on the relationship between digital technologies and society. It first details the approach of research-creation in which research is conducted using of arts-based methods. This is followed by a discussion of specific arts-based methods used in research-creation: creative writing, artistic methods, and creative data stories. Next, it sets out ways in which research undertaken using traditional social science methods can be disseminated in creative ways using creative non-fiction and fiction, film and exhibitions. It closes by noting some critiques of arts-based approaches.

Keywords: arts-based methods, research-creation, data stories, fiction, non-fiction, art, film, exhibition, social sciences

Introduction

Over the last two decades, there has been a turn towards using creative and experimental practices within social sciences research as a means to examine the materialized, embodied, emplaced and experiential nature of the relationship between digital technologies and society. Arts-based methods, utilising various forms of creative writing (e.g., speculative fiction,

digital poetry, short stories, and creative non-fiction), art and craft practices (e.g., painting, photography, sculpture, textiles) and performance (e.g., theatre, film-making, music), have been utilised as a means to research and make sense of digital life and to communicate research findings to various audiences (Kara 2015; Hawkins 2021). The turn to arts-based methods does not deny that there is much creativity and inventiveness in the design and use of traditional social science and humanities methods. Rather arts-based methods utilise their affordances to ask and explore the same questions in alternative ways, which might provide answers that are more illuminating or more effectively engage audiences. This paper is centrally concerned with these affordances and the use of arts-based methods for undertaking and disseminating research. The first section details the rationale of research-creation; that is, using creative practices as a means to conduct research. This is followed by a discussion of how research-creation is being undertaken in practice and the specific methods being used. The next section documents how research conducted using traditional social science methods can be disseminated using creative media. The final section details some concerns regarding the use of arts-based methods and their efficacy.

Research-creation

Typically, the use of arts-based methods in academic research occurs near the conclusion of a project, a means to communicate findings to non-academic audiences using media (e.g., creative non-fiction, film, artwork, exhibitions, podcasts) that employ significantly different forms and composition to tradition academic outputs (e.g., journal papers and books). Research-creation, however, utilises creative practices and media throughout the entire research process, its logics and methods permeating research design and implementation. As such, research-creation 'is not the creative presentation of, nor artistic experimentation with, pre-existing 'data' harvested through traditional … methods' (Truman 2021: xx). Rather, the framing and process of conducting research is realised by employing artistic practices, alongside the use of social science and humanities theory and methods, to examine social matters (Loveless 2019; Truman 2021). The aim is not necessarily to produce data that will then be analysed in a subsequent process, or to test a hypothesis or theory (Borgdorff et al. 2020). Rather the process of research-creation is the means of insight creation for participants and of producing knowledge. Research-creation can be practised by a scholar-artist working alone, but more typically is collaborative in nature involving a scholar and an artist working together, often with other participants such stakeholder or community members (Szanto and Sicotte 2022).

Research-creation, its advocates contend, enables new ways of knowing, representing and intervening. The process opens up new questions, fresh insights, alternative ways to think through issues, and novel and engaging ways to represent and communicate with audiences. This is because artistic practices re-attune the attention and perception of its practioners (Hawkins 2015). By utilising a creative register, research-creation enacts a sense of estrangement (pushing a person outside of what they comfortably know) and defamiliarisation (making the familiar strange) that generates a distancing mirror and prompts critical reflection (Loveless 2019). It enables the charting of knowledge that is not easily expressed with words or in a formal engagement, and to explore experiences which might otherwise be silenced (Tarr et al. 2018). Undertaken collaboratively, it fosters dialogue and interaction between participants that is less encumbered by hierarchal and formal relations that is usual in communal and workplace settings. Lupton and Watson (2021: 466) contend that research-creation, as an embodied, experiential set of practices that engage directly with discursive, symbolic and imagined meanings, help to 'surface unexpected … less taken-for-granted' and hidden views, as well as affective affordances, and expose 'practices, habits, routines, tactics [and] sensory engagements.'

The critical reflection inherent in its practices, Foley (2021: 34) argues, 'can help us to become more aware, more conscious and conscientious' about the way we make the world. The creative process prompts participants to question their epistemological and ontological viewpoints, the assumptions and values of their working practices, and the institutional structures and contextual framing of their work, and to consider ways to re-make and re-organise these in productive and just ways. Indeed, the approach has its roots in feminist, queer, decolonial and social justice praxes as a means to trouble established epistemologies and power relations within the academic research process (Loveless 2019; Truman 2021). As such, it is often action-orientated, not only a means to understand an issue in a fresh way, but also a potential means to intervene and transform the issue itself (Hawkins 2015). The key outcome then might not be an artwork or short story, but rather a shift in viewpoint and priorities of the participants, including those who initiated the project; that they come to understand an issue in a different way, which might transform how they subsequently think and act. In this sense, research-creation 'invites us to pause and "step-away" from our current path, to reconsider and apperceive our existing conditions and predicaments'; it is 'a process that serves to open up inquiry, raise questions and discover problems, more so than solve

them' (Foley 2021: 34). It casts critical light on the taken-for-granted and prompts alternative ways to know and act. Later, the creative endeavour and the artistic products might be reflected on, additional discernments deduced, and further outputs composed, with the artistic work and successive insights shared through various media (e.g., papers, books, websites, social media, and exhibitions).

Traditional social science and humanities research design and methods are typically staid and formalised. They are carefully determined in advance of entering the field and engaging respondents. The approach and methods chosen are usually well tried and tested. Once implemented, the research procedure and tools remain fixed throughout data generation to ensure continuity and equivalence of data across a sample. In some cases, there might be some degree of improvisation, such as with unstructured interviews, though these usually employ some scaffolding and choreography to ensure the same kind of information is gathered across respondents. In contrast, research-creation is an approach that is inventive, lively, and speculative (Tarr et al. 2018). It will utilise methods with little track record, or adapt or devise new ones. It can use multiple methods in combination and the approach and methods can evolve and mutate as the research takes place. Indeed, the approach encourages exploration, experimentation, play and improvisation (Kara 2015; Szanto and Sicotte 2022). There is then a liveness to the process, rather than a bracketing or bordering as with more traditional methods, which is reflective of the relationality, contingency, context and ongoingness of everyday life (Tarr et al. 2018). The process is also 'lively' in the sense that it seeks to be provocative and stimulating, and to evoke a new understanding of the world (Tarr et al. 2018).

That said, research-creation is not an 'anything goes', entirely unstructured undertaking (Truman 2021). Like all research, it requires a planning stage that provides a framing and some conditions, limitations and protocols to the process, even though the endeavour itself might not be fully decided and be open to improvisation on inception. Planning includes the formulation of 'ethics protocols, coordination with participants, and curation of materials' (Truman 2021: 14). Nor is research-creation an unskilled process that can be undertaken effectively by anybody. Indeed, some practioners make the case that people who wish to undertake research-creation should be as skilled in the arts and crafts being utilised as they are in research techniques (Piirto 2009, cited in Kara 2015). Moreover, they should be aware of the context and nuances of creative practices; that is, have some domain knowledge about

concepts, methods, techniques, and application. Just as a scholar would be wary of an artist with no training in sociological methods or disciplinary knowledge (its theory and corpus of work) saying they are going to undertake a sociological study, we should be sceptical of a sociologist with no formal training undertaking an artistic project (Marston and DeLeeuw 2013). Others argue that this is an exclusive and exclusionary position as what is important is the process rather than the creative product (Kara 2015). Anyone can attempt to produce a story, poem, picture, and photograph, and engage in meaningful critical reflection while doing so. Moreover, collaboration can bring together people with varying skillsets that can complement one another and enhance the process.

Approaches to research-creation

In order to put a shape on the unfolding of research-creation a number of approaches have been developed. Jessica Foley has run over 40 research-creation workshops between 2013 and 2020 through her Engineering Fictions, Stranger Fictions and Data Stories projects. These workshops have a well-defined research design, which she terms 'inreach', describing it as a choreographic process that is catalytic and supportive of transversality (that is, communication and productive collaboration between participants) (Foley 2016; see Foley 2019, 2021 for accounts of the process and outcomes). Each workshop has a 'foil', a person who oversees the research-creation process, co-designs the workshops, sources materials, directs the activities, and acts as the workshop facilitator. The foil works with a 'catalyst', who is a member of the community taking part in the workshop, and who has a desire to examine an idea, question, proposition or provocation. The foil and catalyst co-develop a 'seed' for the workshop – the issue that is to be explored – and co-design the methods to be used and associated instructions and constraints. The catalyst is the person who introduces the seed to the community using whatever medium they wish (e.g., through story, slideshow, music or performance). Each workshop has five basic stages.

- Attuning, in which people gather, socialise and are introduced to one another.
- Seeding, in which the seed is revealed.
- Conversing, in which the seed is discussed collectively.
- Writing (though this could equally be any creative activity), in which the prepared exercises are undertaken.
- Sharing, in which the creative outputs are shared, discussed and reflected upon.

While Foley has undertaken a large number of workshops, using a variety of methods to explore her 'seeds', each has been a one-off event or part of a chain of events, with each event typically using a single method in isolation. Ash Watson (2020: 68) instead advocates for a braided approach in which 'multiple methods are simultaneously employed across distinct research phases, with equal significance and attention given to each method in all phases.' A mix of creative and traditional qualitative and quantitative methods are employed, with two or more in use at the same time and preferably for same duration. Every method has its strengths and disadvantages and using more than one enables the vantage points of each to be gained and to ameliorate in part their limitations (Watson 2020). The research design has a number of phases, with each phase consisting of a period of data generation followed by a period of review before re-entering the same field site to conduct the next phase. Importantly, each strand (application of method) of the braid is seen as distinct, undertaken as a separate exercise, though they are chosen to complement each other, with the findings woven together to produce a braid of shared understanding. The aim is not to use the methods as a means to triangulate data and findings, with those that are not corroborated across methods being discarded. Instead, any differences revealed are reflexively examined in the review periods to consider why divergences and contradictions might exist. The review also considers which methods are appropriate to employ in the next phase to extend the braid and deepen the insights it reveals. In this way, knowledge is produced iteratively, reflexively and synergistically.

Rather than producing a braid, Annette Markham (2013) advocates for creating a bricolage using a remix methodology. She describes bricolage as 'the process and product of using what is ready at hand to get the job done,' borrowing and adapting philosophy, concepts, methods and techniques as needed (Markham 2018: 44). She draws inspiration for her approach from remix culture, in which ideas, techniques, media and materials are spliced together in creative ways to produce new entities (such as sampled music, mashup video, memes, remixed fashion, open source code, fab/maker products). Markham (2018) frames bricolage as an epistemology, action, and product. Bricolage she contends is a way of knowing that mirrors how we come to know the world by piecing together the moments, fragments and glimpses we encounter daily (e.g., conversations, overheard gossip, social media posts, news stories). Bricolage seeks to draw together those discoveries and relationalities to jerry-rig through assembling and layering some kind of understanding of their complexity and meaning (Markham 2018). Bricolage as an action consists of making

sense of a situation or solving a problem with the available resources, recognizing that this action is contingent and partially incidental and accidental. Bricolage as a product is the resultant coalesced knowledge ('the unique collage, montage, composite, fragmented, or layered account that comes out of the process of … inquiry') or the artistic output produced through action (Markham 2018: 50). Bricolage as an approach contrasts markedly then to the framing and structures of traditional social science research with its formalised research design aligned with theories and hypotheses. Markham (2013, 2018) enacts bricolage through her remix methodology. This methodology uses various methods in combination, usually including arts-based methods, and plays with perspectives to see what results. She identifies five activities of remix inquiry, which she has applied in workshops to explore phenomena.

- Generate – the assembly of ideas and data, including all the workings and supports such as notes, early drafts, mindmaps, uncoded and coded transcripts.
- Play – the process of exploring and experimenting with the generated material through playful, improvised and inventive combinations.
- Borrow – the finding and bringing together of ideas, concepts and techniques to cast new light and help make sense of the remixed material.
- Move – continuing to develop and evolve sense-making by revisiting the materials and charting the shifting perspectives and transformations in questions and meaning making.
- Interrogate – Reflexively questioning the research process, positionality and situatedness, ethics, the phenomenon being examined, and the knowledge produced.

These activities aim to produce a bricolage that deciphers meaning from the diverse materials generated and encountered throughout the research process, and is simultaneously mindful of the politics of producing such a bricolage.

Research-creation in action

A variety of arts-based methods can be utilised within research-creation projects, such as the use of creative writing (including short stories, speculative fiction, improvisation and word play, poetry, screenplays, cartoons), producing artworks (including visual, performance and installation art), making data stories (including interactive media, data art, data physicalisation), photography, dance, film-making, creating games, sound and music, and theatre production. As way of illustration, this section discusses the first three. In each case, the process of research-creation can be undertaken by the researcher independently, or

collaborating with a writer or artist, or working in partnership with a community of interest usually through workshops.

Creative writing in research-creation

Creative writing as a means to conduct research uses techniques such as word play and storytelling to explore phenomena, experiences and the relations between people, places and things. It enables its practioners to blend facts and the imagination, to consider scenarios and to speculate, to be inventive and playful, to surface and explore connections and meanings, and use expository and lyrical modes of expression (Singer 2013; Loveless 2019). Jessica Foley and Ash Watson specialise in using creative writing as a means of performing research-creation, and both have extensive experience of undertaking their own creative practice. In her series of Engineering Fiction workshops, Foley asked workshop participants to use a range of improvisational writing exercises, including the creation of short stories, poems, sonnets, mindmaps, lyrics, and manuals (Foley 2016, 2019). These provided a rich set of creative writing about particular phenomena, which the group could then further explore through discussion. Watson (2020) used her braided approach to entwine autoethnography, discourse and narrative analysis of literature, and fiction writing to produce a sociological novel, iteratively crafting the work through a number of phases. In subsequent work with Deborah Lupton, she used creative writing prompts in two workshops with community members to explore the socio-material and affective dimensions of personal digital data (Lupton and Watson 2021). In a third workshop, participants worked with art paper, magazines, excerpts from scholarly research, and their own initial writings and mappings to produce a collaborative zine in which collage, creative writing, illustration are layered together (a visual mini-book).

Truman (2021) details a number of research-creation projects utilising creative writing. 'Intratextual entanglements' was a collaborative mail project in which 34 participants were sent a scanned text and invited to write observations in the margins or engage with the tex however they wished. The returned texts were then sent to another participant, inviting them to annotate the annotations. In another project, she conducted a set of writing and walking exercises with school children, 'exploring rhythm and movement in literature through walking-writing, thinking about place through movement and video poems, walking and writing about speculative versions of the city, describing more-than-human entanglements through Tanka poetry, highlighting social injustices experienced by walking through

narrative, creating linguistic maps of affective environments, composing synesthetic verses, and making a dérive map of the school' (Truman 2021: 72). Another project consisted of creating a Twitter bot, entitled 'PostQual Diffractor Bot', which composes tweets based on a dictionary and rule-set that parodies post-qualitative literature by auto-generating paper titles that might sound genuine. In order to explore how social credit scoring in China is being perceived, Lee (2019) employed a scenario-based story completion method, inviting 22 participants to react to a scenario and extrapolate a possible future from it. Given the political sensitivities around social credit scoring and surveillance, using a creative method rather than an interview allowed participants to express views in a less formal way. Kitchin (2021) used short stories, along with biographical essays, as a means to explore the politics and praxes of data lifecycles and how data shape everyday lives. The project 'How to Run a City Like Amazon, and Other Fables' invited participants to use speculative fiction to reveal the desires of smart city proponents by illustrating how cities might function if they were run on the business models of numerous companies (Graham et al. 2019).

Artistic methods in research-creation

Research-creation using artistic media aims to use the process of creating an artwork, and the artwork itself, as a means to generate insights about a phenomenon. Here, there is an attentiveness to the art practices employed, as well as the 'finished' object, recognizing that art is constantly in the process of becoming, formed through its creation and its engagement by audiences, and art acts as a site through which knowledge, meaning and identity are reflected on and recast by its practioners and audience. In this sense, art is 'an ensemble of practices, performances, experiences and artefacts' (Hawkins 2011: 465) and research-creation capitalises on these qualities to explore issues and views that might not be so easily be expressed through traditional social science methods.

Jeremy Wood and Pip Thornton have used artistic practices to explore digital life through their own creative endeavours. Wood (2022) is an artist and mapmaker who has been exploring personal cartographies and location tracking by GPS-enabled devices since the early 2000s. Through a series of art works, in which he traces his own movements, he has examined the authority of maps and issues of accuracy and trust in locative media in the digital age (Lauriault and Wood 2009; Duggan 2021). Thornton is an academic who engages in artistic practice as means to conduct research. Interested in what she terms 'linguistic capitalism', and the value of all words in Google AdWords and how their auctioning dictates

the ordering of search results on the platform, she devised an artistic intervention, {poem}.py (Thornton 2018). {poem}.py works by feeding poetry into the Google AdWords keyword planner using a python script to ascertain the suggested bid price for each word, then printing the poem using a receipt printer one word and its bid cost per line, along with the overall cost. In this way, she exposes the hidden inner workings of Google's most profitable business using a technology familiar to all.

Webster (in press) and Osborne et al. (2019) detail collaborations between academics and an artist. Like Thornton, Dan Webster's collaboration with the artist Michael Hanna engaged with Google AdWords, in their case exploring how the marketing system works in practice by placing ads and seeing how users engaged with search links to 16 art works connected to 0.1km radius areas in Belfast and Milan. Those that clicked on the ads and were presented with the artworks were invited to engage in an email conversation with their creators. In this way, creating and placing the artwork revealed the inner workings of Google AdWords and also became the means of sourcing feedback. The Make/Shift/Space project examined social media data related to specific places using performance art (Osborne et al. 2019). The performances were undertaken by artist and researcher, Emily Warner. The project first extracted geotagged photos and associated text from Flickr, posted between 2009 and 2016, which were sited within a bounding box around the city of Birmingham. Examining the areas of Balsall Heath and Digbeth, 24 sites were then selected based on the clustering and density of posts. At these sites, Warner and her assistant set up a stand and produced small artistic products through engagement with the Flickr data, the local setting, and interactions with the people present, also sharing the event online via Twitter and Periscope. In this way, the project examined the relationship between people and the material, virtual, and imagined qualities of space.

The Make/Shift/Space project involved some engagement with local citizens. Likewise, artist and designer, Christian Nold has engaged over 2,000 people in 25 cities as part of his biosensing community mapping project. Participants explore their local area wearing a sensor device that measures galvanic skin response, which provides a simple indicator of their emotional arousal (Nold 2009). The data were used to create emotion maps, revealing those places and local issues participants most strongly felt about. Participants then annotated the maps to explain their reactions. Combining maps provided a communal view, which Nold has published in a variety of formats for different cities, including in 3D. Similarly, the

‘Everyone’s East Lake’ project deployed research-creation using a participatory art performance to engage citizens about a land grab by developers of a state-listed ecological scenic area in Wuhan City, China (Lin 2013). Organised by an architect and artist, citizens were asked to produce an artwork along the lakeshore to voice their concerns over environmental degradation and state and corporate power, with 60 pieces of work being produced by 54 participants. Some these works involved producing physical and online maps. For example, the ‘Strolling with 200 mu’ (33 acres) was a performative mapping in which an interactive tool was added to Google Maps that enabled users to place a polygon sized to 33 acres over any portion of the globe (Lin 2013). In this way, they could get a sense of the scale of lake in-fill being proposed. In turn, the art works provoked wider discussion and resistance to the illegal development.

Creative data stories

A core resource for research are data from which information and insights are derived. Research-creation has been used to throw critical light on the politics and praxes of generating data and how it is used to communicate information; in other words, to tell stories about data. As an alternative to conventional data visualisations, a number of projects have produced data physicalisations; that is, creating physical forms ‘whose geometry or material properties encode data’ (Jansen et al. 2015: 2; Offenhuber 2020). Such physicalisations create tactile as well as visual artefacts, produced through crafts such as knitting, felting, quilting, weaving, potting, sculpting and jewellery-making (Lupton and Watson 2021). For example, Weinberg (n.d.) has encoded climate data from the National Oceanic and Atmospheric Administration (NOAA) into climate datascapes of woven tapestries and coiled sculptures, providing a more tangible artefact than a table or graph. As summarised by Lupton and Watson (2020), other creative data physicalisations include the production of data souvenirs (Petrelli et al. 2017), data patinas (Lee et al. 2016), digital ceramics (Desjardins and Tihanyi 2019), and even customised-shaped chocolates and flavoured drinks enabling consumers to taste the data (Khot et al. 2015). Data physicalisations can be supplemented by additional data being map-projected onto models and sculptures, and augmented with tangible interfaces that enable a degree of interactivity and response (Jansen et al. 2015). Other forms of interactive data stories can be entirely digital and shared online. This has included the creation of data art. For example, as part of the Building City Dashboards project, three artists were given real-time data relating to the cities of Dublin and Cork in Ireland, which they then utilised in the creation of three artworks: a 24 hour sound mapping of traffic data, an

interactive locative media augmented reality app, and a virtual reality environment of word clouds linked to library loans (BCD 2018). In the same project, Jeneen Naji produced 'The River Poem' in which parts of James Joyce's novel Finnegan's Wake was map-projected onto a 3D printed model of Dublin, the words travelling along the length of the River Liffey (Rzeszewski and Naji 2022). These research-creation projects create what Stark (2014) terms 'data visceralizations'; that is, data that we 'see, hear, feel, breathe, ingest', which stimulates a visceral physical or emotional response rather than just critical reflection.

Creative means of dissemination

> "What if the most powerful way to communicate the research embodied within a certain 'chapter' is not to write about it on a page, but to 'write' it through video? Or in a multimedia installation? Or with a live performance event? Or through an art-activist intervention?" (Loveless 2019: 41)

In research-creation, the act of producing the creative work is the means through which the research is conducted. It is also possible to use artistic media to communicate the findings of research undertaken using traditional methods as an alternative or supplement to academic papers and books, and as a way to reach and engage wider audiences. As Loveless (2019) notes, artistic media might be the most powerful way to communicate research findings. Their use is also being fuelled by calls for research to have greater impact beyond the academy. These calls are being driven by governments seeking to translate their investment in research into applied outcomes and to demonstrate the societal value of research (Bastow et al. 2014), and by social movements who want to ensure that knowledge does not get trapped in ivory towers and only speaks to intellectuals, but is opened up for all to consider and apply (Fuller and Kitchin 2004; Nagar 2013). As such, there is increasing interest in communicating ideas and analysis using artistic media, such as various forms of creative writing, interactive digital media, infographics, virtual reality, artworks, exhibitions, theatre, podcasts, documentaries and films, as well as through social and traditional media (newspapers, radio, television).

Creative non-fiction and fiction

Creative writing is seen as an attractive means of conveying research findings because it provides a different, more accessible and playful, register to 'sterile, jargon-filled, and

formulaic' academic writing (Leavy 2015: 1). For Singer (2013: 141), creative writing enables a toggling back and forth between fact and imagination, between expository and lyric narrative, and to blend together 'scene, description, mediation, raw fact, speculation and reportage' and to cast off 'neutral third person invisibility'. Creative writing opens up new possibilities to be inventive in form, such as producing creative non-fiction, interactive multimedia narratives, short stories, poetry, memoirs, and narrative journalism. Creative non-fiction seeks to convey facts and insights gleaned from a project through a more engaging text. This includes essays that eschew formalised academic narrative for a more personalised, reflexive voice that utilises personal experience and viewpoints to explore subjects from different angles (Philips and Kara 2021). For some, creative non-fiction, while rooted in facts, reads more like fiction, 'shar[ing] with fiction the elements of detail, image, description, dialogue, and scene' and striving to 'show, not tell' and to 'bring the reader on a journey of discovery' (Singer and Walker 2013a: 3). A number of techniques can be used to convey ideas and interpretation including 'montage, juxtaposition, toggling, fragmentation, white space, etymological exegesis, the weave, the tangent, and the digression (Singer and Walker 2013b: 139). Through digital mediation, creative non-fiction can be quite experimental. Monson (2013) added glyphs to his book, 'Vanishing Point', to denote words that can be typed into a website to unlock new content. Another essay can only be read fully if the HTML code is viewed as additional text is hidden in the comment fields. Monson's aim is to create a text that is 'mutable, updatable, and potentially multilayered, and to offer the reader another avenue of exploration' (Monson 2013: 84). Also utilising the multimedia and interactive qualities of the internet, the Art/Data/Health project created an online, multimedia story about the COVID-19 lockdown in Brighton, UK, that combines text, live-action video clips, animated infographics and first-person testimonies (Fotopoulou and Beavon 2020). Others have used fiction as a way of conveying the essence of their research, such as the novel produced by Watson (2020). Her novel is part of the Social Fictions book series, which publishes social research in the form of novels and plays (Philips and Kara 2021). Several different forms of writing can be used to convey the same material to different audiences. For example, Kitchin (2014) details how a range of writing praxes, including fiction, blog posts, policy briefs, newspaper op-eds, academic papers, and grant applications were used to disseminate on-going research.

Film

Producing films and audio-visual outputs, such as animation, for communicating research has become more common in recent years due the affordability of equipment, access to open-source editing tools, and an ability to share the outputs widely via the Internet. Films enable the presentation of audio-visual content and, in particular, movement, multisensory interaction and the stream of experiential unfolding rather than static snapshots (Garrett 2011; Ernwein 2020). Documentary making was a key output of a project that examined the digital lives of residents of high rise apartments on the periphery of Toronto. This project used a combination of surveys and non-fiction storytelling to explore the uneven and unequal distribution and access to digital technologies and infrastructures and how these are experienced in everyday life (Cowen et al. 2020). As a means of communicating the findings, the researchers worked with local residents to produce an interactive online documentary, 'Universe Within: Digital Lives in the Global Highrise' (Cizek 2015). The Building City Dashboards project produced a set of eight short videos to showcase the project's work as part of an online exhibition (BCD 2020). Given the highly visual and interactive nature of the produced work (e.g., 3D spatial media) the videos give a much stronger representation of the outcomes than the written word or static 2D images. The videos were produced because Covid-19 restrictions led to the cancellation of two public exhibitions, but have the advantage of remaining online for as long as desired and are accessible to much larger audience. Instead of a documentary, Sava Saheli Singh (2022), working with screenwriters, has produced a set of four short films as part of her 'Screening Surveillance' project. Each story explores issues related to the highly intrusive surveillance enabled by networked digital technologies. For example, '#tresdancing' speculates on how surveillance and control through new educational technologies will reshaping schooling and student's everyday lives, and 'Blaxites' considers how surveillance of social media might affect access to healthcare (Singh 2022). The films reveal the power and potential consequences of new surveillance technologies, and prompt critical reflection in relation the viewer's own lives, through storytelling that is relatable to the public.

Exhibitions

Another means to communicate with the public is through exhibitions of artistic media. This might be the display of artwork, data visualizations, infographics, and audio-visual displays, and may include installations and interactive media, such as touchscreens or the use of virtual reality. Rather than just act as a means of communication, an exhibition can also act as a site of experimentation and further research (Kullman 2013). Here, visitors to the exhibition are

observed as to their behaviour and interactions, or are surveyed and interviewed, to gauge their views and experience. In 'The Museum of Random Memory' participants were invited to take part in performative installations where they engaged in interactive analog and digital memory-making activities, including donating a personal memory to the system, in order to prompt critical reflection on how datafication and automated data-related processes shapes their lives and their personal and cultural memories (Markham and Pereira 2019a/b). A series of eight exhibitions were held, with the installations varying in each case as the researchers experimented with the creative media they had developed (e.g. testing the effects of changing layouts, formats, space, prompts, and technical assemblages (Markham and Pereira 2019a). #AanaJaana was a month long public exhibition in 2019 in one of New Delhi's busiest metro stations in that presented Whatsapp diary entries made over a six month period by young women living in an area of slum resettlement on the periphery of the city (Datta and Thomas 2022). The project explored 'what happens when women 'see' and 'speak' with their phone,' their digital and spatial marginalisation, and the expression of power over women's bodies and their experiences of place. The Whatsapp entries were used to create a set of large billboard posters that explored issues identified by the women, including sexual harassment when commuting and inclusion and omission from the emerging smart city, with viewers invited to reflect on the issues and to change their behaviour (Datta and Thomas 2022).

Critique of creative approaches

While research-creation and the use of artistic media for dissemination have much to offer in terms of exploring research questions in ways that produce new insights and share the knowledge produced with diverse audiences, they have not been universally welcomed. There are concerns as to whether arts-based methods are a valid means to produce academic knowledge (Baldacchino 2012). Qualitative methods and approaches have long been critiqued for lacking rigour, objectivity and reproducibility due to their openness, lack of standardization, and unrepresentative samples. This critique is magnified for research-creation, where not only does the research process vary with each undertaking, but no process is repeatable due to its liveness (Tarr et al. 2018). Moreover, the experience of taking part in the process is important to being able to interpret what took place (Tarr et al. 2018). Further, research-creation is not practised in a detached, neutral, and objective manner, but rather it is implicitly, and most often overtly, political, seeking to change the world in some way through its praxes (Borgdorff et al 2020). As such, research-creation fails the central ambition of the scientific method; that is, to produce data that others can re-analyze and knowledge that is

consistent, reproducible, and generalizable. This places a question mark against its integrity, reliability, credibility, trustworthiness and accountability for the knowledge produced. Research-creation might be evocative and generative, but its detractors argue it is also too open-ended and confrontational, and does not produce conclusive, defensible findings or arguments (Loveless 2019).

As with research-creation, there are some concerns about using creative means of dissemination. Creative writing, filmmaking, and producing artwork and crafts to a standard that is effective at communicating research requires skill. Those that do these kinds of work for a living have usually undertaken professional training over several years. Researchers, in contrast, have been trained to write non-fiction, academic narratives. It is naïve to think that academics can leap from novices to experts across any media of expression and communication. The danger of trying to do so without collaborating with experts is the production of amateur works that fail in their ambition. Even for professionally produced works, there are some concerns that creative media can lack clarity and intelligibility of meaning and suffer from subjectivity in messaging (Kara 2015). That is, unlike an academic paper – which tries to unambiguously state how the research was undertaken, what was found and the conclusions drawn – artistic media are more open to interpretation. Moreover, as Singer (2013: 141) notes, '[i]f a piece of nonfiction reads like fiction or poetry, how can you tell it's true?' Others have critiqued what they see as the cynical use of creative media by the academy to comply with the impact agenda of government and funding agencies (Loveless 2019). Here, the creative media are not employed because they are viewed as the most appropriate means of communication but to fulfil a criteria. This has led De Leeuw et al. (2017: 6) to argue that the users of artistic media need to 'remain sufficiently vigilant and critically aware to ensure they do not become a parody of themselves, something wholly corruptible and able to be put to use in exactly the opposite ways as those for which they were intended.'

For practioners, these critiques judge creative approaches on the terms of the detractors, failing to understand the inherent benefits to creative endeavours and that they are explicitly a challenge to the epistemologies of traditional approaches. What others see as weaknesses, practioners often view as strengths. These weaknesses though do mean that persuading people to participate in research-creation projects can be a challenge as there is often a scepticism concerning the utility, integrity and validity of the process. This was evident

amongst the police and state surveillance workers that Foley (2021) engaged, and with the engineers she had worked with previously who felt the research design unscientific. However, she notes that those who took part found the process and the critical reflection it engendered useful and even asked for follow-on sessions as the workshops had prompted new questions and ways of thinking that they found productive. Interestingly, though the participants were wary of creative inquiry and critical reflection, they paradoxically expressed a desire for such endeavours to support their work. A key issue then is overcoming any initial scepticism and convincing individuals to participate, a task that might require help from a group insider along with a clear articulation of the purpose, process and potential benefits.

References

Baldacchino, J. (2012) Preface: Scholarship and Art's Ambiguous Objects. In Daichendt, G.J. *Artist Scholar: Reflections on Writing and Research*. Intellect, Bristol. pp. xi-xxiii.

BCD [Building City Dashboards] (2018) Building City Dashboards Data Art Exhibition. https://www.maynoothuniversity.ie/library/events/building-city-dashboards-data-exhibition

BCD [Building City Dashboards] (2020) Exhibition. https://dashboards.maynoothuniversity.ie/exhibition/

Borgdorff, H. (2020) Cataloguing Artistic Research: The Passage from Documented Work to Published Research. In Borgdorff, H., Peters, P. and Pinch, T. (eds) *Dialogues Between Artistic Research and Science and Technology Studies*. Routledge, London. pp. 19-30.

Cizek, K. (2015) Highrise - Universe Within. National Film Board, Canada. https://www.nfb.ca/interactive/highrise_universe_within_en/

Cowen, D., Mitchell, A., Paradis, E. and Story, B. (eds) (2020) *Digital Lives in the Global City: Contesting Infrastructures*. University of British Columbia Press: Vancouver, BC.

Datta, A. and Thomas, A. (2022) Curating #AanaJaana [#ComingGoing]: Gendered authorship in the 'contact zone' of Delhi's digital and urban margins. *Cultural Geographies* 29(2): 233-252.

De Leeuw, S., Parkes, M.W., Morgan, V.S., Christensen, J., Lindsay, N., Mitchell-Foster, K., and Jozkow, J.R. (2017) "Going unscripted: A call to critically engage storytelling methods and methodologies in geography and the medical-health sciences." *Canadian Geographer* 61(2): 152–164.

Desjardins, A. & Tihanyi, T. (2019) ListeningCups: a case of data tactility and data stories. ACM: Proceedings of the 2019 on designing interactive systems conference, 2019 Vancouver, Canada. 147–160.

Ernwein, M. (2020) Filmic geographies: audio-visual, embodied-material. *Social & Cultural Geography* 23(6): 779-796.

Foley, J. (2016) *inreach: A Choreographic process of transversality*. Unpublished PhD, Trinity College Dublin.

Foley, J. (2019) EF#1.19 How do I Love Thee, Let me Count /Map the Ways… *Engineering Fictions*. https://engineeringfictions.org/2019/03/02/ef1-19-how-do-i-love-thee-let-me-count-map-the-ways/

Foley, J. (2021) *Fastidious Inquiry, Weird Compliance: A Corona of Sonnets by Anonymous*. Humanities Commons. http://dx.doi.org/10.17613/qbg4-6b33

Fuller, D. and Kitchin, R. (Eds) (2004) *Radical Theory, Critical Praxis: Making a Difference Beyond the Academy?* Praxis E-Press. https://kitchin.org/wp-content/uploads/2020/05/RTCP_Whole.pdf

Garrett, B. (2011) Videographic geographies: Using digital video for geographic research. *Progress in Human Geography* 35 (2011): 521–541.

Graham, M., Kitchin, R., Mattern, S. and Shaw, J. (2019) *How to Run a City Like Amazon, and Other Fables,* Oxford, Oxford: Meatspace Press.

Hawkins, H. (2011) 'Dialogues and Doings: Sketching the Relationships Between Geography and Art', *Geography Compass* 5(7): 464–478.

Hawkins, H. (2015) 'Creative geographic methods: knowing, representing, intervening. On composing place and page', *Cultural Geographies*, 22(2), pp. 247–268.

Hawkins, H. (2021) *Geography, Art, Research: Artistic Research in the GeoHumanities*. Routledge, London.

Jansen, Y., Dragicevic, P., Isenberg, P., Alexander, J., Karnik, A., Kildal, J., Subramanian, S. and Hornbaek, K. (2015) Opportunities and challenges for data physicalization. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI)*, ACM, New York.

Kara, H. (2015) *Creative Research Methods in the Social Sciences*. Policy Press: Bristol.

Khot, R.A., Lee, J., Hjorth, L. and Mueller, F. (2015) ‘TastyBeats: Celebrating heart rate data with a drinkable spectacle’, in Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction. ACM, New York, pp. 229–232.

Kitchin, R. (2014) Engaging publics: Writing as praxis. *Cultural Geographies* 21(1): 153-157.

Kitchin, R. (2021) *Data Lives,* Bristol, Bristol: Bristol University Press.

Kullman, K. (2013) Geographies of experiment/experimental geographies. A rough guide. *Geography Compass* 7(12): 879–894.

Lauriault, T.P. and Wood, J. (2009) GPS Tracings – Personal Cartographies. *The Cartographic Journal* 46(4): 360-365.

Leavy, P. (2015) *Method Meets Art: Arts-Based Research Practice*, New York: Guilford. 2nd edition.

Lee, C.S. (2019) ‘Datafication, dataveillance, and the social credit system as China’s new normal’, *Online Information Review*, 43(6): 952–970.

Lee, M.H., Son, O. and Nam, T.J. (2016) Patina-inspired personalization: personalizing products with traces of daily use, in: *Proceedings of the 2016 ACM conference on designing interactive systems*. ACM, Brisbane, pp. 251–263.

Lin, W. (2013) Situating performative neogeography: tracing, mapping, and performing Everyone’s East Lake. *Environment and Planning A* 45(1): 37–54.

Loveless, N. (2019) *How to Make Art at the End of the World: A Manifesto for Research-Creation*. Duke University Press: Durham.

Lupton, D. and Watson, A. (2021) Towards more-than-human digital data studies: developing research-creation methods. *Qualitative Research* 21(4): 463-480.

Markham, A. (2013) ‘Remix culture, remix methods: Reframing qualitative inquiry for social media contexts’, in Denzin, N.K. and Giardina, M.D. (eds.) *Global Dimensions of Qualitative Inquiry*. Walnut Creek, CA: Left Coast Press, Inc. pp. 63–81.

Markham, A. (2018) Bricolage. In Navas, E., Gallagher, O. and Burrough, X. (eds) *Keywords in Remix Studies*. Routledge, London. pp. 43-55.

Markham, A. and Pereira, G. (2019a) Analyzing public interventions through the lens of experimentalism: The case of the Museum of Random Memory. *Digital Creativity* 30(4): 235-256.

Markham, A. and Pereira, G. (2019b) 'Experimenting with algorithmic memory-making: Lived experience and future-oriented ethics in critical data science', *Frontiers in Big Data* 2. http://www.frontiersin.org/articles/10.3389/fdata.2019.00035/full

Marston, S.A. and De Leeuw, S. (2013), 'Creativity and Geography: Toward a Politicized Intervention', *Geographical Review*, Vol. 103 No. 2, pp. iii–xxvi.

Monson, A. (2013) Text adventure. In Singer, M. and Walker, N. (eds) *Bending Genre: Essays on Creative Non-Fiction*. Bloomsbury, London. pp. 81-90.

Nagar, R. (2013) 'Storytelling and co-authorship in feminist alliance work: Reflections from a journey.' *Gender, Place and Culture* 20(1): 1–18.

Nold, C. (2009) Emotional cartography: Technologies of the self. http://emotionalcartography.net/EmotionalCartographyLow.pdf

Offenhuber, D. (2020) What we talk about when we talk about data physicality. *IEEE Computer Graphics and Applications* 40(6): 25-37.

Osborne, T., Warner, E., Jones, P. I. and Resch, B. (2019) Performing Social Media: Artistic Approaches to Analyzing Big Data, *GeoHumanities* 5(1)**:** 282-294.

Petrelli, D., Marshall, M.T., O'Brien, S., McEntaggart, P. and Gwilt, I. (2017) Tangible data souvenirs as a bridge between a physical museum visit and online digital experience. *Personal and Ubiquitous Computing* 21(2): 281–295.

Philips, R. and Kara, H. (2021) *Creative Writing for Social Sciences: A Practical Guide*. Sage, London.

Piirto, J. (2009) The question of quality and qualifications: writing inferior poems as qualitative research. In Prendergast, M., Leggo, C. and Sameshima, P. (eds) *Poetic Inquiry: Vibrant Voices in the Social Sciences*. Rotterdam: Sense Publishers. pp. 83–100.

Rzeszewski, M. and Naji, J. (2022) Literary placemaking and narrative immersion in extended reality virtual geographic environments. *International Journal of Digital Earth* 15(1): 853-86.

Singer, M. (2013) On convention. In Singer, M. and Walker, N. (eds) *Bending Genre: Essays on Creative Non-Fiction*. Bloomsbury, London. pp. 141-49.

Singer, M. and Walker, N. (2013a) Introduction. In Singer, M. and Walker, N. (eds) *Bending Genre: Essays on Creative Non-Fiction*. Bloomsbury, London. pp. 1-7.

Singer, M. and Walker, N. (2013b) Unconvention. In Singer, M. and Walker, N. (eds) *Bending Genre: Essays on Creative Non-Fiction*. Bloomsbury, London. pp. 139.

Singh, S.S. (2022) Screening Surveillance. Surveillance Studies Centre, University of Ottawa. https://www.surveillance-studies.ca/projects/screening-surveillance

Stark, L. (2014) Come on feel the data (and smell it). *The Atlantic*, 19 May, https://www.theatlantic.com/technology/archive/2014/05/data-visceralization/370899/

Szanto, D. and Sicotte, G. (2022) Research-creation about and with food: Diffraction, pluralism, and knowing. *Journal for Artistic Research* 26. https://www.jar-online.net/en/exposition/abstract/research-creation-about-and-food-diffraction-pluralism-and-knowing

Tarr, J., Gonzalez-Polledo, E. and Cornish, F. (2018) On liveness: using arts workshops as a research method, *Qualitative Research*, 18(1): 36–52.

Thornton, P. (2018) A critique of linguistic capitalism: Provocation/intervention. *GeoHumanities* 4(2): 417-437.

Truman, S. (2021) *Feminist Speculations and the Practice of Research-Creation: Writing Pedagogies and Intertextual Affects.* London: Routledge.

Watson A (2020) Methods braiding: a technique for arts-based and mixed-methods research. *Sociological Research Online* 25(1): 66–83.

Webster, D. (in press) Art, ads and algorithms: Developing research-creation methods as an approach to researching digital platform technologies. *Qualitative Research*

Weinberg, T. (n.d.) About the woven climate datascapes. https://www.taliweinberg.com/datascapes

Wood, J. (2022) We are the map; we are the data. http://jeremywood.net/artworks.html