

Section 1

Making and assembling



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Towards a conjectural paradigm for interdisciplinary research

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Making and assembling produce an odd pairing of terms. Making derives from the short vocalization ‘mek’ from an Anglo-Saxon word, and hearkens to the Germanic verb ‘*machen*’ meaning to do or to make. It has both a universal application, in the sense that everyone from children to adults makes sound, while on the other hand, it aligns with specialists who form unique or distinctive works, such as a fine machine or a beautiful painting. Making, or doing, also leads us directly to processes whereby materials become transformed by an action, such as a person making a cocktail or the weather making us feel hot. On the other hand, assembling is Latinate, as with the French verb ‘*assembler*’, in English also to assemble, as in the putting together or gathering of people, objects or things. Etymologically, this latter term relates then to the important notion of ‘assembly’ as a site of public cultural enactment, as well as to the assembly line of Fordist manufacturing. We might also have a more prosaic view of assembling in contemporary culture when we consume the plasticity of a robotics toy, a piece of IKEA furniture, or a Facebook page. Thus, we might conceive of a sharp contrast between making and assembling as methods, in the sense that making suggests creating, and something more primal, fashioned even from mud, whereas assembling tends towards order, and something more civilized, or institutional. We do not assert this dichotomy in any cultural hierarchy because we prefer to examine these terms operating in relation to one another, and as moving generatively between the social and linguistic, or human and non-human, in contemporary research.

It is possible to assemble a range of theorists – experimental thinkers – who become touchstones for different ways of making and assembling in interdisciplinary research, and scholars have become increasingly attuned to the ways in which theories of practice might differ from one discipline to another (Schatzki 2001: 11). Thomas Kuhn, for instance, acknowledges this when he writes about both the specificity of science as a knowledge practice and the generalizing power of a paradigm shaped by practice. In the process of narrating interdisciplinary research, and its potential admixture of norms equating to disciplines, alongside the entanglement of the practical, social and conceptual for this essay, we have arrived at Carlo Ginzburg’s notion of the conjectural paradigm – what he has called ‘the lightning recapitulation of rational processes’ (1989: 117). This is a concept that allows us to find a space in-between disciplines, as well as to do research work that makes and assembles the ethical, political, creative, socially engaged and fun.

Such research may also be productive of a distinctive ontology, one that embraces both the history and power of representations as well as embodied social relations. To return to our key terms by way of exemplifying this ontology, the tensions between the primal and the civil recall in part Elaine Scarry's foundational book *The Body in Pain: The Making and Unmaking of the World* (1985). Scarry's privileging of the word 'making' and its antonym in her subtitle offer a fruitful starting place to rethink these opposing ideas and their impact on systems of thought more broadly. In her analysis of war and torture, for instance, Scarry notes that 'physical pain . . . is language-destroying' (1985: 19): thus invoking the political dimension inherent when pain is deliberately employed as an ideological tool designed to dehumanize. For Scarry there is ample evidence of how regimes seek to 'unmake' their victims and their experience of the world. The act of making, then – specifically through the act of creative expression (song, literature, film) – also has a concrete ideological function of *re-making*, or *re-assembling*, of putting together and creating anew that which has previously been unmade. Making, in Scarry's terms, involves both imaginative work, as well as an 'activity extended into the external world, and has as its outcome a verbal or material artefact' (1985: 177). Whether the making of a political structure, encompassing legal texts and border police, or the making of structural or sensory objects, this complex proposition includes 'obligations':

For made things do incur large responsibilities to their human makers (and their continued existence depends on their abilities to fulfil those responsibilities: a useless artefact whether a failed god or a failed table, will be discarded); just as, of course, human makers also incur very large obligations to the objects they have made.

1985: 182

When we make – whatever we make – the 'responsibility' we take for the act itself is, from Scarry's perspective therefore, intrinsically ideological.

Going beyond this humanistic concept of creation, the notion of assemblage is regarded as central to the ontology of Gilles Deleuze and Félix Guattari's *A Thousand Plateaus* (2004). The use of the term assemblage, as Ian Buchanan points out, has however been derived from the (mis)translation by Brian Massumi of their term, *agencement* from French and he proposes a more suitable term might be arrangement (Buchanan 2015: 383). In this sense, an assemblage might involve reorganizing diverse elements from across disciplines to create something unpredictable or with new valorizations. Emphasizing the dynamic process rather than the final product itself, for Deleuze and Guattari, all assemblages are historicized through combination, and as such they also have agency: for instance, any given political formation authorizes the circulation of bodies, the expression or repression of affects, and the production or reproduction of collectives and institutions. An *assemblage*, such as a research problem or task, can therefore be driven both by processes of territorialization and deterritorialization, and in its analysis, by coding and decoding such arrangements. An *assemblage* functions then through the deliberative fusion of multiple aspects of a situation. For Deleuze and Guattari: 'An *assemblage*, in its multiplicity, necessarily acts on semiotic flows, material flows, and social flows simultaneously (independently of any recapitulation that may be made of it in a scientific or theoretical corpus)' (2004: 25).

Guattari's experiments in the psychiatric clinic, for instance, 'used the grid as a tool to transversalise' and to lead all staff, residents and visitors 'towards the apprehension of the singular scenes composed and modified by each participant in relation to the relevant collective constraints and institutional matters that emerged in the process' (Genosko 2009: 61). For the ethico-political development of how we conceive methodologies to be 'made' in this introduction, Deleuze and Guattari vitally consider an assemblage to involve re-conceptualizing the components

of a research project by allowing for a critical heterogeneity, both of logic and aesthetics, to emerge.

The movement of interdisciplinarity

In comparison with these radical deconstructive methods of making and assembling, the conventional heuristics of academic knowledge claim the actualization of fields of knowledge, constituted by historically defined sets of relationalities, positions, or lines of argument. Scholars of disciplinary modes of researching mostly occupy a discursive space, an institutional or subject position in relation to other thinkers via established patterns of citational linking. Within a discipline, these arguments are supported by evidence, which in turn develop lines of argument. In interdisciplinary discourse, however, these elements that make spatial sense of theory-making are sometimes characterized by an in-between-ness, and a not-quite-belonging. So, rather than making a space of knowledge for ourselves from a centralized location of discursive action, or in terms of unidirectional lines and stable shapes that serve as basic elements of a rather geometric way of modelling an argument, the interdisciplinary turn leads, we would suggest, towards a more dynamic, spatialized understanding of what a field of knowledge is and, by extension, who the specialists in the field might be, such as the authors assembled here, some well known and others less so.

If in response to new conditions, the research processes of interdisciplinarity foster the particular space of ideation as limen, as threshold, or as interstice, then they also function like nodes in a network, as spaces inter or in-between. Movement, as Nicolas Salazar-Sutil argues, might be about the physical locatedness of human movement, but it might also be conceived 'in terms of electronic location within global networks' (2015: 211). In this shifting of positions beyond the linear accumulation of ideas, our argument goes further: interdisciplinarity implies more than space, it implies movement, what we might define as the multi-dimensional properties of images, objects or thought changing in time and space. As such, this alternative paradigm involves a spatial and temporal realization of any movement that precedes or follows it, as well as a recognition of mobility as a process of sensitizing research to a particular situation within discourse, within art, within the social.¹ We are not alone in mounting this argument for movement, and experience, as critical to the new formations of interdisciplinary research in cultural studies, science studies, social and political theory. For Bruno Latour:

In my view, ecology is only very rarely a politicized form. Usually the questions I am interested in – about sensitizing, about an Anthropocenic recognition of mobility, of process – these questions are sealed off by politics, and, surrounded by well-meaning self-righteousness . . . [as a] metaphor for complete control, the puppet actually makes its puppeteer carry it somewhere else. It gets modified, mobilized, or moved – and you are then moved by the thing you move, which is the most interesting relation we have with the world.

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This realization of academic thinking as movement in terms of interdisciplinary research is dependent, then, upon acts of making or assembling (or, likewise, unmaking and disassembling).

In this essay, the notion of movement as a pre-eminent paradigm and method also serves as an invitation to adopt a kinetic way of 'doing' ideas in the academy that will allow scholars to build new and specific models for interdisciplinary research that are appropriate to the challenges of our time. In the movement from one field to another, such research will test and corroborate theory, enable comparison of different forms of evidence, and require the construction of new kinds of research artefact, instance or residue. The contributions assembled in this section argue

and exemplify a range of approaches to interdisciplinarity that have been encouraged by a fundamental change in the way they make theory and assemble alliances through research: they are conjecturing projects and processes within a spatiality of communication, and a horizon of social transformation, that sees knowledge production happen in electronically and increasingly mediated ways with, however, an ongoing sense of the unevenness of distributions of power, wealth and access. They therefore practise research through making and unmaking, assembling and disassembling.

All the authors here stake a claim on interdisciplinarity, flagged by backgrounds that link and diverge. In spite of the interdisciplinary framework, these people are also located within disciplines – even if and when the focus is to work beyond ‘just’ finding something new or different. Their methods include the attempt to interrogate/interrupt/interpolate the restrictions of disciplines to work towards remaining open to new practices, ideas and methodologies, by embracing the conjectural paradigm over the restrictions implied by any traditional privileging of the general. We know this not only based on the entries themselves, but because we asked some of these authors by email to articulate their relationships to interdisciplinarity and how it helps to model their identity as researchers and we found their answers most illuminating.

For Catherine Ayres:

Being an interdisciplinary researcher to me requires an ethos of generous critique. I try as hard as I can to appreciate the contributions various disciplines are trying to make to our intellectual world, even when this means directly challenging the core tenets of my ‘home’ discipline.

Thomas Jellis offers a different approach in terms of how he moves beyond disciplinarity in his professional practice. ‘I’m inclined to think in terms of disciplinary matters of concern – or refrains – and how these might also speak to other fields; the task is to work out how to enable temporarily shared trajectories between them.’ Harmony Bench reflects upon how this process changes her academic identity:

My understanding and framing of myself as within a discipline or as adhering to a methodology has shifted over the past several years. Since all of my training has been interdisciplinary (with the exception of a degree in ballet), disciplinarity was not a concern of mine until going on the job market, at which point I described myself as a generalist in the field of dance.

In contrast, Margaret Wertheim has spent a career outside of academia, peripatetically challenging the disciplines of science and mathematics to rethink its models, calculations and designs as hand-made, collective formations. And yet she notes:

[W]e all benefit in our daily lives from the knowledges produced and acquired by these specialists, and we should all applaud the dedication and commitment it takes to achieve this kind of work. Every academic discipline has been subject to such diversification and subdivision, which seems to be one of the characteristics of our intellectual age.

Matthew Reason, on the other hand, acknowledges an important subjectivity in the very term discipline, noting that it ‘looks very different according to where you are standing’. He continues, ‘I have found the real challenge of cross-disciplinary work is when the methodologies

don't align, when there are not only different discourses or points of reference but different understandings of what knowledge is.' So, whether a researcher works in the physical or social sciences, the arts or the humanities, there are paradigms that constrain and constitute a disciplinary subjectivity and methodologies of practice. Ramon Lobato positions his own research as being based in one discipline, while reaching out productively to others: 'I work between media and cultural studies, and also draw a lot on economic and geographic modes of analysis and thinking.' Moving from cultural texts to hard data, Lobato continues,

I feel my core disciplines provide a useful home-space that can be moved through and pushed back at when needed, so I have a fairly comfortable and pragmatic relationship with those – and tend to view other disciplines as providing useful ideas to be ransacked and raided as needed.

We concur with Lobato, because it is how we ourselves 'do' ideas. While many of our research interests and practices overlap, notably around bodies, feminism and mediated genres, we have found that we make and assemble in strikingly different ways. The field of performance studies, for Rachel, straddles forms of analysis that read historicized alignments between embodiment and culture, text and agency, nature and representation, while on the other hand, she is concerned with the messiness of experience, akin to what Jane Bennett has called 'vibrant matter': the 'earthy, not-quite-human capaciousness' of things (2010: 3). As such, contemporary performance research maps relations that are simultaneously semiotic (between concepts) and material (between things), or both. Derived from theatre studies (initially literary studies of drama), anthropology, film and cultural studies, the interdisciplinarity of performance research has never asserted fixed relations between subject and object, nor one singular perspective on reality. On one level, its method evolves like the Freudian analysis of signs, and on another it examines a Foucauldian archaeology of power within disciplinary structures, however, performance studies also gives agency to artists and scholars to improvise and play with the dynamics of theatrical forms of expression and communication. An event, and its multiple unfoldings, might thus involve intransigent actors, accumulated objects and hybrid structures, whether it is a choreography, a festival or the arduous ascent of a mountain range. In research terms, in this contested field, both participant and observer become challenged by the presence of diverse subjects and the mediation of experience.

Rachel's own research addresses modernist and contemporary theatre aesthetics, particularly in relation to dance histories, with an acknowledgement that both archival and repertory sources provide valuable insights into the transnational significance of cultural production.² Since Diana Taylor's (2003) interleaving of documents and embodied performance that transmit 'cultural memory' in Latin America, many performance scholars have stressed the remaking of political, cultural and social traditions as well as the complexity of performances that transmit new and embodied meanings, whether in the performance of protest or, as dancer Deborah Hay (2000) would contend, in the choreography of cellular movement in the body.

This background came to the fore in a recent digital arts project Rachel conducted, which involved archivists, a dancer, cultural theorists, computing engineers, a games designer and dance scholars in the making of a digital avatar from a silk 1920s' dance costume. The making of this 'daffodil dress' provoked consideration of why we seek to collaborate in interdisciplinary or multi-disciplinary projects (Fensham and Collomosse 2015: 148–161). Of course, such scientist-artist collaborations are increasingly common but such projects require the assembling of a team who can find some common ground over different questions. For instance, why do historians think about the costume as a singular representation in a dance repertoire? Or, why do archivists

inscribe its details in a catalogue entry? Or, how do computer scientists abstract it as algorithms in a software program? In each of these sites, what happens to the affective labour or embodied history of the garment? Given that there is always something at stake in a method, these questions of how the garment might deliver an experience of movement, rather than be relegated to tissue paper in an archive box, could only be answered by an interdisciplinary methodology.

Formatively the dress itself became the agent of a shared enquiry that moved between historical contexts, folding and interacting with women's bodies, escaping from corsets and constraining social values in the early twentieth century, into the refrain of liquid, slower, on-screen mobilities. Compared favourably with more masculinist avatars and surveillance technologies, the dress also offered its own reconfiguring of computer vision research. As an inquiry into the visual regimes of cultural history (early twentieth century and the present), the methodology confronted materialities that arise from wearing a particular dance costume at a given historical moment as steps towards the virtuality of an idea about movement with wider consequences. 'The ruffle on a dress', as Walter Benjamin suggests somewhat cryptically, might produce an image, or conceptualization, of the secular desire for an 'eternal' (1989: 69), and so the research presses against the temporal and sensory properties of costume in relation to performance history.

While Rachel's primary area of focus is on Dance and Theatre Studies, Alexandra is primarily a Cinema Studies scholar, whose research incorporates aspects of art history, anthropology, performance studies and gender studies in work that primarily focuses on horror, cult and exploitation cinema traditions. As, however, a practising radio and film critic, her ideas about and around cinema manifest in a less formal way than academia traditionally dictates, and as part of this more public facing engagement with screen cultures she maintains an active Twitter account that she uses as a forum to post film stills: a kind of informal digital scrapbooking. The image sets that receive the most attention are those constructed loosely around the idea of Aby Warburg's *Mnemosyne Atlas* project (1924–1929): four film stills are arranged in a grid, connected by motifs pertaining to composition, colour or *mise en scène*.

As Cornelia Zumbusch (2010) notes, 'between 1926 and 1939 Warburg's work on the Atlas consisted of arranging and mounting photographs of artworks, as well as commercial art, playing cards, or stamps, in various ways on canvas covered wooden panels'. Zumbusch continues that, like Benjamin's *Passagen-Werk* (1927–40), 'both view visualization – not only on the level of the object, but also in terms of a representational principle – as an irreducible aspect of historical research' (2010: 119). From this perspective, although initially intended to be a fun, light-hearted way to present eye-catching film-related visual material, these sets have opened seemingly endless new ways into thinking about film, not only in terms of its formal qualities, but also in regard to its myriad histories and the ideological mechanics of representation. In the context of social media, it has also opened up new collaborative possibilities with fields she would not previously have thought to have located in a shared critical space: most recently, philosophy, fashion theory and political science.

From a formal perspective, the discipline of Cinema Studies has had a long-held bad habit of reducing the representation of sexual violence in cinema to simplistic generic notions of codes and conventions relating to this trope. A broader historical overview of how screen images of sexual violence and retribution fit into art historical traditions, particularly the so-called 'heroic' rape imagery of the Italian Renaissance has been missing and Alexandra has sought to redress this gap in her earlier monograph on the broadly dismissed category of rape-revenge cinema (Heller-Nicholas 2011). For most critics, images of rape on film were historically understood in relation to the so-called 'media effects' model about the potentially harmful influence of screen violence on its audiences,³ or – more foundationally – to rely heavily on the psycho-analytic model instigated by Laura Mulvey's essay 'Visual Pleasure and Narrative Cinema' (1975).

Although art history is not a radically new interdisciplinary combination with Cinema Studies, it is particularly uncommon in terms of representations of gender on film, and through this perspective Alexandra re-assembled an alternative history: through art iconography, she could investigate what part these films played in wider confusion about sexual violence across a range of different cultures more generally. Adopting Diane Wolfthal's observation that 'diverse notions' of sexual violence in medieval and early modern art 'coexisted contemporaneously' (1999: 182) beyond the privileged domain of Italian painting, Alexandra found a similar phenomenon in the contemporary rape-revenge film. Wolfthal's critical model of sampling the contemporaneous thus offered a framework that permitted a remaking of how the intersection of rape and revenge could be conceived, right back to cinema's earliest days. The act of exploring differences between rape-revenge films from Japan, Argentina, Turkey, Canada, Australia, Germany, France and Britain as well as the dominant Hollywood film industry constructs an act of critical assembling and making. Aligned with insights from the playful and popular assemblages of her Twitter account, these complementary discursive frames have encouraged a more geo-political reading, well beyond traditional psychoanalytic and media effects approaches, of how violent films become manifest in a range of cultural and historical contexts.

In these accounts of interdisciplinarity from our contributors, we have identified a shifting of researcher as subject, a kind of conceptual movement, whereby disciplines and their methods undertake subtle realignments. Nowhere is this more demanding, and potentially exhilarating, when making and assembling the materials, problems and persons for a research project, than when the demands of practice shape the development of concept-formation.

Making and assembling as practice

To a certain extent, the methodology of assembling and making is predicated upon the 'practice-turn' in social and applied research. Theodore Schatzki has defined this as 'the belief that such phenomena as knowledge, meaning, human activity, science, power, language, social institutions and transformations occur within and are aspects or components of the *field of practices*' (2001: 11). Beyond the social sciences, however, this shift towards recognition of embodied human activity has dominated the discourse that has arisen in art schools around 'practice-as-research', a now well-theorized approach to undertaking research in and through the materials and historically attuned methods of distinctive art practices (Roms 2010). Without rehearsing at length these arguments, which have ranged from the phenomenological to the critical, to the interweaving of ideas with processes of production, they lead above all to an emphasis on iterative experimentation. The concept that is most productive in this context arises not from the recognition of research as a distinct form of creative thinking, or even from the institutional imperatives that have required the establishment of a separate qualifier for artistic research, but rather for its revaluing of practice as a form of knowledge production that can be creative and critical, affective and cognitive (Borgdorff 2012).

The Marxist notion of praxis complements this question of practice as it relates to making or performance as research because it shifts the focus from the individual artist's productive performance of technique and back to the role of human practices as a form of reproduction or assembly in the workings of a social system or order of knowledge. Additional approaches to practice draw from the emphasis in Bourdieu's educational sociology on fields of practice, an acknowledgement that cultural production is itself always embedded in a social formation that is not fixed but forms an interlinked network of practices, ways of moving, being and shaping the world, or habitus (Bourdieu and Passeron 1977: 31). Practice, for Bourdieu, connotes a 'durable training' and 'internalisation' of cultural values that produce both the inculcation of ideas, as well as the agency, that is important not only to artists but social theory.

Another move that might be made from practice-as-research is to the mastery of those practices acquired through the repetition and learning requirements of a new or higher level of technical competency or performance capacity. Appropriate scholarly skills need also to be 'supplemented by some combination of perception, propositional knowledge, reasons and goals' that formalize order or express attitudes and positions, in short as an assemblage, whether making a painting or establishing an ethnographic study (Schatzki, 2001: 17). Practice is therefore not accidental, but rather a form of doing which requires attention to the activity of acquisition, the necessity of rendering and re-rendering in order to shape the outlines of knowledge over time. From a critical perspective, a practice may become stultifying and lead to the passivity of a normative horizon of understanding, or the acquiescence to a social and political ideology and regime, but alternatively it can generate new alignments and distancing from habit, pattern and variation.

In his book on *Material Thinking* (2004), the cultural theorist, Paul Carter writes of methodologies of creative practice aligned both with 'craft', the technologies required and acquired through working with materials, whether they be celluloid film, dance gestures, clay or paint; and that of the thinking in and with artists whose own methods rub up against the sociality of knowledge production in such a way that materials and their signs become discursive, as they enter into historical, social and political formations. As he writes, there is 'a propensity of materials to form into significant spatio-temporal groupings. Some of these are instantaneous and registered eidetically; others depend on calibrating the relations between things that happen, and holding in mind (and place) the Brownian notion of multiplicity' (2004: 180).

For Carter, this relationality of materials demands of the researcher a range of responses, that include remembering, waiting, tracing, assembling, mimicry, evaluating, decoding, etc. And the researcher may or may not find their labours are successful, since there will be events and 'non-events', as well as institutional structures that 'bracket(ed) off the environment of making' (2004: 52). Carter seeks to reinstate a value within the practice of making that is respectful of these attributes of sensory and critical juxtaposition; for the artist is always situated within formal constraints, they have a body, as well as methods for making and remaking, placing and replacing or recording and re-arranging.

For the researcher who is not an artist, the need to emphasize practice as a method sounds like a tautology since all processes of research arise not only from practising thought, but they also involve the technologies and techniques of a disciplinary or interdisciplinary set of knowledges. Examples of this in science might be the biochemist who studies the contents of their Petri dish but also feeds the insects that go under the microscope, organizes the coloured dyes into bottles and jars, and takes the photographs that record changes on the surface of the glass. Organizationally, these methods of assembling and disassembling precede the critical tools required to read and interpret variations within a system. How equally intricate the methodologies of the humanities or social science researcher, with their assembling of file cards, bibliographic notes, interview schedules, film footage, and the like. These practices involve finding a method or series of methods to work on or with materials (paper, sand, crochet, people, postcards, data, maps, etc.) within a critical framework that has now displaced the dichotomy between objects of study and the subject as researcher.

Towards a conjectural paradigm

To formalize this notion of method as movement and practice more fully, we contend that what is at play in the doing of interdisciplinary research is what Italian historian Carlo Ginzburg has identified as the 'conjectural paradigm'. Ginzburg's 'conjectural paradigm' might appear to fly against dominant scientific trends for cultural and social analysis, but he has identified its

precedents: from primitive hunters to modern scientists. This conjectural paradigm allows the utilization of a broad range of critical tools, in which the selection and application of these various approaches are governed by a defining, dynamic instinct. While Ginzburg identifies intuition as being essential to this process of deduction, he uses the term cautiously: 'I have scrupulously refrained up to now from bandying about this dangerous term, *intuition*. But if we really insist on using it, [it is] . . . synonymous with the lightning recapitulation of rational processes' (1989: 117). Ginzburg states that this type of intuition lies at the heart of a vast range of eclectic but equally rigorous and important intellectual enquiries – from Sigmund Freud's psychoanalysis to Francis Galton's fingerprint technology, from Sherlock Holmes to art historian Giovanni Morelli, from modern medicine to traditional folkloric practices. The conjectural paradigm is therefore an 'epistemological model' (1989: 96) positioned in opposition to the dominant 'scientific paradigm' that he claims has governed the

quantitative and anti-anthropocentric orientation of natural sciences from Galileo on (that) forced an unpleasant dilemma on the humane sciences: either assume a lax scientific system in order to attain noteworthy results, or assume a meticulous, scientific one to achieve results of scant significance.

1989: 124

As demonstrated by his eclectic range of examples, this conjectural paradigm is not new, and 'it is very much operative in spite of never having become explicit theory' (Ginzburg 1989: 96). Its value, he claims, is that 'such a study may help us break out of the fruitless opposition between the "rationalism" and "irrationalism"' (1989: 96) dichotomy that marks the scientific paradigm.

The importance of Ginzburg's conjectural paradigm to making and assembling in research lies as much in its 'rational' aspects as its 'lightning' component. The notion of *speed* is vital to the conjectural paradigm but it is not that there is a total absence of rational thought processes involved; rather they are identifiable *only* after those initial connections have been made in the 'lightning' flash of cognition. Once the skills are attained (be they the deductive skills of Sherlock Holmes, Giovanni Morelli or the Neolithic hunter), the conjectural model does not reject reason and rationality as such, but insists that real intellectual insight can be most effectively produced in this instinctive, instinctual flash. Spawned from rational knowledge, and the labour of a rigorous chiselling at an intractable problem, the effort of making has a 'gut' moment of clarity that defines the conjectural paradigm. Ginzburg's approach asks the researcher not to merely trust the process, but specifically to *trust our own* process as it emerges from what has been assembled.

This claim does not imply simply an individual justification of an intuitive idea, dramatized in an instant of revelation, but rather a conceptual willingness to engage with new understandings of how we do research, and of how the social manifestations of making a research culture require the assembling of new configurations of people, skills and technologies. In the methodological acts of making and assembling of our contributors to this collection, we see the conjectural paradigm at work, manifesting as a 'general impulse', to invoke Ramon Lobato's term, that drives each researcher towards their chosen methodologies, not naively but with an orientation towards what might mould or stratify their research paradigm.

Each of the contributors to this section offer, through their use of a singular present participle, a concept (and sometimes more than one) that builds a vocabulary and introduces skills that might shape the kind of research we are proposing. Catherine Ayres and David Bissell, for example, champion the notion of 'suspending' as a valuable methodological intervention

in interview methodologies – of putting on hold, of pausing, of acknowledging acts of repression typical of traditional research practices. ‘Introducing “suspending” as part of a researcher’s toolkit may enable radically different practices, politics, and ethics of research’, they state. ‘But doing so also in some ways demands *more* of researchers’. This ‘more’ requires an opening up to the critical potential of ‘discomfort’, and a turn towards insight over learned professional practice. Their willingness to conjecture fights against the idea of an in-process research topic being somehow ‘unfinished’.

By employing the ballet classroom exercise *enchaînement*, Harmony Bench considers the methodological benefits of arranging in data visualizations, which itself requires an intuitive combination of a range of other practices: gathering, collecting, generating, evaluating, filtering, sorting, cleaning, charting, scoping, curating, assembling, visualizing, correcting, testing, juxtaposing, modelling and crafting. For Bench, mapping a touring repertoire demands a combination of scholarly composition with ‘arrangements . . . [that] offer internally coherent, yet potentially inexhaustible combinations’. As Bench argues, this interdisciplinary methodology enables the global circulation of social, political and cultural mobilities.

For Thomas Jellis, his model of experimentation shifts away from both the fashionable deployment of the term and its scientific origins. His approach is twofold: first through ‘the invocation of attentive participation’ and the researcher’s experimental incorporation of a range of activities in their practice (for him, these include ‘talking, reading, designing, cooking, walking, foraging, choreographing’). Second, the researcher as impresario – one who makes unusual connections – potentially shifts ‘the energies of a field in productive ways’. Jellis issues an invitation to become an experimental subject in interdisciplinary research so that we ‘amplify the ways in which experimental hubs exceed particular locales’.

Margaret Wertheim’s entry on figuring usefully produces a gendered analysis of symbolic language and its use in scientific research. Extending feminist critiques of science, Wertheim notes that ‘figuring calls our attention to the wisdom of embodied objects, whose qualities are not merely reducible to, or predictable from, their descriptive codes’. For Wertheim, this critique informs a methodology of tactile geometric construction akin to handiwork in an eco-critical method. While natural forms such as corals, kelp and sea-slugs have long existed, mathematicians spent centuries formalizing structural logics that could not describe such phenomena. Even now, with our greatly expanded understanding of geometry, many natural structures still cannot be wholly articulated by this apparatus.

Rebecca Coleman seeks to rethink imaging as an encounter with her research subjects, and as a site of establishing the researcher explicitly as a maker. Coleman explores ‘some of the ways that the social sciences might work with practices developed in, and/or inspired by, art and design, and as a consequence might draw attention to making images as a research practice’. Developing a series of practical and conceptual questions, she focuses on two of her own research projects – one around making collages and the other on making and sending postcards. By doing so, Coleman raises urgent questions around participation and the status of the participant, in terms of both researchers *and* their subjects. Coleman frankly confronts the complexities of participatory research.

For Matthew Reason, drawing as an act of making is at its most practical level itself a methodological process. ‘Marks made on paper – with pencil, crayon, ink, pen – appear instantly, they are real and absolute’, he says. They demand we ‘spend time with our thoughts, memories or experiences as we begin, develop and complete a drawing’. The phenomenology of drawing – of making an impression – for Reason is not a philosophical abstraction but linked to an immediate awareness of presence and possibility. Rather than a pure theory of affect, he values the discomfort and pleasures of drawing both in and for his research. Experiences that appear

ephemeral, intangible and ineffable through this methodology are brought into being by the process of reflection: crucially, ‘experience here isn’t only had, but also made’.

Accompanied by found objects, gestures and vocalizations, for Jennifer Green sand drawings constitute a multimodality that communicates ‘important information, coding movement, habitation and histories’ of Australian Indigenous communities. In interdisciplinary research, linguists require a greater responsiveness to the complexity of ‘verbal art-forms’ and their narrative locality. Green recognizes that while traditional methods might disassemble sand stories into a series of semantic units, taken as a whole, they become a ‘small repertoire of linear, curvilinear, circular and spiral forms represent[ing] people, plants, artefacts, domestic items and other aspects of local environments’. For Green, ‘delineating the similarities and differences between sand story songs and other song repertoires from Central Australia leads to a more sophisticated understanding of the ethnopoetics of the verbal arts’.

Ramon Lobato employs the concept of ‘rescaling’ to address methodological tensions between micro and macro in relation to his research on media industries. For Lobato, rescaling ‘involves manipulating notions of scale in research design’, an approach that he has found useful in addressing a tension in his area of research where traditionally ‘methods used to study industry do not always work well in the world of media’ (for example, textual analysis or reception studies), and vice versa. Lobato steps back to address how the logic of contexts (corporate, legal, commercial, cultural, institutional, etc.) affect methods and the research we make. Through contrast and inversion, rescaling reveals the problematic and reductive logic of binaries such as big/small and micro/macro.

We are struck in reading through the essays in this section, how much the conceptions of assemblage and making are resistant towards the certainty of historical conceptions of singular truth, let alone the notion that an objective research paradigm consists only of a rationality. In harnessing intuitive responses in the research encounter, the interdisciplinary dynamic of the methods explored by our authors implies something deliberative, in allowing the unexpected to emerge from the activity of the collaborators – again privileging the notion of process over end-product. Indeed, as Luciana Parisi has suggested there is a ‘topological notion of physical uncertainties defined by the directly lived, the gestured, the felt, the danced, or generally by experienced contingencies’ (Dawes 2013). We would like to call this the movement of doubt, a valuation of doing that installs an aspect of modesty and humility into research, because the process is emphatically and necessarily framed around what each researcher does not know, rather than a ritualistic posturing and repeating the motions of what we can already assert.

While the fields of practice in which many of us research might increasingly overlap, in relation to new problematics and expanded social networks, our theorists – and we ourselves, in this essay – seek to offer possible approaches for rejecting the reductionist demands of scientific methods that can be imposed on humanities and social sciences research by research funding bodies, citation factors and other structures that dominate academic institutions today. We are perhaps united in a rethinking of disciplinary research as an interdiscipline that involves an assembling and making which remains dynamic, linked to a shifting of perspectives, and a picking up of tools and a downing of preconceptions as they relate to new and unanticipated situations. We see the challenge of an interdisciplinarity of methods to be its mobility, or its emphasis on movement between one state and another. Although the research subjects in these contributions might, at first, look disconnected, what unifies them is the idea of movement. Making and assembling as an interdisciplinary methodology is an act of hovering, of moving towards, shifting away, being drawn to and pulled back. This almost magnetic sense of attraction and repulsion sparks the creation of research: the making of ideas, and the assembling of knowledge.

Notes

- 1 See, for instance: Ingold (2011).
- 2 For further consideration of archival theory, see Fensham (2013).
- 3 This was typified in a famous Roger Ebert review of the notorious rape-revenge film *I Spit on Your Grave* (Meir Zarchi, 1978) from 16 July 1980, which can be found online at www.rogerebert.com/reviews/i-spit-on-your-grave-1980 (accessed 21 August 2016).

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Arranging (*enchaînement*)

Harmony Bench

Within the classical ballet tradition, the concept of choreography was preceded by that of arranging: dance masters availed themselves of a codified vocabulary of movements and steps, which they ‘arranged’ into dance compositions. This essay focuses on arranging as a method or practice suited to contemporary interdisciplinary research with an emphasis on the digital humanities. Broadly construed, arranging refers to any process of collecting, ordering, fitting-together, and displaying objects – from flowers to furniture to puzzle pieces. My own thinking is informed by the sequencing of steps known in ballet as *enchaînement*, a type of classroom exercise in ballet technique in which a series of travelling steps are linked (literally chained) together as a phrase or combination that moves across the dance floor. *Enchaînements* are built, or arranged, from a discrete vocabulary and syntax that determines which movements or steps may logically precede or follow others. Connections among individual step-units are not wholly predetermined, nor are they wholly open to any connection whatsoever.

While pre-existing the computational, ballet as an aesthetic vocabulary and a mode of training participates in a digital episteme. It cultivates habits of mind and body that resonate with contemporary database logics, valuing, for example, modularity, reversibility, and symmetry within a system of units that can be broken down into ever-smaller components, or conversely, built into an almost infinite number of compositions. Though my own understanding is informed by *enchaînement*, I find in the larger concept of arranging a productive model for my recent forays into data-driven scholarly projects such as the *Mapping Touring*¹ project I present here. Arranging as a method is concerned with crafting relationships of contingent interdependency; it draws attention to internal coherence and sense-making through the juxtaposition and co-articulation of units of information and their relations.

The given to be arranged

Mapping Touring is a digital humanities research project that tracks and maps the appearances of early twentieth-century dancers, choreographers and dance troupes with an emphasis on touring. My concern is to represent the dates of performance, cities and venues, and repertory performed, giving shape to economies of movement through which gestural vocabularies and ‘kinesthetic legacies’ (Srinivasan 2007: 2) flowed prior to our current media-saturated era.

With this project, I am interested in the movement of movement – how it moves, what it moves, where it moves, why it moves, and who or what moves it. To craft the mapping dimension of the project, however, I have also been required to generate the datasets that can then be plotted and visualized.

Media theorist Lev Manovich cautioned in *The Language of New Media*, ‘data does not just exist – it has to be generated. Data creators have to collect data and organize it, or create it from scratch’ (2001: 224). The term data comes from the Latin word *dare*, which means ‘that which is given’ (Galloway 2015). As a mass noun, ‘data’, which are given unordered or unorganized, attain their value as a collection or a set that can be parsed and displayed. Data are given to be arranged, and it is the process of arrangement, first as a set and later as a visualization, that makes data usable and therefore meaningful. Arranging is the process of forging relationships among the given data. Though data have the aura of neutrality, they already carry the weight of interpretation within a system of cultural values that guide identification and assembly within scholarly research. In arranging data, one shapes and re-shapes the relations within a collection such that analysis and further interpretation may follow.

In my *Mapping Touring* project, we are gathering data about performance engagements from concert dance programmes.² Although archives contain scrapbooks, route books, correspondence, newspaper reviews, and other artefacts with which we corroborate the performance data, it has been necessary to focus primarily on programmes to delimit the parameters of the project. However, in selecting concert programmes as our source material, we also limit ourselves to performance events that subscribe to a cultural logic in which the creators, performers and audiences of dances are human; dance pieces are identified as unique entities (notwithstanding variability over time); and the dates, times and locations of each event have been documented. Because this project renders the historical record anew, it cannot change that record or offer a substantive challenge to the ideologies and biases that produced it. But in moving from the case study to the dataset, the gaps and absences that historians and cultural scholars have already identified in the record should appear in even greater relief. For this reason, as theatre scholar Debra Caplan (2015) has compellingly argued, macro-histories are most productively arranged in tandem with micro-histories: as methodological complement rather than competitor. *Mapping Touring* certainly pursues a macro-history of twentieth-century concert dance, but the universalizing tendencies of such a digital humanities project can be interrupted when researchers arrange canonical figures and standardized data alongside micro-histories, local performance cultures and marginalized performance practices.

Arranging as composing and discerning: datasets and visualization

Initial stages of arranging as a method might include gathering, collecting, generating and evaluating, followed by activities such as filtering, sorting, cleaning, charting and scoping. Later steps might be curating, assembling, visualizing, correcting, testing, juxtaposing, modelling and crafting. Though I have presented these as stages, in point of fact I have found it necessary to travel back and forth along this spectrum of activities. First attempts at data visualization offer new insights as well as rehearsal for the fuller project, and also make errors or a need for additional information apparent. Arranging data through visualization is thus a mode of discovery as well as display. Inevitably, visualizations reveal flaws and deviations in the underlying data, such as misspelled names or titles. Visualizations thus occasion a return to previous steps to correct, refine and clean.

However, cleaning data risks erasing important information in favour of standardization. In this way arranging data is also like arranging steps in ballet, where cleaning refers to a process

of bringing dancers into alignment and producing a desired level of uniformity prior to performance. Both forms of cleaning are subtractive rather than additive: they take away ‘impure’ features. It is only when seeing an arrangement together that one can see what is out of place – what is ‘noise’ or what does not make sense and requires further investigation or scholarly analysis. Not all anomalies, however, are impurities to eradicate; many lead to important discoveries, add nuance, or open new lines of scholarly or aesthetic inquiry. Though cleaning is necessary to make data meaningful by making comparison possible, premature or overly zealous cleaning can erase the very differences one hopes to find.

For example, in a small project helping me test the larger *Mapping Touring* idea, I assembled performance data from Anna Pavlova’s tours to Central and South America during the First World War (see Figure 1.2.1).³ In plotting the performance locations on a map I discovered an anomaly. It would appear that Anna Pavlova and her company are in Puerto Rico and San Francisco at the same time. Human error is the most logical explanation for the uncertainty as to where Pavlova actually was. However, the dataset is incomplete, and company members did not always travel together due to injuries or visa problems. Furthermore, the turn of the twentieth century is full of copycat performers who stole each other’s routines and sometimes performance identities. What is clear is that this particular arrangement of location information revealed an anomaly that requires further attention, whether that ultimately means correcting the data or following its lead toward a new analysis of Pavlova’s global movements. While I could clean this data by simply erasing the unlikely San Francisco appearances, doing so without first determining how they came to be listed there would be a missed opportunity. Arranging can reveal outliers, but the difference between a mistake and a discovery can only be discerned with further exploration.

Arranging as interpreting, or data hermeneutics

Creating new arrangements of old information can help scholars re-examine assumptions and inherited narratives. In concert dance history of the twentieth century, for example, New York City quickly emerges as a global cultural capital. Yet, creating an arrangement of performance data that weights all locations equally – regardless of the number of engagements – paints a very different picture of what it meant to be a performing artist or performance audience in the first half of the twentieth century. Suddenly unexplored mid-sized cities and small towns emerge as important destinations for the arts. How might evaluations of audience sophistication shift if, for example, we discover that artists perform the same repertory in small towns as they do in large cities? Or if it appears instead that artists select different repertory for different cities, what might that indicate about how they relate to audiences, or their understanding of audience perception? Arranging touring information alongside railway routes and other modes of transportation (Wilke 2014; Elswit 2015) promises to shed additional light on performance engagements in smaller towns, and might further assist in re-evaluating the geography of aesthetic cosmopolitanism in light of long-distance networks (Latour 1987) that connect movement vocabularies across continents. Arranging the domestic touring pathways of concert dance with popular vaudeville and burlesque circuits will also give historians and cultural theorists a better understanding of how movement vocabularies circulate in relation and in direct response to each other.

For the sake of this essay, I have only focused on a small portion of Pavlova’s touring data, but the possibilities of arranging as method lie not only in rendering a single strand of data in different visual arrangements, but also arranging touring information from different artists alongside each other. For example, understanding Pavlova’s movements during the First World War would be further amplified by creating an arrangement that included the performance

Anna Pavlova's company tours to South America 1917-1918
(Gran Compañía de Ballets Clásicos Anna Pavlova)

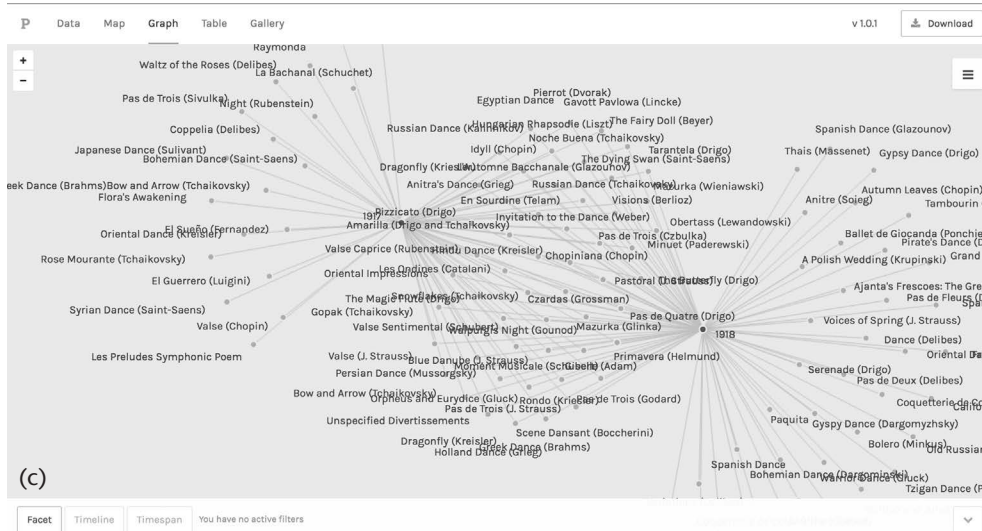
Program by Country and Date

Year..	Month	Day..	Country	City	Program
1917	July	12	Chile	Valparaiso	Giselle (Adam); Hungarian Rhapsodie (Liszt); Pizzicato (Drigo); Gavotte (Adam); The Magic Flute (Drigo); Walpurgis Night (Gounod); Waltz of the Roses (Delibes)
		13	Chile	Valparaiso	Giselle (Adam); Hungarian Rhapsodie (Liszt); Pizzicato (Drigo); Gavotte (Adam)
		14	Chile	Valparaiso	Flora's Awakening; Invitation to the Dance (Weber); Oberstass (Lewandowski)
		15	Chile	Valparaiso	Coppella (Delibes); Waltz of the Roses (Delibes); Pierrot (Dvorak); Ni
		22	Chile	Santiago	Flora's Awakening; Invitation to the Dance (Weber); Mazurka (Glinka); The Fairy Doll (Beyer); Walpurgis Night (Gounod); Primavera (Helmu
		24	Chile	Santiago	Amarilla (Drigo and Tchaikovsky); Chopiniana (Chopin); Gopak (Tchaikovsky)
		25	Chile	Santiago	The Fairy Doll (Beyer); Invitation to the Dance (Weber); Mazurka (Glinka)
		26	Chile	Santiago	Coppella (Delibes); Greek Dance (Brahms); Rose Mourante (Tchaikovsky)
		29	Chile	Santiago	Coppella (Delibes); Greek Dance (Brahms); Rose Mourante (Tchaikovsky); The Magic Flute (Drigo); Invitation to the Dance (Weber); Waltz of the
August	2		Chile	Santiago	Raymonda; Noche Buena (Tchaikovsky); Oberstass (Lewandowski); P
	3		Chile	Santiago	Showflakes (Tchaikovsky); Egyptian Dance; Waltz of the Roses (Delibes)
	4		Chile	Santiago	Oriental Impressions; Orpheus and Eurydice (Gluck); Hungarian Rhapsodie (Liszt)
	5		Chile	Santiago	Showflakes (Tchaikovsky); Egyptian Dance; Waltz of the Roses (Delibes); The Magic Flute (Drigo); Orpheus and Eurydice (Gluck); Pizzicato (Drigo)
	15		Argentina	Buenos Aires	The Fairy Doll (Beyer); Walpurgis Night (Gounod); Primavera (Helmu
	19		Argentina	Buenos Aires	Coppella (Delibes); Greek Dance (Brahms); Gavotte Pavlova (Lincke)
Sept.	5		Argentina	Buenos Aires	The Fairy Doll (Beyer); Walpurgis Night (Gounod); Mazurka (Glinka); Pi
	23		Argentina	Rosario	The Fairy Doll (Beyer); Egyptian Dance; Oberstass (Lewandowski); Pi
	30		Argentina	Rosario	The Magic Flute (Drigo); Showflakes (Tchaikovsky); Oberstass (Lewandowski); C
October	4		Argentina	Rosario	Coppella (Delibes); Hungarian Rhapsodie (Liszt); Night (Rubenstein); The Magic Flute (Drigo); Walpurgis Night (Gounod); Mazurka (Glinka)
	10		Argentina	Buenos Aires	Flora's Awakening; Invitation to the Dance (Weber); Mazurka (Glinka)
	11		Argentina	Buenos Aires	Oriental Impressions; Chopiniana (Chopin); Primavera (Helmu)
	13		Argentina	Buenos Aires	Showflakes (Tchaikovsky); Orpheus and Eurydice (Gluck); Waltz of the
	14		Argentina	Buenos Aires	The Fairy Doll (Beyer); Walpurgis Night (Gounod); Oberstass (Lewandowski)
	16		Argentina	Buenos Aires	Amarilla (Drigo and Tchaikovsky); Les Preludes Symphonic Poem; M
	18		Argentina	Buenos Aires	Orpheus and Eurydice (Gluck); Hungarian Rhapsodie (Liszt); En Sou

(a)



(b)



(c)

Figure 1.2.1 These screenshots represent three arrangements of the same data as (a) a list, (b) a map, and (c) a network, which I have opted to present in three different visualization platforms. Each arrangement highlights a different component of the underlying data from Pavlova's touring in Central and South America during the First World War: the list in Tableau shows a chronological progression in tandem with repertory performed; the map in CartoDB represents an a-temporal geo-spatial accumulation of events; the network in Palladio sorts repertory into works performed in the 1917 and 1918 calendar years, and those shared between the two as part of the same performance season, which generally runs July–June.

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engagements of other artists or companies during the same time period, such as Diaghilev's Ballets Russes, Isadora Duncan, or Ruth St. Denis and Ted Shawn. How do their touring patterns relate to each other? Are the movements of one contingent on the movements of another? Does one seem to exhibit more freedom of movement than another?

Too often, data visualizations are presented as rhetorical black boxes – assertions presented without substantiating data, which nevertheless claim status as truth through quantification. A hermeneutic approach to data, however, considers the arrangement at hand, supporting the critical evaluation of what Orit Halpern describes in *Beautiful Data* as the 'aesthetic crafting to this knowledge, [the] performance necessary to produce value' (2014: 5). What does a specific arrangement suggest or argue, and how do the aesthetics of the arrangement help or hinder that argument? What other arrangements might counter its claims? What is the ideological bent of the data or its process of generation? What role does software play in foregrounding or obscuring certain interpretive possibilities?

Arranging, which enables combinations and re-combinations of a given set of data, establishes contingent interdependencies among (in)dependent variables. In the case of Anna Pavlova, one is reminded (or learns for the first time) of the diversity and extensiveness of Pavlova's repertoire. Not only did Pavlova and her dancers perform familiar classics from the Russian ballet canon, they performed social dance pieces, orientalist works, indigenous-themed dances, operas, and dances composed in response to local dance traditions. *The Dying Swan* might have captured the public's imagination, but arrangements of Pavlova's repertoire tell a more nuanced story. Furthermore, Pavlova is remembered for the global reach of her touring, but the business and mechanics of travel, along with competition among dance artists for venues and audiences, has not been fully researched. Nor have scholars delved into comparative analyses of thematic or stylistic similarities in repertoire across companies. Yet when looking at a map of touring, a list of performance locations, or the spread of repertoire performed from season to season, such considerations come to the fore. Arranging performance data into sets and visualizations opens new avenues for analysing networks and geographies of influence, political economies of touring, and the global circulation of movement practices and aesthetics.

As a method for contemporary interdisciplinary research, arranging combines experimentalism with composition in scholarship. Researchers arrange data, working back and forth through processes of gathering, cleaning, displaying, and analysing, crafting relationships among pieces of information to determine which arrangement might offer a new perspective or prompt a new question. Arrangements, like the *enchaînements* found in ballet studios, offer internally coherent, yet potentially inexhaustible combinations. They can expand or contract in scope but remain rule-bound; they are flexible but logical. A shift of relation can produce new interpretations and understanding.

Notes

- 1 *Mapping Touring* is supported by the Office of Research's Grants for Research and Creative Activity in the Arts and Humanities at The Ohio State University. See Bench 2015.
- 2 Archives frequently contain both performance programmes and souvenir programmes. Souvenir programmes are generally produced for an entire tour and contain extensive contextual information such as biographies, librettos and photographs, but do not reflect the locales in which an engagement was held. Performance programmes, in contrast, document the specifics of each performance event within a local context, including local advertisements and announcements.
- 3 This project was undertaken in conversation with dance scholar Kate Elswit for a co-authored presentation. See Bench and Elswit.

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Drawing

Matthew Reason

What am I asking, if I ask a research participant to draw me a picture?

In different guises this request has been asked of participants across psychology, health, education, marketing and my own context of arts audience research. In all these areas, and others, the invitation to draw has become one of a range of visual methodologies recognized as having great potential when conducting research with people.

The use of drawing is often described as a ‘projective technique’, motivated by the perception that when responding to direct questioning research participants may either be reluctant or not consciously able to reveal their true attitudes or deepest feelings. To address this difficulty, researchers use methods designed to enable participants to ‘project’ their feelings through mediating activities. Examples include the use of word association tests, sentence and story completion, photo sorts and indeed drawing. Drawing is utilized in this manner in contexts as diverse as market research – to circumvent participants’ self-consciousness and ‘delve below surface responses to obtain true feelings, meanings or motivations’ (McDaniel and Gates 1999: 152) – and art therapy – where its use is ‘based on the accepted belief that drawings represent the inner psychological realities and the subjective experiences of the person who creates the images’ (Malchiodi 1998: 5).

There are, however, a variety of contentious propositions here, both ethical and methodological, particularly in the assertion that a drawing methodology reveals truths below the surface of the participant’s consciousness. Art therapy, in particular, has moved away from an overly ‘diagnostic’ use of drawing, where the expert therapist asserts their ability to know the experience and feeling of the participant through the content of the drawing alone. Instead, drawing as a research methodology has become fundamentally connected to participants’ talk about drawing. That is, participants are perceived as ‘expert’ in their own experiences and positioned as the first and most important interpretation of their own drawings. This is the case both in therapeutic (Malchiodi 1998) and research (Gauntlett 2007) contexts.

As a ‘draw and talk’ methodology, drawing is no longer an almost magical process that is revelatory of inner or authentic truths. If we ask a research participant to draw we cannot presume that this necessarily makes the responses more insightful, or more complete, or more anything else than those communicated by talk alone. It is, however, a request that constructs a specific dynamic between researcher, participant and the subject/object of enquiry that has the

potential to produce different kinds of insights and understandings (see for example Elliot Eisner (2008) on visual knowledge).

When I ask a participant to draw me a picture I am inviting a different dynamic than if I had simply asked them to talk. I do not expect them to respond instantly. Instead drawing imposes a slowing down, a pause for reflection in the returning to memories. Yet, and this is vital, it is not simply a pause for thought (and I might very well ask a participant to have a think about something for a few minutes before answering). More specifically, it is a pause to draw.

Drawing is an activity in which the marks made on paper – with pencil, crayon, ink, pen – appear instantly, they are real and absolute, but which also requires us to spend time with our thoughts, memories or experiences as we begin, develop and complete a drawing. This combination of duration *and* immediacy is the unique quality of drawing as a research methodology. It is at once an active doing and also a quieter, reflective thinking. Through this duration it



Figure 1.3.1 Lost in drawing. A research workshop in progress. Photograph Brian Hartley. Copyright Matthew Reason

is possible for thoughts, realizations or insights to come into knowing in a manner that is less about discovering something pre-existing and more about constructing knowledge through the process itself.

While the nature of drawing is much debated within art theory, 'drawing' as an arts-based or creative research methodology is typically framed fairly broadly and rarely narrowly conceived in terms of media or materials. In my own practice, I have tended to provide participants with a diverse range of arts materials and allowed them to select those that most suit their temperament or the nature of what they want to communicate. The results often go beyond the qualities of line to include elements such as colour and texture, producing artefacts that might at times be closer to painting or even collage (when participants elect not to draw on paper but rather rip it up and 'draw' *with* paper). Visual or expressive 'mark making' might, therefore, be a more accurate if less evocative description for the diversity of creative processes that participants employ. Considered either as drawing or mark making, participants are required not only to spend time with memories, thoughts and feeling but also to start to externalize these visually. The mark is both of the participant, and yet also separate from them; it is, as Joseph Beuys puts it, the changing point at which ideas become 'the visible thing' (Rose 1993). Mark making therefore operates for participants as both a form of research (what is it I know about this memory? What did I see? What do I remember?) and of expression (how did it make me feel? What did I think about it?). The result is a process of reflective contemplation, as participants' responses are mediated through the act of making a mark – a line, a shape, a trace, a shade – with this active doing enabling a dialogic process between participant and an art work that is exterior to them.

My own research focuses on audiences' memories, experiences and perceptions of theatre and dance performances. A typical scenario might involve accompanying a group of child or adult audience members to a performance and then facilitating an arts workshop with them. Audiences often like to talk about the performance they have seen, and implicit within the drawing workshops is the desire to slow down and extend this desire to share and externalize the experience. In this context, the particular request is for the participants to 'draw something you remember from the performance'.

In my own practice this request is framed and structured with care. The workshops begin with warm-up drawing games – getting the participants to 'take a line for a walk' or draw portraits of themselves with their 'wrong' hand. As researcher, I join in these exercises, using all of our drawings as an opportunity to explain that I am not concerned with the relative quality of the pictures. Here it is worth noting that drawing as an activity is experienced very differently by adult and child participants. As Pia Christiansen writes, children themselves consider 'all' children to be competent at drawing, which to them is an ordinary rather than specialized activity (Christensen and James 2000: 167). When working with children, therefore, drawing feels a natural activity and following the introductory exercises the workshops consist of an extended period of largely free drawing. As the children draw I will talk to them, individually or in pairs, asking them to tell me about their drawing and through that about the performance they witnessed.

For most adults, in contrast, drawing is not an everyday activity and many grown-ups will automatically assert that they 'can't draw'. For this reason, running art workshops with adults requires additional structured elements, continuing the drawing exercises through the whole process with further suggestions designed to distance participants from their self-consciousness about drawing. So, for example, participants might be invited to draw with their eyes closed, without taking their pencil off the paper, or on a large sheet of paper while using a pen taped to the end of a two-metre-long bamboo cane.

Whether with children or adults, the process of drawing invites participants to spend time with their memories and experiences. In making the decision of *what* to draw and *how* to draw it, participants are required to invest effort and project themselves into their art work and into their memories. Drawing represents a prompt to consider what things looked like, what things meant and how things felt. Or, more accurately, to *discover* this knowledge *through* the process of drawing. Here a couple of examples are useful.

A seven-year-old girl draws a puppet goose from the theatre performance she saw in her school hall. But she does so not as a puppet and not from the perspective given to her in the performance. Instead this goose is a fully fledged bird, depicted flying high above the stage, which is shown as small and far below. In the picture the goose is crying. The drawing depicts something not literally seen in the performance and from a perspective different from that of the audience. While prompted by the performance, the detail and specificity of these acts of imagination and empathy are only fully realized through the requirement to draw.

In another example, a woman in her 40s constructs a collage by slowly and laboriously cutting and sticking long red strips of card to a black sheet of paper. As she works she comments of the dance performance she had seen: 'I mostly got a feeling from it, I got a kind of sense of it being very, very angular and full of energy. But with a real kind of tension there.' Here the content and materiality of the picture echoes the memory, constructing a visceral, sensory response to the performance. Both the picture and the performance are an expression of angles and staccato tension.

In very different ways – one abstract and the other figurative – these examples display a sympathy between the visual depiction and the emotional meaning invested into the memory. In other words, the process of responding visually requires the participants to look again, look closer and through investing themselves into the memory depict more than they had



Figure 1.3.2 Crying goose. Child's drawing of *Martha* by Catherine Wheels Theatre Company. Copyright Matthew Reason



Figure 1.3.3 Angular and full of energy. Adult's collage of *Ride the Beast* by Scottish Ballet/ Stephen Petronio. Copyright Matthew Reason

seen – adding, interpreting, imagining, playing. The verbal responses, therefore, are the product not just of the original experience but also of the artistic intervention into that experience.

It is important to note that the transformative impact of the creative process is not generic but specific to the particularities of the methodology of visual expression, as manifested, for example, in the challenge of representing a theatre or dance performance on paper and the manner by which the participants engaged with the materiality of art making. The making of a picture takes time: thoughts and intentions at the beginning change and evolve as the image develops. Participants did not simply decide what to depict, but rather discovered both the what and how of the (re)presentation in the act of doing. As one of the adult participants in a research workshop commented:

I thought the interesting thing for me when doing the art work was that I started with something but I started a dialogue with my image. So I started to put in other things that weren't there. But they were thoughts and feelings, so it opened up a conversation with myself about my memory of what I'd seen.

While the possibility of invention might concern a researcher seeking some externalized truth, for me this notion of a dialogue between the research participant and their experience is both striking and useful. In my research, I am interested in exploring audiences' aesthetic, embodied and emotional experiences of theatre and dance. These are by definition ephemeral and often seem both intangible and ineffable. Indeed, John Carey suggests that not only are the aesthetic experiences of *other* people impossible to access, but in truth our own aesthetic experiences are largely unapparent even to ourselves (2006: 23). Aesthetic experiences, therefore, can be considered not as something that participants know and simply have to tell, but instead

as something that is brought into being by the process of reflection. Experience here is not only had, but also made.

The transformative process of drawing as a creative expression should, therefore, be considered a process through which new and different kinds of knowledge are generated and communicated. This is central to much artistic research and can be seen in terms of what Henk Borgdorff (2010: 61) describes as ‘the pre-reflective, non-conceptual content of art’ that ‘creates room for what is unthought, that which is unexpected’. It is a process that is not linear or fully planned, but equally not fully unintentional. Along with other forms of visual expression, drawing is not simply a projective technique, but a form of structured exploration and generation. It is an approach particularly suited to researching emotional or affective memories, where the interest is in the lived phenomenological experience of the participant. Drawing, potentially at least, is a process that exposes the unthought and the unexpected, often not just to the researcher, but also to the participants themselves.

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Experimenting

Thomas Jellis

The notion of experiment is increasingly attracting a certain cachet within and beyond academia. Perhaps what is most striking about this interest in, and proliferation of, experiments is that they are no longer understood to be the domain of the sciences, nor of a narrowly exclusive range of avant-garde aesthetic practices. Although experiments are still sometimes looked upon as ethically ambiguous (if not dangerous), various spaces, practices and events are increasingly being described as experimental. This is as pervasive in pop culture as it is in academia. For instance, turn on the TV and witness the fawning over the latest experimental chef. Or look at the huge grant for the recently established social science ‘lab’ at your university. It might even be claimed that, like the injunction to be critical in the 1990s, the injunction to be experimental has become one of the defining refrains of the early twenty-first century and certainly contemporary research in the social sciences.

Within this context, it becomes important to investigate the ways in which experiment is mobilized and to what ends. There are many things at stake here, not least of which is the value of experiment, especially when its currency is in danger of being devalued through the proliferation of the term. That is to say, if the notion of experiment is expanded to include ever more things, what happens to its specificity? Moreover, what kind of analytical purchase does it provide? My own research has sought to bear witness to this ever-increasing plurality of experimenting, a ‘something/happening’ that is gathering force and gaining traction through diverse energies. Crucially, I have sought to position myself as both investigator of how this experimental inflection is taking place and, in a very real sense through my own experimenting, to become a vector of the inflection itself. As much as my research seeks to foreground the new spaces and logics of experiments that are emerging, I am also interested in putting these ideas to work – to see how I too can experiment.

I am drawn to the notion of reclamation to think through this burgeoning experimentalism. By this I do not mean ‘taking back what was confiscated, but rather learning what it takes to inhabit’ (Stengers 2008a: 58); learning what can be done anew, with an experimental approach that is no longer tethered to the sciences. Crucial to what follows is an acknowledgement that these alternative experiments, however considered – ‘extra-scientific’ (Vasudevan 2007), ‘ethico-aesthetic’ (Guattari 1995), ‘wild’ (Lorimer and Driessen 2014) or simply uncategorizable – do not conform to the model of experiment as concerned with hypothesis testing. Such experiments

disrupt the very notion of what it means to experiment, making no ‘clear distinction between the terms “experience” and “experiment”’ (Stengers 2008b: 109).

Although it carries with it a good deal of epistemic baggage, not least its association with positivism, reclaiming experiment is an opportunity to reflect on the ends of experiment and to think about how certain forms of experimentation serve to redefine problems for researchers. In this essay I want to outline how experiment may facilitate a flexing, or disruption, of ways of thinking. Following calls to document and reflect on ‘innovative forms of methodological experimentations’ (Dwyer and Davies 2010: 95), what follows is an attempt to consolidate outputs from an ever-increasing methodological repertoire to suggest how an experimental approach might be cultivated. I do so by reflecting on two examples of my own modest experiments, which might be characterized as participating and relaying. This comes out of a research project that examined the relations between geography and experiment (Jellis 2013, 2015). In large part, the impetus for this was my contention that there are new spaces of experimenting that are worthy of examination as a part of a renewal of experimentation within geographical thinking. The empirical remit of such a project consisted of ethnographic investigations of a loose constellation of laboratories, across Berlin (Insitut für Raumexperimente), Brussels (FoAM), London (Office of Experiments) and Montreal (SenseLab and Topological Media Lab), through which to examine experimenting.

The first way I want to explore my own attempts at experimenting is by way of participation. Much has been written about participatory research and related ideas of co-production, not to mention engagement and inclusivity. Yet this kind of work has rarely theorized how any research is always already an ongoing participation with the world, rather than something that can be chosen or selected. This is a participation that unfolds by ‘becoming affected and inflected by encounters’ (McCormack 2008: 2). Participating at sites, for me, involved a range of activities – talking, reading, designing, cooking, walking, foraging, choreographing – and I came to embrace the awkward role of not knowing quite what I was attending to, which others who have undertaken ethnographic research may relate to. My affirmative stance was quite literal; I always said ‘yes’ to suggestions and became involved in all kinds of projects. As such, I was enrolled into these experimental spaces in a number of ways. Some of my work appeared at an art exhibition in Berlin; an essay I had written was published in a collaborative book; I became part of an editorial board for one of the lab’s journals, where I was also involved in the translation of texts; I represented another collective at a book launch and produced internal reports of events; I was also involved in copy-editing on a manuscript from another experimental group. Much of this work, then, was textual, but nevertheless it indicates the ways in which I became part of – if only temporarily – these experimental groups and practices. More than this, though, it is about not imposing arbitrary limits on participation; we do not need to stick to what we are comfortable with (and for me, this included, in particular, foraging and dancing). It is also important to remind ourselves that participation precedes recognition, it preceded me saying ‘yes’, as ‘our awareness is always of an already ongoing participation in an unfolding relation’ (Masumi 2002: 231). Whether we like it or not we are always already participating, and so the very question of what it means to participate is something with which one can but experiment.

How then to respond to such a suggestion? My way of working this through has been with the invocation of attentive participation, which builds on work to recalibrate participant observation (see Thrift 2000). Although we might look to extend what counts as participation, it is crucial that it is not participation just for the sake of it. As such, I tried to experiment with participant observation by questioning what I could participate in and how this might be

refashioned to foreground attention in particular ways. This follows through any research process, such that any attempt to outline the unfolding relations and emergent events involves constructing lures for attention – where attention is a means of ‘becoming able to add, not subtract’ (Stengers 2008b: 99) – to make more of ‘the feelings, the codes, the awkward intensities, the architected space, the architecture of time’ of fieldwork (Dewsbury 2009: 326). Building on ethnographic research and its descriptive qualities, such an approach looks to amplify the manifold experiences of any kind of fieldwork in a way that does not seek recourse to fidelity but to re-animation. This is part of an ‘ethos of stretching the means by which research is done and striving to continue as experiments fail or always come short in the attempt’ (Dewsbury 2009: 323). Research outcomes might, then, be less about what we have found or extracted, and more about what we have done – and struggled with – and the affective swash of these encounters and their after-effects.

The second, and related, way I have been thinking about experimenting is about the researcher as a relay, or an impresario. In my own research on experimental spaces, one thing that I could contribute to the sites was my awareness of other, similar organizations that I was already working with or in the process of negotiating access of some sort. Something that emerged as an important way of experimenting was the modest undertaking of *connecting* disparate experimental groups. This kind of work does not fall within the criteria for measured outputs that many of us worry about – or at least those of us based in the UK – and yet it can serve to radically reconfigure the working practices of hitherto only loosely associated sites. Of course, this might well not be the case; there is every chance that an encounter will result in silence; not necessarily failure but certainly no follow-up or future connections. The researcher as impresario might, at first blush, sound grand – portentous even – and yet it is a risky, uncelebrated, decidedly unsexy endeavour that offers a profoundly different way of thinking about comparative research.

In this sense, this process of connecting made explicit that these various labs are not so much distinct sites as different ways in which the things I am interested in can relate to one another. And it was through this process of connecting that my research started to trouble the notion of a coherent ‘experimental space’ across these seemingly distinct ‘field-sites’. By putting in touch one experimental lab with another, they were able to seek out synergies, highlight differences, and pool techniques for experimenting. But it also helped me to think differently about these groups – through what I termed experimental ecologies. To think experiment ecologically is to attend to the ways in which experiment always escapes particular sites. And so by fostering these connections between ‘my’ different field-sites, or put differently, relaying the various matters of concern from one to the next, I was able to amplify the ways in which experimental hubs exceed particular locales.

While it might be a big claim for an interdisciplinary method, experimenting can serve as an instance of – and an ethos for – reclaiming or shifting the energies of a field in productive ways. To be sure, experimenting has the potential to be disruptive of repertoires of practices and of modes of thinking. While it has been invoked in sometimes uncritical ways, which can suggest a certain heroism, a focus on experiment and the experimental cannot be dismissed as a passing intellectual fad as it raises crucial questions for how the social sciences proceed methodologically. More specifically, my concern has been with how experiment is a ‘searching for a new way of going on’ (Thrift 2008: 223). The question of experiment might continue to remain elusive, but this is no bad thing. Instead, in this age of ‘experimentality’, to experiment in thought and method is to reconfigure what constitutes the world.

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Figuring

Margaret Wertheim

Figuring is a word with deep interdisciplinary resonances in mathematics, literature and science; and as an activity it encompasses diverse histories and contexts: from textile makers weaving patterned figures with jacquard looms to courtly dancers spinning dynamical figures across a ballroom floor. The human figure, long a staple of artistic representation, is now a locus of constant measurement as we count steps and calories to figure our physiology. As cognitive beings, of course, we are continually figuring things out. In this essay I want to focus on the act of making figures that instantiate scientific and mathematical principles, a practice-based methodology that lies at the heart of the Institute for Figuring (IFF), a Los Angeles based organization I co-founded and direct with my twin sister Christine Wertheim. The IFF – its acronym being the logical symbol for ‘if and only if’ – is an enterprise dedicated to the aesthetic and poetic dimensions of science and mathematics (www.theiff.org). With my background in physics, and Christine’s in literature and philosophy, the institute was born from our entwined desire to explore processes of figuring as a way of thinking beyond symbolic form.

Although Western thought has long privileged symbolic modes of representing information – the mathematical equations of physics, the DNA code of molecular biology, the binary codes of computation – we suggest that the insights illuminated by material figuring extend traditional disciplinary approaches and often reveal surprising facets of knowledge. In our work, we explore how sign systems can manifest in concrete figurative forms. For instance, fractals can be constructed out of business cards, platonic solids can be woven from bamboo sticks, hyperbolic surfaces can be crocheted, tessellations can be cross-stitched, the projective plane can be knitted. Even the logic underlying digital computing has a geometric analogue that can be represented by a three-dimensional network. Not infrequently, abstract relations have correspondences in material objects that lend themselves to concrete play, and to a consequent playing with ideas. As a practice of making concrete figurative forms, figuring calls attention to the wisdom of embodied objects, whose qualities are not merely reducible to, or predictable from, descriptive codes.

Partly stimulated by Friedrich Froebel’s revolutionary nineteenth-century ‘kindergarten’ system of pedagogy (Brosterman 1997), with its focus on tactile geometric construction, another inspiration for our practice has been the field of chemistry. As the study of atomic assemblages, chemistry is inherently combinatoric; there are only a hundred or so atoms but these can be arranged in an infinite variety of molecules. Not everything, however, is possible, for various

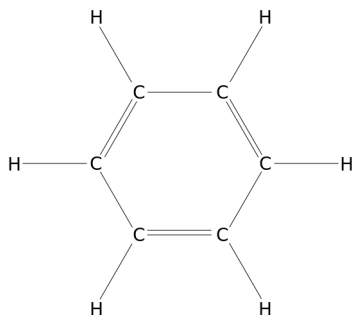


Figure 1.5.1 Hexagonal structure of benzene. Image courtesy of the Institute for Figuring.

laws, patterns and regularities assert themselves. To articulate such relationships, chemists have developed a variety of symbol systems, including a lexical notation for specifying any particular compound as well as a graphical notation for representing the arrangement of its atoms in space. Take the case of benzene, a vital organic molecule made up of six carbon atoms and six hydrogen atoms. Benzene's chemical formula is C_6H_6 , and its graphical representation is shown in Figure 1.5.1.

In figuring out how molecules work and how they can be assembled, chemists also make three-dimensional models to represent how chemicals occupy physical space. In the past, these were hand-crafted out of balls and sticks, for example Watson and Crick's famous model of DNA, yet contemporary chemical modelling is mostly now done on computers, including state-of-the-art virtual reality set-ups, such as the CAVE where researchers can move around and through a simulation to explore the physical figure of their molecule (Cruz-Neira, Sandin and DeFanti 1993). The design of new drugs, for example, is largely premised on understanding the *shapes* molecules make and the specific shapes of the body's receptors into which they must fit. A good deal of pharmacy is applied geometry and here function literally follows form.

At the IFF we aim to create circumstances where participants can experiment with similarly embodied activities, generating objects that delight the eyes and stimulate our haptic sensibilities while also illustrating formal sets of relationships. Such acts of figuring allow for creative exploration within a context of rules and constraints having their own internal logics. Interested in the dance between codes and forms, like chemists, we also seek insight by figuring out problems through the structures of our models. In one key project, our *Crochet Coral Reef* (Wertheim and Wertheim 2015), we examine hyperbolic geometry through crochet, an unlikely conjunction between mathematics and feminine handicraft inspired by a discovery by Daina Taimina, a mathematician at Cornell (Taimina 2009). In hyperbolic space (an alternative to the Euclidean space we learn about in school), geometric forms behave in novel ways: parallel lines can diverge while the angles of a triangle may sum to 0° . In Taimina's models such theorems may be visually illustrated by sewing diagrams onto the woollen surface, thereby concretizing abstruse mathematical concepts (Wertheim 2005).

Geometrically precise, Taimina's models are generated from a simple algorithm – 'crochet n stitches then increase one', where ' n ' may be any fixed number. Additional stitches increase the surface area, generating the geometric opposite of a sphere. But what happens if we deviate from this rule? Let us say we increase one in every three stitches, then one in every ten? Here we no longer get a hyperbolically exact surface, for it is no longer geometrically regular. Just as there is only one *sphere* (an object with constant *positive* curvature), so there is only one pure hyperbolic surface (an object with constant *negative* curvature). By morphing the code and

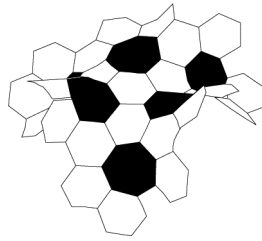


Figure 1.5.2 Model of the hyperbolic plane constructed from hexagons and heptagons. Image courtesy of the Institute for Figuring and *Cabinet* magazine.

manually introducing deviations, we crochet Reefers move away from mathematical ‘perfection’ into a domain of organic possibility. In the *Crochet Coral Reef* project, we are indeed exploring negative curvature analogues of wonky spheroid forms such as the oblate shapes of sea urchins and the asymmetries of eggs. Nature itself has been playing with such forms in the frilly surfaces of corals, kelps and sea-slugs for hundreds of millions of years. Yet mathematicians, with their formalized rules, spent hundreds of years trying to prove that such structures were impossible.

Across the academic spectrum, we see a growing interest in and sensibility towards embodiment and the qualities of material being. The philosopher of science, Evelyn Fox Keller, for instance, has noted the limitations inherent in the ‘master molecule’ theory of DNA and drawn attention to the dynamic role of the cell cytoplasm in embryonic development (Fox Keller 1995). Feminist science studies scholar Donna Haraway celebrates entangled webs of ‘symposis’ (a word meaning ‘to make with’), in which embodied critters together create and nurture environmental health (Kenney 2015). In mathematician Brian Rotman’s radical proposal for a non-Platonist account of mathematics, articulated in his book *Ad Infinitum* (Rotman 1993), he suggests that doing maths is itself an active embodied process. Much like the act of crochet, Rotman declares that even mathematics results from cognitive acts carried out by physical agents subject to physical limits, and thus, he says, there is no such thing as a perfect sphere or perfect straight line. For him, *all* mathematical objects – including numbers – are finite entities that arise when concrete actors construct them. Rather than a static and transcendent domain waiting to be discovered, Rotman considers mathematics as an evolving landscape of forms continuously brought into existence by communities of practising mathematicians.

By morphing a crochet code, and exploring the potentialities of a woolly DNA, we at the IFF have created communities of localized knowledge and expertise who branch out from geometric perfection to generate vast simulations of coral reefs. To date, more than 10,000 women in a dozen countries on five continents have collaboratively stitched a crochet ‘tree of life’. ‘Iterate, deviate, elaborate’ has been the motto for this handiwork, which now constitutes a globally extensive experiment in applied geometry and emergent algorithmic complexity. As life on earth begins with simple cells and evolves into ever-more complex forms, so our crochet forms have evolved. Figuring with our fingers – a literal *digit-al* technology – has opened a diversity of patterns that provide a yarn-based analogue for thinking through Darwinian ideas.

These crafted objects are underpinned by a DNA-like code (the pattern of stitches that can be written down in symbols, much like the symbols articulating molecules). Yet the code is not wholly determinant. When figuring with materials, the properties of substances impress themselves on structures, causing chains of consequence that often cannot be predicted in advance. A form figured in stiff acrylic thread might stand pert like a stony coral, but constructed in silk it might flop like a piece of kelp. Real figures – as opposed to idealized mathematical ones – result not just from the codes and equations scientists use to describe them, but also from

the qualities of their components. As in chemistry, *matter* matters, and the structural properties of molecules also result not merely from their chemical formulae but, critically, from physical interactions between their parts. This is why proteins are so hard to model on computers; here scientists must engage with the real-world physics of complex atomic interactions. As a methodology, our insight is that figures themselves come into being through acts of figure-ing that involve rules and deviations, material substances and dispersed communities of practice.

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Imaging

Rebecca Coleman

A focus on *imaging* enables a consideration of the ways in which images might be the subject or outcome of a research project, and also an integral part of *doing* it. In this contribution, I consider some specific images that have been made in my research, both by research participants and myself. However, the main focus of the chapter is on understanding imaging as a research methodology that involves processes of making, assembling and circulating. In this sense, I am interested here not so much in how images may be considered as data, but more in how they may participate in the creation and dissemination of research; in what images might do in and for the research process. In particular, I place emphasis on the ‘ing’, in order to indicate the processual character of making, assembling and circulating – these are dynamic and transformational practices – and of images – which are themselves understood as potentially unfinished, sensory and affective experiences (rather than static objects or texts).

Such an understanding of the role of images in research might appear rather obvious to those in the performing and visual arts involved in practice research, where arts and media practices are recognized as generators of knowledge, and perhaps as performative interventions. However, with some notable exceptions, in the social sciences images have largely been considered as representations to be analysed in order to make sense of patterns and inequalities in visual culture, and/or as means of documenting encounters and experiences with the social world. While these approaches remain important, this contribution aims to explore some of the ways that the social sciences might take up practices developed in, and/or inspired by, art and design, and as a consequence might work with imaging as a research practice. Hence, I make interdisciplinary methodologies and methods the focus of my discussion, paying particular attention to the conceptual and practical issues that such approaches provoke.

I discuss two examples of how my research has worked through different imaging practices: the first involves research participants making collages, and the second involves me, as researcher, making and sending postcards. The images at stake here are thus broadly understood. They include collages and postcards both as images themselves, and as images that are made through a range of materials including other images, as I discuss below. My understanding of imaging is similarly broad. I consider how imaging can potentially involve multiple and diverse aims and practices, how different participants within a research project might (or might not) produce and circulate images, and how imaging as interdisciplinary methodology raises a number of

questions that require further attention. While this chapter explores two examples from my own research, it is important to note that this focus is not prescriptive; other still and moving images and imaging practices (e.g. those involving videos, painting and drawing) might also be relevant to the suggestions I make here. That is, my understanding of images as open-ended experiences and of imaging as processual and transformational might lend itself to a range of approaches that are concerned with the non-representational, sensory, and inventiveness of the social world.

Imaging as process and practice

The understanding of imaging that I outline above can be unpacked through a first example of a project with young women on how they experience their bodies through images (Coleman 2009). In this research, I wanted to empirically study how these girls' experiences of their bodies emerged and were arranged through relations with different kinds of images. Much feminist research on girls' bodies and images concentrates on media images. While these images were raised as significant, what also became apparent in my research was that other images – including photographs, mirror images, and comments about their bodies from other people – were also important. Methodologically, I included image-making sessions alongside the more traditional sociological methods of individual and group interviews.

The aim of these sessions was to try to integrate images into the research, so that images were not just the subject of the research (what it was about), but part of how images were themselves studied (a methodology). I was also interested in encouraging participants to visualize and examine their experiences of their bodies.

The sessions involved the girls collaging images of their bodies through materials from different sources, including magazines, a Polaroid camera, craft materials, make-up and sweet wrappers (see Figure 1.6.1, and also Coleman 2009). To begin to think through these collages, the notion of assemblage is particularly helpful. An assemblage refers to a temporary and changing arrangement of multiple parts (Deleuze and Guattari 1987). The collages made by the girls can thus be understood as assemblages; they are constituted by materials taken from various sources, which are arranged in ways that demonstrate how they have been transformed in the move from one source and setting to another (e.g. from a magazine to a collage, from mass media to a classroom to various academic publications), and in the relations the parts have with each other (e.g. through how they may be juxtaposed, and/or organized so as to create a particular impression).

Furthermore, in these collages, issues concerning change are highlighted. For example, Anna's collage (Figure 1.6.1) highlights how understandings of a person might change depending on whether they are based on looks and appearance or 'what's inside'. Other participants juxtaposed photographs of themselves with images from mainstream women's magazines. Fay, for example, assembled a photograph of herself with magazine images and wrote 'I wish', indicating what she experiences her body to be, and what she would like it to become. Here, then, imaging as research methodology is a process through which specific images are created, which can then be analysed as social science data.

However, as well as the images themselves being critically analysed, the research methodology of imaging is itself worth considering. The sessions were productive in that the girls clearly enjoyed participating, with some asking for the sessions to be extended so they could continue working on their collages. While making their images, some of the participants also began working together in informal ways. For example, discussing what materials and techniques others had used for inspiration for their own collages, and having seen how others had included them,

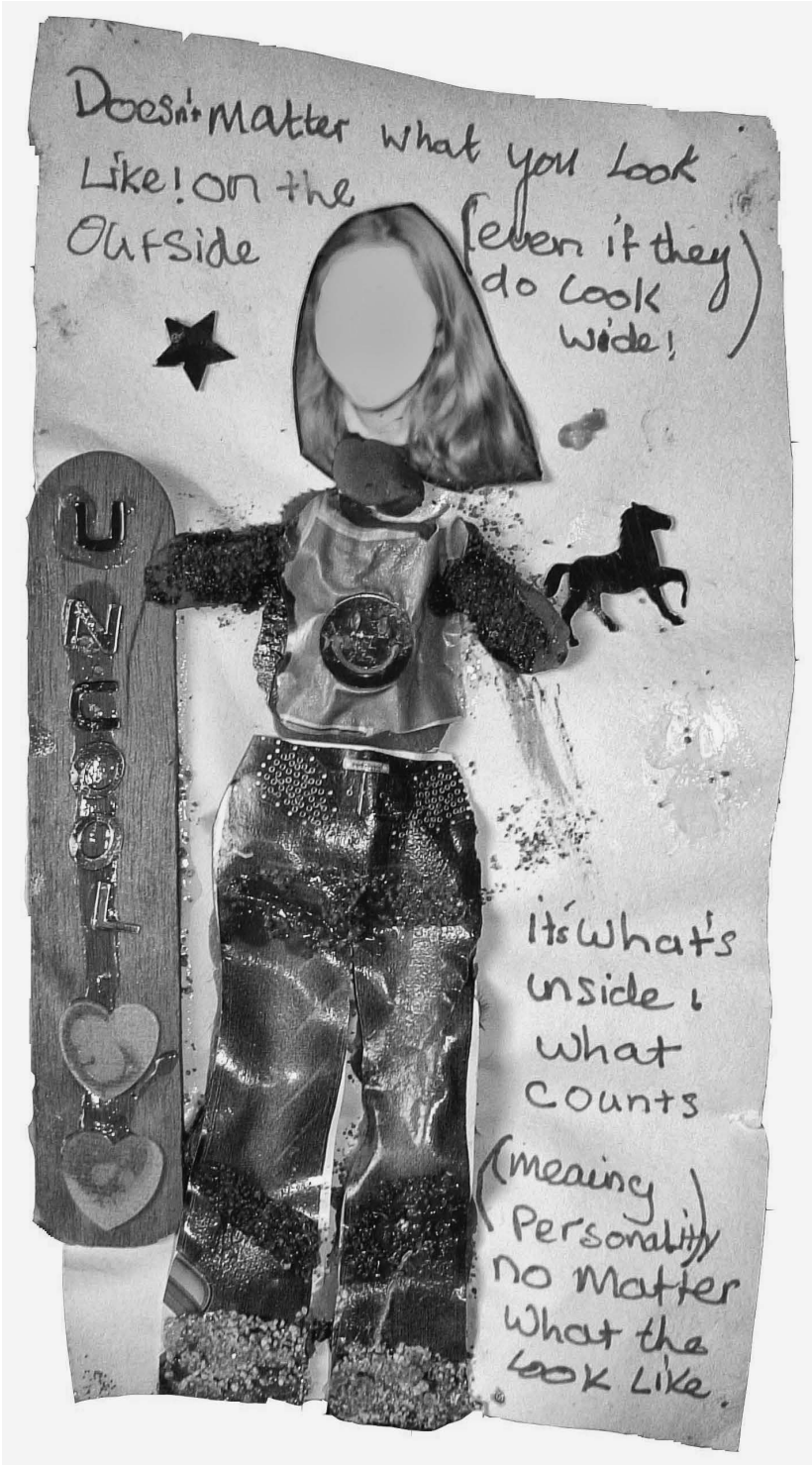


Figure 1.6.1 Anna's image

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a number of the girls incorporated pipe cleaners into their images towards the end of the session. As well as belonging to an individual participant, the images produced were therefore clearly shaped by the group experience, enabling me to reflect upon how different methods produce different kinds of knowledges and data (a topic that commonly features in discussions about the strengths and weaknesses of individual as opposed to group interviews, for instance).

The imaging methodology also raised a number of challenges. After they had made their collages, I asked the girls to explain them to the group. This was not so much because I think it is necessary for visual, sensory or imaging research methodologies to be translated into words, but rather to encourage the girls to reflect on their images, and the experiences of their bodies with which they had engaged (see also the chapter on Drawing for a similar point) and to share them with the group. However, the girls found it difficult to verbalize their experience of making the images and the images they made. Imaging as methodology, therefore, raises questions regarding whether and how articulations about and assessments of such practices are necessary, possible and/or desirable. Relatedly, although I had wanted to make images a central part of the research, as a sociologist more familiar with writing about textual data, I struggled to know what to do with the images once they had been made. Indeed, in the book on the research, I discuss the images in one section of one chapter, and treat them similarly to extracts from the interviews I conducted. This technique demonstrates how visual and sensory as well as textual data are valid, and how imaging is a productive methodology; however, incorporating the images into a relatively traditional written publication was perhaps not the most appropriate means of attending to either the specificity of the images that were produced, or the imaging methodology deployed.

A second example is a project that attempts to put speculative visual methods to work to explore a recent patent by Amazon for 'speculative shipping', where goods will be shipped in advance of order to geographically distributed hubs to minimize the time between online order and delivery (see Coleman 2016). To solve the problem of returning speculatively shipped products to the warehouse if the item is not subsequently ordered, the patent proposes to deliver the package 'to a potentially interested customer as a gift' to 'build goodwill' (Spiegel et al. 2013). This notion of creating goodwill through the delivery of unexpected packages in the post is noteworthy, given how the patent for speculative shipping was described in the press as 'delightful and exciting [. . .] We like getting things in the mail, even if we didn't ask for them' (Kopalle 2014).

In one iteration of the project, I attempted to develop my own system of speculative shipping, drawing on mail art; an artistic movement aimed at creating international networks of artists based on gift rather than commercial exchange, and challenging distinctions between high and low culture in terms of what materials might be used in the practice. Using materials bought from Amazon as well as the packaging they were delivered in, I made postcards that I sent in the UK Royal Mail postal system to unsuspecting recipients, which I asked them to write and/or draw on and return to me (see Figures 1.6.2 and 1.6.3). In some ways then, the research created images, in that the postcards can be understood as collages which could be analysed both before they were mailed and after they were returned. They can therefore be treated as research data.

However, the broader aim of the project was to explore the implications of this imaging methodology for how images may be circulated. Would it be possible for this methodology to create a 'delightful and exciting' means of exchange between people who did not know each other? In many ways, the project failed: of the 26 postcards I sent, only one was returned to me – and it was left blank. However, in other ways, this failure enabled me to understand the imaging methodology I had deployed as 'less a case of answering a pre-known research question



Figure 1.6.2 Selection of postcards made

[. . .] than a process of asking inventive [. . .] questions’ (Wilkie, Michael and Plummer-Fernandez 2014: 4). For example, I have asked, might sending unexpected packages in the post be unwelcome, rather than delightful and exciting? Are the postcards I made recognizable as gifts, in the ways that unexpected packages received from Amazon are? What happens when data are not produced in a research project in the way that they were designed to be?

Furthermore, the process of making the postcards led me to learn about mail art, and to consider how it might transform into a sociological method, which necessarily includes making

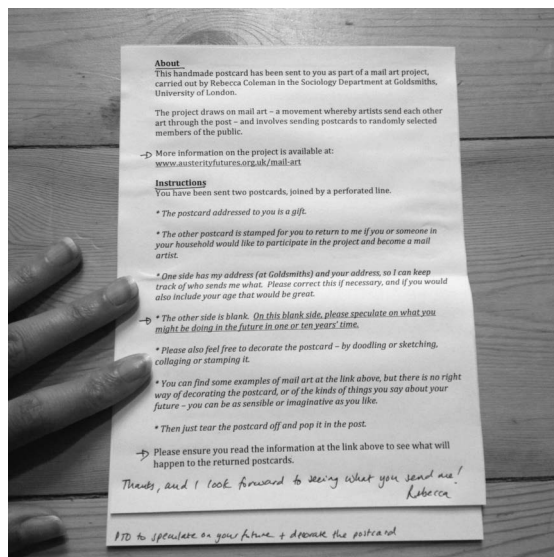


Figure 1.6.3 Outline of research and instructions included on postcards

decisions about research ethics. How might hitherto unknown participants of research be involved in circulating and disseminating research in ways that are ethical? What kinds of ethical questions regarding recruitment, inclusion, anonymity and ‘impact’ might this kind of research raise? Still further, presenting on this research project in different contexts has illuminated how boundaries between different disciplines remain monitored. Sociologists have asked me how the project is sociological: What are my data? How will I analyse them? What is my understanding of the social and the role of sociology in relation to the data? Artists have critiqued both my artistic skills and understanding of mail art.

Conclusion

This chapter has introduced some indicative cases of how imaging might be of value to a wider project of developing interdisciplinary methodologies. In terms of my second example, while the tone of some of the questioning around disciplinary boundaries has been dispiriting, the questions draw attention to both the difficulty of doing interdisciplinary work – what happens when methodology itself becomes that which is in focus in a project? What audience is the research engaging? – and the necessity of developing such interdisciplinary projects. For example, if Amazon’s speculative shipping might elicit feelings of delight and excitement, it seems reasonable to ask how social science research might provoke and engage such feelings. Would imaging be able to produce positive affects? Are text-based methods and modes of analysis most suitable to grasp what Les Back calls the ‘the fleeting, distributed, multiple, sensory, emotional and kinaesthetic aspects of sociality’ (2012: 28)? Questions emerging from the first example concern how images produced in imaging research might be disseminated, and relatedly, whether the production of such data requires the social sciences to move ‘beyond text’. Perhaps, as Puwar and Sharma (2012) argue, the social sciences might revive notions of curation, taking up practices more widespread in the arts, and requiring new forms of auditing to account for non-textual outputs.

Such questions indicate how interdisciplinary methodological practices might cultivate what, in a discussion of speculative design and sociology, Mike Michael calls the ‘common byways’ along which seemingly different and distinct methods, practices and approaches travel; ‘How can the engagements between these be rendered open, multiple, uncertain, playful?’ (Michael 2012: 177). Such engagements are necessary, I would suggest, in light of broader shifts that see methods as entangled with the becoming of the social world, and as a means of engaging both research participants and potential audiences in creative, meaningful and affectively enriching ways.

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Rescaling

Ramon Lobato

This essay reflects on a tactic I call *rescaling*, which involves manipulating notions of scale in research design. It is not a formal methodology; rather, it is a sort of general impulse, or perhaps a flexible methodological device, that can be useful for illuminating relations between apparently disconnected phenomena. In what follows I discuss how rescaling can potentially be used within my own field of media and communications research, and perhaps in some other fields as well.

The context in which I have come to think about these issues is through undertaking research projects on digital media industries, in particular, on those productive elements of the media that exist outside the boundaries of ‘industry’ per se (Lobato and Thomas 2015) – examples include free software, piracy and user-generated content. Such research presents specific methodological challenges. For example, there are obvious difficulties with data collection, reliability and sampling when studying systems that are, by nature, informal and ephemeral. Second, there is the problem of finding the right analytical tools for the job. Methods used to study industry do not always work well in the world of media, and methods used to study media do not always work well for industries. I found it necessary to cobble together a framework from a variety of disciplines, drawing on ideas from economic anthropology, political economy, and cultural studies as needed, and trying to work across social science and humanities approaches. Undertaking this research has been difficult, but it has also been generative from a methodological perspective because of the need to improvise.

One consequence of this research is that I have begun to think a lot about scale, and how it can be tweaked and inverted for the purposes of research design. Scale in research is about, among other things, the interdependence between the big and the small, and how we conceptualize this relationship in our data collection and interpretation. When studying industries, for example, we make certain kinds of choices about what counts most in the analysis and at what level of ‘the economy’ these things are located. In other words, we enact an imaginary vertical ordering of the elements that make up an economy. But as geographers including Agnew (1993) and Allen (2011) remind us, notions of scale are always socially constructed and have real-world effects that can be illuminated in and through moments of scalar tension. As Marston (2000: 220) writes, ‘scale is not necessarily a preordained hierarchical framework for ordering the world – local, regional, national and global’ but rather ‘a contingent outcome of the tensions that exist between structural forces and the practices of human agents’.

Scale as a critical concept can be traced back through various intellectual traditions. Feminist and postcolonial theory, for example, have given us powerful tools with which to understand the relationship between big and small; so have anthropology, social history and development studies, in their emphasis on the interdependence of structural forces and everyday lifeworlds. And then there are the many literary and artistic provocations that ask us to see the big and the small in new ways (including surrealism and the writing of Georges Perec). So we have an array of conceptual resources available to us when thinking about scale.

Within social science research on industries, the problem of scale often finds expression in the tension between macro and micro levels of analysis. At the top end, social science is of course well served (or poorly served, depending on your view) by structural theories of economic change. These approaches often mirror a particular kind of relationship of scale: experts use 'big' frameworks – including political economy and regulatory theory – to study 'big' things, like multinational corporations and government policy development. In media industry research, this often translates into 'a political-economic perspective that emphasizes macrolevel structural issues of regulatory regimes, concentration of media ownership, historical change, and their larger connection to capital interests' (Havens, Lotz and Tinic 2009: 234).

Like all ways of knowing, such methods have limitations. Tools such as the Herfindahl–Hirschman index, for example, which measures levels of industry concentration using a scale from 0 to 1, rely on the kind of financial data that is normally only available for publicly listed companies. From this perspective, a lot of what passes for industry research has an in-built bias towards large, listed firms, which are often taken to be constitutive of industry more generally. In other words, standard tools of economic analysis tend to reflect and produce certain ideas about what industries are – ideas that are culturally and historically specific. This particular model does not always translate well to cultural and media industry research, for example, because some parts of these industries have quite different organizational logics.

A parallel tradition of research takes a micro-level view of industries using micro-level methods. This approach is associated more with economic anthropology, certain forms of cultural sociology, and, in the humanities, cultural studies and cultural history, which tend to think of industries as structured formations of people, power and discourse. From this perspective, industries can be investigated by looking at the people and practices that constitute them, so the first step in research is to generate detailed and contextualized accounts of everyday practices at ground level. In this 'bottom-up' tradition we therefore often find situated studies of cultural workers and professionals, grounded in ethnographic and qualitative interview traditions (Caldwell 2008; Hesmondhalgh and Baker 2011), as well as close analysis of industry discourses and 'trade talk'. This is the arena of modest claims, rigorous theorization, reflexivity and grounded speculation, where knowledge is understood as provisional and situated.

These patterns will be familiar to many readers as reflecting the epistemological cleavage between empirical social science and interpretive humanities traditions – something regularly attacked within the flattened ontologies of actor-network theory, non-representational theory and ecological and topological epistemologies. This cleavage is rarely so stark in practice because the correspondence between macro and micro methods and objects of study can be – and often is – productively inverted by juxtaposing different scales. For example, across existing media industry research one can find many examples of research projects that use *bottom-up methods to study large things* (as in the ethnography of media institutions), or *top-down methods to study small things* (as when researchers use methods like network analysis to study small online communities).

Let me provide some examples to illustrate the point. In recent research projects, I have studied a range of actors in media industries (including executives, fans, pirates and geeks); observed activities in retail sites and online spaces; scrutinized web forums; read archives of

leaked material; analysed pricing patterns; compiled biographies of key individuals and case studies of typical companies; and so on. Over the course of this research I learned through trial and error that interesting findings tend to emerge when I applied the ‘wrong’ scalar approach, sometimes by accident. For example, when investigating the economic dynamics of pirate DVD vending, it was quite useful to spend part of the interview with ‘pirates’ asking the kind of questions one would ask a corporate executive. Who is your competition? How much do you charge for your products, and why? Where do you get your stock from? Who works for you, and how do you manage them? This helped to cut quite quickly to the commercial realities structuring what is, after all, a commercial operation. In other words, it was necessary to *rescale* my assumptions about the methods appropriate to these actors.

A second example comes out of a project I have recently been doing on the anonymization and personal privacy software industry. This is a most unusual industry to study because it is highly fragmented, with very low barriers to entry, and many companies operate as bedroom enterprises. It has no industry associations and no central sources of data. Yet it has all the dynamics of any other commercial sector, including fierce competition, differentiation, professionalization and labour mobility. To analyse this industry we did some of the things that one would do when studying a ‘big’ industry: compiled an international database of known companies; collected data on server locations, price points and marketing strategies; and interviewed company representatives willing to speak on the record. But we also had to use the micro-level methods associated with qualitative research: hanging out in online spaces, signing up for various services and trying them out, discourse analysis of promotional materials, and so forth. And during interviews, it was helpful to mix up the micro and macro scales by interspersing data-oriented questions (‘how many staff do you have, and where are they located?’) with questions inviting more textured, qualitative responses (‘take me through your average working day’).

What I want to suggest is that these inversions of scale can be understood as a kind of methodological tactic. In other words, juxtaposing the big and the small – and the methodological orientations associated with each scale – often produces useful insights. This is not a radical proposition; nor is it new. But I find that playing around with notions of scale can be useful as an exploratory process when devising a research programme, even when we are investigating the ‘hard’ stuff of firms, industries, revenues and so on. Translating these ideas into research practice provides a framework for experimenting with macro and micro scales and the methodologies associated with each – a framework that I have found well suited to studying the unfamiliar institutional forms of digital media, but which might also be useful as an exploratory device in other fields as well.

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Sand drawing

Jennifer Green

Human interactions consist of a creative bricolage of the resources a culture brings to its communicative tasks. As well as speaking, people might point to real and imagined entities and locations, manipulate fictive objects in the air with their hands, create traces, maps and diagrams, use writing systems, and make permanent or semi-permanent marks on a range of surfaces. Sign languages are the primary mode of communication for some, and for others sign is used either alongside speech, or instead of speech in particular cultural contexts. Tangible items such as tools, technologies and other aspects of the social and environmental context might also be employed (Goodwin and LeBaron 2011; Nevile, Haddington, Heinemann and Rauniomaa 2014). Understanding why particular ways of communicating meaning take precedence over others, and modelling exactly how this complexity is orchestrated remains one of the challenges for understanding human language.

Recent work in linguistics and in a variety of related disciplines has led to a growing recognition of the multimodal nature of human communication (Kendon 2004; Enfield 2009; Jewitt, Bezemer and O'Halloran 2016). Moving away from speech or text-only perspectives it is now the norm to see language as 'embedded within an interactional exchange of multi-modal signals' (Levinson and Holler 2014: 1; Vigliocco, Perniss and Vinson 2014). Although usage of the term 'multimodal' varies greatly, the ways that people produce and perceive communicative signals can be envisaged as falling within two major modality divisions. Speech utilizes the vocal/auditory modality, and sign languages, gesture and systems of graphic representation utilize the kinesic/visual one. Within each modality are various systems or 'potentials' that convey meaning. The fundamental units of communication can thus be envisaged as 'composite utterances' in which elements of different semiotic systems work together (Enfield 2009).

This essay considers several of the semiotic parameters that are employed in the telling of Indigenous sand stories from Central Australia. Sand stories are a traditional narrative form in which skilled storytellers, primarily women and girls, incorporate speech, song, sign, gesture and drawing (Wilkins 1997; Munn 1973; Green 2014). In sand stories a small set of conventionalized graphic symbols are embedded in a complex semiotic field that includes various other types of actions, for example lexical manual signs, as well as speech. Such narrative practices emerge in a particular cultural and ecological niche where soft sand is readily at hand. The significance of the ground is seen on many levels. It is a locus of important information, coding

movement, habitation and histories, like a vast notice board. It is a place of day-to-day habitation and relaxation, and for the seated person invites inscription. The surface of the ground is valued for its rich palette and observed in the minutiae of its seasonal variation.

Bringing an analytic perspective to understanding how the complexity of sand stories works to convey meaning raises methodological and conceptual challenges. An interdisciplinary approach to these questions can draw upon insights and methodologies from sign language and gesture studies, ethnomusicology, semiotics, psychology and anthropology, to name a few. Such an approach also presents an opportunity to ‘move beyond the empirical boundaries of existing disciplines’ (Jewitt *et al.* 2016: 2) and develop new approaches for data analysis that can account for phenomena that in some instances fall below the radar of academic inquiry if a narrow perspective is taken. At the methodological level, and as appreciation for the role of ‘visible bodily action’ (Kendon 2004; Seyfeddinipur and Gullberg 2014) in communication grows, many linguists are using video technologies for language documentation. This enables consideration of multiple aspects of complex utterances, and the ways that various types of action – for example, gesture, sign, drawing and eye-gaze – work together.

The thematic content of sand stories ranges from accounts of day-to-day events to performances of traditional narratives that are closely associated with the topography of the land and its ancestral progenitors or ‘Dreamings’. In remote Indigenous Australia, particularly in the pre-television era, sand stories were a form of popular entertainment. For children, they provide a context for developing a range of spatial and graphic skills, as well as training and practice in the verbal arts. Although some knowledge of the ways these stories were told in the past is highly endangered, the form is still used, even as the practice is adapting to meet changing social contexts.

Sand stories begin with the clearing of a space on the ground in front of the narrator. The resultant drawings and mini-installations of objects are both product and process, and involve a complex interplay between dynamic and static elements. The semi-permanence of the graphic marks made on the ground is subservient to broader rhetorical aims as the story unfolds. Between ‘scenes’ or ‘episodes’ the seated narrator wipes the space on the ground in front of them clean before beginning to draw again. Drawing on the ground is done with the hand, or with sticks or wires (Figure 1.8.1). A story-wire is multi-functional, used as a drawing instrument and as a tool to point with. Story-wires are also used to provide rhythmic accompaniment, and repeated tapping of the wire on the ground embellishes the soundscape, sustains the attention of interlocutors and propels the narrative forward. Small leaves are sometimes used to represent story characters and the narrator choreographs these embodied objects on the sand space in front of them, which some have likened to a miniature stage set (Figure 1.8.2).

In sand stories a small repertoire of linear, curvilinear, circular and spiral graphic forms represent people, plants, artefacts, domestic items and other aspects of local environments. One of the most common of these is the ‘U’ shape which represents ‘person’, and this graphic form bears an iconic resemblance to the imprint on the sand made by a seated person. The ways that these simple elements are combined to generate new meanings suggests that the graphic forms of sand drawing have a rudimentary syntax. As can be seen in Figure 1.8.2, a semi-conventionalized oval shape drawn on the ground and representing a wooden dish can co-occur in the context of an arrangement of leaves that represent people. Their age and gender are conveyed by the relative size of the leaves and by the faint traces inscribed on them, derived from the painted designs that women wear when they perform ceremonies. Other lines drawn in the sand are traces of movement, re-enacting ancestral pathways or representing everyday journeys (Ingold 2007; Munn 1973; Green 2014). Varying the speed and rhythm with which a line is drawn or a leaf is moved in these narratives evokes particular types of action. For example, the graphic



Figure 1.8.1 Using the story-wire (Photo: J. Green)

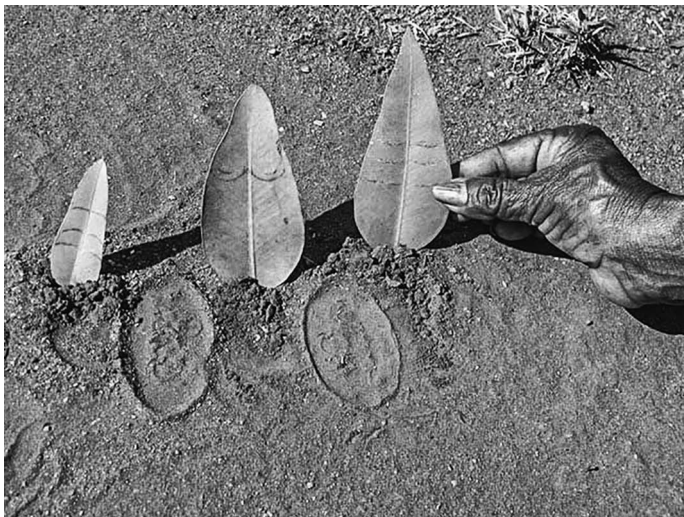


Figure 1.8.2 Small objects such as leaves are used to represent narrative characters (Photo: J. Green)

traces of sporadic or staccato movements are associated with dancing, while unbroken lines may be visual representations of journeys between locations that have been previously inscribed on the drawing space. These aspects of the semantic complex may be observed in real-time, or deduced from the traces that actions leave on the sand.

Another feature of lines drawn in sand stories is that they tend to be accurately configured in space, in what Wilkins has referred to as a 'geo-centred absolute frame of reference' (Wilkins 1997: 143). They convey correct spatial information, just as deictic or pointing gestures tend to do in Indigenous communities in Central Australia and in many other places in the world. So a line, particularly one representing motion, drawn in an east to west trajectory will be generally



Figure 1.8.3 An action results in a mark on the ground and ends with a deictic gesture in the air (video still, Eileen Pwerreri Campbell, *Ti Tree* 2007) (Green 2014: 164)

interpreted as indicating motion on that cardinal axis, rather than in an arbitrary unspecified direction.

At the micro-analytic level, disassembling sand stories into a series of semantically coherent action units or ‘moves’ shows how units of action in sand stories are not amenable to bounded categories. The ‘burden of information’ (Levinson and Holler 2014: 1) may shift from one means of expression to another, and be distributed across different media. Let us follow a simple action that illustrates this point. The narrator’s hand moves seamlessly across the soft surface of the ground, leaving a visible trace before moving into the air in a unitary action that crosses media – the earth and the air (Figure 1.8.3). This action disrupts pre-conceived notions of what the boundaries between gesture and drawing might be and demonstrates the semiotic possibilities of communicative actions that have graphic consequences. In the example shown in Figure 1.8.3, spatial information is distributed between the graphic traces on the ground and the pointing gesture in the air. This composite action that crosses media coheres as a semantic whole.

The types of vocal performance found in sand drawing are similarly complex, and without an interdisciplinary and collaborative approach that draws on insights from linguistics and musicology some of the richness of these vocal repertoires might be lost or overlooked. In addition to conventionalized or arbitrary aspects of spoken language that are amenable to traditional linguistic analyses, there are idiosyncratic vocal effects and poetic devices that add rhetorical flavour and texture to performances. Some sand stories include song, and repeated song texts may punctuate longer texts that are more speech-like. Some vocal phenomena fall on a continuum between sounds that are characterized as more like ‘speech’ and those that sound more like ‘song’. Moving between vocal performances that are either more song-like or more like ordinary speech has the pragmatic effect of signalling degrees of formality of a sand story. An interdisciplinary methodology helps to investigate the relationship between various aspects of speech, such as pitch, intonation and rhythm, and features of music or song – beats, melody and musical rhythms. Delineating the similarities and differences between sand story songs and other song repertoires from Central Australia leads to a more sophisticated understanding of the ethnopoetics of the verbal arts from that region, and, more generally, of the diversity of verbal art forms world-wide.

In the Indigenous sand drawing tradition from Central Australia the integration of diverse communicative resources is complex and aesthetically appealing. Understanding how sand stories work provides an insight into the narrative traditions of an ancient culture. As a case study in complexity, enriched by an interdisciplinary approach, it contributes to the theory and analysis

of multimodality in human communication, and shows how communicative messages that draw on multiple modalities are integrated. Developing tools for the analysis of multimodal narrative performances such as these challenges disciplinary boundaries and leads the study of 'language' in a new direction. This approach highlights similarities and differences between differing theoretical perspectives and research domains. More broadly it contributes to understandings of the human language capacity, its relationship to other aspects of cognition, and the role that various types of human action play in communication.

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Suspending

Catherine Ayres and David Bissell

John shifts uncomfortably in his seat, tapping his coffee cup, and tells Catherine he can't do overnight hikes anymore, because his wife is ill. Catherine skips over this revelation with the callous speed that comes with research interview performance anxiety. She hastily directs John back to the 'research topic' at hand – national parks in Australia.

This interview encounter took place in 2013 as part of Catherine's doctoral research. Throughout the intervening years (and likely well into the future) Catherine regrets her anxious impatience to get back to a more 'relevant' line of discussion; this still feels like a missed opportunity to respond more caringly and attentively to such a delicate moment of vulnerability and trust. Many of us engaged in qualitative research have surely had similar experiences of regret. These intensities, however, are silenced, or at least muffled, in research outputs that omit these moments in favour of juicy narrative quotes that serve as evidence in support of arguments or findings. And yet these are the sticky moments that, although rarely acknowledged, slice into our research practices and into our lives.

We introduce the concept of 'suspending' here to highlight how the multiple durations that comprise interviews are a significant dimension of the research encounter that is often overlooked across a range of disciplines in the social sciences, with analytical attention instead devoted to the symbolic and rhetorical dimensions of what was said. Different durations resonate at different times, sometimes immediately, and sometimes years after the initial encounter. Following Ingold's (1993) observations about the multiple co-existent temporalities of landscapes, we want to suggest how the interview 'landscape' is steeped in the pasts and possible futures of researcher and researched alike, a site in which trajectories converge and transform. We want to revisit the interview event between Catherine and John to draw out 'suspending' as a methodological intervention filled with theoretical, practical and ethical possibilities for thinking empirical encounters.

In the context of qualitative interviews, researchers might feel compelled to adhere to core methodological tenets, such as generating 'valid' and 'relevant' data, and ensuring participants are informed and comfortable (Pitts and Miller-Day 2007). These are undoubtedly important considerations, but these, and other research conventions, may also inadvertently give rise to regrets such as the interview encounter with John. We argue that 'suspending' some assumptions

to do with the performance of research interviews enables new research practices, new ways of sensing the multiple durations of interview encounters, and new forms of knowledge around the ethical considerations to which we researchers attend.

A common refrain in qualitative research literature is around the necessity to steer or guide unstructured or semi-structured interviews along the lines of preconceived research problems¹ and this ability to guide the research interview is often seen as a core research skill, where staying on track is the researcher's responsibility (Sarantakos 2013). Such persistent focus on the authority and skill of the researcher, however, reduces the importance of the singular twists and turns that might happen during the encounter itself. When we are steadfast in our notions of the research topic, defined by predefined research questions or problems, the illness of John's wife seems tangential, a disruption to the proper task of researching national parks. But suspending some of these assumptions of relevance to research topics enables more sensitive consideration of these little escapes. *Something* happened within John that moved attention in a different direction. Attending to what precipitated this change of direction calls into question the infinitesimal, imperceptible, or 'molecular' processes 'through which attention takes place' (McCormack 2007: 365). What transitions had occurred within John for him to deviate from discussion of national parks to such an intimate revelation? And crucially, how might attending to these molecular modulations enable new understandings of complex formations of identities, values or politics?

Paying attention to such molecular transitions might require different modes of communication than researchers have traditionally utilized in research encounters. Indeed, one reason for rushing over John's mention of his wife was Catherine's discomfort with such sudden intimacy that disrupted what she envisioned as a 'normal' mode of engagement between a researcher and a participant. Paul Harrison has gestured towards the significance of such instances in testimony, which 'confound, resist or simply withdraw from such engagement' (2010: 162). While we might usually see disruptive or unexpected instances as failures on the part of the researcher – for example, a failure of the researcher to engage the participant fully in the research topic – Harrison invites us to consider how these instances are, in fact, important constitutive elements of testimony. Paying attention to how and when such instances take place might, for example, require suspending the desire to adhere to norms that determine 'appropriate' modes of conversation that allow for smooth or easy communication.

Brian Massumi's writing on the energetics of events helps us to think about the multilayeredness of what is actually going on as we talk with someone in an interview. On one hand, there are the symbolic dimensions of expression. So, in our case, this would be the *content* of the talk that happens in interviews – the wordy sentences that end up as our interview transcripts, and the sorts of conventional meanings that often end up being ascribed to them. On the other hand, he points out that we are also affected at a much more immediate bodily level. This is the strength or duration of the *effect* of the expression of those spoken words on the bodies present. This is the dimension that can often be overlooked when we are trawling through the words in our transcripts, perhaps long after the interview itself took place. Massumi refers to this as its *intensity*.

Intensity has a felt dimension. What is so significant about this is that while there is a relationship between content and intensity, it is absolutely not predictable. The content, or *what* is being talked about, might amplify or dampen the intensity, for instance. But this felt intensity is much more unruly. As Massumi points out, this is because '[i]ntensity would seem to be associated with nonlinear processes: resonance and feedback which momentarily *suspend* the linear progress of the narrative present from past to future' (2002: 26, emphasis added). For instance, a long-forgotten memory might involuntarily cut in at an unexpected moment, perhaps ushered in by

the precise words being spoken, or the manner in which they are said, adding something new to this present moment. As the intensity changes, our expectations about what might come next are destabilized.

The key point here is that it is not that we as researchers should be making a conscious choice to suspend the linear shape of a narrative. Suspending, in this sense, is not something that we force on a situation. Suspending is about being sensitive to the way that intensities can catch us off guard, surprising us, and changing the course of events. It is the intensity of the event itself through the precise playing out of talk as content and expression that, as Massumi says, creates a 'state of suspense, potentially of disruption' (2002: 26) from where it might be difficult to imagine what could happen next. So, if there is a skill here to be developed, we suggest that it is about cultivating our responsiveness to the singular moments that bead all encounters. Analytically, what this might mean is that rather than focusing on just the content of interviews in the vain hope of stitching together a coherent narrative, acknowledging the interview's intensities reminds us that such coherence is really just a fragile semblance made up of countless little suspensions.

To return to Catherine's interview encounter with John in this light demonstrates how heavily researchers rely on expectations of how a research interview can, or should, be performed. But adhering to habitual conventions of speech could reduce our openness to move with the subtle singularities each interview participant might offer. In this case, John offered something special, a complex signal that his body had moved from the topic at hand, revealing his own unique connection with the topic of national parks in Australia. Although Catherine tried to steer the discussion back to the topic, in doing so she could not help but feel she missed an opportunity to move *with* John, to be guided by him and his unique contribution as a research participant. Perhaps in this case Catherine might have remained silent, allowing John the option of elaborating further, or she could have suspended her own discomfort and directly inquired into the reasons why John connected the research topic and his wife, or offered an equally intimate connection. Or perhaps Catherine could have balanced her images of interview practices with an ethos of trying to notice 'different kinds of things that might be happening, or things that might be happening differently' (Coleman and Ringrose 2013: 4).

Catherine's reluctance to move with John was also shaped by an uncertainty over whether, indeed, John's revelation about his wife's illness should be treated as data. Of course, as Davies and Davies have put it, there are 'multiple possible trajectories in the tales that we, and our research participants, tell in the process of "generating data"' (Davies and Davies 2007: 1140). This particular trajectory, over time, became the richest and most profound moment in Catherine's doctoral research. John's mention of his wife's illness was pivotal in an argument around the complexities of how people connect to national parks. But Catherine had considerable qualms about utilizing this revelation in her research; after all, her information sheet and consent form – developed as part of a human research ethics application – said nothing about John's wife. To develop this moment into a full and rich empirical illustration, Catherine had to suspend her imagination of what, precisely, constitutes data and how it can be put to work. This moment also points to broader ethical concerns over what it is to conceptualize a person – with all their vulnerabilities and peculiarities – as a source of data for research outputs and how this utilitarian attitude can affect both participants and researchers in different and unforeseeable ways.

The temporal arcs of such ethical considerations can be unpredictable, with research encounters following us into our futures and leaping to mind, unbidden, with surprising intensity. Gail Lewis, for example, has outlined how her intense (yet secret) hatred of one of her interview participants has endured for 15 years, though her thinking around this event has transformed (Lewis 2010). These 'slow creep' (Bissell 2014) intensities of research encounters reveal the need

for thinking about the multiple durations of research – the speeds, slownesses, and transformations through time. Deploying ‘suspending’ as a conceptual and methodological lure points towards the importance of these enduring capacities of empirical research to affect us in myriad ways far beyond the immediate interview, observation or ethnography. Suspending judgements on how and when research encounters are important requires us to be more open to uncertainties of research and perhaps calls for more nuanced evaluations of research ethics that accommodate the possibilities of such uncertainty.

The interview moment discussed here was pivotal in thinking about the complexity of people’s relations to national parks. John revealed but one example of how these relations are steeped in complex, infinite assemblages of memories, ideas and practices that cannot (and, perhaps, *should* not) be easily reduced to the kind of ring-fenced ideas that Catherine was initially trying to explore in her research, which framed her initial sense of what ‘relevant’ lines of conversation would be for her interview with John. In this sense ‘suspending’ is not only a useful orientation for how to engage and interact in a research interview, but also a mode through which the multiple temporalities of such assemblages can be allowed to bloom. Suspending, we suggest, is therefore an orientation for attending to the multiple temporalities of research processes. Collecting, interpreting, analysing and presenting research materials, for example, each present opportunities for experimenting with ‘suspending’ as a methodological sensibility.

Introducing ‘suspending’ as part of a researcher’s toolkit might enable radically different practices, politics and ethics of research. But doing so also, in some ways, demands *more* of researchers. Although the imperative of research ethics is around minimizing harm by increasing the comfort of participants at all costs, this risk-averse strategy risks closing off political possibilities afforded by moments of *discomfort* (Ahmed 2006). Catherine’s encounter with John illustrates the importance of discomfort in research interviews. It was precisely this moment, this uncomfortable moment, which opened out into a fruitful illustration of the complexity of research encounters. The concern of research ethics in this case, then, is not to shut down or minimize the chance of discomfort, but rather, calls on researchers to employ strategies such as those we have suggested here in their navigation of these moments. Ethical decisions then become decisions about how to treat these moments with the care and consideration they deserve. But to move towards this mode of navigation, we must suspend our assumptions around how we can perform research interviews, and attend more carefully to how those encounters might endure in multiple ways.

Note

1 Although some ‘grounded theory’ research claims to elide this convention, researchers in this area presumably do have at least a general field of inquiry in mind.

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