

**MATERIAL GEOGRAPHIES OF THE MAKER MOVEMENT:  
COMMUNITY WORKSHOPS AND THE MAKING OF  
SUSTAINABILITY IN EDINBURGH, SCOTLAND**

**Thomas S.J. Smith**

**A Thesis Submitted for the Degree of PhD  
at the  
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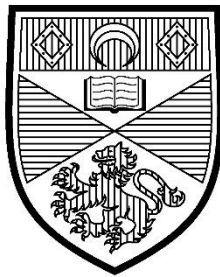
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Material Geographies of the Maker Movement:  
Community Workshops and the Making of  
Sustainability in Edinburgh, Scotland

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University of  
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This thesis is submitted in partial fulfilment for the degree of  
PhD  
at the  
University of St Andrews

September 8<sup>th</sup>, 2017



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<sup>1</sup> Geographies of sustainability, society, inequalities and possibilities.



# Publications and Conference Papers Produced During PhD

## *Peer-Reviewed Articles:*

Smith, TSJ & Reid, L (2017) **Which 'Being' in Wellbeing? Ontology, Wellness and the Geographies of Happiness**, Progress in Human Geography, Advance Online Publication, DOI: <https://doi.org/10.1177/0309132517717100>

Smith, TSJ (2017) **Of Makerspaces and Hacklabs: Emergence, Experiment and Ontological Theatre at the Edinburgh Hacklab, Scotland**, Scottish Geographical Journal, Vol. 133, No. 2, pp. 130-154.

## *Book Reviews:*

Smith, TSJ (Forthcoming) **Book Review: Hackerspaces: Making the Maker Movement**, cultural geographies

Smith, TSJ (2016) **Book Review: Thinking Like a Mall: Environmental Philosophy After the End of Nature**, Ethics, Policy & Environment, Vol. 19, No. 1, pp. 114-117

Smith, TSJ (2016) **Book Review: The World Beyond Your Head: How To Flourish in an Age of Distraction**, Journal of Modern Craft, Vol. 9, No. 1, pp. 105-107

## *Edited Books:*

Smith, T, Campbell, N, Du Cann, C, Strang, E, Wheeler, S (2016) **Dark Mountain Issue 9**, Dark Mountain Books

Smith, T, Kingsnorth, P, Du Cann, C, Wheeler, S (eds.) (2015) **Dark Mountain Issue 8: Technê**, Dark Mountain Books

## *Misc. Publications:*

Smith, T (2015) **Anarchism and Non-Representational Theory in the Social Sciences**, e-International Relations, special topic of Anarchism and Social Theory,

available from <http://www.e-ir.info/2015/08/07/anarchism-and-non-representational-theory-in-the-social-sciences/>

I have also written pieces for various outlets including *The Conversation*, *the Dark Mountain blog*, *Times Higher Education*, and *Dissident Voice*.

*Conference Presentations:*

**2017 - The Making of a Diverse Economy: Communities of Practice, Sustainability and the Spaces of the Maker Movement**, part of the session on Alternative Green Practices at the Association of American Geographers (AAG) annual conference, Boston.

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*'...Can we challenge*

*the mass status quo*

*Of labour, not love?*

*Can we let go?'*

'Double Dividend' by Brian Kingston

---

## Abstract

Recent years have seen the emergence of a novel type of community space around the world, labelled variously as makerspaces, hackerspaces, hacklabs, Fab Labs, and repair cafés. These workshops, often known collectively as the ‘maker movement’, have inspired considerable speculation regarding their potential to prefigure a more sustainable economy, including a shift to localised and participatory forms of production and consumption (Smith and Light, 2017). Until recently, the social scientific work on such spaces has been sparse, especially in-depth ethnographic work, though scholars are increasingly turning their attention to them, particularly in the fields of design and science and technology studies.

This thesis, a practice-led ‘enactive ethnography’ drawing from three case study workshops in Edinburgh, Scotland, explores the question of sustainable development and maker spaces along two main axes: firstly, the emergence of sustainable practice in such spaces, and secondly, the relevance of such spaces to the cultivation of human wellbeing. The thesis is the first examination of such spaces drawing from developments in social theory towards relational materialism, more-than-representational approaches, and a focus on social practice.

It draws a number of conclusions. Firstly, that claims of an undifferentiated global ‘maker movement’ may be exaggerated: the grassroots participant-led creation of such spaces results in irreducible diversity and local differentiation. Secondly, while claims about the potential of such spaces for reconfiguring global production and consumption are overstated, when viewed from a practice-oriented perspective, the communities of practice populating such sites comprise potent and potentially-valuable crucibles of knowledge and materials. And thirdly, trying to move away from individualistic conceptions of wellbeing, the case studies provided evidence for the shared workshops playing a crucial role in the contingent emergence of participant wellbeing. These findings are further



developed in tandem with a posthuman reading of maker practices, contributing to timely scholarly debates on 'making' and 'craft'.

## 1 Introduction

By way of an introduction, I would like to outline some of the factors which inspired this project from the outset. The year 2012 saw the small-scale release of a pamphlet, *Manifesto for the New Materialism* (Simms and Potts, 2012), co-authored by Andrew Simms, former Policy Director of the new economics foundation (NEF), and Ruth Potts, who had worked on the Great Transition campaign, also at NEF. The Manifesto identified what it saw as an error in environmental thought, whereby materialism had gained solely negative connotations for its association with unsustainable, debt-fuelled consumerism in industrialised societies. This demonstrated, the authors argued, that environmentalism had become a form of asceticism; that the solution to wasteful consumption in contemporary ‘Western’ societies is to be found with a turn inwards, to the spiritual and ethical, say, valorising an abstention from material consumption.

Simms and Potts are no fans of contemporary ‘materialism’. Citizens are stuck in something of a ‘hedonic treadmill’ – a vicious dynamic of desire for the new, often artificially-created to meet the needs of a capitalist system which seeks growth for growth’s sake, propagating what Thorstein Veblen (2005) characterised as ‘conspicuous consumption’. Furthermore, between 1970 and 2009, Simms and Potts tell us, the number of consumer electronic gadgets in the average UK household increased eleven-fold. Even when such gadgets replaced less efficient predecessors, overall use and energy consumption tended to increase, in an instance of what has been called the ‘rebound effect’, or Jevons paradox, first highlighted by the 19<sup>th</sup> century economist William Stanley Jevons.

The manifesto contrasted this ‘old materialism’, which pushes us beyond any semblance of a sustainable social life, with an alternative ‘new materialism’. This was an attempt to reground environmentalism through an engagement with the world of ‘things’, instead of taking absence from it, placing at its heart Herman Daly’s dictum that future sustainable economies need to be underpinned by a

“subtle and complex economics of maintenance, qualitative improvements, sharing, frugality, and adaptation to natural limits. It is an economics of better, not bigger” (quoted in Simms and Potts, 2012: 10). “At the heart of this new relationship,” the authors maintained, “encoded in a different attitude toward making, owning, sharing and caring for things, lies both much greater potential human wellbeing, and lifestyles that are far less damaging to our life-supporting biosphere” (p. 8). The examination of this latter claim goes to the heart of this thesis.

The manifesto wasn't on its own, in its call for a return to things, and it is this convergence of work, on two fronts, which fascinated me.

On the one hand, it coincided with a burgeoning of both popular and academic publications interested in craft and the handmade. Sennett (2008: 8), for example, developed the idea in his best-selling work, *The Craftsman*, that “we can achieve a more humane material life, if only we better understand the making of things”. The flourishing of such work at this particular historical moment is perhaps unsurprising. After all, since at least the early 20<sup>th</sup> century Arts and Crafts movement of William Morris and John Ruskin, craft has been seen as a foil for modes of (usually capitalist) production which alienate us from ourselves, one another, and the environment; an idea also evident in the work of Marx (Hudis, 2013). In public discourse, craft is also posited as antipathetic to the extremes of mass society, being comprised of the hand-made, the unique and the small-scale. As Adamson (2010: 5) has put it, “it entails irregularity, tacit knowledge, inefficiency, handwork, vernacular building, functional objects and mysticism. Further, craft's association with gendered, ethnic and local identities could be seen as inherently resistant to (or, potentially, critical of) modernity's homogenous transcendentalism.” I will return to this topic in Chapter 2.

A second notable convergence with Simms' and Potts' ‘new materialism’ came about through scholarship in the social sciences in the past two decades, often also referred to as ‘new materialism’. This materialism is a body of work across

disciplines as diverse as feminist science studies, science and technology studies, philosophy, sociology, geography, anthropology, and politics, which examines, in the phrasing of one paper title, how “matter comes to matter” (Barad, 2003). Often opposed to strong forms of social constructivism, it signals something of a paradigmatic shift towards the appreciation of material agency, matter, and materials, both nonhuman and human, and how they come to be felt in social life. Human geography has been at the leading edge of such developments in this turn to ‘things’ in the social sciences, not least through varieties of hybrid, more-than-human and more-than-representational geographies (Lorimer, 2005; Thrift, 2008; Whatmore, 2006). This scholarship gains a brief mention, just once, in the *Manifesto of New Materialism*. Namely, they quote Jane Bennett’s *Vibrant Matter* as suggesting that awareness of the vitality, independence and relationality of things may encourage us “to treat nonhumans – animals, plants, earth, even artefacts and commodities – more carefully, more strategically, more ecologically” (Simms and Potts, 2012: 12).

We shall return to the philosophical underpinnings of the new materialism in coming chapters, but they raise the question of how these developments come together empirically, in everyday life: on the one hand, the positing of a ‘new materialism’, among both activists *and* theorists, and, on the other hand, a renewed interest in the handmade and the tacit. How would it be possible to gain insight, as a social scientist, into the possibilities of this shift from an ‘old’ to a ‘new’ materialism, and what implications do such ways of thinking and doing really hold for the creation of more sustainable modes of existence?

To begin to address these questions, I will introduce another serendipitous development: the ‘maker movement’ and the rise of accessible community-oriented workshop spaces in cities around the world.

### 1.1 The Rise of Makerspaces

In their work *Diverse Economies: Performative practices for ‘other worlds’* the influential writing partnership, J.K. Gibson-Graham (2008: 627), framed their post-

capitalist academic project as the recognition and construction of community economies, “economic spaces or networks in which relations of interdependence are democratically negotiated by participating individuals and organizations.” They convincingly claimed that the prevalence of these economic practices quantitatively outstrips involvement in the capitalist sector, while potentially having “more impact on social well-being than capitalism does” (Ibid: 617).

They name a number of such spaces, including consumer, producer and worker cooperatives, Community Supported Agriculture schemes, local and complementary currencies, enterprises in the social economy, co-housing movements, eco-villages, fair trade and community-based resource management. In dealing with such endeavours, researchers face a choice:

to continue to marginalize (by ignoring or disparaging) the plethora of hidden and alternative economic activities that contribute to social well-being and environmental regeneration, or to make them the focus of our research and teaching in order to make them more ‘real’, more credible, more viable as objects of policy and activism, more present as everyday realities that touch all our lives and dynamically shape our futures. This is the performative ontological project of ‘diverse economies’ (Ibid: 618).

One form of space not mentioned by Gibson-Graham was coming to prominence at about the same time that their paper appeared. These are the gatherings of makers, hackers, programmers and crafters meeting face-to-face in organised ‘makerspaces’ to build, hack, and alter the world around them. Neglected in geographical scholarship, the spaces of this ‘maker movement’ increased in number across the UK more than ten-fold in the five years from 2010 to 2015 (Nesta, 2015), to around 100, with a further 1400 or so in operation globally<sup>2</sup>.

These numbers are likely to be larger, however, in part due to the problems of adequately defining such spaces, and the likelihood of spaces existing which don’t

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<sup>2</sup> <http://www.popsci.com/rise-makerspace-by-numbers> [Accessed 04/03/16]

cleanly fit into particular definitions (the Edinburgh Remakery and Grassmarket workshops referred to in this study being two examples). Nesta's research furthermore hinted at the diversity of such spaces, with the six main types of tools found in makerspaces being, respectively, digital fabrication tools, general hand tools, electronics, woodwork, computing and fabric tools. While traditionally operated by communities of volunteers, makerspaces have increasingly been found across both the private and public sectors also. Public libraries and universities are increasingly utilised to house such initiatives, while TechShop is a pay-as-you-use commercial variant found in ten locations across the USA. Fab Labs (or Fabrication Laboratories), meanwhile, are a further variant of maker space, a franchise originating from the Center for Bits and Atoms at MIT, with over 560 registered Fab Labs worldwide. It appeared that if one wanted to study the 'new materialism,' the rise of 'making'-oriented spaces would be as good a place as any to start.

"How will we live, learn, work, and play when anyone can make anything, anywhere?", asked Neil Gershenfeld (2012), director of MIT's *Center for Bits and Atoms* in the journal *Foreign Affairs*. Such heady speculations, commonplace in writings on the maker movement, are not, it should be noted, entirely quixotic. The form of open-access fabrication workshops which he pioneered, namely Fab Labs, are now distributed across every inhabited continent. Couple this with the rise of thousands of autonomous parallel workshops – the hackerspaces, makerspaces, hacklabs and repair cafes – and we have an increasingly prominent use of (predominantly) urban space.

Chris Anderson (2012) has called this development 'The New Industrial Revolution', while Henry Ford's great-grandson has stated that, if born today, Ford 'probably would have started in TechShop'<sup>3</sup>. In the midst of such grand claims, increasing numbers of scholars are turning their attention to how maker spaces

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<sup>3</sup> [http://www.techshop.ws/press\\_releases.html?&action=detail&press\\_release\\_id=50](http://www.techshop.ws/press_releases.html?&action=detail&press_release_id=50) [Accessed 11/10/2014]

can form the basis for rapid prototyping and sustainable innovation, collaborative consumption, the local repair of consumer products, a reduction in transport emissions, and much else besides (Birtchnell and Urry, 2013; Kohtala and Hyysalo, 2015; North, 2010; Smith et al., 2013; Troxler and Maxigas, 2014).

The idea of “making anything, anywhere,” as Gershenfeld put it, has raised fascinating questions about our social futures. This is perhaps most vividly encapsulated by 3D printers, a technology which in many ways epitomises debates around the ethos and potential of the maker community. 3D printing technologies vary enormously, and are used in industry<sup>4</sup>, but, in their most famous, small-scale form, involve the extrusion of layers of molten plastic to build up a 3D model of pretty much any shape imaginable. If, for example, you needed a part to fix your washing machine, but it wasn’t available locally, you could simply print one out; or so the story goes.

The open-source innovation driving such developments has lent itself to a diversity of ends. For example, e-NABLE is a community of open-source enthusiasts who collaborate on the design of free 3D-printable mechanical prosthetic hands, building on the original release of the “Robohand” in 2012<sup>5</sup>. Thousands of these assistive devices are now in use around the world. In 2013, a University of Texas graduate named Cody Wilson made headlines around the world with the free release of digital schematics for a 3D-printable gun, the Liberator. These plans were downloaded more than 100,000 times in the first two days, with the 3D printing technology being used, in this case, as a political symbol demonstrating the limitations of the nation state to regulate production, including that of lethal weapons.

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<sup>4</sup> Olson (2013) recounts that industrial 3D printers are being used by Boeing to produce components for its 787 aircraft, for example, while the Chinese government is, at the time of writing, developing a military transport aircraft, the Xian Y-20, also made with 3D printed components.

<sup>5</sup> See [enablingthefuture.org](http://enablingthefuture.org). There are currently also tens of millions of in-ear hearing aids being used worldwide with personally-tailored shells constructed by 3D printers (Olson, 2013).

Policy makers at various scales are also beginning to take a different kind of interest in these developments. In 2014, the US president Barack Obama announced June 18<sup>th</sup> to be the National Day of Making at the opening of the White House Maker Faire, having previously spoken of “the promise of being the makers of things and not just the consumers of things” (quoted in Nascimento, 2014). In Barcelona, the local authority is in the process of setting up a Fab Lab in each city district, under the banner of 'the self-sufficient city', while in the UK, maker spaces are being used to revitalise libraries for the 21<sup>st</sup> century. This is the case with projects at Exeter and Dundee public libraries, to take just two examples.

The maker movement itself, however, extends beyond innovation through eye-catching and media-friendly technologies such as 3D printing, laser cutting and CNC milling. Coincident with the such developments, there has also been a turn to more traditional skills such as textile repair, sewing, knitting, furniture repair, weaving, woodwork and more (Luckman, 2015). Indeed, one of the key perspectives put forward in this thesis shall be that there is no 'maker movement' in any strong sense, but rather a diversity of participants undertaking a variety of creative tasks in diverse, very loosely linked, spaces. This is not stated to undermine the possibilities presented by these spaces. If anything, it suggests the opposite: that they are meeting diverse social ends, just a few of which can be explored in this thesis.

### **1.2 Research Questions, and Thesis Outline**

As the resource intensity of contemporary industrialised societies becomes increasingly impossible to deny, and as top-down inter-governmental processes for sustainability prove inadequate to the task put before them, people are forced to look for living alternatives. As Shove (2010: 1273) has put it, “if there is to be any effective response [to the ecological crisis], new forms of living, working and playing will have to take hold across all sectors of society.” What follows, therefore, is an examination of three maker communities as they relate to this dual problem of “the good environmental life and the environmental good life,”



to take Coeckelbergh's (2015: 197) memorable phrasing – otherwise termed the 'double dividend'.

The journey of undertaking this research brought me into contact with makers constructing rocket mass stoves out of waste materials for those living in the now-dismantled Jungle refugee camp at Calais, the founder of a tool library facilitating the communal sharing of diverse tools, hackers constructing heat sensors for their houses and open-source Wi-Fi networks for their city, boat builders connecting with the nautical heritage of their communities, recovering drug addicts rebuilding their lives, and much else in between. Making sense of this diversity is the project of the rest of this thesis and calls for the introduction of the project's aim and core research questions, which are as follows:

<b>Research Aim:</b> To contribute to debates on the relationship between recently-established community workshops and sustainable development.	
RQ1	Do contemporary workshop spaces enable engagement with more sustainable practices (as often assumed in the popular literature)?
RQ2	How do such spaces matter for contemporary notions of 'well-being'?
RQ3	How can scholarly treatments of 'making' be informed by new materialist and posthuman approaches in the social sciences?
RQ4	In what ways do non-representational, 'new materialist' and 'post-qualitative' approaches in the social sciences affect the undertaking of qualitative research in human geography?

Research questions 1-3 each underpin one of my empirical chapters, and are supplemented by the methodological fourth question, which will be reflected on in Chapters 3 and 7. The thesis proceeds as follows:

Chapter 2 presents the results of a literature review, with Section 2.1 more closely examining 'making' and 'craft'. Building initially on David Pye's distinction between the 'workmanship of risk' and the 'workmanship of certainty,' themes from the workmanship of risk are developed to include notions of embodiment, tacit knowledge, posthumanism and the performative agency of materials. Finally, literature on maker spaces and making from across human geography and the social sciences more generally are surveyed, and gaps in the literature highlighted.

The social science of sustainability and sustainable development are then introduced in Section 2.2, identifying the notion of the 'double dividend' as underpinning sustainability research, either explicitly or implicitly, with its twin components of *sustainability* and *wellbeing*. A dualistic and humanistic trajectory to the recent literature on both terms is identified, wherein pro-environmental change is reduced to 'behaviour' and the conceptual and historical richness of the term well-being has been hollowed out and reduced to numerical form in the new 'science of happiness'. The chapter works to replace this individualism and anthropocentrism with questions of social practice, community and more-than-human entanglement.

Chapter 3 outlines the study's methodology, examining the methodological implications of 'new materialism,' complemented in geography by 'more-than-human' and 'more-than-representational' work. The rationale for the choice of an enactive ethnographic method in the current study is explained, along with an outline of the field work undertaken, and the relative strengths and limitations thereof begin to address RQ4.

Chapter 4 is the first empirical chapter of the thesis, providing ethnographic insight into the material practices taking place in community workshops. It focuses on the commonalities and differences presented across the varied maker practices of furniture construction, pyrography, 3D printing and laser cutting. Responding to RQ3, a posthuman 'mangle of craft' is posited. This builds on Andrew Pickering's seminal work in the sociology of science on the 'mangle of practice,' as well as

non-hylomorphic theories of technology, as put forward by Gilbert Simondon, Tim Ingold and others.

Chapter 5 draws on field notes, observations, interviews and a digital archive, to respond to RQ1, examining the implications of community workshop spaces for environmental practices. It refrains from dwelling on issues such as environmental awareness raised, attitudes changed, as well as quantitative achievements such as tonnes of waste diverted from landfill, or tonnes of carbon reduced. Instead, the workshops are analysed through the insights of social practice theory, as stores of competence where past practices and vernacular creativities are remembered and valued, stores of materials, and where stores of meaning are enacted and shaped.

Given critiques of the predominance of quantitative approaches to wellbeing research, the penultimate Chapter 6 extends the relational and materialist ontology drawn on thus far to ask how makerspaces affect participant wellbeing. This analysis will draw attention to the ‘therapeutic taskscape’ of the workshop, emphasising affective, atmospheric aspects of wellbeing, and ending with a discussion of ‘flow’ states.

The final chapter discusses the empirical findings, explicitly outlining the contribution to knowledge made, and proposing potentially valuable avenues for future research.

### 1.3 Concluding Remarks

I would like to conclude this introduction with a brief reflection, already hinted at with the mention of diverse economies above, on the role of studies such as this. Underpinning everything discussed in this introduction, from the spread of collaborative maker spaces, to the possibilities of non-representational research in the social sciences, and all that will come below, is my commitment to research, as Chatterton and Pickerill (2010: 481) put it, which provides “accounts of the messy, gritty and real everyday rhythms as activists envision, negotiate, build and enact life beyond the capitalist status quo in the everyday”. In the uncharted

waters of the *Anthropocene/Capitalocene/Necrocene/Chthulucene* (the terms multiply), it is my suspicion that we will need as much insight as we can gain into community economies, along with their varied practices, competences, and affectivities.

While participants may not think of the spaces in precisely these terms, the thesis asks, in other words, “What kind of economic relationships foster sustainable ways of flourishing?” (Gibson-Graham et al., 2016: 707). My hope is that the field work and case studies herein can contribute to a broader, growing geographical understanding of – and practical engagement with – (variously) community-based, self-managed, non-hierarchical and post-capitalist alternatives to the status quo.



## 2 Crafting Sustainability: A review of the literature

*Our Common Future*, often referred to as the *Brundtland Report* (World Commission on Environment and Development, 1987), has held a pivotal role in defining the term sustainable development, referring to it as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 8). Ubiquitous in the literature, this definition contains two broad elements; the meeting of human needs, and the achievement of environmental sustainability in meeting these needs.

The influence of those two words, sustainable development, has increased almost exponentially since that time. In the year 2000, Switzerland became the first country to enshrine 'sustainable development' in its constitution (Caradonna, 2014), stating that the Swiss cantons must aim for “a balanced relationship between nature and its ability to renew itself, on the one hand, and the demands placed on it by the human race, on the other.”<sup>6</sup> More recently, the UN has unveiled a series of high-profile Sustainable Development Goals (SDGs) which, in 2015, replaced the Millennium Development Goals (MDGs) as the UN’s focal initiative on global development. Though suggesting that the term sustainable development has been uncontroversial in its definition and acceptance, the opposite is the case, with the three decades since the Brundtland report being marred by debates about the usage and implementation of sustainable development (Nielsen et al., 2010).

Redclift (2005: 213) has highlighted how the term “has been used in a variety of ways, depending on whether it is employed in an academic context or that of planning, business or environmental policy”, with it remaining “often unclear whether these different perspectives are complementary or mutually exclusive” (ibid). As summarised by Seyfang and Smith (2007: 584), “Everybody, it appears,

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<sup>6</sup><https://www.are.admin.ch/are/en/home/sustainable-development/strategy-and-planning/understanding-of-sustainability-in-switzerland.html> [Accessed 18/08/17]

is committed to sustainable development. But not everybody is seeking sustainable development in the same way.”

The literature presented in this chapter shall situate my study in this contested landscape, setting up the problem of how social scientists have tried to make sense of human impacts on the environment and how we can best understand the place of workshops in those impacts.

As ‘making’ is so central throughout this thesis, I shall begin there, reviewing social scientific work on craft and making, and exploring key scholarly contributions and debates from within geography and further afield. The chapter then introduces a developing field of literature on theories of practice in sustainability research, and related writings on ‘environmental skill’, to frame the theoretical background of the current study. It shall be proposed that such work overcomes the individualism of much current social science, and provides a less top-down conceptualisation of sustainability. Finally, literature on the study of wellbeing from geography and further afield shall be presented, and the argument made that similar moves towards practice and the more-than-human have been evident in that realm of scholarship also.

## 2.1 Thinking Through Making

In this section, I hope to navigate a line between literature on ‘craft’, which has tended to focus only on ‘traditional’ forms of making, and the literature on maker spaces, which is often characterized by a fascination with ‘newer’ technologies. It proceeds as follows: firstly, the rich and varied resonances of craft are clarified, examining some definitions which have been proffered, and tracing some of the term's etymological and conceptual roots. Then, the implications of the social scientific examination of craft from ontological and epistemological perspectives will be outlined. Section 2.1.3 then notes how, while specific examination of the maker movement has been absent in the field of human geography, recent years have seen a blossoming of geographical work on more ‘traditional’ forms of

making. Finally, the rapidly-expanding literature on maker spaces and the maker movement outside geography will be examined, and conclusions drawn.

There is an important tension at the heart of the scholarly study of craft which warrants highlighting at the outset, and which haunts much of this thesis. Namely, as highlighted by Adamson (2010), to write about craft is to write about something “fundamentally nondiscursive,” something which is “learned with the body rather than the mind.” While I will challenge Adamson’s strong body/mind dichotomy, this does constitute a challenge “for anyone who wants to do justice to making through the seemingly inadequate tools of words and ideas” (ibid: 1).

Adamson’s challenge hasn’t prevented a remarkable renaissance in writing on craft – both popular and academic – in the initial two decades of the 21<sup>st</sup> century, as we saw in the introduction. Amongst other notable contributions, there has been the runaway success of Richard Sennett’s (2008) *The Craftsman*, best-selling status obtained by Crawford’s (2009) *Shop Class as Soul Craft*, and the founding of a dedicated *Journal of Modern Craft* (Journal Editors, 2017). Given an imperative to lead lives appropriate to the ecological challenges of our time, there is “increased interest in the Green movement with its concern for making things that will last, do not use diminishing resources, are a pleasure to use and fit within a social fabric of maker/consumer” (Racz, 2009: 34; see Evans [2011] for further discussion on the environmental impetus of frugality). Further, Thurnell-Read (2014: 46) writes that “craftwork has increasingly been suggested as offering an appealing antidote to modern industrial production”.

Craft as a resistance, a refusal, and a questioning of the unsustainable trajectory of industrialisation has a “powerful history” dating at least from the late nineteenth century (Greenhalgh, 2009: 403), particularly during the Arts and Crafts movement’s reaction to industrial repetition and deskilling (Betjemann, 2008). Ruskin then argued, for example, that “men were not intended to work with the accuracy of tools, to be precise and perfect in all their actions. If you will have that precision out of them, and make their fingers measure degrees like cog-



wheels and their arms strike curves like compasses, you must unhumanise them” (quoted in Craig, 2006: 100). This reactive tendency can be seen right up to the present, in writings on DIY and craftivist subcultures (Levine and Heimerl, 2008; Ratto and Boler, 2014a), and is succinctly summarized in the *Manifesto for the New Materialism* (Simms and Potts, 2012: 14) discussed in the previous chapter:

A world in which we all hold a wider range of practical skills leaves us less at the mercy of disposable goods and built-in obsolescence, and more in a position to shape and fashion the world around us in satisfying ways. It gives us real freedom to replace the illusory version promised by the market.

The reality of contemporary craft is, however, more complicated than this.<sup>7</sup> As Knott (2013: 57) writes, “controlling the production process from start to finish seems to encapsulate the anti-capitalist credentials of craft. Yet this idealism ignores how craft procedures, both commercial and non-commercial, always depend in some way on the capitalist structures they aim to oppose. Indeed, even Morris, the father of the Arts and Crafts idealism, could not effect his designs without the help of a skilled labor force engaged in repetitive actions, and his company Morris, Marshall, Faulkner & Co. needed the support of ‘well-to-do people sympathetic to his aims’”.

Craft is, therefore, many things to many people; not least a marketable industry which in the UK is said to employ more people than forestry and fishing<sup>8</sup> (Racz, 2009) and which is worth more than three billion pounds to the economy (Crafts Council, 2014b; Jakob, 2012). It is also rapidly changing form, increasingly subsumed into the broader term ‘making’ (Gauntlett, 2011), and caught up in the rise of what has been called the ‘maker movement’ (Posch, 2017) (Section 2.1.4, below). For many authors, furthermore, it is more than an industry or a

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<sup>7</sup> Indeed, this complicated nature shall spur the discussions of Chapter 4.

<sup>8</sup> Though a closer look at the statistics shows that out of the 102,000 people that craft employs in the UK, only 7,000 are employed directly in craft industries, with the remaining 95,000 “employed in craft occupations outside the creative industries” (Crafts Council, 2014a: 4).

movement, and sheds light on much more fundamental realities of human existence. After all, as Risatti (2009: xii) states, “all the world's people are bound together by the creation of craft objects, something that began with the dawn of human time” (see also Barba, 2015).

However it is examined, it is clear that craft has never had a stable identity (Adamson, 2010; Racz, 2009). Jakob (2012), for example, has outlined one history of post-industrial craft, existing in three waves, which is helpful in conceptualising the ebb and flow of the term's popularity. The first wave consisted of the Arts and Crafts movement of the late 19<sup>th</sup> and early 20<sup>th</sup> century, already mentioned above. The second wave consisted of the revival of handmade goods as part of the countercultural and new ecological ethos of the 1960s and 1970s. And now, Jakob holds, we are amid the third wave, starting roughly just before the turn of the millennium, which “attempts to reconcile and reconnect the aesthetic and political values of craft,” two aspects which had become somewhat alienated from each other during the late 20<sup>th</sup> century (Ibid: 130).

Abstracting from such historical genealogies, to find a core or essence to the human propensity to make, appears rather fruitless. As Dormer (1997: 5) notes, “general definitions of 'craft', 'technology' or 'design' tend to be pretty hopeless, in the same way that definitions of art tend to be,” with Greenhalgh (1997: 20) concurring that, regarding the terms craft and craftsman “whether for or against it...most have professed an unsureness as to what exactly it means”. “Craft, crafting and crafters,” holds Jakob (2012: 129) “are little understood terms and practices.”

However, Dormer (1997: 7) proposes that attempts to define craft tend to fall into one of two categories, both of which, he contends, tend to remain “unavoidably sloppy”. First, craft is synonymous with 'studio crafts,' “covering everyone working with a craft medium” and often including “producers of functional ware as well as abstractionist sculptors working in textiles, clay or glass” (ibid). Usually taking the form of lists of categories, this was the approach used by the UK Crafts Council

(Crafts Council, 2014a; see also Jakob, 2012), in their recent attempt to measure and define craft, with the aim of having it included in national economic measures. The discrete sectors they identified were, for example:

- Manufacture of Jewellery
- Smiths and forge workers
- Weavers and knitters
- Glass & ceramics makers, decorators & finishers
- Furniture makers and other craft woodworkers
- Repair of furniture & home furnishings
- Upholsterers
- Binding and related services
- Other skilled trades not elsewhere classified

However, this approach manifestly fails to say anything about the actual process of crafting (Adamson, 2007; Jakob, 2012). Therefore, the second common mode of analysis, according to Dormer (1997: 7), can mean “a process over which a person has detailed control, control that is the consequence of craft knowledge”. This would include, for example, Sennett's (2008: 8) concise definition of craft as “the skill of making things well,” as well as subsuming Metcalf's characterisation of a craft object as “substantially made by hand” (quoted in Racz, 2009: 3).<sup>9</sup> The

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<sup>9</sup> Although this emphasis on the ‘hand’ appears problematic on at least three fronts: 1. It raises questions about the status of the rest of the body in the process of making; 2. It apparently ignores remarkable objects made by, for example, physically-impaired artists using their mouths and feet; 3. It is unclear where the skilled use of various mediating tools and technologies in the making process fits into this definition. Similarly, Sennett's idea of “making things well” raises the question ‘how well?’ This debate over proficiency, expertise and the increased blurring of amateur and professional is discussed by Banfield (2017).

craft labourer, as the influential sociologist C. Wright Mills stated, “becomes engaged in the work in and for itself; the satisfactions of working are their own reward; the details of daily labor are connected in the worker's mind to the end product; the worker can control his or her own actions at work; skill develops within the work process; work is connected to the freedom to experiment; finally, family, community, and politics are measured by the standards of inner satisfaction, coherence, and experiment in craft” (quoted in Sennett, 2008: 27).

One of the most widely-cited 20<sup>th</sup> century explorations of craft in this second tradition is *The Nature and Art of Workmanship*<sup>10</sup>, by David Pye (1995 [1968]), which articulated a distinction between the 'workmanship of risk' and the 'workmanship of certainty'. Pye was a professor at the Royal College of Art in London, a highly-skilled bowl and box carver (the 'workmanship of risk'), and a designer of furniture for industrial production (the 'workmanship of certainty').

Pye (Ibid: 20) attempts a nuanced definition of craftwork as “workmanship using any kind of technique or apparatus, in which the quality of the result is not predetermined, but depends on the judgment, dexterity and care which the maker exercises as he works”. It is craftsmanship, or craft, therefore, which is synonymous with 'the workmanship of risk', a practice in which “the quality of the result is continually at risk during the process of making” (ibid). The workmanship of certainty, at the other end of the spectrum, finds its purest state in what Pye calls “quantity production” and full automation:

An operative, applying the workmanship of certainty, cannot spoil the job. A workman using the workmanship of risk assisted by no matter what machine-tools and jigs, can do so at almost any minute. That is the essential difference. The risk is real. (p. 22)

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<sup>10</sup> There is a preponderance of masculine imagery, a history of male-dominated industries, and writings by mostly male writers in this field. This has a problematic and complex history – tending to exclude the variety and importance of women’s craft skills (Rosner and Fox, 2016) – leading to terms such as ‘workmanship’, which I try to avoid using here.

The product or output in the workmanship of certainty is predetermined prior to making, with this certainty, for Pye, being of most relevance in the industrial mode of production. As such, industrialism replaced the risk characterizing “all the works of men which have been most admired since the beginning of history,” until only the last few generations (Ibid). This is a distinction to which we shall return below, as well as in Chapter 4.

The English word ‘craft’ is derived from the German, *Kraft*<sup>11</sup>, translating as ‘power’, tapping into two significant, historical senses of that word - “the ancient sense of craft as a means of achieving potency” (Adamson, 2010: 457) and the ascription of “power to the object itself...[as] an active agent in the process of social transformation” (Ibid). Plato, however, rooted craft in the Greek word for “making,” *poiein* – also the parent word of *poetry* – alluding to its creative and transformational origins.

As such, the term *poiesis* would go on to play a central role in Martin Heidegger’s (1977) influential commentary on technology and the modern condition, *The Question Concerning Technology*, which builds on Plato’s insight. Heidegger equates *poiesis* with what he terms a ‘bringing-forth’, a tendency shared by a continuum of activity, not only by “handcraft manufacture,” but also “artistic and poetical bringing into appearance” (p. 10). He argues that, in its original sense, the root term of technology, *technē*, “is the name not only for the activities and skills of the craftsman, but also for the arts of the mind and the fine arts” (p. 13). *Technē* is thus “something poietic” (Ibid), though this poetic mode of *technē* was – in our industrial age – to be displaced by “modern machine-powered technology” (Ibid). The latter, paraphrased by Glendinning (2014: 11) is “a way of revealing that discloses everything everywhere as measurable, calculable and orderable (available at our command and at our convenience)”, and is thus the antithesis of *poiesis*.

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<sup>11</sup> With craft in German translating as *handwerk*, or *kunst* (art, skill, artistry, craft).

For Heidegger, technology converts all in its purview to the objectified and standardised form of “standing reserve”, putting to nature “the unreasonable demand,” such as that found in the case of fossil fuels, “that [it] can be extracted and stored as such” (Heidegger, 1977: 14). This is contrasted with the imagery of an old windmill which, though “its sails do indeed turn in the wind; they are left entirely to the wind's blowing...the windmill does not unlock energy from the air currents in order to store it” (Ibid). In *The Craft Reader*, Adamson (2010: 404) summarises Heidegger's thought as maintaining that “there are ways of making that connect us to existence, to the world we inhabit, and others that separate us. The former of these 'technologies', of course, are the crafts”.<sup>12</sup>

Heidegger's work has been crucial to perhaps the most influential living scholar of making, the anthropologist Tim Ingold (Ingold, 2006, 2007a, 2010, 2013). Related to Heidegger's *poiesis*, Ingold has described making as a growing and weaving of *things*, rather than a production of *objects*. Here, ‘thing’ is used intentionally as a derivation of *ting*, a Germanic term indicating 'gathering,' an etymology which has also been built on by Latour (2005), amongst others. For Ingold (2013: 45), “the process of making is not so much an *assembly* as a *procession*, not a building *up* from discrete parts into a hierarchically organized totality but a carrying *on* — a passage along a path in which every step grows from the one before and into the one following, on an itinerary that always overshoots its destinations”.

Heidegger's dualistic characterisation of our age as one defined by a frenzied technology which strays from the earlier and more integrated craft of *technē* was separately investigated, historically and sociologically, by his contemporary, Lewis Mumford. Mumford wrote wide-ranging and meticulously-researched tomes, elaborating in great detail the development of the urban environment (Mumford,

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<sup>12</sup> While often disparagingly portrayed as romantic and regressive, Glendinning (2014) has argued that the critiques and visions put forward by thinkers like Heidegger (and William Morris) were more nuanced than is usually acknowledged. They may look at “the old rootedness” (ibid: 20) for inspiration, but their take on an economy of craft was far from puritan or prescriptive.

1997) and the history of human technics, culminating in his *magnum opus*, *The Myth of the Machine* (Mumford, 1967, 1971).

For Mumford, human-scale labour (which he calls ‘democratic technics’) was first challenged, not at the dawn of the industrial revolution – as many craft histories would portray – though this was of course a significant shift, but rather at the beginning of civilisation. As agricultural society led to societal complexity and hierarchy, this period was marked by the rise of the first inhuman machines – the megamachine – albeit with replaceable, standardised components made up of people, rather than cogs or wheels. “From late Neolithic times in the Near East, right down to our own day”, says Mumford (1964: 2), “two technologies have recurrently existed side by side: one authoritarian, the other democratic, the first system-centred, immensely powerful, but inherently unstable, the other man-centered, relatively weak, but resourceful and durable”.

Given the interpretations of Mumford and Heidegger, a concern with craft activity – far from falling on one side of a 19<sup>th</sup> century industrial/pre-industrial dichotomy – therefore tackles conceptual and philosophical questions which reach to the core of social life (Jakob, 2012). Adamson (2010) and Greenhalgh (1997) point out that craft should not be seen just a reaction to modernity, but a phenomenon with a long genealogical legacy, and which has signified different forms of relations in the world. Sennett (2008: 9) agrees here when he calls it “misleading” to suggest that craftsmanship waned with the advent of industrial society (see also Hobbes, 1997: 32). Rather, it “names an enduring, basic human impulse, the desire to do a job well for its own sake” (Sennett, 2008: 9).

In this section, a picture of craft has been sketched as more than just a discrete industry or mode of work, but also a skilled and creative manner of engaging with the world. In the proceeding two sections, I will develop some of the crucial epistemological and ontological themes raised by treatments of craft in the social science literature.

### 2.1.1 Craft Knowledge

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Consider a man felling a tree with an axe. Each stroke of the axe is modified or corrected, according to the shape of the cut face of the tree left by the previous stroke. This self-corrective (i.e., mental) process is brought about by a total system, trees-eyes-brain-muscles-axe-stroke-tree; and it is this total system that has the characteristics of immanent mind...But this is not how the average Occidental sees the event sequence of tree felling. He says, "I cut down the tree" and he even believes that there is a delimited agent, the "self", which performed a delimited "purposive" action upon a delimited object.

Bateson (1973: 317)

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Towards the beginning of Sennett's (2008: n.p.) work, *The Craftsman*, he admits being struck by writer's block, at one point, during the book's writing. "What is your guiding intuition?" a friend asked, in an attempt to clarify the work; to which he responded, "making is thinking". Sennett clarifies (ibid: 7) that *contra* the denigration of manual work, "the discussions the producer holds may be mentally with materials rather than with other people...Another, more balanced view is that thinking and feeling are contained within the process of making".

The nexus of thinking, feeling and making highlighted by Sennett raises a challenge for a Western epistemology traditionally grounded in Cartesianism. Descartes famously posited a division between mind and matter, with mind (and hence knowledge) as something immaterial; thereafter reducing the matter of the world to mere mundane, extended stuff – *res extensa* (Harding, 1986; Plumwood, 1993; Mathews, 2003). Leaving the animate world of our bodies "thoroughly forsaken"



(Abram, 2007: 162), this classic foundation of knowledge has led to what has been called an 'epistemology of the eye' (Brinkmann and Tanggaard, 2009), or what Dewey (1930) termed the 'spectator theory of knowledge'<sup>13</sup>, privileging a disengaged subject observing the world from a distance.

This distance has, however, looked increasingly untenable for the social sciences, not least given recent work on extended and embodied cognition (Clark, 2008; Lakoff and Johnson, 1999), which has increasingly led to the elaboration of a much more worldly 'epistemology of the hand' (Barad, 2003; Brinkmann and Tanggaard, 2009; Vaesen, 2014). Abram (2007: 165) notes "the utter entanglement not only of our bodies but of our *minds* (our rarefied intellects) within this mysterious lattice of intertwined lives and living elements that we call earth."

Gilbert Ryle (1945: 8) noted that "it is a ruinous but popular mistake to suppose that intelligence operates only in the production and manipulation of propositions, i.e., that only in ratiocinating are we rational." Delineating the relationship between "museum-possession" and the "workshop-possession" of knowledge (p. 16), Ryle held that to do something intelligently "is not to do two things, one "in our heads" and the other perhaps in the outside world; it is to do one thing in a certain manner. It is somewhat like dancing gracefully" (p. 3).

Ryle's use of the word 'workshop' and Dewey's engagement with practical know-how<sup>14</sup> suggest that studies of craft have long played a key role in advances in epistemology. To this day, craft studies point to the radical inseparability of not just mind from body, but also mind from world, with huge implications for the conception of human knowledge (Brinkmann and Tanggaard, 2009; Vogel, 2015). For example, Lambros Malafouris (2008b) has engaged in fruitful ethnographic

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<sup>13</sup> Dewey, for Lakoff and Johnson (1999: xi), "saw that our bodily experience is the primal basis for everything we can mean, think, know, and communicate. He understood the full richness, complexity, and philosophical importance of bodily experience."

<sup>14</sup> Dewey (1925: 7) wrote that "ignorance is one of the chief features of experience; so are habits skilled and certain in operation that we abandon ourselves to them without consciousness."

engagement with potters and ceramicists, concluding that craft practitioners usually “do not know how they do it or they simply lack the means to express or communicate this form of tacit knowledge” (p. 19). “No one – not even the potter himself”, he continues (p. 20), “can have access to this type of information because no one...can tell the fingers how hard they can press the clay in and up so that the walls of the vessel will not collapse.” Instead of dictating material outcomes, artisans and practitioners, according to Ingold (2013: 25) are therefore “itinerants, wayfarers, whose task is to enter the grain of the world’s becoming and bend it to an evolving purpose”.

This focus on a tacit and more-than-human dimension of human activity was perhaps most famously elaborated at an early stage with Ryle's (1945) distinction between ‘knowing-that’ and ‘knowing-how,’ described by Portisch (2009) as the difference between being able to recite a recipe and actually being able to skilfully cook a dish (see Duguid, 2005, for a lucid introduction to these debates). Influentially, Michael Polanyi (2013 [1966]) built on Ryle’s work to reconsider human knowledge as “starting from the fact that we can know more than we can tell” (p. 4). Polanyi’s primary example in this case is that “we know a person’s face, and can recognize it among a thousand, indeed among a million. Yet we usually cannot tell how we recognize a face we know” (Ibid.). Through the example of the wielding of tools, he goes on to consider the performance of skill and “the bodily roots of all thought, including man’s highest creative powers” (p. 15). In tool use, “we make a thing function as the proximal term of tacit knowing, we incorporate it into our body – or extend our body to include it – so that we come to dwell in it” (p. 16).

Polanyi’s notion of tacit knowledge therefore echoes the quote from Gregory Bateson which opened this section, indicating that skilled performance and craft can in no way be fully accounted for by the mind sending linear instructions to the body. Rather, Malafouris (2008a) introduces the concept of *material agency* to highlight how agency in skilled comportment is neither the property of humans

(as the social sciences have traditionally held), nor a property 'possessed' by things (as a thinker such as Latour might portray it), but rather "there is no way that human and material agency can be disentangled" (p. 22). As Ingold (2009: 94) has written, skilled practice is "not so much imposing form on matter as bringing together diverse materials and combining or redirecting their flow in the anticipation of what might emerge". Duff and Sumartojo (2017: 419) furthermore assert that "creativity is a function of an assemblage...It is not an attribute of specific individuals". After all:

a painting is as much a force of canvas, timber, brushes, light and space, and the hue, viscosity, temperature, saturation and intensity of paint as it is a subjective function of the artist's desire or intention. (p. 420)

While I shall return to these questions in Chapter 3, on methodology, Ingold (2013: 6) sees the way of the craftsperson as the archetype for social research or "*an art of inquiry*" (ibid: 6) as, to practice a craft is "to allow knowledge to grow from the crucible of our practical and observational engagements with the beings and things around us". Every venture in the 'workmanship of risk' "is an experiment: not in the natural scientific sense of testing a preconceived hypothesis, or of engineering a confrontation between ideas 'in the head' and facts 'on the ground', but in the sense of prising an opening and following where it leads" (ibid).

Summarising, Malafouris (2008a: 30) states that "pragmatic effect and as such agency is not a matter of private thought and imagination but of actual practice and being-in-the-world" (cf. Lave & Wenger, 1991). Craft knowledge, then, is a property of "the grey zone where brain, body and culture conflate" (ibid: 22), similar to Lave and Wenger's (1991: 15) conceptualisation that "learning is a process that takes place in a participation framework, not in an individual mind". This question of 'participation frameworks' leads to the consideration of relational and non-dualistic ontologies, the topic of the next section.

## 2.1.2 The Ontology of Making

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In the study of material culture, the overwhelming focus has been on finished objects and on what happens as they become caught up in the life histories and social interactions of the people who use, consume or treasure them...What is lost...is the creativity of the productive processes that bring the artefacts themselves into being: on the one hand in the generative currents of the materials of which they are made; on the other in the sensory awareness of practitioners.

Ingold (2013: 7)

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The implications of craft for the social scientific investigation of everyday life are perhaps most evident with the breakdown, not just of traditional epistemologies of distance, but also of the boundary between epistemology and ontology themselves, increasingly coming under question in related work from new materialist writers such as Ingold (2013), Barad (2003), and Bennett (2010). On this, Ingold (2013: 5) quotes Barad: “we do not obtain knowledge by standing outside the world; we know because “we” are *of* the world. We are part of the world in its differential becoming.” Indicative of an alternative ontological approach, he therefore reduces the historical opposition between participation and observation - “rather, the one depends on the other” (p. 5-6).

Traditionally, however, craft (alongside art) has been explored through the lens of *hylomorphism*, the prevalent view of making historically. It originates with Aristotle's perception that any made object is a compound of matter (*hyle*) and form (*morphe*), which are only then brought together in the finished object (Ingold, 2012; See the work of Evnine [e.g. 2013] for contemporary

hylomorphism). For example, Betjemann (2008: 184) noted the common perception among leading craft scholars that “skill and technique, understood as ways of enacting one’s plans, are the agents of craft’s essential logic”; that is, designs and plans are made and this in some way ‘produces’ the craft object.

Dewey (1980: 135), for one, contrasted the anthropocentric inadequacies of hylomorphism with a more ecological approach: “Since the ultimate cause of the union of form and matter in experience is the intimate relation of undergoing and doing an interaction of a live creature with the world of nature and man, the theories, which separate matter and form, have their ultimate source in neglect of this relation.” Elsewhere, he elaborated that “to artisans form is alien, unperceived and unenjoyed; absorbed in labouring with material, they live in a world of change and matter, even when their labors have an end in manifestation of form” (Dewey, 1925: 91). With the emergence of the new materialism, other scholars have also been moving beyond hylomorphic imagery (Ingold, 2007a, 2007b, 2010; Roberts, 2017).

Perhaps the defining critique of hylomorphism was made by the French philosopher Gilbert Simondon (Massumi et al., 2009; Ingold, 2013; Roberts, 2017). Simondon (2009) was interested in the question of ‘ontogenesis’; that is, instead of privileging what he called the “constituted individual”, we should look into “the system of reality in which the individuation occurs” (p. 4). Perhaps Simondon’s most famous and – for the object of this thesis – relevant example of ‘individuation’ and ‘ontogenesis’ relates to a traditional clay brick (Roberts, 2017).

At first glance, the making of a brick would seem to be a prime example of hylomorphism, with a literal form (a wooden mould) being used to press formless matter (clay) into a rectangular shape. This interpretation misses the point, however. As Ingold (2013: 25) notes, “the mould is no geometric abstraction but a solid construction that has first to be built from a specific material (traditionally, a hardwood such as beech). For another thing, the clay is not raw. Having been dug out from beneath the topsoil, it has first to be ground, sieved to remove stones

and other impurities, and then exhaustively kneaded before it is ready for use.” Furthermore, “when the brick maker ‘dashes’ a clot of clay into the mould, the expressive force of the maker’s gesture, imparted to the clay, comes hard up against the compressive resistance of the hard wood of the mould’s walls”. Ingold (2006: 75) calls this “field of practice” in which the continual engagement of such activities takes place, the *taskscape*. In the *taskscape*, we no longer have two separate beings *inter-acting*, with the subject’s mind imposing form on the object matter, but rather we have two or more things ontologically entwining and entangling.

I would like to foreground two primary lessons drawn from such work on hylomorphism:

Firstly, to get beyond the idea of the imposition of ‘form’ onto ‘matter’, and towards ontogenesis, scholars need to be sensitive to the specifics of particular materials and processes. As we saw in the discussion of brickmaking, specific materials act in very specific ways when entangled in particular assemblages. It has been argued, however, that this point is often missed in recent generic discussions of ‘materiality’ and ‘objects’ in the social sciences. As Ingold notes (2007a: 2), “the concept of materiality, whatever it might mean, has become a real obstacle to sensible enquiry into materials, their transformations and affordances” (Ibid: 2).

Secondly, I would note that this conceptualisation of craft – as a site of risk-laden, materially-specific, and ontologically-flattened practice – holds a close resemblance to Andrew Pickering’s influential work on the “mangle of practice” (Pickering, 1993). In the ontology of the mangle, human ‘achievements’ in art and science are seen, instead, as the result of a contingent and messy process of “tuning” – a dialectic of resistance and accommodation (Pickering, 1995, 2010, 2016). Human actors set up some material apparatus, material resistance emerges, the practitioner makes some material accommodation or alteration, and

so on, with a 'successful' or 'unsuccessful' process emerging from such a reciprocal, symmetrical process.

The non-hylomorphic and 'mangle-ish' becoming of objects therefore complements the ontological project of new materialism "to think slowly an idea that runs fast through modern heads: the idea of matter as passive stuff, as raw, brute, or inert" (Bennett, 2010: n.p.). Rather than lodged in the thought and discourse of the uniquely human subject, this onto-epistemology holds that "the ultimate cause of action in this chain of micro and macro events is none of the supposed agents, human or non-humans; it is the flow of activity itself" (Malafouris, 2008a: 35). Bennett (2007: 144) cites Dewey as a precursor to the new materialist desire to break down the cartesian subject and overcome the idea of a dead, passive material world and indeed, at an early stage, Dewey (1980: 58) had been fully aware of the more-than-human constitution of the self:

The epidermis is only in the most superficial way an indication of where an organism ends and its environment begins. There are things inside the body that are foreign to it, and there are things outside of it that belong to it de jure if not de facto; that must, that is, be taken possession of if life is to continue...The need that is manifest in the urgent impulses that demand completion through what the environment – and it alone – can supply, is a dynamic acknowledgment of this dependence of the self for wholeness upon its surroundings.

The previous two sections have introduced some key issues with regard to how craft has been conceptualised in the literature, with implications for questions of ontology and epistemology. These broadly materialist and naturalist underpinnings will be further clarified, particularly when exploring the methodology of the current study in Chapter 3. Before proceeding to that, I will examine the literatures on craft within human geography, specifically, and social scientific work which has looked at the 'maker movement' more broadly.

### 2.1.3 Geographies of Making

While literature on maker spaces and the so-called ‘maker movement’ is, at the time of writing, essentially non-existent within human geography (though see peripheral work by Smith [2017] on hacklabs and experimentation; Meyer [2013] on DIY biology; Jiménez [2014] on open source infrastructure)<sup>15</sup>, work on craft, drawing on many of the debates and developments presented above, is of growing prominence in the field (Carr and Gibson, 2017). It has attained less centrality in the discipline, however, than its occurrence either in the popular literature or in other social scientific disciplines such as anthropology (Atkinson, 2013; Ingold, 2007a, 2013, Marchand, 2008, 2010; Walls, 2016; Warnier, 2007) and archaeology (Barrett, 2014; Bleed, 2008; Crown, 2014; González-Ruibal, 2014; Hodder, 2014; Webmoor, 2013).

Yarwood and Shaw (2010), writing on craft as a hobby, put this disciplinary neglect, in part, down to a privileging of outdoor, easily-monitored activities in geography, such as tourism, travel and sport, as well as an uncertainty amongst geographers with regard to where craft should be placed in the work/leisure binary. However, much recent geographical work tangential to questions of craft has tied into a renewed interest in geographies of creativity and practice in spatial thought (Hawkins, 2013; Nash, 2013, 2000; Ferraro and Reid, 2013). There has been a significant output in recent years relating to creative geographies, although, perhaps displaying ‘ocularcentrism’ (Paterson, 2009), this has largely focused on traditional art media and visual methodologies (Dixon et al., 2012; Hawkins, 2013, 2014, 2015; Hunt, 2014). Engagement with those practices which have been traditionally conceived of as craft, in this growing area of research, has been more limited.

That said, Richardson (2016a) has explored the various spaces of artistic knowledge co-production, including the workshop, the event and the project,

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<sup>15</sup> Last (2013) also makes passing reference to the notable German hacker organization the Chaos Computer Club (CCC).



focusing specifically on creative writers, though the discussion has broader implications for geographies of creativity and, indeed, draws on craft literature, including that of Sennett, cited above. She notes the importance of face-to-face interaction in workshop spaces both for learning and feedback, and for the emotional work of building trust between participants. This trust was then crucial in allowing for frank feedback, facilitating improvements in future work.

In their one-off paper researching model railway builders, Yarwood and Shaw (2010: 425) also focus on the relationality of craft practices, examining “the nature of the relationship between the individual consumer and wider networks of craft practices”. This is important, for them, in order to examine the spatial processes associated with craft-consumption, in a discipline where little is known about “the spaces of indoor leisure, where it is practiced and how these places are linked to wider networks of production and consumption” (Ibid: 426). This neglect is particularly strange given what Watson and Shove (2008) – cited by Yarwood and Shaw – call the “transformative” nature of craft and DIY, both in terms of the people who do it, the physical structures within which they work, and their consumption and production activities:

One round of DIY has implications for what might be tackled next and for the confidence, or otherwise, with which new projects are approached. As a result, practitioners’ ‘careers’ – both individually and collectively – determine related forms and types of production and consumption. (p. 72)

Taking a different angle, Nigel Clark, in a series of recent publications (Clark, 2015, 2016b, 2016c, 2016a), has examined the early history and subsequent development of *pyrotechnology*, that is, fiery arts of production and metallurgical crafts. This project looks to the relevance of making for “any renewed negotiation with the stuff of the earth”, and builds upon Clark’s (2011) earlier monograph, *Inhuman Nature*, which placed human sociality more fully within the context of a dynamic, unruly and tumultuous planet. He notes (2016a: 17) that:

Our focus on the long durée [sic] of artisanal practice serves as a reminder that metaphors of forging, shaping, molding or constructing social worlds have literal traces, and in turn hints at the distance that has opened up between modern social thought and what was once the everyday work of manipulating matter-energy to make useful and beautiful things.

Working with a broad conceptualisation of ‘making’, Carr and Gibson (2015) have formulated a geographical research agenda which acknowledges that “ecological crisis demands more, rather than less, attention to materials and making processes that constitute our world.” This review sets the broader scene for a growing, albeit patchy, selection of recent work on the geographies of craft, which has thus far included taxidermy (Patchett, 2015b, 2017), ceramics (Miller, 2016), knitting (Mann, 2015, 2017; Price, 2015), surf-board construction (Warren, 2016), leather boot making (Gibson, 2016), creative clusters (Harvey et al., 2012), craft metalwork (Drake, 2003), craft brewing (Thurnell-Read, 2014), friendship in craft circles (Hall and Jayne, 2015), regional craft networks (Thomas et al., 2013), quarrying, dry-stone walling and stonemasonry (Paton, 2013; Edensor, 2011, 2013; Paterson, 2015), making-as-methodology (Carr and Gibson, 2017), and discussions of sustainability (Ferraro and Reid, 2013).

While each researches a different domain, such work somewhat contradicts Chris Anderson’s (2012: 47) statement in *Makers*, that ““Place” matters less and less in manufacturing these days—ideas trump geography.” Rather, it underlines how questions of skill and material competence have been of interest, particularly in recent cultural geography (Banfield, 2017; Vannini and Taggart, 2014), coupled with broader questions of dwelling and practice (Cloke and Jones, 2001; Hunt, 2016). Often drawing on the work of Ingold, this rapidly expanding body of work also shows echoes of Pye’s legacy, whether through direct citation (Miller, 2016; Patchett, 2015a), or through parallel development of notions of risk. Carr and Gibson (2015: 7), for example, describe making as “a material conversation – a physical provocation and a response, iterated over and again, working with the

material to understand its capacities, analyse error and make adjustments”. Miller (2016: 6) notes how “matter enables and constrains, playing its agentic part in making practices, which involve embodied skills and familiarity, cognitive knowledge and an active role for tools and materials.” And Harrison (2009: 995) notes that failure is a central aspect of skill; “highly skilled activity [is] highly skilled precisely insofar as it takes place as close to this limit as possible, without crossing over. The dancer can slip and break his ankle; the rock climber lose her grip and fall.”

Ingold (2017: 1) has himself drawn together this interest in an Afterword for the journal *cultural geographies*, writing that “skill is the ground from which all knowledge grows”. His meditation on skill highlights how the merging of body, mind and environment which takes place in skilled practice is an “endlessly creative” and inherently risk-laden activity:

A seasoned practitioner knows that to embark on any venture means pushing the boat out into the stream of a volatile and ever-changing environment, with no knowing what will transpire. It is an inherently uncertain business. Over-confidence is the mark of the novice...to practice any skill means exposing oneself to the befalling of things, and enduring whatever they have in store. (p. 3)

Attempts to grapple with questions of making and skill in human geography have drawn, to varying extents, on non-representational theory (NRT), an approach which has come to prominence over the last two decades, predominantly in UK-based human geography (Lorimer, 2005; Thrift, 2008; Phillip Vannini, 2015; Hunt, 2014). NRT shall be examined in more detail in Chapter 3, given its focus on social life not solely as a site of human meaning and interpretation, but as composed of material-discursive practices (Anderson, 2014; Miller, 2016; Thrift, 2008). For now, it's adequate to note that, given Adamson's comment above on the paradoxical challenge of writing about something as obviously tacit as craft, NRT-inspired modes of proceeding in geographical scholarship, including sensuous and 'haptic'

geography (Paterson, 2009; Dixon and Straughan, 2010), seem an apt theoretical development within human geography for the investigation of craft.

### 2.1.4 Makers and the Maker Movement in the Social Sciences

While human geography seems largely devoid of work on the contemporary maker movement, academic disciplines outside of geography have also, until very recently, seen only a marginal interest in these spaces (Hielscher and Smith, 2014)<sup>16</sup>. In 2014, Sheridan et al. (2014: 529) noted a “dearth of empirical research on makerspaces”, while two years later Kohtala (2016: 4) still maintained that “little empirical research on material peer production currently exists, and the environmental impacts, and benefits, of digital fabrication are largely unknown” (see also Kohtala and Hyysalo, 2015). This paucity is somewhat surprising, given the rise of such spaces as early as the 1990s (Hielscher and Smith, 2014), with Smith et al. (2013: 15) noting that “beyond practitioner aspirations, significant questions remain unanswered as to whether and how the ‘sociotechnical framings’ claimed for digital fabrication are manifesting in realities on the ground”.

Growth in this area is, however, becoming evident in fields such as Science and Technology Studies (STS) (Smith et al., 2013), design studies, and education studies (Halverson and Sheridan, 2014; Peppler et al., 2016; Sheridan et al., 2014) and can also be seen with the founding of a dedicated online journal on the topic, the *Journal of Peer Production* (peerproduction.net), as well as numerous special issues (Hunsinger and Schrock, 2016; Richterich and Wenz, 2017; Söderberg and Delfanti, 2015). Such growth, seen in the majority of citations in this section coming from 2014 onwards, comes on the back of “a surge in cultures of making, from DIY, craft, and repair to hacking, 3D printing, digital fabrication, and electronic tinkering” (Toombs et al., 2014: n.p.), a surge which Barba (2015: 639) calls “the making moment”.

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<sup>16</sup> I will here leave aside popular accounts, such as those of Anderson (2012), Dougherty (2012) and Gershenfeld (2007), which often tend towards the polemical (Davies, 2017b).

Kohtala (2015) notes that this is a field largely characterised by a technocratic focus, stemming from fields such as “operations and production management, environmental management and/or design and engineering” (Ibid: 657; Ratto and Ree, 2012). This tends to “fetishize” tools, “seeing all problems as ones that technology can fix” (Smith and Light, 2017: 168). For example, Birtchnell and Urry (2013: 391) examine “whether and to what degree...a new socio-technical system might be emerging” around newly-accessible personal fabrication technologies such as 3D printing, a socio-technical system which “could mean that ships stacked with thousands of TEU<sup>17</sup> containers filled with consumer goods become a remnant of the relatively recent past” (p. 402; see also Birtchnell and Hoyle, 2014). Dickel et al. (2014: n.p.) note how “shared machine shops provide infrastructures for novel forms of collaboration,” “a protective space for potentially path-breaking innovations”, and that they “embody significant properties of a reflexive innovation society” (also Fleischmann et al., 2016).

There are number of issues with the broad statements issuing from this innovation- and technology-centred perspective. Firstly, it has ignored the preponderance and merging of both so-called ‘high’ and ‘low’ tech approaches, including traditional ‘crafts’ within such spaces, tending to prioritise the former over the latter (Kadish and Dulic, 2015). Secondly, this work tends to elide, or sanitise, the complex and often contradictory social life of these spaces. As Smith and Light (2017: 171) note, “beyond some abstract general features, makerspaces are not really a singular thing”, with “digital fabrication [articulating] very localized activity that requires in-depth study on the ground” (2013: 3). Thirdly, political questions tend to be written out of such accounts, in favour of a form of technological determinism. Such determinism sits poorly with the complex outcomes of “a wide set of practices that ultimately aim to give control over

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<sup>17</sup> A twenty-foot equivalent unit (TEU), which is a term used for what are commonly known as ‘shipping containers’.

sociotechnical systems to a broader group of people, effectively democratizing the tools and knowledge of technical production” (Barba, 2015: 639).

On the question of sustainability, Fleischmann et al. (2016: 115) note that the sustainability of community-based workshops remains to be adequately assessed (see also Olson, 2013) and that, rather than being beacons of sustainability, they may “lead to diminished (resource) scale efficiencies and intensify production and consumption through the possibility of continual, customized manufacturing and uncontrolled production.” Furthermore, the authors call for more research, noting that work on this front has been neglectful of the breadth and depth of environmental social science (see also Smith et al., 2013), being largely undertaken through economic, and often reductive, life-cycle assessments of technologies or manufactured items (Hielscher and Smith, 2014; see Gebler et al. [2014] and Kreiger and Pearce [2013] for examples).

Countering assertions that 3D printing could allow communities to reduce their reliance on global transport infrastructures, scholars note that the technologies held in maker spaces are no panacea, and often require the transportation of material feedstock<sup>18</sup> and building materials themselves (Olson, 2013; Fleischmann et al., 2016; Smith and Light, 2017). Olson (2013: 37) writes that while generalisations are impossible to make, given the varying uses and developing technologies, “so far personal 3-D printing is leaning more toward overproduction of throwaway goods than toward a new model of sustainable consumption”. However, moving away from narrow questions of material use, Nascimento (2014: n.p.) holds that the actual sustainability value of such labs “may reside in a clear re-thinking about the specific values, norms and relations...to be embedded in artifacts”.

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<sup>18</sup> Such as 3D printer filaments, acrylic plastics, MDF wood etc. It should be noted that such feedstock is mostly comprised of highly-refined materials, such as ABS and PLA plastics in the case of filaments, which are themselves energy-intensive to produce (albeit also widely recyclable).

Maxigas (2012), in a relatively early paper, attempted an historical genealogy of Hacklabs and Hackerspaces, arguing that they descend from two distinct lineages – the former coming predominantly from the autonomist and anarchist movements, and the latter descending from the digital hacker community. In reality, obtaining clarity in such matters is difficult. The current use of ‘Hacklab’ or ‘Hackerspace’ has become more or less interchangeable with other terms, such as ‘makerspaces’ and sometimes even Fab Labs (though the latter are a particular form of entity franchised from MIT). Smith (2014), in turn, finds historical parallels with Technology Networks, supported by the Greater London Council in the 1980s to encourage community-driven innovation and empowerment.

The democratization and grassroots politicization often held to inhere in the spaces of the maker movement has been described as ‘critical making’ (Ratto and Boler, 2014a; Kadish and Dulic, 2015) and touted as an important response to the top-down priorities of technocratic high-tech societies. Within this work, makers have been broadly defined as “those who tinker, fix, recreate or assemble objects and systems in creative and innovative directions, commonly adhering to the search for alternative and non-deterministic pathways to live in contemporary material worlds” (Nascimento and Pólvara, 2016: 3). Evident in such work is an idealism in the framing of the spaces. For example, Nascimento (2014: n.p.) elsewhere speaks of “far-reaching transformations in how we can conceptualize and act through technology”, describing maker communities as “vanguard agents in creating, experimenting, producing and distributing new technological solutions, and as such, leaders in generating disruptive innovations that largely affect scientific, economical, educational or government organizations, and ultimately, societal structures as a whole” (Nascimento and Pólvara, 2016: 2).

For Lindtner (2015: 871), such proclamations remain “a utopian vision rife with technological determinism that portrays software-enhanced machines as the harbingers of a third industrial revolution.” Troxler and Maxigas (2014: n.p.) similarly note that “shared machine shops figure as the occupied factories of peer

production theory – worker owned production units which often look like the perfect illustration of the revolutionary theory on first sight, yet on closer look exhibit all its contradictions.” It has been said that no two spaces are the same (Kostakis et al., 2015) and, while acknowledging the empowerment and community which are often evident in such spaces, Davies (2017a, 2017b) has picked up on several important contradictions, noting that there is a “multiplicity of accounts of what hacking is and can do and a jangling disconnect between certain public accounts of it and what appear to be the priorities and interests of “ordinary hackers”” (Davies, 2017a: 11).

In her 2017 book *Hackerspaces: Making the Maker Movement*, Davies notes the problematic gender relations endemic to many hacker and makerspaces, resulting in some women establishing women-only spaces (Nascimento, 2014; Toupin, 2014; Fleischmann et al., 2016). Rosner and Fox (2016) recount how the current preponderance of male-dominated spaces is shadowed and reinforced by histories of hacker and maker culture which tend to rely on mythologies of “middle-class, college-educated, and often male technologists” (p. 558) to the exclusion, for example, of feminist histories of women’s craftwork, and the crucial role played by women in early computing. In their report on a workshop on makerspaces and sustainable development, however, Smith and Light (2017: 167-168) note an awareness of this in the European makerspace community at least:

Ensuring inclusivity, diversity and building an open community was seen as central. Makerspace strengths rest in the encounters they create and the ensuing cross-fertilisation of ideas, knowledge and practices...There is scope for running makerspaces in ways that are more welcoming to groups that are poorly represented at present.

The spaces also have a contradictory relation to capitalism and the wider economy, often touted as both the next evolutionary phase of capitalism and the means of transcending capitalism, simultaneously. Davies (2017b) notes that while these are often touted as radical spaces of self-reliance, her interviewees “got



their supplies from big-box stores, paid rent to expensive inner-city landlords, and ordered cheap laser cutters from China” (p. 11). Irani (2015), furthermore, has studied ‘hackathons’ in India, noting that through their questionable technopolitics they contribute to the formation of a certain “entrepreneurial citizenship”. Söderbergh and Delfanti (2015: 794) highlight that “hacker practices and innovations are adopted, adapted, and repurposed by corporate and state institutions on a regular basis” and “made to serve other ends than the (emancipatory) ones claimed at the outset.”

To dwell solely on such critiques, however, could be to miss the point. As Davies (2017a: 12) recounts:

The hackers and makers we spoke to were almost uniformly passionate enthusiasts of the maker movement. They cared deeply about the success of their spaces and spoke about the ways that involvement in these spaces had changed their lives. They did not view hacking as a practice that was failing to live up to particular ideals; by and large, they had little interest in having abstract discussions with us about what hacking should be and what it was.

Davies goes on to describe the vast majority of what takes place in the maker spaces she studied as ‘serious leisure’, requiring “effort and perseverance” (p. 14) but resulting in significant fulfilment, drawing on seminal work by Stebbins (1982; Jackson, 2010). On this more day-to-day level, the ethnographic study of one particular space allowed Toombs et al. (2014) to identify the importance of social relations and identity in maker spaces. Elsewhere the same authors (Toombs et al., 2015) have identified the mundane community maintenance and ethics of mutual care which underlie much of the hyperbole around ‘maker spaces’.

To conclude, while human geography has seen a dearth of work on the topic, the growing social science literature on maker spaces to date has itself had a very particular and partial style and focus. When not focusing on technological, engineering or design issues, there is a tendency to emphasise something like a

general ‘hacker spirit’ (Davies, 2017b), ‘maker ethos’ (Nascimento and Pólvara, 2016) or ‘maker identity’ (Toombs et al., 2014), prioritizing the discursive over the experiential, and therefore giving only marginal consideration to the day-to-day operations, affects and (un)sustainable practices of particular spaces or lacking fine-grained accounts of particular tools and techniques. This opens a significant gap in the literature which I hope to address.

### 2.1.5 Concluding Remarks

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Serious thinking about our own personal place in the environment will inevitably involve thinking through craft.

Adamson (2007: 167)

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In the late 1990s, Greenhalgh (1997: 47) asked “what concept of craft can be developed to allow it to generate a philosophy and aesthetics for the next century?” This section has presented craft as a growing focus in the social sciences of the 21st century. Hard to define, yet risk-laden and emergent, craft entails a tacit resonance between maker and materials, human and object, an encounter between this hybrid being called a human, and non-human/material agencies.

Historically, Western scholarship has attempted to draw lines in the sand between practice and theory, art and technology, maker and user (Sennett, 2008). As Ingold (2012) and others have exhaustively shown, however, making is a process of constituting things from the threads of life, not simply a technique of imposing form on matter. It is the complexity of this encounter which makes craft such a fruitful and ever-changing topic of research.

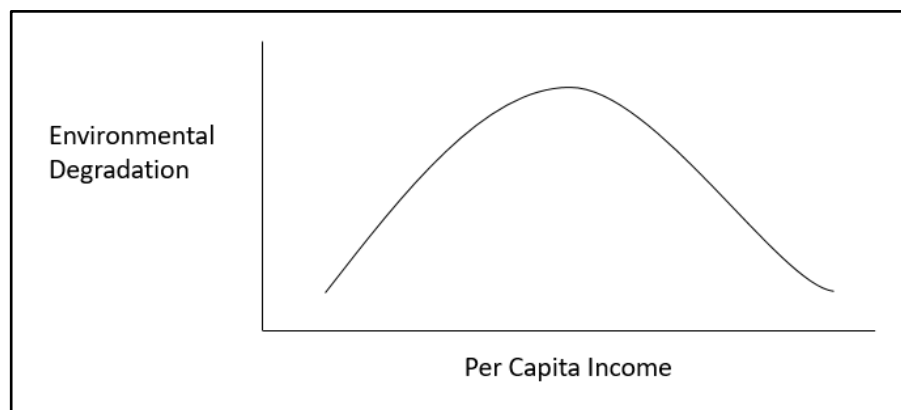
## 2.2 Sustainability and the Double Dividend: A Practice-Based Approach

Moving to discussions of sustainability, our distance from an ecologically-appropriate existence is underlined by the fact that political and economic life remains centred around one classic, mono-dimensional measurement: Gross Domestic Product (GDP), a measure of all the goods and services produced within the borders of a certain economy. This was seen, for example, in the focus on growth in the Brundtland report, which held it to be “essential that global economic growth be revitalized” (World Commission on Environment and Development, 1987: 89). While alternative grounds of development have been proposed, the economic growth-based standard of development remains dominant (Borowy and Schmelzer, 2017; Pickerill and Maxey, 2009), in spite of Simon Kuznets, one of the lead codifiers of the GDP metric in 1937, warning that it could be subject to “illusion and resulting abuse” (quoted in Caradonna, 2014: 129).

The centrality of GDP has had numerous historical rationalisations, which have been central to a hegemonic conception of sustainable development as ‘ecological modernisation’ (Pickerill and Maxey, 2009). Two of these relate directly to wellbeing and sustainability, respectively. First, there was the concept in orthodox economic thought that the ‘rising tide’ of growth would ‘lift all boats’, that is, that gross economic growth would trickle down to an entire population, increasing wealth, prosperity, and flourishing for all, including the poorest in society (Costanza et al., 2013: 127; Hopwood et al., 2005). However, the growth of recent decades has resulted in unprecedented global inequality, with the world's 85 richest people now estimated to be as wealthy as the poorest 3.5 billion (Wearden, 2014). As Hopwood et al. (2005: 49) put it, wealth, “unlike water, is rushing uphill.”

The second influential hypothesis with regard to GDP growth is visually portrayed in the environmental Kuznets curve (EKC) (Figure 1), which posits that a society's

environmental impact takes an inverted-U shape, first rising as a country 'develops' (i.e. its GDP rises), and then levelling off, before falling as a certain level of wealth is attained (Næss and Høyer, 2009). The theory behind the curve's trajectory is that only through economic development can societies afford to be concerned about the environment and thus, "rather than being a threat to the environment...economic growth would be the means to eventual environmental improvement" (Stern, 2004: 1419). Such is the logic, for example, underpinning *Our Common Future*, while the EKC was also adopted as a framework by the World Bank in the 1990s (Borowy and Schmelzer, 2017). However, a widely-cited paper on the topic, by Stern (2004), concludes that there is little evidence that this relationship between gross income and reduced environmental degradation holds, while others note the presence of, at best, relative decoupling (Borowy and Schmelzer, 2017; Schandl et al., 2017). Deb (2009: 96-97) concludes that "energy, land and resource use do not fall with rising income" and dismisses the EKC as a "chimera".



**Figure 1: Environmental Kuznets Curve. Source: The Author**

Given the link between growth and socio-environmental pathologies, the key question thus becomes: What should sustainable development sustain, if not growth (Foster, 1996; Redclift, 2005) or, in the words of Amartya Sen (2013: 9), "what rival conceptions to sustainable development may be worth considering?" Constanza et al. (2013: 128) for their part have sought to redefine development as "the improvement of sustainable human well-being, not merely improvement in

material consumption.” So too has Tim Jackson (2011: 2) prominently called for ‘prosperity without growth’, arguing that “in pursuit of the good life today, we are systematically eroding the basis for well-being tomorrow.” Jackson (2005) has instead proposed that what he terms a “double dividend” may be possible, a win-win situation in which sustainability and wellbeing are obtained simultaneously, rather than being diametrically opposed:

This is not, in any sense, a simple task, nor one that can easily be pursued by any given individual or set of individuals. On the contrary, it is a fundamentally social and cultural project, which will require sophisticated policy interventions at many different levels. Nonetheless, it remains a very real possibility that we could collectively devise a society in which it is possible to live better (or at least as well as we have done) by consuming less, and become more human in the process. (p. 32).

In the sections which follow, I shall flesh out some of the dynamics of the “social and cultural” project of the double dividend, written about by Jackson, beginning with critiques of how transitions towards these new forms of living have been theorised up to now. If the resulting paradigm of sustainable development is failing to slow environmental destruction (Moore, 2015; Caradonna, 2014) and is also faltering in the provision of human wellbeing, then what alternatives exist? Further, what role can certain spaces – in this case maker spaces – play in such a transition towards a society which is both more sustainable and fosters ‘wellbeing’, however understood?

### 2.2.1 Social Practice and Pro-Environmental Social Change

In an influential paper, Elizabeth Shove (2010) criticised what she saw as a one-model-fits-all emphasis on individualistic, cognitivistic and behavioural approaches in contemporary environmental policy debates, usually drawing on “the dominant paradigms of economics and psychology” (p. 1274).<sup>19</sup> Shove

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<sup>19</sup> While her focus tends to narrow down to climate change, the point maps onto other environmental challenges which are all-too-often ignored in this literature.

identified the core element of this dominant approach – “which locates citizens as consumers and decision makers and which positions governments and other institutions as enablers whose role is to induce people to make pro-environmental decisions for themselves” – to be the ABC model: that is, focusing on cultivating better *Attitudes*, leading to improved *Behaviour* and more sustainable *Choices*.

Policy in the realm of sustainability often assumes that the primary problem to be faced is that individuals lack sufficient information to act to protect the environment, or are inadequately incentivised to do so. Thus the field is “dominated by efforts to nudge behaviour, modify attitudes and encourage individuals to make better, greener choices” (Shove, 2014: 415). While pro-environmental activists and campaigners run awareness campaigns to educate the populace, or policy bodies publish reports with titles such as *Changing Behaviour Through Policy Making* or *Motivating Sustainable Consumption*, such work, for Shove (2010), reinforces problematic assumptions by falling back on a specific model of the human-as-agent; that is, viewing society as constituted by ‘citizen consumers’ or individualistic actors. Sen (2013: 7) notes, for example, that the Brundtland Report, contained a conception of humanity which assumed people as ‘consumers’ or as simply ‘people with needs’, while Moloney and Strengers (2014: 95) similarly note how the caricature of a ‘citizen consumer’ implied in policy “fits within the dominant ideology of neo-liberalism (and within the broader goals of capitalism).”

Shove’s conceptual move is to draw on a genealogy of practice theorists to emphasise the important role of less discursive, and more mundane, everyday behaviours in causing environmental degradation (Duguid, 2005; Meyer and Kersten, 2016). Shove et al. (2012: 3) note that in theories of practice “the greater part of the processes at stake do not lie within the realm of discursive consciousness”, and draw on the work of pragmatists like William James and John Dewey who accorded great importance to “embodied skills and know-how and the contention that experience is best understood not as an outcome of events

and intentional actions, but as an ongoing process or flow in which habits and routines are continually challenged and transformed” (p. 5; see also Duguid, 2005).

Practices, as Reckwitz (2017: 115) notes, “are anchored in the bodies of individuals and act through them.” In a widely-cited definition, he elaborates that a practice “is a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge” (Reckwitz, 2002: 249).

Brown and Duguid (2001: 203) note the “ambiguity” of the term practice, signifying “both work itself (the practice of a medical practitioner, for example), and rote tasks or exercises designed to help learn to work (as in piano practice)”. As such, an important distinction exists in the literature between ‘practices-as-entities’ (practices of cookery, say) and ‘practices-as-performance’ (instances of piano practice, say) (Røpke, 2009). There is an iterative relation between these two terms, with practice-as-performance referring to the situated and specific ‘doing’ of a practice (the topic of Chapter 4), and practice-as-entity (the topic of Chapter 5) referring to more collective (and often historical) notions of practices as a “set of interconnected heterogeneous elements”.

Shove and colleagues (Shove et al., 2012) have simplified Reckwitz’s diverse ‘elements’, quoted above, into three major ‘elements of practice’: materials, meanings and competences. Materials, here, comprise “things, technologies, tangible physical entities, and the stuff of which objects are made”, meanings relates to “symbolic meanings, ideas and aspirations”, while competence “encompasses skill, know-how and technique” (p. 14). For its parsimonious simplicity, it is this tripartite categorisation of practice elements which shall be used when discussing the social practices of community workshops in Chapter 5.

Instead of persuading individuals to change their behaviour, one by one, practice theorists advocate for a more emergent, nonlinear, polycentric and complex vision of how pro-environmental behaviour change comes about, emphasising the emergence and decline of various social practices (Maller and Strengers, 2015; Shove and Walker, 2010). For instance, Shove (2014: 426) calls for the “building [of] networks and coalitions and constructing partnerships that make the conditions of sustainable practice possible”, with the practical consequences of such an intervention “likely to be unstable and unpredictable in that the practices they seek to shape are subject to ongoing reproduction/transformation” (p. 427). Regarding this instability, she notes (2010: 1278) that “these are not processes over which any one set of actors has control”. Instead:

transitions toward sustainability do not depend on policy makers persuading individuals to make sacrifices, specified with reference to taken-for-granted benchmarks of normal non-sacrifice; or on increasing the efficiency with which current standards are met. Instead, relevant societal innovation is that in which contemporary rules of the game are eroded; in which the status quo is called into question; and in which more sustainable regimes of technologies, routines, forms of know how, conventions, markets and expectations take hold across all domains of daily life. (Ibid.)

For Kurz et al. (2015: 122), the social practice literature posits three primary routes towards intervening in, and altering, unsustainable practices. Firstly, policy makers or other interested parties “could strive to reconfigure practice elements such that less sustainable elements...become systematically less prominent and alternative, more sustainable, elements are promoted”. Secondly, “a practice orientation encourages policy makers to consider whether one might seek to influence one practice by targeting adjacent practices”. Finally, “policy makers might seek to reconfigure social connections and networks through which practices circulate and develop”. The latter entails recognising the role of communities of practice, which, to take their examples, “might include groups of cyclists in a workplace sharing tips to make their commute safer, more efficient and enjoyable, or



participants in a local organic vegetable box scheme exchanging recipes according to which produce is plentiful each month". All of these 'interventions', speak to Schatzki's (2012) temporally-emergent notion of prefiguration, whereby material arrangements, infrastructures and other practice elements prefigure and influence the subsequent performance of practices.

The implication of conceptualising sustainable development in this more distributed manner is that achieving sustainability and wellbeing will be a multi-faceted, temporally- and spatially-diffuse process which involves more than externally-imposed environmental management, regulation, holding better attitudes or making better choices. Much of the formative literature in what has come to be called 'Social Practice Theory' (SPT) has focused on domestic behaviours within households, such as cooking and showering, or, less often, behaviours in the workplace, such as energy consumption practices around air conditioning. Therefore, though Shove (2017: 159) states that many practices "involve making, repairing, adapting or somehow intervening in the lives and flows of things", this thesis constitutes the first examination of practice theory at the level of shared workshop and community space.

### 2.2.2 Social Practice & Environmental Skill

Just as the *Manifesto for the New Materialism* held that the response often put forward to destructive consumerism is to withdraw from the world of things, or become ascetic, so too is much environmental and sustainable development policy and practice in the ABC model framed in a way which appears to try to separate the social/cultural and natural spheres, encouraging a duality between destructive humans 'in here' and a nature 'out there' which is in need of protecting. This dualism is seen in the focus of much environmental policy on negative 'harm reduction' or control and management, whether reducing certain 'impacts' (such as pollution or carbon emissions), say, or in evaluating measurements such as environmental 'footprints'. Policy in this vein is formulated

as if the environment were something quantifiable and apart from us, which we then harm or ‘impact on’ (Rip, 2006).

This approach has largely proved inadequate in provoking any serious transitions towards more sustainable trajectories. As we have already seen, practice theory provides one possible alternative to such dualism, particularly relevant to this thesis in the more recent emphasis of practice scholars on embodied and posthuman/hybrid aspects of practices (Maller, 2015), for example as developed in Maller and Strengers’ (2015) work on practice memory, inspired by related ideas around ‘muscle memory’, Royston’s (2014) work on skilled management of energy use in the home, Watson and Shove’s (2008) examination of competence and more-than-human elements of DIY, and Gherardi’s (2017: 47) work on following “objects and their becomings with humans” in the “entanglement of sociomaterial practices”.

Coeckelbergh (2015) has also critiqued the manner in which this *culture/nature* or *human/environment* duality is doubly reinforced in much environmental thought. His philosophical work instead tries to work towards “a new environmental ethics, which shifts from a modern approach focusing on “nature” (external and internal) and recommending self-control, a strong will, independent thinking, liberation, purity, knowledge (know-that), rationality, feeling, naturalness, and authenticity, to a non-modern, more relational approach that starts with recognising our ‘being-in-the-world’ and which recommends skilled engagement with the environment” (p. 201).

Coeckelbergh’s primary goal is to examine, and overcome, a classic conundrum in the environmental behaviour change literature: the disparity often found to exist between a person’s knowledge of environmental issues and their propensity to act on those issues – a disparity that confounds ABC-type interventions. This is the so-called value-action gap (Whitmarsh et al., 2011), which means, as Coeckelbergh summarises it, that “when it really comes to doing things differently and to *living* differently, even those who are sympathetic to green thinking fail to make changes

to their lives or limit their efforts to cosmetic “lifestyle” changes” (see also Evans [2014]).<sup>20</sup> Coeckelbergh, like the social practice theorists (see Shove, 2010), notes that the value-action gap is only mystifying if we assume that cognitive values and propositional knowledge *should* lead to more environmentally-benign behaviours and denies that pro-environmental behaviour change can be reduced to learning and acting on information in this manner. In order to overcome this misconception, he says, an appreciation of ‘know-how’ – a topic which has been largely neglected in the environmental social science literature (Royston, 2014) – must instead be brought into play. This would highlight the importance of skilled activity in everyday life, with its requisite emphasis on embodied, pre-discursive and habitual knowledge. “The problem with the gap between knowledge and action,” he states (p. 200), “was that, as moderns, we understood “knowledge” as knowing-that to the exclusion of knowing-how.” Indeed, Brown and Duguid (2001: 204) posit a reverse causality, that “only by first spreading the practice in relation to which the explicit makes sense is the circulation of explicit knowledge worthwhile. Knowledge, in short, runs on rails laid by practice.”

A growing literature posits that a shift away from an emphasis on ‘knowing that’ environmental problems exist, to much more practical and embodied ‘know how’, *could* allow us to move towards a more sensitive, active and skilful engagement with the environment, foregrounding processes which “are sensory, situated and relational, and also temporally complex” (Royston, 2014: 155). This emphasis on practical experience accords with Maiteny’s (2002: 303) assertion that “the less experiential and more individualistic is the sense of connectedness with the environment, the more tenuous or fragile seems to be the commitment to behaviour change.”

Coeckelbergh is not alone in working towards this explicitly non-modern, non-dualistic understanding of the cultivation of pro-environmental practices in

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<sup>20</sup> In fact, Coeckelbergh cites research which purports to show that exhorting people to be more environmentally virtuous in their attitudes and behaviours can indeed have the opposite effect, as people shun being dictated to.

society. Steven Vogel (2015) makes a remarkably similar move<sup>21</sup>. He begins by examining the many inconsistencies in contemporary uses of terms such as nature and wilderness, and explores what reality, if any, is to be found in the designations between the natural and the artificial. Vogel draws a crucial distinction, however, between his *postnatural* environmental philosophy and past accounts of nature labelled ‘social constructionist,’ such as influential and widely-cited work by William Cronon (1996). Vogel claims that Cronon and colleagues made the anthropocentric error of flirting with idealism by ‘confusing epistemological issues with ontological ones’ (p. 35). That is, while social constructionists showed that the *idea* of nature is constructed culturally, their arguments quickly become a form of idealism when discussing actual, material “nature”. Formulating an argument very close to that of the new materialists, and drawing on work from the philosopher of science Ian Hacking, Vogel states that:

The confusion of ontological with epistemological questions is characteristic of a modernist or Western reason that systematically mistakes itself for the world, unable to acknowledge the difference between its own conception of things and the things themselves. (p. 35)

Rather than abandoning social constructionism entirely, Vogel explores what a more coherent use of that phrase might be, and builds a formidable case for a more literal social construction of nature, through *practice*. Coming full circle with theories of social practice, he holds that dualistic tendencies in contemporary thought work to underplay the extent to which our environment is built:

The interest of a postnaturalist environmental philosophy in “social constructionism” would then mean this: an interest in the social processes through which the actual environment we currently inhabit – which is above all a built one – came to be built (constructed)...Indeed, one might argue that the environments human beings inhabit are *all* built ones: building an environment, which is to say transforming the world around them through their

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<sup>21</sup> Meyer and Kersten (2016) also link Vogel’s work with new materialism and social practice theory in their vision of an environmentalism of ‘everyday life’.

practices, is what human beings do (“by nature,” so to speak). And they do it socially: the transformative practices through which humans construct the environments they inhabit are themselves socially organized ones, by which I mean that they are normatively and intersubjectively structured. (p. 43)

Here, we can see fruitful parallels emerging with the ideas put forward in Simms and Potts’ *Manifesto for New Materialism*. Rather than the usual proposition of humanity as alienated from ‘nature’ per se, Vogel notes instead that our species is alienated, to a lesser or greater extent, *from their environment*, for instance by mechanisms such as the market economy. In the latter case, those living in market economies tend to take their surroundings as a fetishized given and, through this fetishization, remain neither able to see its construction, nor able to care for it.

Vogel, as we have already seen from the previous quote, discusses the thorough sociality of our environment (everything from urban spaces to global climate change); that is, its construction through practices, and speculates on how we can engage in a project of what he calls ‘democratic environmentalism,’ constructing our environment in a more participatory manner, more ‘carefully, humbly, self-consciously’ (p. 232). The fundamental question for environmentalists, summarizes Vogel, is this:

What kind of world would be the best for us—and not just us, but also the many creatures, animate and not, with whom we share it—so that all of our lives can be flourishing ones, and the world we inhabit can be as beautiful as possible? (p. 237)

Just as Shove maintains that there are no quick fixes or technological solutions, so do Vogel and Coeckelbergh decline to present easy solutions. Instead, as Coeckelbergh (2015: 208-209) holds, “developing environmental skill and conviviality is a process of trial and error, of experiment; there is no final design, no blueprint, no original state of nature that can save us”. What we do need is “the ethical-environmental knowledge that emerges from skilled engagement

with the environment, from environmental *habitus*, from our involvement as environmental beings in natural-social practices, in embodied and materially and culturally mediated activities. If we have *that* kind of knowledge...we can bridge the gap between knowledge and action; in skilled activity, we are already moved and “internally” motivated.”

Vogel and Coeckelbergh show faith that through skilled engagement with the environment and the building of democratic community, we could not only build more humane environments – environments conducive to human flourishing – but also pursue many of the more traditional projects of environmentalism: the project of protecting green spaces, or species at risk, or, indeed, landscapes which humans have had little role in constructing. Writing from a philosophical angle, they can be forgiven for not exploring in more detail the practicalities and specificities of this question. However, as practice is inherently social (Duguid, 2005), and as this thesis deals with particular forms of ‘community’ spaces, I now discuss literature from the social sciences discussing the notion of ‘community’ as it relates to this bringing about of pro-environmental practices.

### 2.2.3 Community Practices of Sustainability

In spite of the nonanthropocentric thesis otherwise driving Vogel’s work, the community which he holds as being crucial to the formation of democratic, sustainable *environments* has strictly Habermasian connotations, being deliberative and humanistic in nature. That is, he focuses on decisions made amongst articulate people, presumably adults, on a level playing field. I will instead explore practical notions of community such as those envisioned in the work of the Pragmatist John Dewey, and in literatures on communities of practice. Moving away from communities of propositional knowledge, Coeckelbergh (2015: 174) has drawn on Dewey to envision “a collective process of trial and error through which people become more environmentally skilled, [and] through which a “community of skill” emerges that has its own bottom-up discipline and organisation”.

Recent explorations of Deweyan local associations and local participatory democracy shed further light on the possible value of such community-based processes. Much as Vogel maintains that our environment is alienated from us, so did Dewey believe that the trajectory of Western societies left the individual unable “to discern the social forces that affect his/her life” (Kosnoski, 2005: 197). Through the market economy, industrialisation, and the spatial distribution of production, amongst other means, society “renders differentiated and specialized groups of citizens unable to discern the impact they have upon each other” (p. 198). As a counterweight to this fragmentation, Kosnoski therefore places Dewey’s thought in conversation with more contemporary thinkers, such as Robert Putnam, who “focus on the aesthetic character of the social entities individuals experience in their everyday life, such as voluntary associations, commodity exchanges, and workplaces” (p. 203). Dewey’s concern, for Kosnoski, was that “the construction of associations would assist the individual in locating himself/herself in fragmented society and therefore realizing the public implications of his/her seemingly isolated actions” (p. 193).

Dewey’s interest in the role of community foreshadowed a more recent focus on the role, and potential importance, of community involvement in transitions to more sustainable societies (Middlemiss, 2011; Middlemiss and Parrish, 2010). Work in this area from across human geography and cognate disciplines has focused on community renewable energy (Walker et al., 2007), Transition Towns (North and Longhurst, 2013), local food movements (Hayes-Conroy and Martin, 2010), local currencies (North, 1999) and sustainable housing (Pickerill and Maxey, 2009; Seyfang, 2010), to name just a few examples. This shift in emphasis is also evident beyond the academic realm. For example, while the seriousness of a centralised government’s statements espousing the importance of community should be taken with scepticism, the role of community was highlighted in a government policy paper by the UK’s (now defunct) Department of Energy and Climate Change (DECC), noting:

[Community groups] have the freedom to develop creative solutions that meet local needs, offering important learning that might be scaled up across the country. ...communities are often able to mobilize and engage people more effectively than Government (quoted in Evans, 2014: 306; see also Whitmarsh et al., 2011).

In an influential paper, Walker (2011: 777) notes that such statements are emblematic of an increased prevalence of various notions of community in “carbon-related discourse, viewed as positive, productive and contributing to the successful implementation and social embedding of various forms of carbon reduction activity” (cf. Hobson et al., 2016). He taxonomizes six diverse, yet interconnected, meanings which the term ‘community’ has generally held<sup>22</sup>, noting that the term’s use in the environmental social science literature often encapsulates a range of such meanings simultaneously (see also Aiken, 2016).

Aside from divergent uses of the term, a number of authors have noted the lack of a firm evidence base with regard to the efficacy of community-oriented environmental initiatives (Reeves et al., 2014). One attempt to address this lack of evidence, however, has been a broad literature on ‘grassroots innovations’, launched with a paper by Seyfang and Smith (2007; see also Smith et al., 2016), which examines the role of community-based niche innovations, such as alternative food networks, community energy projects, low-impact developments, local currencies and Transition Towns, to play a role in more systems-wide socio-technical transitions for sustainability (Seyfang and Longhurst, 2013). The possible strength of grassroots innovations is explained by Smith and Stirling (2016: 16):

In many respects grassroots innovators are unencumbered by the demands of investors, policy silos, institutional logics or disciplinary boundaries that pervade conventional innovation settings. The grassroots is at greater liberty to explore different values and visions. These can be

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<sup>22</sup> These are ‘community as actor’, ‘community as scale’, ‘community as place’, ‘community as network’, ‘community as process’ and ‘community as identity’.



neglected or marginalised concerns, (such as seeking more creative or meaningful work), or environmentally sustainable practices (like organic food production), or more localised production and consumption (like a makerspace)...

Generalising about 'niche' innovations in this field of study has, however, itself been critiqued by Aiken (2015: 768) for robbing community initiatives of much of their "social and spatial particularity", often situating them as innovations located solely in relation to larger, hierarchical conceptions of "landscape and regime forces".

Furthermore, while often taken as unalloyed goods, terms such as 'community' and 'collective action', can be exclusionary, marginalizing, or can be used to serve other unsavoury ends (Brown and Duguid, 2001; Hobson et al., 2016). Walker (2011) notes this more complex side to community initiatives. For example, while appearing inclusive "communities can also be deeply exclusionary, marginalizing those who are seen as not fitting. Places and communities are not synonymous — there can rather be multiple overlapping and sometimes conflicting communities within a place. Communities can be transient and dynamic, fracturing as events unfold and relationships evolve" (p. 778).

For some, furthermore, a focus on community is seen as a retreat from bigger, 'universal' questions of emancipatory projects across borders (North, 2010; see also Anderson, 2017). Aiken's (2014, 2015, 2016) examination of the Scottish Government's Climate Challenge Fund, and particularly Carbon Conversations and Transition Towns initiatives, has demonstrated the possibility of co-option of 'community' as a site of response to global issues, through a form of neoliberal governmentality:

Community in [these] examples...is not a site removed or free from state power and state effects, but is a key site where the state can be seen to act; in this case through the local elisions of community, and the delegation of

responsibility and (rhetoric of) agency to individuals for their carbon lives. (2015: 777)

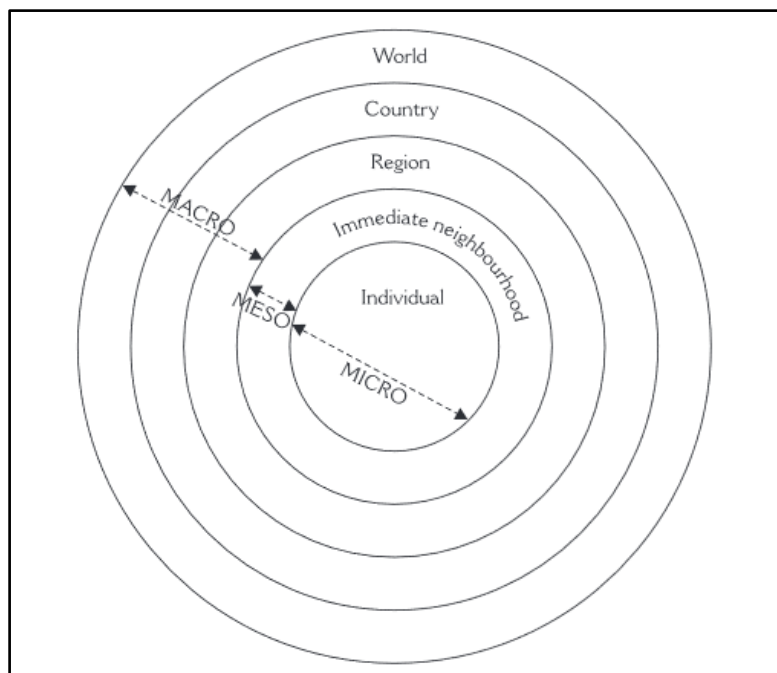
More supportively, however, North (2010: 586) has written that, in spite of these complexities and potential weaknesses, community initiatives “are developing radical new conceptions of livelihood and economy that directly cut against the logic of growth-based capitalist economic strategies and elite conceptualisations that ‘we all know’ that trade liberalisation leads to wealth while barriers limit growth” (See also North, 1999; North and Longhurst, 2013). Other scholars have noted the potential power of linking diverse distributed community projects and processes (Pickerill and Chatterton, 2006). Indeed, communities can be seen as particularly effective in achieving such goals, as they “have emergent properties that, while they are no doubt the outcome of individual actions, amount to more than the sum of those actions” (Duguid, 2005: 115).

### 2.2.4 Communities of Practice

Geographers have examined these ‘emergent properties’, not simply in terms of discussing autonomous and ecological communities (Chatterton and Pickerill, 2010; Woodward et al., 2012), but also having dealt conceptually with related notions such as communities of place, communities of practice, networks of practice, and questions of ‘belonging’ in the various spaces of social life (Richardson, 2016b). Evident in this literature is a sense that the vision of community as a bounded local scale is giving way to more complex visions in which the local and the global are meshed together in a variety of specific ways (Amin and Roberts, 2008).

Amin and Roberts (ibid: 366) draw on actor-network approaches to note that “what determines the texture of ties or trust is not spatial proximity, but the nature of contact, intermediation, and communicative complexity involving groups of actors and entities.” Reid et al. (2010) speak to the interstitial status of community workshops in this thesis, noting the importance of a scalar analysis at the ‘meso level’, to balance the usual focus on macro (e.g. regional and national)

and micro (individual) processes. This ‘meso’ scale of analysis, perhaps portrayed simplistically in Figure 2, “can be defined as communities of interest akin to ‘the local’, identifiable by heterogeneity, collective interest and shared social identity” (p. 317) and allows appreciation for emergent, irreducible aspects of social life, as well as the existence of ‘common property’ and shared goods. These factors are of crucial importance when taking community workshop spaces as the object of research.



**Figure 2: Conceptualisation of community types and interactions. Source: Reid et al. (2010)**

Of particular relevance is the ‘communities of practice’ literature, instigated by the seminal work of Lave and Wenger (1991), and examining “the shared use of space, tools, and materials; shifting teaching and learning arrangements; individual and collective goals; and emergent documentation of rules, protocols, and processes for participation and action” (Sheridan et al., 2014: 509). Indeed, Lave and Wenger’s work on communities of practice drew from craft or task-based ethnographies, in particular, examining the disparate activities of Yucatec midwives, Vai and Gola tailors, naval quartermasters, and meat cutters, to highlight how embedded craft knowledge requires the cultivation of “experience,

tacit knowing, embodied know-how, continuous learning and (kin)aesthetic awareness” (Amin and Roberts, 2008: 358).

In spite of the critique by Amin and Roberts that the term ‘community of practice’ has itself become imprecise and overused, its use in relation to the spaces of this thesis seems apt, particularly in discussing “face-to-face interaction between members working in close proximity to one another, in which identity formation through participation and the negotiation of meaning are central to learning and knowledge generation” (Ibid: 355). The face-to-face is only one part of the story of communities of practice, however, with Duguid (2005: 113) articulating broader “networks of practice” – the sharing of practice among practitioners who may not come into direct contact with one another – a term which maps onto cross-community learning through blogs, online tutorials, wikis and other means which are relevant in the case of contemporary groups.

Geographers and other social scientists with an interest in practice have also noted the crucial role which communities of practice might play, with Shove et al. (2012: 161) noting that, when moving away from individualistic approaches to sustainability, “policy makers would do better to study the changing contours of specific ‘communities of practice’ as conceptualized by Lave and Wenger....as part of a deliberate strategy to reconfigure the character and the distribution of the elements of which more sustainable practices *could be* made, and in seeking to break the ties that hold other less sustainable arrangements in place.”

Everts et al. (2011: 331) have written of the importance of geography in answering questions such as “How do new practitioners enter the community, how do they get ‘skilled’ and how ‘skilful’ are they, and finally, how do some eventually ‘forget’ to perform the practice defining and maintaining the community?” in terms of “[looking] into the various vehicles and attachments that connect the sites and entities engaged in the practice in question.” How these sites connect and are maintained brings us to one final body of work in human geography relating to community, communities of practice and sustainability transitions. This is the

literature on ‘diverse economies’ which draws practice-oriented research away from supposed ‘everyday practices’ of the home, to which they have arguably been too wedded, to examine alternative niche communities and their daily performance (Pickerill, 2015).

### 2.2.5 Diverse Economies

Distinct from the grassroots innovations literature, geography has seen a blossoming of work on ‘community economies’ and ‘diverse economies’, influentially outlined by J.K. Gibson-Graham (1996). This draws on feminist, prefigurative, and poststructuralist anti-capitalist critiques of a hegemonic Marxist strain of geographical thought, describing the latter as ‘capitalocentric’ for locating capitalism as the locus of analysis around which all else turns. Proposing instead an examination of more diverse community economies, Gibson-Graham (2008b: 623) align their work with scholars such as Don Mitchell and Doreen Massey who, they say, give:

“insights into research agendas that open up when we abandon the ontological privileging of systemic or structural determination. Their work does not suggest that we can remake the world easily or without significant resistance. We cannot ignore the power of past discourses and their materialization in durable technologies, infrastructures and behaviors...But we can choose to create new discourses and counter-technologies of economy and construct strategic forms of interplace solidarity, bringing to the fore ways to make other worlds possible.”

A core tenet of the diverse economies perspective stems from feminist perspectives on work and the economy, highlighting that wage labour – the dominant focus of much Marxist thought – comprises just the tip of an iceberg of forms of social reproduction, which ranges from nonmarket gifts, to volunteer work, and co-operative forms of production (Figure 3).

## Material Geographies of the Maker Movement



**Figure 3: Community Economy Iceberg. Artist: James Langdon**

This awareness of the need to acknowledge (community-based) alternatives has important implications for how our environment is constructed. Gibson-Graham (2008a: 38) note that, all-too-often, representations of various kinds “portray the market as singular, mysterious, normal, lawful, imbued with expansive authority and force. Yet, as we examine the diversity of markets...we see how they are constructed, protected, played with, manipulated, bounded, undermined, institutionalized, deinstitutionalized, personalized, niched, and so on” (see also Pickerill and Chatterton, 2006).

There is a choice to be made, they continue elsewhere (Gibson-Graham et al., 2016: 706), “as to whether the capitalist economy is represented as a force of nature or as a precarious assemblage of powers, practices, technologies and discourses that must be continually reconfigured and performed.” Through this focus on the assemblages of practice, a rich symbiosis appears possible between thinking through transitions in social practice – which all-too-often gives the

semblance of being apolitical (Chatterton, 2016) – with the politically-engaged post-capitalist and post-structuralist imaginaries of diverse economies.

### 2.2.6 Concluding Remarks

In this section, I have examined literature relating to the emergence of more sustainable social practices, exploring how communities of practice can (or cannot) play a role in creating more ecological and humane environments. Next, I explore the other side of the double dividend; that is, how do communities (of practice or otherwise) and skilled activity relate to social flourishing? This is the move from examining the ‘good environmental life’, to the related question of the ‘environmental good life’. I will examine how wellbeing has been understood, both in terms of sustainable development and in the wellbeing literature more broadly, and how this understanding might change given recent developments in social theory.

## 2.3 Wellbeing and Sustainable Development

The social sciences have been in the midst of a “happiness turn”, posits feminist scholar Sara Ahmed (2010: 2). An already-vast and multi-disciplinary literature has continued to expand since the turn of the millennium, gaining dedicated journals, including the *International Journal of Wellbeing* and the *Journal of Happiness Studies*. Amongst government bodies, independent think-tanks and the public, a high profile interest in operationalising happiness and wellbeing research has also been widely evident (Eckersley, 2008; Costanza et al., 2014; Frey and Gallus, 2016). Perhaps most famously, the Kingdom of Bhutan mobilised the aspirational concept of Gross National Happiness at a relatively early stage (Priesner, 2004; Zurick, 2006) while, more recently, France saw the release of the *Report of the Commission on the Measurement of Economic Performance*, led by Joseph Stiglitz and titled, *Mismeasuring Our Lives* (Deneulin and McGregor, 2010; David et al., 2013; Scott, 2015).

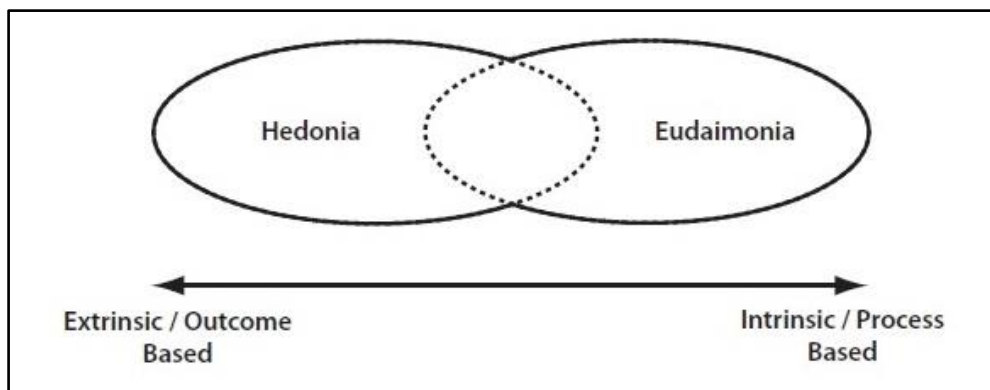
As already introduced in Section 2.2 above, these initiatives have been proposed largely in recognition of the inadequacies of the previous measurement of social development, by proxy, generally in the form of Gross Domestic Product (Scott, 2012; Clark, 2005; White, 2016). Critics of the use of GDP argue that, at best, it is a means, not an end, to human flourishing and wellbeing (although, as we saw above, even its role as a means looks dubious). For example, theorists of the capabilities approach (Nussbaum and Sen, 1993; Sen, 1999, 2013; Clark, 2005) posit capabilities, or the freedoms and capacities people have to live a fulfilling life, as a more valid end of development than monetary gain. Alternative and green economics have also played a vital role in the formulation of such criticisms, arguing that the imperative for economic growth, built into the foundations of capitalist economies, simultaneously undermines ecological sustainability and wellbeing (Schumacher, 1993; Daly, 1996; Cato, 2009; Næss and Høyer, 2009).

Taking the findings of current research on wellbeing at face value, a much-debated empirical 'paradox of affluence' is held to exist, also known as the Easterlin Paradox (Easterlin et al., 2010; Conradson, 2012; O'Neill, 2016), whereby micro-level cross-sectional studies generally show a modestly positive relationship between happiness and income, while long-term macro time-series (of around 10 or more years) show no relationship between happiness and income. That finding is compounded by Max-Neef's so-called Threshold Hypothesis (Jackson, 2011; Max-Neef, 1995), which purports to show that while increases in income may have a positive effect on the subjective wellbeing of people who are very poor in economic terms, after a certain low threshold, material wealth results in little or no greater subjective happiness (Eckersley, 2008). Inequality within societies may indeed be a larger influence on life satisfaction, with peer comparisons and rank in the income distribution sometimes being a greater correlational factor than income (Eckersley, 2008; Kahneman and Krueger, 2006).

In this increasingly active research environment, debates around wellbeing have predominantly revolved around the historically-significant philosophical



distinction between hedonic and eudaimonic approaches, with the former equating wellbeing with happiness, while the latter emphasises broader notions of human flourishing and life satisfaction over time (Deci and Ryan, 2008). Usually traced back to the classical Greek philosophies of Aristippus of Cyrene and Aristotle, respectively, hedonic and eudaimonic philosophies have given rise to distinct but overlapping paradigms of present-day empirical enquiry (Carlisle et al., 2009: 1557; Waterman, 1993; Figure 4)



**Figure 4: Schema of conventional hedonic and eudaimonic paradigms in wellbeing research**

The hedonic perspective posits that only that which can be deemed pleasant or has pleasant consequences is intrinsically good (Delle Fave, 2013b). Foreshadowing utilitarian approaches in more contemporary scholarship, for example, Aristippus of Cyrene held that “pleasure is the *sole* good, but also that only one’s own physical, positive, momentary pleasure is a good, and is so regardless of its cause” (Waterman, 1993: 678).

As Ryan et al. (2013: 117) have noted, hedonic perspectives, through their broadly outcome-based conceptualisation, appear to lend themselves particularly well to scientific measurement, and have thus constituted the majority of studies in the growing 'science of happiness' field, coming to prominence particularly amongst scholars in the disciplines of economics and psychology (Scott, 2015; O’Neill, 2016; Frey and Gallus, 2016). Subjective Wellbeing (SWB) is the dominant formulation used by hedonic researchers in the psychological literature (David et al., 2013: 3; White, 2016) wherein “most research based on the hedonic

perspective...[assesses] subjective wellbeing (SWB) in terms of three components: the presence of positive mood, the absence of negative mood, and life satisfaction” (Carlisle et al., 2009: 1557).

Eudaimonic understandings of wellbeing, on the other hand, add a layer of complexity by looking at the dynamic processes that enable a sense of self-fulfilment, meaning and purpose (Deci and Ryan, 2008). That is to say, eudaimonic approaches look for what is defined as ‘happiness-plus-meaningfulness’ (Carlisle et al., 2009). Returning to its philosophical origins in ancient Greece, eudaimonia refers to living in accordance with what Aristotle referred to as the *daimon* or “true self” (Waterman, 1993: 678). The realisation of the daimon, or human potentiality, “represents the greatest fulfilment in living” of which any individual is capable (ibid.). For example, in Aristotle's *Nicomachean Ethics*, the classic early exposition of eudaimonic thought, the philosopher aims to challenge the hedonists who view happiness as “some plain and obvious thing, like pleasure, wealth, or honor” (Ryff and Singer, 2013: 99). Rather, Aristotle disdained this desire for “the life of gratification” as appearing “completely slavish, since the life they decide on is a life for grazing animals” (Waterman, 1993: 689).

Ryan et al. (2013: 141), key proponents of contemporary psychological research in the eudaimonic tradition, assert that the empirical relationship between eudaimonic and hedonic happiness is such that the former appears to yield a “more stable and enduring” (ibid: 142) sense of wellbeing. However, while often open to claims of paternalism, the evident depth of eudaimonic research has itself been all-too-often flattened with the predominance of various ‘components approaches’ which reduce it to a limited number of discrete and pre-defined categories (Atkinson, 2013; Clark, 2005).

### 2.3.1 The Science of Wellbeing

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Economists are often criticized for transforming the variety of human goodness to a flat metric of money. Wellbeing research may fall prey to a similar criticism by trading one shaky reduction for another.

Vittersø (2013: 238)

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In spite of the somewhat radical origins of wellbeing research, the realisation of the field in recent decades has been notably one-sided, tending towards what has been called a 'science of happiness' perspective which prioritises the quantitative measurement of happiness (Eckersley, 2008; Ahmed, 2010; White, 2016). Drawing on evidence generated through large-scale surveys and experimental approaches (Carlisle et al., 2009; Huppert et al., 2008; Kahneman and Krueger, 2006; Lomas, 2015), this tradition is preoccupied with identifying the variables that enhance or diminish self-reported wellbeing through the use of pre-existing measurements (Duncan, 2007, 2013; Ryan and Deci, 2001; Ryff, 1989; Ryff and Singer, 2013).

Carlisle and Hanlon (2007) question whether many findings, particularly with regards to 'science of happiness' (Eckersley, 2008) and components approaches (Atkinson, 2013), are not simply a reflection of the domain from which the research is emanating – predominantly North American campuses (Fleuret and Atkinson, 2007; Loera-Gonzalez, 2014; Lolle and Andersen, 2015; Lomas, 2015). Their concern is that, in the home of 'positive psychology' – the United States – happiness is increasingly a "cultural ideal and 'cheerfulness' obligatory...negative emotions tend to be seen as evidence of failure, requiring treatment" (Carlisle and Hanlon, 2007: 10; Duncan, 2013; Held, 2004; Ehrenreich, 2010; Burkeman, 2013). While these critics point out that the values cultivated by such a culture of individualism may overlap poorly with other cultural understandings, the results of such studies are "then exported as a human universal" (Ibid; Izquierdo and

Mathews, 2010; Bojanowska and Zalewska, 2015; Panelli and Tipa, 2007; Eckersley, 2008; Lolle and Andersen, 2015). SWB, for example, places the focus of wellbeing on the individual, while “interpersonal dimensions of reality and the self are downplayed in favour of a view of the self as independent and autonomous” (Carlisle et al., 2009: 1558; Danemann, 2014). Hence, that which was supposed to signal a move beyond the dogma of reductive liberalism begins, at this point, to sound remarkably familiar (Scott et al., 2016), resembling the individualistic behavioural approaches from economics and psychology discussed above.

As Mathews and Izquierdo (2010: 8) put it, ‘the very act of measurement presumes a common cultural scale...[D]oesn’t any effort to create such a scale inevitably privilege some cultural conceptions over others? And doesn’t it reify what can be measured, and ignore what cannot be measured?’ (Loera-Gonzalez, 2014). White et al. (2012), writing as part of the UK *ESRC Research Group on Wellbeing in Developing Countries*, have expressed similar concerns regarding the biases underpinning much wellbeing research to date, recounting concrete empirical examples from fieldwork undertaken in India and Bangladesh:

“Faced with general questions (‘Do you have people who help you in times of need?’) people asked for specific examples (‘What kinds of need do you mean?’). Faced with abstract terms, they sought to bring them down to earth. This made us realise that what seems straightforward and self-evident in one context might not be so in another, that the wellbeing approaches assume a culture of questioning that is by no means generally shared. Directness is another aspect of this. Wellbeing and quality of life surveys ask direct questions and seek direct answers, but people in our research communities were often unused to talking in such a way, especially about intimate matters. Our questions might then be met by stories, rather than straight answers, or people would imply something about their own situation through a general exclamation: ‘the

woes of women!” (See Lolle and Andersen [2015] for comparable insights in a European context).

At this stage it becomes clear that tendencies towards a positivistic science across the economics and psychology of happiness can often assume a single mode of wellbeing, measurable in the world (Graham, 2005), and repackage many conventional framing assumptions about human behaviour (White, 2016). This theme has been further highlighted in work by Sointu (2005) which underlines a shift in wellbeing discourse, from a focus on what she calls the 'body politic' to the 'body personal'. Other scholars have similarly raised concerns regarding individualistic and neoliberal framings, whereby individuals become responsible for their own wellbeing condition, displacing a previous concern for community-based welfare (Duncan, 2007; James, 2008; Lambek, 2008; Scott, 2015). This shift is paralleled in the geographical literature (Atkinson and Scott, 2015). While sensitivity to personal difference is not negative *per se*, it is the manner in which this shift has taken place that is telling, reflecting wider social tendencies of the same era. *Homo economicus*, the monadic, self-interested individual of capitalist market societies, has quickly reverted to *homo felix*, the monadic, self-interested pleasure-maximiser.

Having sketched out some of the historical and contemporary context of wellbeing research, I will now give focused attention to human geography and its discipline-specific approach towards these issues. Here, I posit, one can see the strengths of geographical thinking on wellbeing in advancing a field of study which has tended towards assumptions of the irrelevance of place, and a very particular ontology of the subject (White, 2010). The chapter will close with discussion of the affectivity of practice, and its relevance for how we think about wellbeing.

### 2.3.2 Wellbeing in Human Geography

In a 2007 paper, Fleuret and Atkinson (2007: 113) opined that “wellbeing remains relatively understudied” in geography, though they predicted that with “the increased prominence of wellbeing in policy agendas, geographers are likely to turn their gaze to the concept and its expression”. Given some growth in engagement with the topic since, the prediction seems reasonably well-founded, (Andrews et al., 2014; Atkinson, 2013; Conradson, 2012; Edwards et al., 2015; Little, 2015; Schwanen and Atkinson, 2015; Scott, 2012; Scott, 2015). Particular topics examined since this time have ranged from walking (Ettema and Smajic, 2015), music (Kearns et al., 2014) and dancing (Atkinson and Scott, 2015), to gardening (Pitt, 2014), holidaying and pampering (Little, 2015, 2013), and even curiosity (Phillips et al., 2015). However, it has been suggested that this literature has engaged in a less sustained way than other disciplines with historical philosophical debates outlined above (Edwards et al., 2015), assuming a clarity in the meaning of the term “wellbeing” which simply doesn’t exist (Andrews et al., 2014).

The assertion of wellbeing as understudied does diminish, however, two influential, and historically-distinct streams of engagement with forms of wellbeing research arising from within human geography (Conradson, 2012). These are, firstly, an earlier collective and welfare-oriented notion of wellbeing within economic, social and development geography and, secondly, a more recent engagement from within health geography as the disciplinary focus shifted away from illness and disease towards a focus on the place-based facilitation of health (Atkinson and Scott, 2015; Atkinson, 2011; Kearns, Collins, et al., 2014).

The welfarist orientation towards wellbeing was an influential historical development for geography into the 1970s and 1980s, marking something of a radical new frontier for the discipline (Knox, 1978, 1975, 1974; Helburn, 1982; Smith, 1974, 2000b, Pacione, 1982, 1986; Rosenberg, 2014). The approach can be aptly summarised in the question put forward by Smith (1974), namely, “who gets

what where, and how?” and reflects the increased shift within geographical thought at this time towards changing the world through understanding it (Harvey, 1972, 1973; Helburn, 1982; Smith, 2000a). As such, the geographical treatment of these questions signalled a change in disciplinary focus towards “the geographer as humanist...viewing the pursuit of knowledge not as an end in itself but as a means towards improving the human condition” (Smith, 1974: 289), an impetus which remains prominent in welfare-oriented geographical treatments of wellbeing today (Aslam and Corrado, 2012; Ballas, 2013; Ballas and Dorling, 2007, 2013; Chen et al., 2015; Craglia et al., 2004; Mulligan et al., 2004; Wang and Wang, 2016).

Methodologically, such work entailed the use of 'objective' quantifiable measures to create a plethora of ex post territorial social indicators, which were important for mapping local and regional disparities in what was commonly referred to as 'social wellbeing'. While such work was important and its use quickly proliferated (Knox, 1978), a number of general shortcomings remained apparent. Not least of these is the clear gap existing between such work and what might be said of the lived experience of wellbeing (Conradson, 2012; Duff, 2014). Similarities are obvious here with regards to Duff's (2014) remarks on the social determinants of health literature, whereby 'context' and 'structure' are too often installed “as near monolithic constants in everyday life” (Ibid: 4). This gap similarly left the problem of demonstrating causal relationships within spatial differences (Oswald, 2007). Finally, the objectivity of such indicators was, and remains, often let down by the availability of data or the biased selection of relevant metrics (Knox, 1978; Okulicz-Kozaryn, 2015; Oman, 2016).

More recent developments have seen the study of wellbeing under the umbrella of health geography, as the sub-discipline moved beyond a narrower focus on the spatial patterns of physical and mental illness (Conradson, 2012; Kearns, 1993; Smith, 1978). This field of inquiry capitalises to a greater extent on qualitative methodologies (Conradson, 2012; Lea, 2008; Little, 2015; Smyth, 2005) in order to

examine the entanglement of space, subjectivity and health, as they ultimately contribute to (or detract from) wellbeing (Gesler, 1992; Kearns, 1993; Lea, 2008; Duff, 2011).

Geographers working with the key concepts of 'therapeutic landscape' and 'therapeutic place,' for example, examine the history, construction and social practices of places renowned for the facilitation of healing, such as Lourdes or Bath, and more ordinary salutogenic places such as green spaces and healthcare facilities (Pitt, 2014; Curtis, 2010; Williams, 1999; Smyth, 2005; Buzinde and Yarnal, 2012; Gesler, 2003; Milligan et al., 2004; Parr, 2007). While a full treatment of this literature is beyond the scope of this section, the argument put forward by Conradson (2005; cf. Lea, 2008), Rosenberg (2016) and Duff (2014) is that much of this literature tends to conceptualise certain places as inherently therapeutic, rather than relationally so. It has also been claimed that this strain of research works towards revealing where and when 'wellness' arises, rather than "arriving at a deeper understanding of wellbeing" itself (Andrews et al., 2014: 213). Indeed, theories and conceptualisations of wellbeing are rarely discussed explicitly in this literature, with the term often taken broadly as a synonym of health.

Overall, the research presented in this section reaffirms Conradson's (2012: 26) assertion that "geography's distinctive contribution to this broader field of endeavour is to further understanding of the relationship between socio-ecological context, however conceived, and wellbeing". The diverse interests and engagements already shown by geographers, fragmented and theoretically contradictory though they may be (Schwanen and Atkinson, 2015), at least leave the field well situated to reflect critically on some of the most important questions arising in the field of wellbeing, and its relationship to pro-environmental practices. The geographical literature has developed in a distinctive third direction, however, which I feel sits more neatly alongside the question of environmental skill, and it is this more-than-representational approach to



wellbeing research, particularly focusing on craft and ‘the arts’ more generally, which I will outline in the remainder of this chapter.

### 2.3.3 Geography’s Third Approach to Wellbeing: Affect and Therapeutic Taskscapes

Just as health researchers have looked to move past the ‘neighbourhood’ as a simple Euclidian container (Cummins et al., 2007), wellbeing researchers have continued to move past simplistic representations of the local ‘therapeutic place’ (Dunkley, 2009; Atkinson and Scott, 2015; Duff, 2010, 2011). What is brought to the fore in this approach to geographical wellbeing research, is a move towards the taking place of wellbeing on its own terms, so to speak, as an open-ended phenomenon resisting the imposition of pre-established categories. This, for Duff (2016: 59), entails “an account of the ‘real experience’ of recovery...to prise open the spatial and embodied rhythms of recovery, the real experience that propels a body along a line of becoming well.” Indeed, the hybridity and relationality of contemporary human geography shows particular promise in drawing considerations of wellness away from cognitivist and humanist approaches (Duff, 2014; Whatmore, 2006), instead offering an appreciation for the complexities of human-ecological relations. Such complexities map onto the discussion of the nexus of thinking, feeling and making entailed in craft, as we shall see.

Wellbeing is catalysed in and of place, as Andrews et al. (2014) and Tucker (2010) have recently hinted at, with *catalysis* used here to refer to the facilitated shift, never guaranteed in advance, from one temporary state to another (DeLanda, 2015). As such, the contingency and specificity of such an approach remains more faithful to the complex Old Norse and Middle English etymology of happiness, in the form of *hap*, referring to chance, fortune or luck, and sharing the same root, for example, as happenstance and mishap. This moves towards a greater sensitivity to the performative unfolding of wellbeing and illbeing in particular space-times (Dunkley, 2009; Maller, 2015; Phillips et al., 2015), rather than identifying or capturing a true wellbeing which inheres ‘out there’ in a discrete

subject under study. Practically, this approach holds many potential implications for rematerializing and spatialising well-being research, providing richer insights into the particularities of its emergence and stability (Tucker, 2010). That is, it may allow more tentatively causal explorations of the lived experience, “the array of bodies, technologies, affects and events” (Duff, 2014: 35), often concealed behind concepts such as ‘context’ and ‘social determinants’.

One development has been the turn to ‘affect’ in human geography, with Thrift (2008: 172) outlining what he regards as the neglect of this aspect of sociality in due to a residual Cartesianism which sees affect as “a kind of frivolous or distracting background.” In spite of such criticisms, however, Cameron Duff (2016: 62) sees work on affective atmospheres as providing “a unique conceptual and empirical lens for delineating more of the embodied, social and political conditions of recovery.” Andrews (2016: 4) has also highlighted the importance of such work for “illuminat[ing] the energizing passions associated with health and care that are trans-humanly created, transported and experienced,” speaking of the crucial role played by “rhythms, momentums, infectious atmospheres, imminences, and encounters” (Ibid: 13).

Andrews et al. (2014) made initial steps to explicitly engage wellbeing with developments in non-representational theory in this way. Specifically, they used auto-ethnographic methods to assess the ‘taking place’ of wellbeing, arising “initially as an energy and intensity through the physical interaction of human bodies and non-human objects” (Andrews et al., 2014: 211). The authors use their research to call for a rethinking of wellbeing as “something that emerges *as* environment (rather than something that results, or is consciously taken, *from* environment)” (Atkinson, 2013; Foley, 2015). This move towards the more-than-representational was welcomed by notable scholars in the field for its “capacity to contribute to knowledge relating to embodiment, the performance of wellbeing, and the experience of ‘being’ itself” (Kearns, 2014: 147), albeit not without reservations (Kearns, 2014; Hanlon, 2014).

Perhaps of most relevance to this thesis, there have been related attempts at capturing the interplay between practices, place, affect and wellbeing (e.g. Maller, 2015), for instance as captured in the term ‘therapeutic taskscape’, by Dunkley (2009). In coining this term, Dunkley is capitalising on the work of Ingold:

Ingold’s taskscape perspective insists that meaning and emotion, rather than being attached to places, is gathered from engagement within landscape. In that sense, it is performed: ‘...in dwelling in the world, we do not act *upon* it, or do things *to* it; rather, we move along *with* it. Our actions do not transform the world, they are part and parcel of the world’s transforming itself’ (1993, p. 164). (Dunkley, 2009: 89)

Dunkley’s examination of a youth camp in the US therefore privileges “neither the social, material nor the individual aspects of place” (p. 95), with the author concluding that “campers do not apply meaning to the surface of the Camp E-Wen-Akee’s landscape, rather, meaning is the outcome derived from material relations within place and time” (Ibid.). These are “places that are constituted by the on-going interactions and negotiations of diverse elements” (p. 88), whether those interactions at the camp entail eating with campers, listening to stories, cleaning oil lanterns, or collectively constructing tents.

Just as Dunkley looks for “glimpses of health-giving interactions in a moving taskscape” (p. 95), so too does Reckwitz (2017: 119) want to move away from seeing emotion or feeling “as interior properties of individuals only accessible to an introspection plumbing the depths of the psyche”. Instead, he aims to place affect “on the level of social practices themselves” (Ibid.), noting elsewhere that “practice theory and affect analysis not only can, but must, be set in relation to each other” (p. 115; see also Everts et al., 2011). Affectivity, he notes, is “always a relation between different entities” and, as such, the researcher must interrogate things such as spatial atmosphere, while asking questions such as “who is affected by whom or what?” (p. 121). Space, he notes (p. 123), is “not so much ‘used’, but rather entered into by people and experienced...People are affected by

atmospheres arising from the sets of relations of artefacts, as well as from other people, groups or practices.” This perspective, of the role of taskscapes and the affectivity of practice, shall be of central importance in Chapter 6.

There is surprisingly little work in geography, however, which empirically explores the links between craft, spaces of craft, specifically, and wellbeing, and none which examines it through the lens outlined in the previous section. In spite of a recent assertion that “the current landscape of social theory is relevant to arts and health researchers, particularly with new thinking around affect and theories of practice” (Stickley et al., 2016: 6), geographical work on what fosters wellbeing has “largely focused on the use of green space and exercise”, as Burt and Atkinson (2012: 54) state. Furthermore, I could identify no work on makerspaces specifically, and wellbeing, apart from a generic statement in Kostakis et al. (2015: 562) that “it appears that the involvement in hackerspaces could arguably produce social happiness, as it seems to be based on intrinsic positive motivations similar to those of online CBPP<sup>23</sup> projects”.

While no study has been undertaken on this specific topic, including in the previously-mentioned work on therapeutic spaces<sup>24</sup>, some valuable geographical literature does exist with regard to the arts and therapeutic intervention (Parr, 2006; Gregson and Rose, 2000; McCormack, 2013). Parr (2006: 150) has summarised this body of work as presenting an “insistent, if controversial, evidence base from art therapy, community arts and health organizations, individual ex-patients, artists and mental health care practitioners, which claims that participation in the arts (and not just the visual arts) has an important role to play in expressing the ill self, recovering from serious mental health problems and achieving social inclusion” (see also Parr, 2011). Hall (2013: 245) has also noted the role that involvement in the “communities, practice, and sites” of creative arts

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<sup>23</sup> Commons-Based Peer Production.

<sup>24</sup> Though two partial exceptions to this exist; Warren’s (2016) work on emotion and gender in surfboard construction, and Thurnell-Read’s (2014) exploration of the affective, emotional and sensory aspects of small-scale brewing, and the “greater satisfaction from hands-on manual production” (p. 52) to be found therein.

groups can facilitate a sense of belonging amongst disabled participants while, “as people interact, emotions, bodies, and creativity cross boundaries, getting through to blur distinctions between inside and outside, and excluded and included positions” (p. 246).

A recent monograph by Boyd (2016: 1), furthermore, engages with non-representational theory to consider how art making “opens up spaces for the reworking of subjectivities”. Boyd’s research enabled her “to understand how some features of therapeutic space are ‘given’ to us by the world. The environments in which we choose to practise can impact us in unpredictable ways” (p. 76). Crucially, she notes, “spaces of therapeutic art making are temporarily acquired and co-constructed. Effectively, they are shared” (p. 92). Also of relevance is Atkinson and Scott’s (2015: 79) work on the creative arts as a “catalyst that unsettles, disrupts and destabilises well-being, and trips participants out of a performative habitus and the choreographed movements of striated space in ways that enhance rather than harm a capacity for subjective well-being” (Atkinson and Robson, 2012; Atkinson and Rubidge, 2013).

Given limited work within geography, there are two relevant literatures deserving of brief mention in order to provide context for the empirical research which follows: the first comes from the field of occupational therapy, and the second from work on ‘flow theory’ in psychology.

With regard to Occupational Therapy, Levine (1987) has traced the idea of an occupational ‘work cure’ to the United States in the early 20<sup>th</sup> century, supplementing what was then the commonly-prescribed medical intervention of ‘bed rest’. Harris (2008) also notes that craft was the first occupation to be engaged with therapeutically in the field of occupational therapy, as it developed in the late 19<sup>th</sup> and early 20<sup>th</sup> century, in tandem with the predominantly U.S.-based ‘moral treatment’ movement. Foreshadowing the rise of contemporary occupational therapy, the ‘work cure’ evolved as a direct application of the ideas

of the Arts and Crafts movement, pioneered by influential figures such as William Morris and John Ruskin. While that movement had started in England, it quickly gained adherents in the U.S.A, including the famed social reformer Julia Lathrop, who had studied bookbinding at William Morris's Kelmscott Press, as well as a medical practitioner called Dr Herbert J. Hall.

Dr Hall and colleagues championed the development of sheltered workshops, in which patients produced carefully designed objects which were then sold on to support similar initiatives. However, amidst stiff competition from cheaper, factory-made goods, with the demise of the arts-and-crafts movement itself, and with the rise of 'scientific' medical interventions, the energy behind sheltered workshops faltered and, by the middle of the century, their numbers had dramatically declined (See also Taylor and Manguno, 1991; Bissell and Mailloux, 1981). In spite of its decline, however, a scholarly interest in the therapeutic possibilities of craft, and the arts more generally, remains, in relation to a large variety of demographics and social groups (Griffiths, 2008; Hasio, 2011; Kaimal et al., 2016; Noice et al., 2014; Kenning, 2015; Reynolds et al., 2008; Corkhill et al., 2014; Pöllänen, 2015; Collier, 2011; Stickley et al., 2016).

Mee et al. (2004: 226) synopsis findings that "participation in creative occupation provides opportunities for trying out ideas, experiencing feelings of mastery over tools, building confidence and control and adapting to the environment." The bulk of this work has been qualitative in nature, although there is also a growing battery of quantitative research evidence for a relationship between making and wellbeing. For example, Caddy et al. (2012), used patient outcome data from tools such as the Depression and Anxiety Stress Scale (DASS-21) to investigate correlations between mental health outcomes and participation in a creative activity group, in a sample of 403 patients. The study found "statistically significant improvements in mental health outcomes for the participants in the creative activity group over a 5-year period." Garner (2015) found a significant positive influence on anxiety, depression, stress, self-esteem and self-confidence among

33 women taking part in group crafting activities. A widely-cited paper by Gutman and Schindler (2007: 71) has also surveyed neurological findings to conclude that “purposeful and meaningful activities” such as “music, drawing, meditation, reading, arts and crafts, and home repairs...could counter the effects of stress-related diseases and reduce the risk of dementia.”

Research on flow, on the other hand, originated in the work of Mihaly Csikszentmihalyi in the 1970s, examining the relationships between psychological states such as boredom or anxiety and various forms of skilled activity (Csikszentmihalyi, 2000 [1975]). One of the co-founders of ‘positive psychology,’<sup>25</sup> alongside Martin Seligman, and former head of the Department of Psychology at the University of Chicago, Csikszentmihalyi went on to empirically study the satisfaction which could be achieved through a diverse range of creative practices, which he put down to an altered state of consciousness, called ‘flow’.

While largely neglected in human geography (although links have been considered in work by Banfield and Burgess, [2013] and Pitt [2014]), flow has purportedly now been studied, usually by means of either interviews or the Experience Sampling Method<sup>26</sup>, with tens of thousands of research participants globally (Csikszentmihalyi, 1999). The activities highlighted by Csikszentmihalyi, such as the state achieved by rock climbers “when they feel at one with the rock, [or] by musicians when their playing seems to flow of its own accord” (Huta, 2013: 204), involve a state in which absorption in an activity is almost complete and experiences of temporality change considerably (ibid.). As shown in Figure 5, it is postulated that, in order to achieve flow, a balance should be struck between difficulty of the task and the skill of the practitioner:

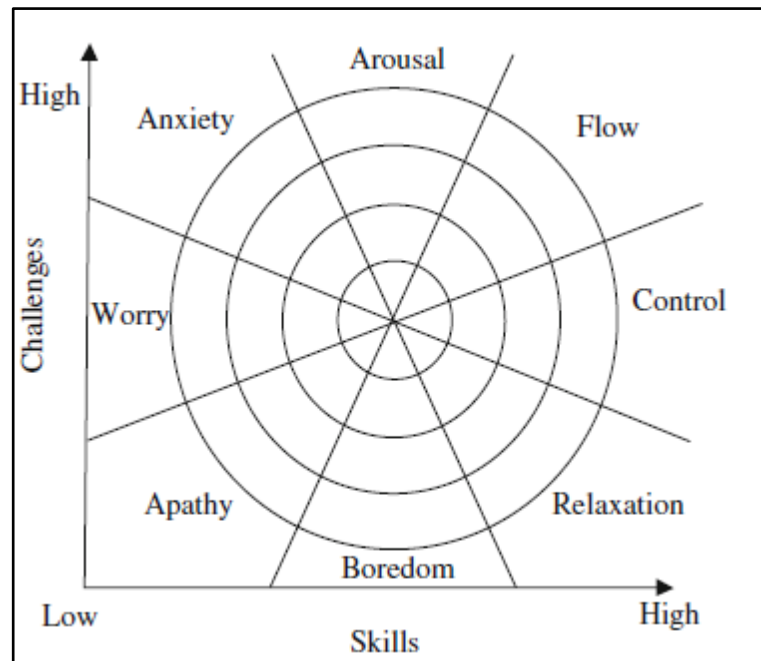
If challenges begin to exceed skills, one first becomes  
vigilant and then anxious; if skills begin to exceed

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<sup>25</sup> Given the critiques of positive psychology introduced in Section 2.3.1, there is some irony to Csikszentmihalyi’s work being productive for the thesis at this point.

<sup>26</sup> Which uses pagers or, more recently, mobile phones to sample experience at random points in time.

challenges, one first relaxes and then becomes bored. (Nakamura and Csikszentmihalyi, 2014: 241)



**Figure 5: Conceptual model of flow, with the flow experience in the top-right section. From Nakamura and Csikszentmihalyi (2014: 248)**

There are number of relevant aspects of flow, from the perspective of this study. Firstly, there is a considerable non-representational element to the flow experience (Banfield and Burgess, 2013), for, as Huta (2013: 204) puts it, “during flow, one does not view oneself as happy – to step into an evaluative mindset would be to break out of the immersion” (see also Ingold, 2017). After the activity, in spite of this, “people report having been in as positive a state as it is possible to feel” (Csikszentmihalyi, 1999: 825), with many describing a sense of transcendence, connection with a greater whole, purpose and meaningfulness (Delle Fave, 2013a). Secondly, in spite of its inception as part of a research tradition of ‘positive psychology’ which has, in this thesis, been broadly criticised, there is, as Nakamura and Csikszentmihaly (2014: 241) put it, a central characteristic of *interactionism* in the flow model:

Rather than focusing on the person, abstracted from context (i.e., traits, personality types, stable dispositions),



flow research has emphasized the dynamic system composed of person and environment, as well as the phenomenology of person-environment interactions.

Noting that the precise manner in which places can be therapeutic remains somewhat unclear, Pitt (2014: 84) has engaged with the notion of 'flow' to explore this interactionism and the manner in which "what people do is as significant as where they are, and reveals activities which are therapeutic." Reflecting Dunkley's (2009) work on the therapeutic taskscape, cited above, Pitt suggests that, complementary to its emphasis on bodily skill and non-cognitive processes, "flow should be employed to recognise how activity and environment interact, and to locate individual experiences within socio-spatial relations" (p. 84).

To return to work on "environmental skill", the research cited in this section contributes initial empirical and theoretical support for Coeckelbergh's (2015b: 159) assertion that "the "health" of a person could be conceptualized as a person's *active relation* to her environment." Affects such as joy are "in the activity, in the training, in the exercise itself" (p. 123) and this opens up the question of "how we can change our lives in a way that makes us and our environment *flourish*" (p. 125). The question of wellbeing as a relation with the social environment will be examined further in Chapter 6.

## 2.4 Concluding Remarks

This chapter began by examining writings on 'craft' and 'making', before turning to the literatures of wellbeing and sustainability, drawing out the parallels of how a certain reductive cognitivism has tended to predominate in these two domains. Relevant across these literatures is a turn to questions of know-how and practice, taken up by scholars in the aftermath of what has been called a "radical culturalism in the social sciences and humanities" (Reckwitz, 2017: 115). This interest in practice, I posit, provides an interesting new ground for work on Jackson's 'double dividend', which has been critiqued elsewhere for reproducing "the economic doctrine of incentivisation, individualisation, self-interest, and rational choice"

(Wingate et al., 2014: 4). The two realms, the human and the material, the emotional and the environmental, are deeply intertwined and, as Pickerill and Maxey (2009: 1533) note, “sustainability requires a holistic approach...the personal and emotional matter as much as the practical and technological”. The cultural project of forming more environmentally sustainable communities will only occur in tandem with the involvement of flourishing communities. This may take countless forms, and it is to just one of those possible forms – maker communities – which this thesis shall address itself. Given the grounding in literature provided over the previous two chapters, I shall now present and justify the empirical study undertaken.



## 3 Towards A Practice-Oriented Ethnographic Methodology for the Social Sciences

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The presumption that we can know what we mean, or what our verbal performances say, more readily than we can know the objects those sayings are about is a Cartesian legacy, a linguistic variation on Descartes' insistence that we have a direct and privileged access to the contents of our thoughts that we lack towards the "external" world.

Joseph Rouse, quoted in Barad (2003: 806)

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### 3.1 Introduction

This chapter deals with methodology, a term encapsulating more than the methods used to collect data, but which also includes the theoretical approach underpinning the choice of those research methods. Expanding on concepts introduced in the literature review, the first section outlines the philosophical roots of, and justifies, a methodology informed by Non-Representational Theory (NRT) and related 'new materialist' developments which have come to prominence in human geography (and other social sciences) over the last two decades. As noted previously, NRT seems a particularly apt development in social theory to capitalise on for this study, examining craft not solely as a site of human meaning and interpretation, but as a site of embodied more-than-human practice.

Questions of practice and performativity have been said to "define" NRT's approach (Anderson and Harrison, 2006: 333), and will underpin the selection of a qualitative ethnographic approach for the study. This approach, I will contend, confounds classical divisions used and written about in social science methodology, divisions which include 'constructivist/interpretivist' vs. 'realist',

and 'inductive' vs. 'deductive'. Details are then given regarding the means of case study selection, data collection, and ethical considerations. By the end of the chapter I hope to have provided a justified methodological framework for the findings presented in the rest of this thesis, while responding to RQ4, which asks how non-representational, 'new materialist' and 'post-qualitative' approaches in the social sciences affect qualitative research.

## 3.2 Practice in a More-Than-Representational World

In what is perhaps its most well-known formulation, NRT has been described as an umbrella term “for diverse work that seeks better to cope with our self-evidently more-than-human, more-than-textual, multisensual worlds” (Lorimer, 2005: 83). This wide-ranging interest has been described as “perhaps human geography's most exciting and controversial development in recent decades” (Hill, 2015: 416), while Jones (2008: 1601) notes such work's central importance in “trying to configure knowledge making/practice which can critically/creatively engage with this troubled world.”

The popularity of NRT among a portion of human geographers in the first two decades of the new millennium (Colls, 2012) has not taken place in a vacuum, however, and the rise of relational-materialist and non-representational approaches more broadly across the social sciences is widely held to constitute a reaction to a linguistic and social constructivist overreach in social theory, particularly over the latter half of the 20<sup>th</sup> century (Anderson and Harrison, 2010; Barad, 2007; Bolt, 2013). The capture of academia by this legacy of representationalism had become evident for many across the social sciences, including in human geography. For one influential critic, cultural geography had “lost its way”, being held captive by “a stubbornly humanist metaphysics”, and remaining stuck in the “academic grind of text and counter-text” (Thrift, 2008: 121; cf. Connolly, 2011). Anderson (2009: n.p.) too notes the prevalence of this linguistic emphasis in the field of geography, referencing “a concern about the overvaluation of the 'representational-referential' dimensions of life following the

discipline's cultural turn.” It has been pointed out, however, that such divisions have a longer history in the historical development of science beyond the 20<sup>th</sup> century, whereby the ‘natural’ sciences were left to explore material causalities, and the ‘social sciences’ were instead tasked with contemplating interpretations, institutions and human social life (Abrahamsson et al., 2015). “To be a traditional sociologist is to be a humanist,” as sociologist of science Andrew Pickering (1995: 25) put it, while “to be a physicist is to be an anti-humanist.”

With breakthroughs made for social constructivism and the turn to postmodernity and deconstruction during the 1980s and 1990s, it suddenly seemed that everything was a product of social construction and/or symbolic orders – landscapes, cities, sex, nature, wilderness, race, the nation, and much more.<sup>27</sup> Within human geography, Lorimer (2003: 202) describes “the mainstay of geographical work since the cultural turn” as “the focus on specific representations or imaginings of place”, but sees NRT as part of “an alternative manifesto” that has emerged:

One that pays closer attention to the range of embodied performances and sometimes instinctive practices that activate social lives...The ambitions of non-representational theorists are to open out an affective realm of touch, movement, gesture and emotion, and so enliven geographical enquiry. This agenda certainly holds some appeal for cultural geography, as it forces us to consider at close range the full 'livedness' of experience. (Ibid)

As an “umbrella term”, NRT has been posited to be relatively flexible and only minimally prescriptive (Popke, 2009; Vannini, 2015), with Lorimer's (2005) “more-than-representational” terminology perhaps fitting such openness somewhat better<sup>28</sup>. Therefore, in the discussion of NRT here, the argument is not that

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<sup>27</sup> This, of course, held important political implications, converting previously essentialised and hardened concepts into something more socially contestable.

<sup>28</sup> I keep the acronym NRT here for its widespread use in the literature, based on the understanding that the “non-” is not strongly exclusive, but resembles Lorimer’s use of the term.

representation and symbols do not methodologically matter (as we shall see, they certainly do, and are mobilised throughout), but instead aims to “reconfigure the terms of their deployment,” as McCormack (2003: 502) put it, placing them into a more balanced role. The issues that arise in achieving this balance shall be discussed below.

For Colls (2012: 430), the main ethos of NRT is deemed to be “a mode of engaging with and presenting the world that emphasises the taking-place of practices and what humans and non-humans do.” Popke (2009: 82) struggles to reduce it to first principles, pointing out that NRT is “a difficult body of work to summarize, and its adherents draw upon a diverse array of resources and inspirations” (outlined in Figure 6). In general, however, “it works toward some kind of embodied materialism that places a significant emphasis on questions of action, practice and, especially, performance, as both an object of inquiry and a particular style of research” (Ibid; cf. Daza and Huckaby, 2014). Paralleling the liveliness of performance discussed in relation to craft in Section 2.1, NRT avoids a computational, and overly-cognitive image of human being, replacing it with the notion that embodiment and artefacts “are not remote epiphenomena but instead are equal partners in cognition” (Wynn, 2014: 491; cf. Malafouris, 2008).

Popke (2009: 81) goes on to describe the umbrella of NRT as signalling, fundamentally “a renewed interest in materialist, corporeal and performative ontologies,” while Anderson (2009: n.p.) includes under this heading such diverse perspectives as “theories of practice, post-phenomenology, various micro-sociologies, actor-network theory, Deleuze and Guattari's heterodox version of post-structuralism and corporeal feminism,” not to mention a complementary and growing interest in questions of transpersonal affect and embodied emotion (Anderson, 2013; Brennan, 2004).

Explored through NRT, the human species contrasts with the idealised view of classical humanism (Schatzki, 2010), being instead a deeply habitual creature who repeats, according to one study, an estimated 45% of everyday behaviours on a

daily basis in the same location (Dewsbury, 2012). It is strange, as Thrift (2008: 58) puts it, that “probably 95% of embodied thought is non-cognitive, but probably 95% of academic thought has concentrated on the cognitive dimensions of the conscious I.”

Let me provide a mundane example to help clarify the issue:

*It's a week-day and I am in my office. It's late morning, my brain is in a tired fog, so I decide to go down to the break room for a cup of tea and some sugar. Having just descended stairs at a rapid pace, it remains unclear to me how exactly I got to the bottom. Of course, I walked down, but without the clear intentionality of taking steps into account, which a cognitive approach would perhaps entail. My body took two or three steps per second, quickly jogging downstairs, without me needing to even look down, or consider where exactly I should place my foot, let alone deciding which muscles I should contract, how much oxygen I should take into my lungs to power those muscles, or how much my heart rate should increase to enable adequate blood flow. This is a well-practiced repetition and, besides, I was distracted, hungry, and lunch-time beckoned. Without consideration, I trusted that the old staircase would hold me, the banister wouldn't fail, and the laws of gravity still held.*

As Anderson and Harrison (2010: 7) note, “most of the time in most of our everyday lives there is a huge amount we do, a huge amount that we are involved in, that we don't think about and that, when asked about, we may struggle to explain”. They describe this as 'background', a concept which forces us to question the fixity of boundaries we tend to place around supposedly unique human consciousness. Put simply, most of human life goes on in this 'background', “without central computation” and relying “on the resources of our perceptual and motor systems” (Wynn, 2014: 491). As Ingold (2013: 109) puts it, “knowledge of the sort that can be rendered formally and self-consciously explicit is but the tip of an iceberg compared with the immense reservoir of know-how that lies beneath the surface and without which nothing could be practicably accomplished.”



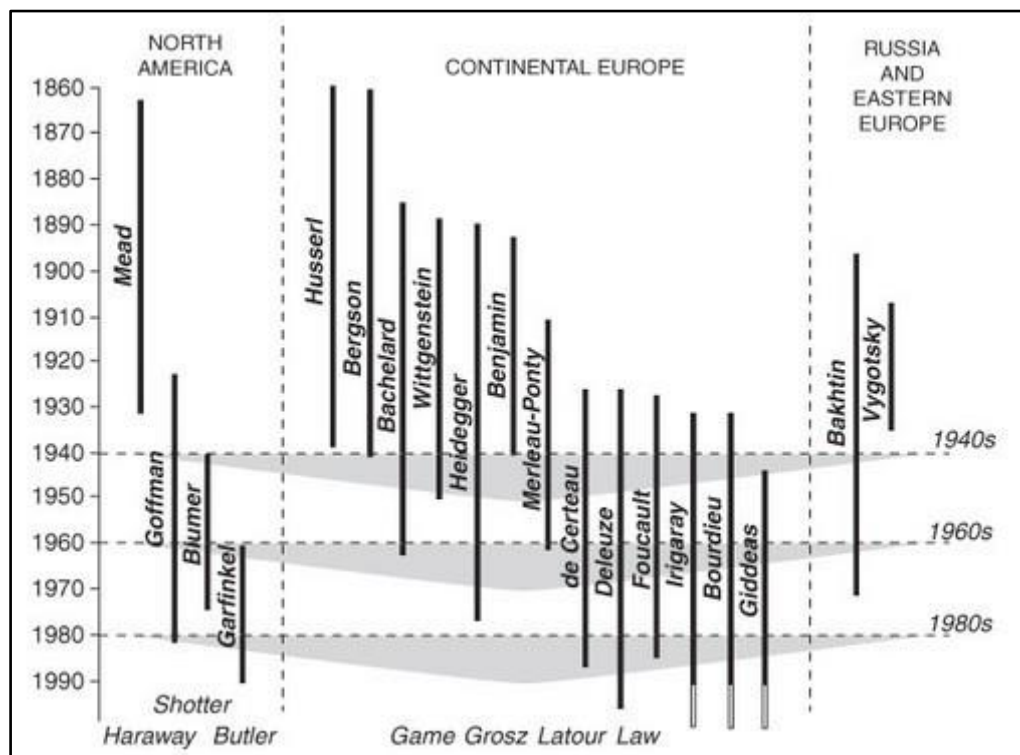


Figure 6: A Genealogy of NRT. Source: Anderson (2009)

Including contemporary scholars such as Haraway, Butler, Latour and Grosz, Figure 6 hints that the genealogy of NRT has in recent years become increasingly intertwined with the related field of 'new' materialism. Alongside such work, NRT signals a broader methodological dissatisfaction “with the ongoing trajectories of enlightenment/modern aspirations of progress towards truth through the elimination of doubt and the application of reason, language and power in the dividing, sorting, representing and fixing of the world” (Jones, 2008: 1600).

Such developments are not confined to human geography, however, with recent moves towards ‘symmetrical archaeology’, for example, also having been particularly illuminating in this respect, with Webmoor (2007: 564) explaining that “humans and things cannot artificially be sieved apart, but rather must be treated as *a priori* ontologically mixed.” Anderson and Harrison (2010: 6) similarly hold the

costly and misplaced division of representationalist thought to consist of the placing world on one side, and its meanings on the other, continuing:

Once established there can be no sense of how meanings and values may emerge *from* practices and events in the world, no sense of the ontogenesis of sense, no sense of how real the really made-up can be...Insisting on the non-representational basis of thought is to insist that the root of action is to be conceived less in terms of willpower or cognitive deliberation and more via embodied and environmental affordances.

Its critics point out that the representational *modus operandi* “separates the world into the ontologically disjoint domains of words and things, leaving itself with the dilemma of their linkage such that knowledge is possible” (Barad, 2003: 811; Marshall and Alberti, 2014). However, a methodological interest in the imbrication of bodies, minds and things reflects NRT’s positing of performativity as a productive epistemological alternative to prevailing theories of social construction, and truth as correspondence (Jackson, 2013; Nash, 2000; Webmoor, 2007). This performative approach shifts discussions of knowledge acquisition (do our descriptions mirror nature or culture?) “to matters of practices/doings/actions” (Barad, 2003: 802; see also Kilpinen, 2009). Performativity positions us back in the world, problematising structure/agency divisions, and, crucially, sees that “the creation of the world did not take place once and for all time, but takes place every day” (Dewsbury and Bissell, 2015: 24; Paterson, 2009).

Judith Butler's work has been central to the performative challenge to representationalism, shifting concepts such as gender, sex and sexuality away from being seen as natural and essentialised concepts, to an ongoing activity constantly performed in the world (Jackson and Mazzei, 2011; Marshall and Alberti, 2014), foreshadowed, of course, by Simone de Beauvoir’s famous maxim that “One is not born, but rather becomes, a woman”. Figure 7 and Figure 8 indicate how a new materialist take on performativity closes further the

humanistic 'ontological gap' between matter and discourse, which remains evident in Butler's account of performativity. In 'traditional' theories of performance (Figure 7) discourse is seen as prior to, and influencing practice, with similarities to our prior discussion of the Value-Action Gap in Section 2.2.2. Barad's account (Figure 8), however, places practice, matter and discourse on an equal, co-constitutive, and materialist footing.

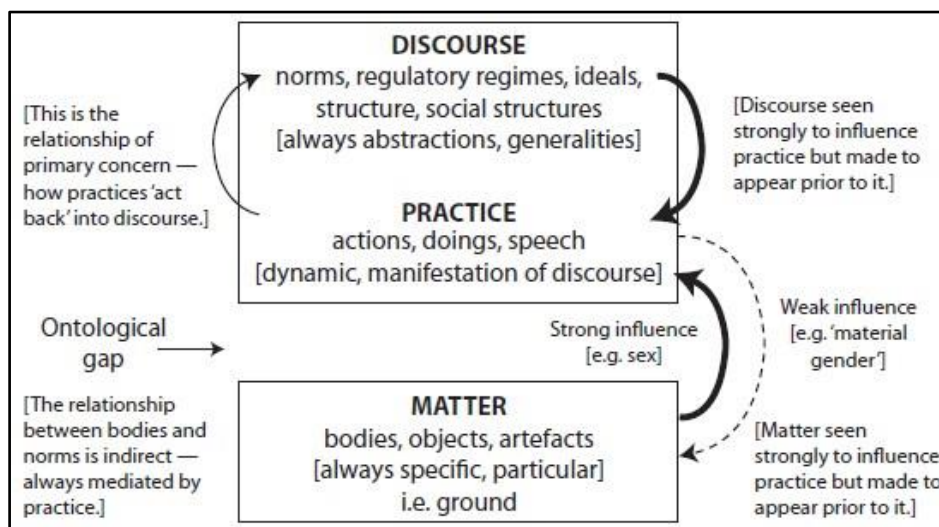


Figure 7: Traditional Theories of Performativity. Source: Marshall and Alberti (2014)

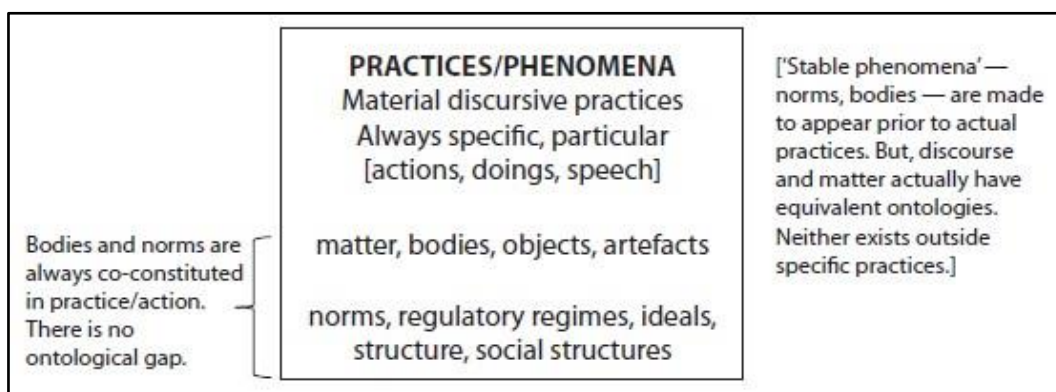


Figure 8: Closing the Ontological Gap. Source: Marshall and Alberti (2014)

It is at this point that we can also see how social practice theory converges with performativity, by examining how the shift to sustainable lifeways is more than just a product of individualistic beliefs and discourses, or economic or psychological rational choices, but rather is an iterative, citational, multi-level

process embedded in messy and entangled combinations of habit, technical systems, and (mis)understandings (Shove, 2010; Gherardi, 2017). Bennett (2005: 454) hints at this irreducibly post-human shift away from agency as intentionality:

Everyday events – blackouts, traffic jams, power surges, upset stomachs, mood swings – repeatedly indicate the presence of a wide variety of actants, some that are personal and some that don't take the form of persons. But even persons are always engaged in an intricate dance with non-humans, with the urgings, tendencies, and pressures of other bodies, including air masses, minerals, microorganisms, and for some people, the forces of fate, divine will, or karma.

Theodore Schatzki (2012: 14), foundational among practice theorists, has noted that a central tenet of this account of human activity is that “human activity rests on something that cannot be put into words” (see also Lizardo, 2007) and, thus, the signature strength of practice theory is that “the tendency to think of objects and subjects, agency and structure, material and ideal, mind and body melt away” (Cutchin, 2008: 1566). Granted the openness of this less dualistic ontology, there is much to investigate through a performative/practice theoretical lens:

There are practices, arrangements, activities, bundles, and constellations. There are questions about which of these exist when and where, their details, how they work and unfold, how they can be designed or altered, and how to prepare people to enter them. (Schatzki, 2012: 23)

With this non-exhaustive list in mind, the next section turns to the appropriate conduct of such an investigation. In doing so, it moves from questions of ontology and epistemology, to more specific questions of methods. By highlighting current debates in what has been termed ‘post-qualitative’ research, I shall make the case for an ‘enactive’ ethnographic study of community-based workshops.

### 3.3 Methods Beyond Representation: (Post-)Qualitative Research

Taking seriously the methodological implications of new materialism and NRT, Lather and St. Pierre (2013: 629-630) ask:

If we cease to privilege knowing over being; if we refuse positivist and phenomenological assumptions about the nature of lived experience and the world; if we give up representational and binary logics; if we see language, the human, and the material not as separate entities mixed together but as completely imbricated “on the surface”...will qualitative inquiry as we know it be possible?

The response to this question put forward here, in response to RQ4, shall be ‘*not quite*’. Lather and St. Pierre take their place amongst a cohort of methodologists over the past decade calling for “post-qualitative” and “post-representational” empirical research (Greene, 2013; Haseman, 2006; Lather and St. Pierre, 2013; Nordstrom, 2015; Pierre and Jackson, 2014; Rosiek, 2013; Vannini, 2014). Such work examines the supposedly “radical implications” of NRT and “the materialist critique of representation” for the undertaking of empirical research (MacLure, 2013: 660; see also Sexton et al., 2017).

MacLure has herself been vocal in her distrust of conventional representational notions of 'data,' 'data collection,' and 'data analysis'. Whatmore (2003: 89) also problematises the “rodent model of data collection”, in which “whether interviewing actors *in situ*, manipulating the digital population of census returns, or trawling documentary archives for traces of past lives, data collection mimics this squirrel-acorn relationship as you scurry about after nuggets of 'evidence' just waiting to be picked up, brought home and feasted on at a later date”. The researcher 'collects' data, as if they constituted discrete objects simply out there in the world. Interviewing has become the dominant method of such data 'collection' in qualitative research, “and the authentic voices of participants are

hallowed, treated reverently by researchers, as if their words...can serve as a foundation of knowledge” (Pierre and Jackson, 2014: 715)<sup>29</sup>.

Then, analysis takes place, on which Maclure (2013: 664) is worth quoting at length:

Conventional forms of analysis frequently find the bodily entanglements of language troublesome or trivial, focusing instead...on the ideational and cultural aspects of utterances (spoken or written) – what they mean; whether they are true, valid or consistent; whether they can be generalised to other contexts; whether they are collectable and codable under overarching themes, categories or ideas; how well arguments hold together, how power and subjectivity are constructed and negotiated...What appears to be troublesome for qualitative method is the manifestation of the body in the cerebral work of research. One could argue, indeed that one of the main functions of method is to contain, manage or forget the bodily entanglements of language, so that it can be freed to represent.

Furthermore, there has been an apparent proliferation, with the increased popularity of qualitative methods, of “positivist, quasi-statistical analytic practice” in qualitative analysis, involving the mechanistic coding of data, to the point at which analysing data qualitatively is often equated with coding (Pierre and Jackson, 2014: 715; see also Brinkmann, 2014). Once coded, the words making up interviews are organised into themes “that somehow naturally and miraculously “emerge” as if anyone could see them” (Ibid: 716). St. Pierre and Jackson (2014) question how this standardisation and “taming” of data (Daza and Huckaby, 2014: 802) remains the situation decades after the insights of the “posts”<sup>30</sup> have been

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<sup>29</sup> Recognition of the limitations and potential of qualitative interviewing will be further examined in Section 3.5 on data collection, below.

<sup>30</sup> “post-positivism, post-subjective, post-humanism, post-modernism, post-structuralism, post-foundationalism, post-empiricism/materialism” (Pierre and Jackson, 2014: 716)

brought to bear. This topic shall be further discussed in Section 3.6, on data analysis, below.

### 3.3.1 Enactive Ethnography



*Figure 9: The author in a workshop. Source: The Remakery*

While not labelled ‘post-qualitative’, there has been a shift towards more-than-human modes of qualitative research in human geography (Edwards, 2017; Davies and Dwyer, 2007; Whatmore, 2003). Such work, as DeLyser et al. (2010: 16) point out, asks us to “rethink the construction of the world to include not just the agency of those we study along with that of the researcher in shaping that world, but also the agency of the material and biological worlds in our work and our world...This is not to reinforce a dichotomy between the material and immaterial, but rather to encourage attention to the ephemeral, the fleeting, the immanence of things and places”. Cadman (2009: 462) notes that “nonrepresentational geographies do seek to harness and experiment with the mainstay of qualitative research methods,” but perhaps in a more performative/playful awareness of how, in the intra-action between researcher and researched, materials are generated (Colls, 2012; Haseman, 2006; Whatmore, 2003).

Anderson (2009: n.p.) is explicit about the implications of NRT for social science methods; that is, learning “to witness the ongoing taking-place of life as a composite of embodied practices”. A non-representational approach to method, focusing on extra-discursive elements as much as on texts and transcripts, entails such witnessing to understand “not just how people describe their world – but how they act in their world” (Pratt, 2009: n.p.). Despite holding “no one-size-fits-all policy for accessing embodied knowledge and emotional response,” Lorimer (2005: 86) has posited, with regard to this ‘witnessing’, a centrality of ethnography as method. He points elsewhere to the popularity of “situated studies of sensuous, corporeal, kinaesthetic experience, and mundane circumstances of materiality, sociability, connection and association” (Lorimer, 2008: 556), noting the application of NRT in ethnographic studies of such disparate topics as cycling, airports, air travel, petrol stations, landscape architecture and walking.

In spite of an expansion of studies employing qualitative methods in human geography (Crang, 2002), ethnography was described at the turn of the millennium as a heretofore underused method, in spite of its potential to provide “unreplicable insight into the processes and meanings that sustain and motivate social groups” (Herbert, 2000: 550). Crang (2002) noted that semi-structured interviews had become “the new orthodoxy” in human geography (see Maller and Strengers [2017] for a more recent reflection on this), with the relative lack of ethnographic methods “limiting studies since this is one of the approaches in qualitative work that can address the non-discursive and study what people do as well as what they say” (Ibid: 650; see also Crang, 2003).

Reflecting an injunction to “follow people and objects in action as they move” (Lorimer, 2005: 89), the method most fitting for the approach of NRT has often been termed ‘observant participation’, in contrast to the ethnographic tradition of ‘participant observation’ (Cadman, 2009; Dewsbury, 2010; Vannini, 2015). As such, a congruence exists with other ethnographic approaches, such as performative



ethnography, enactive ethnography (Wacquant, 2005, 2014), embodied/carnal ethnography (Dutkiewicz, 2015), and sensory ethnography (Pink, 2009).

Finding its roots in the early 20<sup>th</sup> century anthropological studies of scholars such as Malinowski and Radcliffe-Brown, ethnographic case studies are “the study of social interactions, behaviours, and perceptions that occur within groups, teams, organisations, and communities” (Reeves et al., 2008: n.p.; see also Blatter, 2008). While originally (and sometimes still) focused on the description of a community of ‘exotic Others’, taking the researcher far from their home environment, ethnographers have, at least since the Chicago School of urban sociologists, also focused their attention on sites closer to home (Hammersley and Atkinson, 2007). The key features of ethnographic research, as conventionally understood, are described by Reeves et al. (2008: 1020) as follows:

A strong emphasis on exploring the nature of a particular social phenomenon, rather than setting out to test hypotheses about it.

A tendency to work primarily with “unstructured data” — that is, data that have not been coded at the point of data collection as a closed set of analytical categories.

Investigation of a small number of cases (perhaps even just one case) in detail.

Analysis of data that involves explicit interpretation of the meanings and functions of human actions; the product of this analysis primarily takes the form of verbal descriptions and explanations.

The traditional tool of the ethnographer has been the field diary, though today the use of ethnography often involves a plurality of tools, such as observational notes, (structured and semi-structured) interviews, as well as analysis of other sources including documents, pictures, audio-visual materials, and artefacts (Eberle and Maeder, 2010; Hammersley and Atkinson, 2007). Furthermore, in line with the methodological discussions above, ethnographic research “does not rely solely on








what people say about their lives in an interview or on what is reported in documents – rather such data are treated with caution” (Ibid: 55). Instead, as Stewart (2017: 192) has recently noted, ethnographic writings allow the tentative description of “collective states and sensibilities hitting people and traversing otherwise incommensurate things: bodies of thought, assemblages of infrastructures and institutions, new ecologies, the rhythms of a daily living, and the strangely connective tissue produced by handheld devices and social media.”

My organisational ethnography takes a multi-sited case study approach, examining one or more instances of a phenomenon or topic in detail (Blatter, 2008). Flyvbjerg (2011: 302) has highlighted a paradox in terms of such case study research whereby it is simultaneously widely-used and “generally held in low regard”. With regard to this low regard, however, Flyvbjerg addresses five misunderstandings of case study research including, for example, that “theoretical knowledge is more valuable than concrete case knowledge” or that “the case study is most useful for generating hypotheses; that is, in the first stage of a total research process, while other methods are more suitable for hypotheses testing and theory building” (Ibid.). The strength of my focus on cases, however, “is that it can “close in” on real-life situations and test views directly in relation to phenomena as they unfold in practice” (Ibid: 309; see also Boddy, 2016), also addressing Hielscher and Smith’s (2014: 24) observation that “studies that look across several community-based digital fabrication workshops...are still scarce.”

Given the nature of organisational ethnography, it contrasts with the somewhat lengthier immersion of the researcher in a ‘traditional,’ or ‘indigenous’ community which characterised earlier ethnographic studies. In organisational ethnography, the researcher “can work regular hours...It is even possible – and common practice – to enter the field only sporadically, to move in for short periods and to move out again” (Ibid: 57). The emerging constellation of sub-methods (McKechnie, 2008) I used during this immersion included direct observation and participation in

everyday activities, alongside formal and informal interviewing, and documentary analysis (including web presences and mailing list archives).

For the wellbeing aspect of the research, the value and multidimensionality of ethnography seems particularly opportune in the context of critiques made in Section 2.3. In 2016, for example, the UK Government, through Public Health England and in association with the University of Winchester, released a guidance document entitled *'Arts for health and wellbeing: an evaluation framework'*.<sup>31</sup> While not mentioning ethnography – the study highlights mainly questionnaire-based tools for assessing wellbeing – the primary mid-activity observation tool outlined is the arts observations scale (ArtsObs, Figure 10), described as “a non-intrusive tool that is capable of capturing quantitative and qualitative data from participants who are not able to complete questionnaires without interfering with or diminishing the effects of the creative arts process taking place.” While allowing some qualitative data capture, the ArtsObs assumes an almost omniscient and separated observer utilising relatively shallow tools such as that shown below, through which participants are rated before and after the activity.

						
1 (visibly expressed)	2 (moderate)	3 (mild)	4 (neutral / unresponsive)	5 (mild)	6 (moderate)	7 (visibly expressed)
<b>Angry</b>	<b>Frustrated</b>	<b>Sad</b>	<b>Calm</b>	<b>Satisfied</b>	<b>Happy</b>	<b>Excited</b>
Depressed	Restless	Bored	Reserved	Focused	Receptive	Delighted
Aggressive	Anxious	Listless	Quiet	Alert	Entertained	Appreciative
Distressed	Irritated	Tense	Still	Relaxed	Interested	Enthusiastic
Hostile	Upset	Distracted	Passive	Content	Amused	Friendly

**Figure 10: Art Observation Tool. Source: <http://www.cwplus.org.uk/assets/pdf/Manual.pdf> [Accessed 01/02/17]**

By instead placing the researcher-participant in the midst of social sites, enactive ethnographic field work can allow for greater sensitivity, not only to discursive

<sup>31</sup> <https://www.gov.uk/government/publications/arts-for-health-and-wellbeing-an-evaluation-framework> [Accessed 01/02/17]

interactions, but also to the ineffable, the tacit, the affective and the haptic (Crang, 2002; Paterson, 2009; Schatzki, 2012). Schatzki (2012: 24) too places ethnographic methods at the forefront of attempts to understand practices in social life, noting “There is no formal or mathematical or computer-based method that can get at these matters. There is no alternative to hanging out with, joining in with, talking to and watching, and getting together the people concerned.”

This section has discussed how social scientists have grappled with the challenge to traditional qualitative research posed by recent work foregrounding non-representational aspects of social life. It made the argument that some methods are more suited to the objectives of the research project, and highlighted the potential of ethnography in this respect. In particular, enactive organisational ethnography was selected, in the hope that the practice of making could be “both a means and object of insight” (Spinney, quoted in Dutkiewicz, 2015: 28). Having discussed this broader rationale for my choice of methods, I shall now describe the research stages in more detail, starting with the selection of cases.

### 3.4 Selecting and Accessing Research Sites

In case study research, the choice of field site requires careful thought and attention, with purposive sampling often employed to increase the chances of obtaining meaningful outcomes from the study (Blatter, 2008; Seawright and Gerring, 2008). Rather than trying to obtain statistically representative data on a broad population, purposive sampling involves “strategic choices” regarding where research is undertaken (Hammersley and Atkinson, 2007; Palys, 2008), and is used on the assumption that certain categories of cases “may have a unique, different or important perspective on the phenomenon in question and their presence in the sample should be ensured” (Robinson, 2014: 32).

Largely through internet-based desk research, a comprehensive list of possible study sites, or ‘sample universe’ (Robinson, 2014), was assembled. The use of the internet for the identification of these spaces is somewhat problematic, possibly resulting in workshops without web presences being overlooked, but this was

judged as the most practical, and likely most efficacious, means of assessing the presence of such sites, especially as many of the spaces in question use the internet to advertise their presence and attract participants. This comprised identifiable workshop spaces and organisations in the UK and Ireland at the time (early 2015) which could fulfil the following three inclusion criteria:

- Ostensibly 'open' to members of the public (whether through free entrance and drop-in sessions, or relatively low barriers to membership).
- Independent and non-profit, charitable, or educational in structure.
- Allowing members of the public to access and use a variety of tools, equipment and skills.
- Established in the last decade.

Such criteria were felt to be inclusive enough to allow a heterogeneity in possible field sites, without undermining the study's stated goals of bringing light to bear on a specific cohort of contemporary community-based workshop enterprises.

Within these criteria, it was decided that purposive selection for theoretically-relevant variation would be beneficial to provide alternative angles on the project's stated research questions (see Hammersley and Atkinson, 2007). While qualitative research is never strictly generalisable, sampling heterogeneity potentially allows for broader processes of interest to be hinted at, which may be present in wider cases (Baxter and Eyles, 1997; Robinson, 2014). To this end, then, it was decided that more than one case would be chosen, with the decision being taken, for the sake of practicality (given ethnography's time-intensive nature) and empirical depth, to limit case study sites to no more than three.

Ultimately, three sites in close geographical proximity were selected, in the city-centre of Edinburgh, Scotland, a city with a population of 507,000 people at the time of writing. These were the *Grassmarket Furniture* workshop at the Grassmarket Community Project, the *Edinburgh Remakery*, operated by Remade in Edinburgh, and the *Edinburgh Hacklab*. E-mail contact was made with gatekeepers at all three organisations, explaining the purpose of the research and what it would entail for the organisations involved. This initial contact was

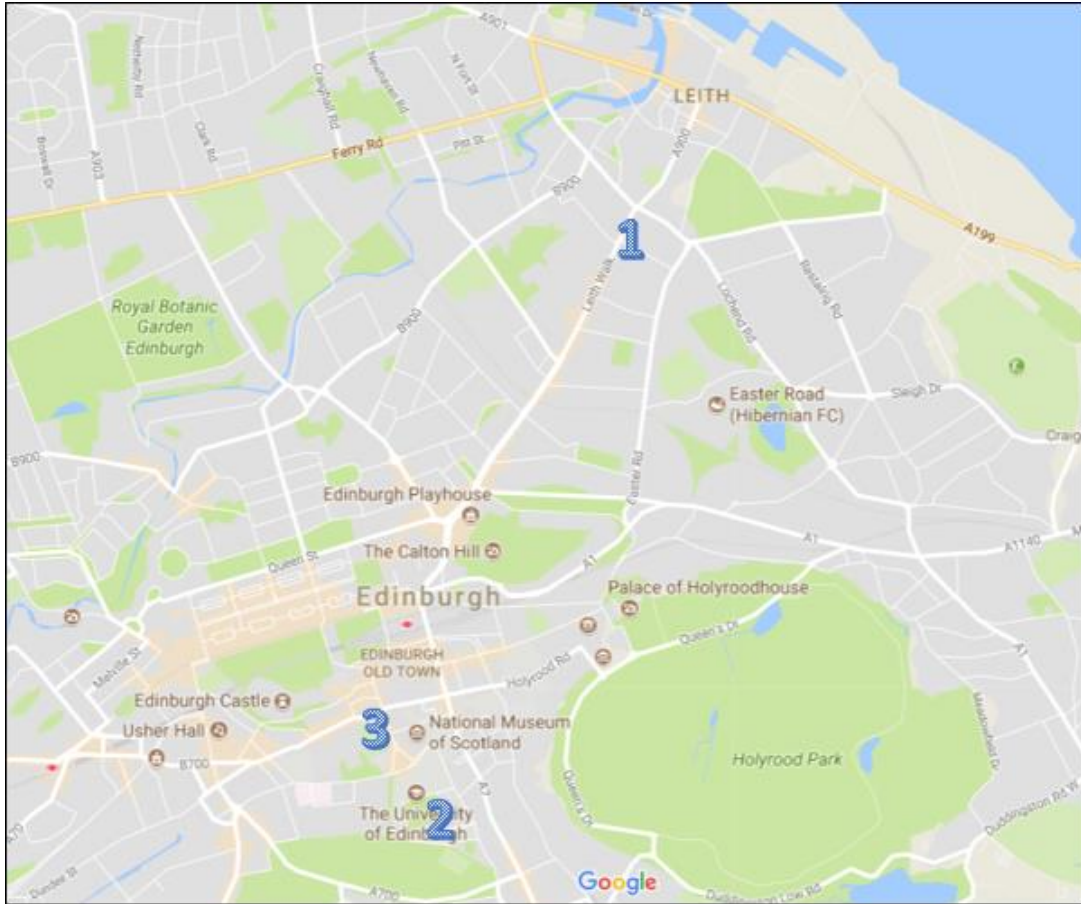
followed up by face-to-face meetings at all three workshops which resulted in written permission to carry out my study at all three.

While acknowledging a significant element of the unknown when embarking on exploratory qualitative research, it was felt that, due to their differing organisational emphases, the three first-choice cases selected would demonstrate considerable organisational, demographic and operational diversity, while being broadly similar in operational scale and socio-economic environment. Their close proximity to each other meant that easier comparison could be made, and possible relationships between the spaces could be recognised (indeed, as it transpired, there was some overlap in participation amongst the three spaces – see Table 1).

While all three cases should be relevant for all research questions, an analytical judgement was made that one workshop might relate particularly well to questions of wellbeing and recovery (Grassmarket), another might speak to the research question on sustainability (Remakery), and the third might probe at shifting definitions and assumptions around the terms ‘making’ and ‘craft’ (Hacklab). Scotland was deemed a suitable location for the research, given an environmental impact<sup>32</sup> per capita which is representative of western Europe more generally, coupled with a significant expansion of community workshops relative to population (Nesta, 2015).

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<sup>32</sup> Exemplified, for example, by an ecological footprint which is twice the per capita bio-capacity of the planet. See: <http://www.gov.scot/topics/archive/About-Archive/scotlandperforms/indicators/ecologicalFootprint> [Accessed 20/02/17]



*1 = Edinburgh Remakery | 2 = Edinburgh Hacklab | 3 = Grassmarket Furniture*

**Figure 11: Location of Field Sites**

### 3.4.1 Grassmarket Furniture

The Grassmarket is an historic marketplace in the shadow of Edinburgh Castle in the Edinburgh's Old Town; nowadays a busy, partially-pedestrianised thoroughfare of popular (and often expensive) pubs, hotels, hostels and retail outlets. While populated by crowds of tourists during the day, and bar-crawling groups at night, the area has historically been blighted by poverty, social exclusion and drug addiction.

The Grassmarket Furniture workshop is a self-financing space, situated as part of the Grassmarket Community Project (GCP), at the junction of the Grassmarket and Cowgate, the latter being the primary location of Edinburgh's nightclub scene. In a somewhat disorienting juxtaposition, the workshop sits equidistant from some

of Edinburgh's most visited tourist sites, a health centre for homeless people and drug addicts, and dark bridge underpasses populated by rough sleepers.

Developed by two nearby ecumenical charities, the Grassmarket Community Project (GCP) was formed as a standalone charity in 2010, moving into an award-winning, newly-renovated building on the corner of Greyfriar's Kirkyard in 2013. GCP aims to create community and provide "sanctuary and support to participants, many of whom are amongst the most vulnerable of our citizens"<sup>33</sup>. To this end, it provides access to training, education, and personal development workshops, including cookery, music, IT, literacy, gardening, and much more, as well as providing employment through its social enterprise café and conference venue.

Founded in 2006, and originally housed in a cramped portacabin, Grassmarket Furniture is now integrated into the new building in a well-equipped workshop space. The workshop is registered as a social enterprise and entirely self-funding in its operations. While more detail shall be given over proceeding chapters, workshop members usually work under the supervision of Tommy, a trained carpenter and care worker, to convert unwanted and disused wooden church pews into bespoke, commissioned furniture, plaques, awards and other objects. Members join for various reasons, often having visited on an open day, though many are referred by mental health professionals, employment services, and homelessness charities. A core team of about six volunteers operate the workshop for four days per week, Tuesday to Friday, with Friday also operating as a drop-in day for both prospective and longer-term volunteers. There is often, however, a waiting list for prospective volunteers.

### 3.4.2 The Edinburgh Remakery

The charity Remade in Edinburgh has an educational focus on encouraging a grassroots shift towards reducing consumer waste, with a particular focus on

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<sup>33</sup> [www.grassmarket.org](http://www.grassmarket.org) [Accessed 18/02/15]



textiles and e-waste, such as computer hardware. It was founded by a group of volunteers in 2011, in the hope of emulating the prior success of a similar charity in London called Remade in Brixton. For a number of years the charity operated out of a small side-street location, running regular workshops including a variety of sewing machine courses, leather repair, furniture upcycling and re-upholstery, computer maintenance and repair, and various other workshops aimed at reducing (mainly) household waste. The organisation also runs weekly volunteer-led 'repair surgeries' at which people can call in and access tools and guidance for repairing various household objects, while also collaborating with other charities and organisations, including the Grassmarket Community Project and Edinburgh University, to provide workshops in a variety of repair skills. They estimate that in 2015 they taught repair skills to over 1000 people, while diverting hundreds of tonnes of waste from landfill.

The charity now operates from the much larger premises at the Edinburgh Remakery, a former bank on the busy road of Leith Walk. The Remakery opened in 2016 and was part-funded by Zero Waste Scotland, through their Circular Economy Investment Fund. With the Remakery, Remade in Edinburgh's operations have expanded beyond the space constraints of their former premises, and now include an enclosed and ventilated dedicated workshop space for woodwork and other maker activities, a dedicated textiles workbench, and a new retail space, helping to fund the organisation through the sales of repaired and second-hand furniture and computers. People can attend workshops and 'repair surgeries', or join as members, with the latter enabling them to hire workshop space and use the accumulated tools and facilities within the space.

### 3.4.3 Edinburgh Hacklab

The Edinburgh Hacklab was founded in the summer of 2010, primarily by members of the Edinburgh chapter of 'Dorkbot ALBA', who had previously met on a regular basis to work on projects which blur the lines of artistic and technological innovation. Dorkbot is itself a global network, meeting under the tagline 'people

doing strange things with electricity'<sup>34</sup>, and which has the stated goal to “create an informal, friendly environment in which people can talk about the work they’re doing and to foster discussion about that work; to help bring together people from different backgrounds who are interested in similar things; to give us all an opportunity to see the strange things our neighbors are doing with electricity.” The Edinburgh chapter of Dorkbot ALBA organised talks, creative and technological meet-ups, and spent seven months “robotifying” an 1890s-era pipe organ – the *Waldfloete*, carrying out a MIDI-based<sup>35</sup> refurbishment.

Originally housed in a small studio at an arts centre in Leith, Edinburgh, the Hacklab was the city’s first hackerspace and, for a number of years, was the city’s only open-access workshop. It quickly outgrew the single room it had been housed in, however, and looked elsewhere for accommodation, ending up at the Summerhall arts complex, close to the Meadows and Edinburgh University. The use of this space evolves according to members’ needs, but currently houses a main room with electronics equipment, a ‘hang out’ space, and basic kitchen facilities, a storage room where members can store projects and equipment, and a workshop space with large shop tools, hand tools and other bulky equipment.

Established simultaneously with a flourishing of similar ‘makerspaces’ and ‘hacklabs’ around the world, the Edinburgh Hacklab operates as a self-organising, member-operated space providing access to a diverse array of tools and technologies, from 3D printers and a laser cutter, to soldering equipment and hand-tools. The space is accessible to the public and can be used for free at certain times of the week, while members (of which there were about 50 at the time of this study) have 24-hour access. Towards the start of its existence, a regular music night was held at the Hacklab, while it has also run a number of occasional workshops on particular topics, ranging from bitcoin and cryptocurrencies, to DIY Biology (Smith, 2017). The Hacklab is also involved in organising the annual

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<sup>34</sup> <http://dorkbot.org/> (accessed 5/03/15)

<sup>35</sup> Music Instrument Digital Interface (MIDI), a technical standard for electronic musical instruments.

Edinburgh Mini Maker Faire, part of the Edinburgh Science Festival, which is attended by more than 1500 people annually.

Having introduced my methodological approach, and outlined the case studies selected, the next section shall focus on outlining how the research proceeded through data collection. Here I shall conclude by highlighting some further strengths of the approach taken, but also reflect on challenges which arose during fieldwork.

### 3.5 Data Collection

*“Everyone, this is Tom, the guy who’s coming in to figure you lot out.”*

Thus, stood outside the workshop at 10am on a damp Tuesday morning, went my introduction to the Grassmarket team by Tommy, in his characteristically light-hearted manner. For the purposes of fieldwork, of course, this was less than ideal. I had no pretensions to ‘figuring *them* out’, nor had I hoped to be singled out like this, apart from the group. We all laughed about it, of course, and I reassured them that I wasn’t there to judge them. Entering the workshop, everybody quickly got on with the day’s work. The group was used to new people coming in and out, and nobody seemed overtly phased.

From that less-than-ideal starting point, data collection ran in two broad phases, through late 2015 and 2016. These distinct phases emerged according to a number of demands and obstacles arising as the research proceeded. Broadly, the first phase involved me residing in Edinburgh, conducting research at the Grassmarket and Hacklab. While the Remakery had been envisioned to open in autumn 2015, due to delays in being able to access the new premises, a break occurred, during which I began analysing data already collected. Following this, a second phase of research began, after I had left Edinburgh. This second phase consisted of ethnographic work at the newly-established Remakery, along with documentary collection and analysis of thousands of messages from the Edinburgh Hacklab’s

extensive mailing list archives. In the age of the internet, however, the probability of research stages becoming blurred in organisational research is increased<sup>36</sup>.

### 3.5.1 Phase One: September 2015-March 2016

In September 2015, I moved to Edinburgh and joined the GCP as a member, with agreement established that I was to be involved in the furniture workshop, as a member of the core workshop team, on Tuesdays, Wednesdays and Thursdays. No strict time limits were set on this involvement but there was an understanding that, balancing my own need to focus on other case sites and the organisation's need to allow others to access the workshop, I would attend on these days for four months, from September 2015 to December 2015.

The day ran from 10am to 4pm, with all volunteers being provided with a free lunch from 1-2pm, which I also attended, alongside general GCP members' meetings. In total, this added up to some 250 hours in the field, further supplemented with interviews conducted with present and past members of the core workshop team.

Starting from early December, I also attended the Hacklab's regular open evenings on Tuesday nights, where members of the public, as well as Hacklab members, attend the workshop to work on projects, access tools, socialise, or gain expertise from others in attendance. I identified a project to work on during my time there (discussed in Chapter 4), and placed an emphasis on learning to use the various tools available, including the 3D printer and laser cutter, as well as observing and interacting with the projects of other makers using the space concurrently. Interviews took place at this time with ordinary and founding members of the Edinburgh Hacklab, to understand the eclectic use of the space and gain an insight into both the motivations and everyday practices of its attendees.

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<sup>36</sup> It would be valid to assert, for example, that given the online presences actively maintained by such spaces, that impressions began forming during my initial research to sketch out potential field sites.

### 3.5.2 Phase Two: March 2016-November 2016

While I had attended a volunteer information evening in January 2016, it wasn't until March 2016 that word was finally obtained that the delayed Remakery refurbishment could go ahead, with the bulk of the refurbishment happening throughout April of that year, at which point I travelled to Edinburgh for two days per week to help out as a volunteer, and attend The Remakery's eventual launch party on the 19<sup>th</sup> May. The Remakery was still not complete at this time, however, with the wood workshop unfinished at the time of the launch, and remaining so until well into July. From this time, until December 2016, I attended a number of workshops organised by Remade in Edinburgh, on sewing machine basics, leather repair, furniture upholstery and wood pyrography and attended the Remakery's repair surgery. The Remakery itself was also, at this time, busy transitioning from a voluntary organisation, to a grant-receiving social enterprise with a number of paid staff and freelance tutors. While the dynamics of such a transition are interesting in themselves, the time demands on all involved in the Remakery at such a formative time resulted in a field experience somewhat distant from the prolonged engagement that I had hoped for. I will reflect more on the unanticipated trials of fieldwork in Section 3.7.2.

On originally making contact with the Hacklab, a member of the board of directors suggested I join the Lab's e-mail list, which I initially used to advertise my research. I found such relatively passive recruitment via e-mail to be much less effective than face-to-face contact. While a classic face-to-face ethnography had been envisioned, it became clear in ensuing months that it would be necessary to also employ digital methods, as the mailing list comprised such a crucial extension of the organisation's day-to-day life, utilised by participants (often many times a day) for everything from technological and project-based problem-solving and troubleshooting, to event organising and equipment purchasing. While ethical implications of this shall be addressed more in Section 3.7, five years of submissions to this list ended up being gathered from the public archive, imported

into NVivo qualitative analysis software for analysis, and subsequently drawn from for the present study.

Virtual ethnography, or so-called 'netnography', is an increasingly prevalent technique of qualitative data collection (Hine, 2000, 2015), with Dwyer and Davies (2010) noting well into the 21<sup>st</sup> century that, in human geography, "it is surprising that qualitative research in or via online environments is still in its infancy." They note the particular value of such "connective spaces" for "those looking to explore the agency of marginalized communities" (Ibid: 93), though I would note that, building on my discussion of community in Chapter 2, it raises interesting questions regarding spatial proximity and virtuality/actuality for 'communities' of all kinds, marginalised or not. Though 'netnography' seems at first glance incongruous with a focus on more-than-representational aspects of the spaces, as with the discussion of interviews below, a plurality of approaches was deemed most appropriate to fully explore the material practices of the spaces.

### 3.5.3 Site Visits and Interviews

While I had, by autumn 2015, identified and gained access to three main field sites, I thought it would be beneficial to deepen my ethnographic work and evolving findings with a broader understanding of, and comparison with, the daily life and workings of other community-based workshops in operation in Scotland. Concurrent with the 'observant participation' described above, therefore, I attended the Edinburgh Mini Maker Faire, which took place at Summerhall, and for which the Hacklab held an open day, affording me a further opportunity to observe and discuss the role of makerspaces with members and visitors. In late 2015 I visited The Forge, a new mobile 'maker space' housed in a series of shipping containers and located on disused land in Edinburgh's West End. At The Forge, I spoke with one of its founders, received a tour of the site, and visited the glass workshop of one of the resident craftspeople.

While exploring possible field sites, I had previously made contact with, and interviewed, a member of the Skill Share Dundee board of trustees. However, in

November 2016, I re-visited Skill Share Dundee in their space on the western outskirts of Dundee, taking part in a community open day and receiving a tour of their facilities from their founder, Peter. In the same month I arranged a visit to the GalGael trust, a community and heritage association in Govan, Glasgow, centred around a woodwork and boat-building workshop not dissimilar in approach to that of Grassmarket Furniture, with the aim of creating “a cultural anchor point around which local people are re-kindling skills, community and a sense of purpose”<sup>37</sup>. GalGael will be a tangential topic of discussion in Chapters 5 and 6. Two site visits were also arranged at this time to MAKLab Glasgow, an organisation operating under the slogan “Empowerment Through Making” and which provides resources and equipment “for people from all backgrounds, of all ages and all abilities to use making as a tool for social empowerment, regeneration, inclusion, economic growth and social capital”<sup>38</sup>. I received a detailed tour of MAKLab from their Studio Mentor, and on my second visit I undertook a soldering workshop, to gain more involved experience with a skill which would be commonplace at the Hacklab.

Finally, towards the end of the second phase of data collection, a visit was made to Dundee Makerspace, a workshop which one of my Hacklab participants had previously been involved with, and to which he had donated equipment. I wanted to trace what had happened to these tools, while comparing the space with that of the Hacklab. On the site visit, I received a tour of their large space, and discussed the dynamics of Dundee’s maker community. I also interviewed the founder of the Edinburgh Tool Library, a charity which, at the time of the research was planning to open its own community workshop (which opened after the study was complete). Such diverse site visits were extremely helpful in informing my field work, highlighting juxtapositions between various spaces and organisational

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<sup>37</sup> [www.galgael.org](http://www.galgael.org) [Accessed 18/07/17]

<sup>38</sup> [www.maklab.co.uk](http://www.maklab.co.uk) [Accessed 18/07/17]

approaches, while bringing to the foreground possible points of interest for analysis.

While the foregoing discussion outlines the sites for what could be described as classical ethnographic ‘observation’, contemporary ethnographies often also supplement observations and field diaries with in-depth participant interviews. Some reservations about interviewing as a method were expressed above, in Section 3.3. I would briefly like to address these here and outline why I felt interviews (and textual netnography) to be a valuable supplementary data source, not least in their ability to provide a deeper understanding, and further interrogation, of issues arising during observant participation.

Due to recent trends towards an appreciation of the more-than-representational in human geography, Hitchings (2012) admits to some unease regarding his use of ‘conventional’ interviewing in studies dealing with everyday practices. He notes that the discomfort is such that, when presenting at conferences he has tended to downplay this aspect of his studies in place of broader statements of ‘ethnographic’ methods. Surveying his past research projects, however, he concludes that “like the tennis player, respondents may be preoccupied at the time, but still able to discuss how things went afterwards” (Ibid: 63; Browne, 2016). That is, the idea that the interview transcript or recording, the photograph or the digital archive, are exhausted by representational concerns is to grant the latter too much power.

Geography has indeed seen an increase in the use of methods such as the ‘walk-along’ interview (Paterson, 2009), with many of the informal conversations contributing to my research resembling something akin to a ‘make-along’ interview. This openness to the unconventional use of more ‘traditional’ qualitative methods is discussed by Dowling et al. (2016: 2), who argue that human geographers are:

harnessing a range of conventional qualitative techniques  
to the task of recognizing and engaging with more-than-



human geographies. They are employing incredibly sensitive and nuanced analyses to data collected from interviews, focus groups, field diaries, ethnographies, secondary documents and archival material. (See also Jackson and Mazzei, 2011; Kuntz and Presnall, 2012; Cragg, 2003)

In my case, informal discussions were recorded only in field notes, with 'formal', recorded semi-structured interviews undertaken in a rather conventional manner, often during lunch breaks at the Grassmarket or in the Hacklab during the day, when the workshops were less busy. Convenience and snowball sampling were used to this end, with the emergent nature of an ethnographic research project resulting in what has been more broadly termed 'organic sampling' (Robinson, 2014), namely, a sample size monitored and altered continuously on both theoretical and practical grounds (Hammersley and Atkinson, 2007). There can, of course, be no set number of interviewees, especially in a study such as this, in which interviews are a supplementary data source, rather than the only one. As Robinson (2014: 31) notes:

Being responsive to the practical realities of research is a key skill for the qualitative researcher, as collecting in-depth data leads to challenges that are *never* entirely predictable at the outset of a project.

Guidelines and expectations for classic interview-based qualitative studies vary from as few as three interviewees in Interpretative Phenomenological Analysis (Robinson, 2014) to a supposed average of 20-30 (Boddy, 2016), though an N of 1 can be justifiable (Baxter and Eyles, 1997). If a sample size is too large it can practically inhibit the close reading of data to which qualitative research particularly lends itself, with Boddy (2016) placing this limit at around 30 interviewees. Such discussions are largely redundant, however, given that emergent sampling needs to be adapted to fit the specific research questions

asked, and the quality of data obtained (Mason, 2010).<sup>39</sup> The resulting sample of in-depth interviews (N=22) for this research, however, ended up heavily skewed by gender (16 Male, 6 Female). While a limitation, this is also reflective of the fact that the majority of members at the Grassmarket and Edinburgh Hacklab, at the time of research, were male.

My questions during semi-structured interviews took a similar format across all three spaces, opening with relatively easy ‘ice breaker’ questions around how long a participant had been involved in a space, and how that involvement came about. This was followed by an attempt to get a sense of biographical trajectory, tracing the person’s involvement in maker activities, usually excavating this story backwards, in reverse-chronological order. Once a rapport was built, the remainder of the interview would turn back to present involvement in the workshops, the significance this has (or hasn’t) had in their lives, and allow me to present them with observations regarding the daily life of the workshops to comment on.

Where possible, interviews took place in the workshops, but a minority took place outside the workshop, and, for practical reasons, one (Jacob) over Skype. Interviewees are detailed in the following table:

<b>Name</b>	<b>Gender / Age</b>	<b>Hacklab</b>	<b>Grassmarket</b>	<b>Remakery</b>
Brian	M, 35-45			
Dennis	M, 45-55			
Daniel	M, 18-25			
Elaine	F, 45-55			

<sup>39</sup> Of course, coupled with the elements of autoethnography in a study of this nature, I count myself as a further participant in this research.

Liam	M, 18-25			
Tony	M, 35-45			
Todd	M, 18-25			
Susan	F, 25-35			
Tommy	M, 45-55			
Ben	M, 25-35			
Edward	M, 25-35			
Harry	M, 35-45			
Kevin	M, 25-35			
Stewart	M, 45-55			
Jacob	M, 25-35			
William	M, 25-35			
Amber	F, 25-35			
Federica	F, 25-35			
David	M, 55-65			
Chris	M, 25-35			
Sarah	F, 35-45			
Molly	F, 18-25	Skillshare Dundee		

*Table 1: Table of Semi-Structured Interview Participants*

### 3.6 Data Analysis

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“The thrill of research resides precisely in the way in which we muddle through and puzzle out aspects of our research project.

We come in with possible ideas, and we quickly become disillusioned with our preconceptions and fascinated by all the ways in which the field operates “all wrong.” We return to the theory, and back to the field, and slowly piece together a theoretical account that can explain our observations, potentially illuminating a broader point that we couldn’t have even guessed at when we began our work.”

Tavory and Timmermans (2014: 7)

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It has become somewhat paradigmatic for qualitative researchers to engage with ‘grounded theory,’ to say that they ‘collected’ data (See Section 3.3 above), and that, if that data is analysed concurrently with collection, then the data reached a point of ‘saturation,’ at which point no new themes emerged. If data collection and analysis take place in different, non-concurrent phases, then the untainted data is inductively coded for themes which also ‘emerge’ apparently spontaneously. As Barbour (2001: 1116) proposes, however, the widespread mention of grounded theory can be problematic, often simply conferring “academic respectability”:

A sleight of hand produces a list of “themes,” and we are invited to take it on trust that theory somehow emerges from the data without being offered a step by step explanation of how theoretical insights have been built up.

In spite of its popularity, I have harboured a similar suspicion that the reporting of such an approach can be a case of box-ticking, more than a justified reflection of how knowledge is produced. Grounded theory appears to betray a naïve

perception of the research process and how it 'purely' represents and recounts what participants say, with the authors of the approach, Glaser and Strauss (1967: 37), going so far as to state that "An effective strategy is, at first, literally to ignore the literature of theory and fact of the area under study, in order to assure that the emergence of categories will not be contaminated by concepts more suited to different areas."

However, when I wrote field notes after a long day in the workshop, for example, it was often difficult to discern plain description from 'contaminated' preliminary analysis. Such an account would do an injustice to my data, my respondents, the irrepressible flux of daily life, not to mention the difficulty with which a researcher can simply say 'I'm learning no more. My research questions have been answered'. Certainly, I did engage in concurrent analysis, with field notes uploaded to NVivo, for the sake of management, and interviews transcribed and preliminarily analysed immediately after their completion. Also, as outlined above, the field work was prolonged and adapted according to certain uncontrollable exigencies, allowing more space for continuous emergent analysis.

However, my approach to analysis fell somewhere between 'data-driven' induction, and 'theory-driven' deduction. In the event, I had immersed myself in relevant theoretical readings in the year prior to commencing field work and to pretend to ignore the impact this has had on the final result would not be adequate. As Timmermans and Tavory (2012: 181) note, "successful qualitative researchers are voracious consumers of substantive sociological theories, who use their reading as a touchstone for research. Not taking current scholarship into consideration risks not only ignorance but also the rediscovery of a well-developed domain." Only with literature reviewed and theoretical interests outlined, did I digitally code for themes and sub-themes across the numerous data sources, including my field notes, interview transcripts and discussion list archives, though these themes were fallible and tentative, variously driven by the data and by changing theoretical concerns, and often both simultaneously.

Due to such concerns, Brinkmann (2014: 722) focuses on the image of the “abductive tool-user, the bricoleur, the craftsperson” as the ideal qualitative researcher, in preference to the inductive “collector” and the deductive “framer” (See also Rosiek, 2013; and Mills, 1970 on research as craft, rather than discovery). A term drawn from Pragmatist epistemology, ‘abduction’ seems particularly apposite for a study on craft skills and making, with John Dewey (1925: 13) also recognising that social scientists, in researching human experience, are first confronted by “the tangled and the complex” and cannot simply deduce or induct.

As Shank (2008: n.p.) has written, “whereas deductive inferences are certain (so long as their premises are true) and inductive inferences are probable, abductive inferences are merely plausible.” Often summarised as ‘inference to the best explanation’, Blatter (2008: n.p.) notes that “the quality of a case study...does not depend on providing detailed evidence for every step of a causal chain; rather, it depends on a skilful use of empirical evidence for making a convincing argument within a scholarly discourse that consists of competing or complementary theories.” Sitting much more easily with notions of positionality, reflexivity and epistemological modesty (all dealt with in the next section), my assertions are therefore made, through abductive analysis, not to speak to a literal truth ‘out there’ in the world, but to respond to, and join in with, the conversations of a (scholarly) community (Timmermans and Tavory, 2012).

### 3.7 Reflexivity, Ethics, and Methodological Learnings

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“One of the most noticeable trends to come out of a use of reflexivity is increased attention to researcher subjectivity in the research process – a focus on how does who I am, who I have been, who I think I am, and how I feel affect data collection and analysis – that is, an acceptance and acknowledgment that ‘how knowledge is acquired, organized, and interpreted is relevant to what the claims are’”.

As reflected in the epigraph above, the term reflexivity – rooted in debates from critical theory, feminism and poststructuralism (Macbeth, 2001) – has been used with increasing frequency in order for researchers to account for their own subjectivity in a research project. While it has “become something of a shibboleth” (Crang, 2002: 651), for Pillow and others, reflexivity is necessary and important, so long as it is not used as a means to ‘transcend’ that subjectivity in the hope of producing an ‘objective’ account. For Cloke et al. (2000: 133), a practice of reflexivity doesn’t eliminate ethical concerns and tensions, but opens up opportunities “to explore ethical terrains more appropriately and more honestly.”

While the term is often simply taken as transparent, Macbeth (2001) makes a useful distinction between ‘positional reflexivity’ and ‘textual reflexivity’ (See also Cloke et al., 2000). The quote which opens this section reflects the former, while the latter has been discussed in the opening sections of this chapter, asking questions such as “Can we truly represent another? Should this even be a goal of research? Whose story is it – the researcher or the researched? How do I do representation knowing that I can never quite get it right?” (Pillow, 2003: 176).

On positional reflexivity, if we understand identity in a somewhat additive and reductive manner, I am the classic privileged ethnographer – white, male, educated and able-bodied – probably largely unaware of his various privileges and the manner in which they ‘taint’ the ‘field’. As Narayan (1993) indicates, however, these things cannot, and should not, be essentialised. I therefore generally agree with her widely-cited problematisation of discussions regarding identity in an early paper discussing the distinctions between ‘native’ and ‘non-native’ anthropologists. Taking what we would refer to today as a relational approach to identity and positionality, she argues that all our identities are “multiplex” (p. 676),

that “we might more profitably view each anthropologist in terms of shifting identifications amid a field of interpenetrating communities and power relations,” and thus that “a rethinking of “insider” and “outsider” anthropologists as stable categories seems long overdue” (p. 673). For Crang (2003: 497) also:

Too often exhortations to reflexivity and disclosure tend to depend upon and reproduce problematic notions of a stable, tightly defined, unchanging research project conducted by a singular researcher, with one stable essential identity, both between locations and over time, and suggest the latter is also true of the researched.

Depending on field site, different light was shed on my positionality, and various characteristics were foregrounded as I played different roles. While generalising is difficult, I felt that at the Grassmarket, my (complex, but largely Irish) identity often placed me as a friendly fellow-‘Celtic’ outsider, from a ‘working class’ background, with life experiences which meant I could, at least partially, identify and empathise with participants’ lives of mental health issues, marginality, addiction and homelessness. However, through my history of higher education and travel, to take just two examples, a gulf could be said to exist, in perception if not in reality, between me and a group of participants who rarely left their own city, many of whom had barely finished secondary school. Amidst the university graduates and IT professionals of the Hacklab, on the other hand, I was a fellow educated, western European male, in his twenties, allowing me to largely fade into the background as and when I desired. How such factors played out at the Remakery, I could never fully grasp, though it felt closer to the Hacklab, being run and staffed by educated individuals with diverse professional backgrounds.

While I don’t doubt that such characteristics played a role, they were entwined in an irreducibly complex way with a number of other factors. In the context of a craft ethnography, for example, studying competence and skilled practice, I often felt myself to be the ignorant newcomer, in the role of hapless learner rather than powerful researcher. As Thrift (quoted in Crang, 2005: 231) vividly notes, “Though



fieldwork is often portrayed as a classical colonial encounter in which the fieldworker lords it over her/his respondents, the fact of the matter is that it usually does not feel much like that at all. More often it is a curious mixture of humiliations and intimidations mixed with moments of insight and even enjoyment”.

I will return to this point in Section 3.7.2, but suffice it to say that ethnographic fieldwork is a risky, embodied process. This sense of (possible) ‘humiliation’ was acute, for example, at the Hacklab where I would feel more comfortable in the Hacklab’s workshop room, surrounded by a toolset which I was more familiar with. Should I stray too close to the soldering station, for example, an ignorance-based anxiety would strike me – sweat on the palms of my hands, and a tightening in my chest – among much more knowledgeable people. Wenger (2000: 233) taps into this anxiety in communities of practice, noting that “If experience and competence are too disconnected, if the distance is too great, not much learning is likely to take place...Mostly what you are learning is that you do not belong.”

Emotions of discomfort, anxiety and tension, no matter how acute, directly influence “what we see, how we get along with others, and the strategic choices that we make in our ethnographies” (Fine, 1993: 281). The story of my discomfort and the limitations that it imposed are part of the story of this PhD, my first piece of independent qualitative research. I am slow to emphasise this issue too much, however, as such knowledge differentials were also massively valuable, particularly at the Grassmarket and Remakery, two workshops whose very *raison d’être* are to equip people like me with basic skills.

People usually responded very positively to my need for instruction, and I feel that being the ‘apprentice’ played an important, ongoing role in breaking down researcher/researched binaries or hierarchies. In such situations, any pretence to the researcher-as-expert comprehensively fell apart. On my first day at the Grassmarket, for example, I was paired up with Tony (who we will meet again in Chapter 6) to work on a large oak tabletop, being produced for a hostel for

homeless men (Figure 12). While I had done some basic woodworking in the past, I was clueless as to how tasks were done in this particular workshop, with Tony, a recovering drug addict, needing to explain in detail each step as we progressed from raw timber to glossy finish. On the second day, Tony reached out his hand, shook it, and told me he enjoyed working with me. Reciprocity can be key to equalizing the research relationship (Pillow, 2003), and even at the Hacklab, allowing someone to show you the workings of a tool tended to open the door to a reciprocal recognition and friendship.



**Figure 12: Constructing Oak Table Top**

Finally, accounts of ‘embodiment,’ as a number of scholars have rightly pointed out (Foley, 2015; Tolia-Kelly, 2006), have a tendency to come from a particular and partial perspective, just as phenomenological accounts of consciousness and experience had done so before them. My field experience was heavily somatic, from carrying timber from the storage shed on the first day, leaving my shoulder bruised, to the minute sensory perception entailed in pyrography, developed through much practice. This is an experience which will stay with me, in one way or another, for the rest of my life. However, such accounts are very much my own partial perspective. This partiality is usually, of course, a reflection of the

perspective of the dominant strata of social hierarchies. While the considerations of (un)equal researcher-researched relations above spoke of the value of my 'inability', this is also very much the story of an able-bodied male researcher growing in haptic sensitivity and capability. While the field would follow me home, whether through pain and minor scratches, or the seemingly incessant presence of 'aquacoat'<sup>40</sup> on my hands in those months, peeling off as I walked through the city, it had a different way of following Tony home, for example, whose ability to do heavy work was always impeded by (and worked to exacerbate) the pain of his multiple disabilities.

### 3.7.1 Ethics

*[Field Notes, December 2015] Liam's problematic relationship to food became an issue in the workshop again today. He continues to refuse to eat the nutritious food served at lunchtime [at the Grassmarket], relying almost solely on crisps, sweets and up to two litres of Irn Bru (we have no idea how much he drinks at home, after workshop hours, nor what he eats there, but from his stubborn behaviour it's unlikely to be much different).*

*We've all become entangled in his welfare at this point, shaking our heads, trying to talk sense into him, concerned by his pasty skin and the unhealthy look in his eyes. We tried again to convince him to at least try something that doesn't contain sugar as its main ingredient. We've discussed it openly and we all genuinely think it will, on a yet-unknown timescale, be the thing that's going to kill him. I'm not sure I intervened as I should have, though, when Brian [another volunteer] began teasing Liam after lunch, saying that it was the quantity of Irn Bru which had turned his hair ginger. Brian, as always, toes a fine line between humour, intelligence, and outright obnoxiousness. The point is serious, but Liam's anger made it apparent that he is tiring of other people's desire to change his diet. I shouldn't have laughed,*

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<sup>40</sup> A generic name used for a liquid treatment used to 'finish' timber products.

*though I did end up talking to Tommy about the tension arising between the two, to try to protect Liam.*

This mundane example hints at just some of the questions raised around researcher responsibility working in dynamic social environments. Cloke et al. (2000: 136) highlight something of a paradox that, with the upturn in interest in practising ‘interpretative social science’ over recent decades, research is seen as “morally more acceptable” – that is, less objectifying and positivistic – while “concomitantly the room for ethical dilemma has undoubtedly increased.” While an institutional ethics board granted permission for the present study, and formal steps have been taken to protect anonymity where possible, it is true that this is only the starting point when it comes to the relational ethical considerations in qualitative research (Gillan and Pickerill, 2012).

On some fronts, the ethical issues for this project appeared minimal. These were relatively thriving, well-established community groups, operating in a sphere – making and craft skills – which seems largely devoid of ethical uncertainties and tensions. Participants were all over the age of 18 and able to consent to taking part in the study. It seemed that, having got to know people, they were happy to contribute to ‘help me’, reciprocating the way we helped each other day-to-day in the workshop, by answering relatively innocuous questions about making in their lives. Ethically, obtaining access was relatively unproblematic. These were not ‘over-researched’ groups and the word ‘research’ wasn’t a dirty one amongst them, unlike, for example, its connotations among many indigenous and global South communities around the world (Smith, 2012). However, while the topic of making cannot be deemed an ethically sensitive issue, in the way that, say, the study of homelessness and addiction could be, some sensitive issues related to health and wellbeing are raised in the thesis, particularly in Chapter 6.

Other ethical dilemmas stayed with me throughout the period of study, not least the danger of veering into research ‘extractivism’. Was I just a ‘research tourist’ (Cloke et al., 2000) and, if not, to what extent was I helping or hindering these

groups? How could I not be a 'research tourist' in a place like the Hacklab, where people were expressing specialised interests which had been developing over many decades and which, in some cases, I had little knowledge of. Could I actively harm them or impact negatively on internal group dynamics? Would my presence cause tensions? How did my enrolment as a PhD candidate colour my choices? On balance, was I doing this for me, for them, or for some broader purpose relevant to neither party? Or all three, simultaneously? Such were just a few of the meta-ethical questions I asked myself consistently and which would probably never be comprehensively resolved or answered.

Participatory methods and action research are, by now, reasonably widespread in qualitative research (Kesby, 2007), and ones which, in their 'strong' form, I admire. It did weigh on me that I hadn't taken that more testing route, by actively including participants in research design, for example, or responding specifically to a self-identified need or imperative within the community. This was due, in part, to a lack of confidence in my ability to engage and enthuse potential participants for deeper engagement.

Cloke et al. (2000: 141) note "the sheer difficulty of holding in tension the very different roles and discourses demanded of an academic researcher dealing with marginalised others". At the Grassmarket particularly, I felt a pressure that I was expected to be of use, as an 'outsider,' to somehow 'evaluate' their work, when I felt that I was really there to respectfully learn from it. To be framed as an evaluative project would have changed the feel of the entire process. To counteract such pressures, I tried, as much as possible, to emphasise that I wasn't there to 'evaluate' anything, but that I did hope that there would be lessons to be learnt which I would feed back after the duration of the project.

While my project never claimed to 'make a difference' in the mould of participatory methods, and was not action research in a 'deep' sense (Kesby, 2007), I do take seriously Gibson-Graham's (2008b: 623) assertion that research is inherently methodologically performative, and that projects such as the one

undertaken here can “[make] credible those diverse practices that satisfy needs, regulate consumption, generate surplus, and maintain and expand the commons, so that community economies in which interdependence between people and environments is ethically negotiated can be recognized now and constructed in the future.” This was tangibly evident, for example, through my active participation in helping to construct the very material infrastructure of the Remakery, or the work I contributed which would, among other things, help to ensure the financial viability of the Grassmarket.

Ethical issues regarding consent, which can plague ethnographic studies, were also a concern for me. In practice, I would confront the blurring of overt and covert study which often takes place in busy public environments. Gaining permission to access a field site is just the very beginning and it proved simply practically impossible, for example, to inform everyone passing through a public workshop on a busy open night, that I was going to go home that evening and write up notes on my observations.

This concern is redoubled in ‘netnographic’ work, whether in recruitment, data collection, analysis or dissemination (Caliandro, 2017). Ethical processes in the latter relatively new realm of qualitative study are often unclear, a fact not helped by a relative lack of discussion in the human geographical literature (Madge, 2007). For example, I made my presence on the list known at the outset, but had concerns in doing so. When sending these e-mails to recruit participants, I was conscious of not derailing the list for my own purposes, and so made sure to send such e-mails weeks, or months, apart.

Other factors which need to be taken into account with digital methods include whether the information is of a sensitive nature, whether it has been made deliberately available in the public domain, and whether that ‘public domain’ is a passively-viewed forum or a mailing list (in which case messages are actively sent into unknown others’ inboxes). As one participant stated, “If I said it on an open forum then, as far as I’m concerned, it’s a public statement that can be used for

any purpose by anyone” (William, personal communication). However, how should archived data be treated when the contributor has withdrawn from the forum or is non-contactable? Much like qualitative research generally, there are simply no ethical rules which can be strictly followed in every case, when it comes to the capture and use of online qualitative data (Townsend and Wallace, 2016).

### 3.7.2 Methodological Learnings

This thesis is certainly not the final statement on makerspaces, though I hope that it is a valuable part of a conversation, prying open the door of these under-researched spaces with a practice-theoretic lens. To close this chapter, I will try to reflect on the research process, in order to highlight the promise, and limitations, of the broader research approach.

Firstly, data collection was relatively ‘unstructured’ and this came with challenges and repercussions for the final product. Retrospectively, I would like to have used a more immediate and forthright note-taking approach, rather than compiling notes at private moments. I think my uncertainty on this front, stemming from inexperience and an over-zealous desire to remain unobtrusive, prevented me from noting or recalling more closely mundane happenings. Relatedly, I regret not making more use of visual methods by filming workshop activities. At the time, this made sense, as the material presence of filming and photography in general can be quite intrusive and disruptive, but there were occasions, particularly in the Remakery, where this would probably not have been the case, and I should have been more assertive in realising this.

I think there are also interesting reflections to be made on the duration of ethnographic immersion, which varied between the case sites. As Fine (1993: 280) notes “the ability to be observant varies, and we should not assume that what is depicted in the ethnography is the whole picture. Obviously for reasons of space, events are excluded, but much is excluded because it passed right under our nose and through our ears and because our hands were too tired to note the happening.” While the general impression in the social sciences seems to be that

the longer the immersion, the better the project which results (Baxter and Eyles, 1997), in reality the 'shock of the new' can be very productive in formulating insights about an evolving project. I saw value on both fronts: longer immersion ensures greater familiarity, yet as more time is spent in the field and the researcher identifies more with the participant group, behaviours, speech acts and practices can begin to be taken for granted. There is certainly a balance which needs to be struck here.

On this topic of identification and immersion, I had received a warm welcome from the Grassmarket, but this was more muted in the case of the two others. This was unexpected, and something which I should have been more prepared for, especially given the differing organisational and membership structures. For example, the Remakery was extremely busy at this time, having not yet been fully established, and I took this to mean that my questions and presence could become a burden (indeed, arranging some interviews proved quite difficult). This hampered data collection, though it certainly struck me that had I taken more of an explicitly 'action research' approach, I could have overcome such concerns about 'buy in' to the research early on.

Online methods ended up being valuable for keeping track of organisational activities, both present and historic, and the paradox of using such 'distanced' tools, along with, say, photography, in a study espousing the 'more-than-representational,' needs to be addressed. I don't want to create a duality between 'good' and 'bad' methods, depending on their distance from language, cognition and representation. Are digital methods the 'best' way to access the colour and atmosphere of social life? Almost certainly not. However, they can be a valuable starting point, particularly if creatively interpreted, analysed, and read between the lines. Such methods do have their own strength, in turn. The Hacklab mailing list data are potentially 'less tainted', through their unsolicited nature, much of it having come into existence before the current study was even conceived.



### 3.8 Concluding Remarks

While setting out the study's methodological orientation, this chapter has begun to address RQ4 on qualitative methods, in an era increasingly attuned to posthumanism and more-than-representational approaches. There is certainly an irony in producing a traditional written dissertation extolling the virtues of practice, material agency and non-representational approaches to social science. I began by arguing that a valuable theoretical and methodological focus has been increasingly evident in the academy in recent years, focusing on questions of embodiment, habit and practice, and it would be remiss of qualitative researchers to ignore this. That said, the chapter tried to avoid drawing a hard dichotomy between qualitative methods like interviewing and the 'witnessing' spoken of by non-representational researchers. Rather, a plurality of approaches were called for, with participants' reflection being complemented by observational methods more attuned to more-than-representational aspects of social life. This balance is hard to strike and it remains to be seen whether the resulting thesis falls too heavily on one side or the other.

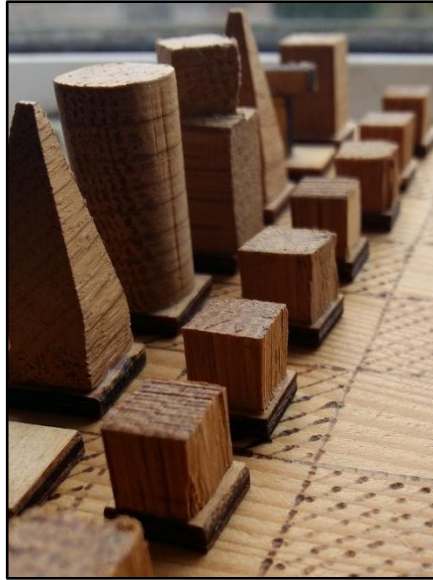
However, an enactive ethnographic approach was put forward as most closely suiting a study of this nature, providing space for multiple traditional and non-traditional qualitative techniques, while placing practice centre-stage. The selection of field sites, as well as the modes of data collection and analysis, were outlined, before important concerns regarding positional reflexivity, textual reflexivity and ethics in qualitative research were addressed. The chapter closed with reflections on methodological challenges faced, and learnings which can be applied in future research.

By now, I hope to have set the scene for the chapters which follow, and outlined the basis for the tentative knowledge claims made therein. The following empirical chapters examine the more-than-human and more-than-representational geographies of community workshops in three different ways. Firstly, I examine the performance of making and the intricacies of the embodied materiality which

characterise various workshop activities. With this foundation in place, I will then zoom out somewhat to explore questions of practice and pro-environmental social change. Then, finally, I examine the resulting implications for what we could term 'wellbeing'.



## 4 Practice-as-Performance: The Mangle of Craft From Pyrography to 3D Printing



*Figure 13: Bauhaus Chess Set*

*[Field Notes, December 2016] To engage practically with the tools, techniques and materials that I need to understand, and to gain a fuller insight into the material practices of the Hacklab, in particular, I have decided to make something<sup>41</sup>. After considering what is practical in terms of my current living situation (a small apartment, no transport etc.), as well as something that's varied enough to allow me to engage in a variety of relatively new maker activities, I will make a chess set. I will begin by 3D printing one set of pieces, making the other set by hand using some more traditional techniques, and then make the board, to fit around and contrast with these.*

*After experimenting with various shapes and sizes of chess sets, with varying degrees of success, I have been pulled towards a Bauhaus-inspired design. It seems*

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<sup>41</sup> Davies (2017b: 109) refers to such projects as 'Trojan Horses,' necessary for workshop attendees because "The hacker emphasis on doing and making meant that simply hanging out in the hackerspace could be seen as passive, uninteresting, not really in the spirit of things."

*an apt choice, in spite of my relative ignorance of art history, given that the Bauhaus school (founded in 1919) aimed to replace “the traditional pupil-teacher relationship with the idea of a community of artists working together. Its aim was to bring art back into contact with everyday life...”<sup>42</sup> Furthermore, Bauhaus is renowned for its attempts to bridge and/or unify William Morris-inspired craft production with the rapidly-developing factory production technologies of the era.*

## 4.1 Introduction

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“Building...is a process that is continually going on, for as long as people dwell in an environment. It does not begin here, with a pre-formed plan, and end there, with a finished artefact. The ‘final form’ is but a fleeting moment in the life of any feature...”

Ingold (2000: 188)

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This chapter explores the material practices of craft across my three field sites. It achieves two things: Firstly, it sets the scene for the broader elements of maker practice – the materials, competences and meanings – examined in the next chapter, by providing detailed insight into the performance of craft practice (practice-as-performance). Secondly, it responds to RQ3 on how the study of craft can be informed by theoretical developments in new materialism and posthumanism. Through empirical examples drawn from across the field sites, and taking seriously Ingold’s (2007) contention that abstract notions of ‘materiality’ – now widespread in work across the social sciences – have sometimes obscured

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<sup>42</sup> <http://www.tate.org.uk/art/art-terms/b/bauhaus> [Accessed 09/06/17]

more than they have illuminated, I will argue for the existence of a dynamic and material-specific ‘mangle of craft’.

The chapter begins in the Grassmarket furniture workshop, focusing on wood preparation, processing and finishing. It then moves to examine pyrography as practiced across both the Grassmarket and the Remakery<sup>43</sup>. Pyrography involves the inscription and marking of wood with high-temperature metal and, I contend, demonstrates the more-than-human emergence of craft practices. The chapter finally explores newer forms of making – 3D printing and laser cutting – which are less traditionally associated with ‘crafts,’ and which could be seen as to accord more with a ‘hylomorphic’ view of making. I will conclude, however, that these technologies too require that workshop participants negotiate the posthuman mangle of material resistance and accommodation.

## 4.2 The Mangle of Woodwork

*[Field Notes, September 2015] Today the volunteers battled with the twisted table top [pictured in Figure 14] - clamping it down tightly during construction, and trying to prevent the unruly wood, which contains a subtle but problematic curve, from springing back and producing an uneven table top. This wasn't part of the plan, but Tommy doesn't seem fazed. He always seems used to slight diversions from the plan. It will either be tamed by 'force', using the clamps, or adapted into the final design. It seems that, in woodwork at least, there is always a modification which can be made*

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<sup>43</sup> Indeed, the Remakery's pyrography tutor, who we shall meet again in Chapter 5, had first learned the skill at the Grassmarket, where she had been referred during a period of homelessness.



**Figure 14: Oak Tabletop Outdoors**

Material transformations at the Grassmarket workshop, for the most part, involved former church pews from across the UK, which are deconstructed *in situ*, before being transported and stored either in a warehouse off-site or at the workshop (Figure 15). These pews are donated to the workshop, either due to church closure amidst dwindling attendance or, relatedly, the increasing tendency of turning church spaces into more dynamic, accessible and multi-functional community spaces, complete with moveable furniture. The quality of wood removed from these churches tends to vary enormously and it was emphasised from the start that you can't be sure of the quality of the pews until you start to work with them. However, the acquired timber tends to be in reasonably good condition and can even include high-value hardwoods, some of which is likely to be testament to a colonial-era hardwood trade.



**Figure 15: Pew Stored Prior to Processing**

Once diverted from the waste stream, converting the timber into a usable form is the primary part of the Grassmarket's process. Carpenters and furniture makers, of course, usually prefer to work with 'sawn wood' – clean, milled, straight-grained and with few imperfections. On arrival, however, the pew timber resembles that pictured above; scratched, damaged, with uneven edges, a heavy lacquer finish, and filled with old, rusty, often disintegrating nails. However, this history of use, materially imbued in the wood through such imperfections, is integral to the success of the workshop's products. As I was told, by Susan:

*You're going to have imperfections in the pews. So with the TV unit there, they had big holes from where it had been screwed in before, so you have to drill that out and then put a plug in [to conceal the hole]. You would never have that on a piece of brand new timber, but that's just the kind of character of it I think. And people know [that].*

Unveiling this 'character' of the timber, and re-converting the pews into a usable raw material requires, firstly, the careful removal of the wrought iron nails which



previously held the pews together. If left embedded in the timber, these would go on to cause expensive (and potentially dangerous) damage to machinery such as planers and table saws. Due to the unique nature of each piece of timber – the pews were constructed for a particular church and built in the style of a particular carpenter – this removal is completed ‘by hand’. I had been taken aback at how efficient the volunteers were at this, conveying considerable skill during an activity which one could think is a fairly menial task. In reality, this requires a vast range of improvised techniques, employing hammers, chisels, hole punches, and a number of other tools often not expressly designed for this task.

Part of this improvisation is further provoked by the decayed nature of the nails which leaves them liable to snapping, at which point they become even more embedded within the wood. In a discussion of the creation of artefacts, the environmental philosopher, Steven Vogel (2015: 113), frames this process well. He notes that “as the nail goes deeper into the wood, the chemical structure of the former encounters the biological structure of the latter in a way that produces complex reactions on each side that none of us could hope to grasp or even really fully to imagine, all of these subject ultimately to Newtonian laws of motion, or at different levels to relativistic and quantum mechanical effects as well. Without these processes there would be no hammering; yet the hammering goes on, and indeed can only go on, in a kind of deep ignorance of their details.”

Once the nails have been removed, the timber is cut to size and the dense and heavy-duty lacquer in which the pews are coated must be planed off, in two of the only workshop processes completed entirely by machine. The use of machinery is itself far from simple, however, and regularly beset with delays or unexpected events. In a regular occurrence, for example, undiscovered nails chip the blade of the planer. This, in turn, results in uneven planing, which will have to be time-consumingly corrected by participants by hand (using metal scrapers) at a later date. The dense protective coating of the pews also tends to clog up the machine’s internal mechanisms, causing regular shutdowns of the operation for cleaning.

The mundane occurrence of this clogging, and other forms of damage, equate to 'resistance' in the workshop, with resistance being a foremost element of the tuning that occurs in Pickering's posthuman mangle, or dance of agency (Pickering, 2010). Resistance denotes "the failure to achieve an intended capture of agency in practice" (Pickering, 1995: 21) and while Pickering discusses resistance and failure in the context of scientific practices, this is also the defining characteristic of crafting, as we saw when discussing the work of David Pye and others in Chapter 2. Through resistance, linear ends are frustrated, and this calls for the secondary phase of accommodation, which Pickering terms as "an active human strategy of response to resistance". This response can include things such as revisions to goals and intentions, or revisions to machines and tool use.

In craft practices, the close interplay between these two – resistance and accommodation – renders them more or less inseparable, with one giving way to the other according to the affordances of the material and the skill of the practitioner. There is, that is to say, a 'mangle of craft'. Ingold (2017: 3) speaks of "improvising a passage through an as yet unformed world" and has written that skilled practice involves being patient, waiting "for things to fall into place in a way that affords follow-through, rather than jumping in front with your own intentions and expecting everything to fall into line behind...Mastery and submission, agency and patience, and strength and vulnerability are two sides of the same coin."

Material resistance arises practically everywhere one looks in the workshop. Materials split unexpectedly, hands and tools slip mid-use as attention fades, sandpaper clogs with the resin of timber at variable rates, tools become blunt. Natural materials like timber provoke our attention, for their beauty and uniqueness, but also often in quite undesirable ways. Twists in wood grain, for example, perhaps caused by some abnormality which has been sedimented in a particular tree's growth habit many years prior can cause resistances such as that noted in the field note which opens this section: unevenness, disobedience, non-compliance to human ends.

Wood, which is supposedly 'dead' when it is brought into the workshop perpetually moves and warps, usually in unforeseen and unforeseeable ways. Ingold (2013: 48) refers to the need to "improvise solutions to problems that could not have been anticipated, and to wrestle with materials that are not necessarily disposed to fall, let alone to remain, in the shapes required of them". Indeed, this movement often continues long after the timber has been used to construct a piece of furniture. For example, one participant noted the experience of constructing a TV cabinet from elm which, when relocated from the workshop to its new home, had expanded, rendering its doors and drawers unusable. Indeed, while often assumed to be discrete entities, objects are wildly permeable to ambient and environmental variables (Edensor, 2011). Having learned from this – realising that elm has a particular tendency to warp in damp or humid environments – caution was subsequently exercised when, for example, embedding a mirror within an elm frame on a future project. After all, should it decide to warp in its new environment, the glass could crack, ruining the piece. Learnings about necessary measures of adaptation are then shared, and carried forward amongst participants in the workshop.

Due to this unpredictable, unruly and resistant nature, materials can also act as the great leveller between participants in a workshop, throwing up heretofore unencountered problems and confounding easy solutions. The following field note recounts just one instance of material resistance confounding and drawing participants together:

*[Field notes, November 2015] I've been working on applying a finish to the edge of a tabletop, using a 'surform' (a portmanteau of 'surface' and 'form') – basically a woodworking tool resembling a cheese grater, which is dragged across the surface of timber to remove gratings. It's useful in creating what woodworkers call a 'waney-edge' on the corners and sides of items of furniture. Not the most sophisticated of methods, waney-edging allows (somewhat) for imprecision and*

*looseness in its production, and results in a look which is appealingly ‘organic’ on the eye (Figure 16). “You want people to want to touch it,” noted Tommy.*



**Figure 16: Example of ‘Waney-Edge’**

*Unfortunately the surform kept sticking, meaning my movements were jerky and I couldn’t get the smooth curves which are needed. It must have looked as if my incompetence was to blame at this stage, because Liam saw me struggling to get the right finish on the timber, and came to help. He has more woodwork experience than me and, in a friendly way, likes to demonstrate this. He confidently walked over, clearly assuming that this would be a situation in which he had the requisite knowledge, only to discover that, in fact, the resistance was greater than expected. He has the same issue I have: the material doesn’t yield and, somewhere in the intra-action between tool, timber and participant, there is a serious blockage taking place. He seems to struggle even more than I did, in fact. We thus return to square one, and speculate on alternative ways forward, acknowledging that there’s something unusual going on with the grain of this particular piece of*

*timber. A few minutes of trouble-shooting follows, experimenting with various alternative surforms of varying shapes and patterns, different manual techniques (pulling versus pushing, at different angles and with a range of forces).*

Many of the idiosyncrasies which lead to such resistance come down to material specificities, which are immense and all-too-often under-explored in the abstract turn to materiality across the social sciences. The term timber, much like the term materiality, conceals as much as it conveys, betraying a tendency to “constitute the rest of the world as if it were a set of mere objects” (Connolly, 2011: 31). Ingold (2007a: 3) asks:

...might we not learn more about the material composition of the inhabited world by engaging quite directly with the stuff we want to understand: by sawing logs, building a wall, knapping a stone or rowing a boat? Could not such engagement – working practically *with* materials – offer a more powerful procedure of discovery than an approach bent on the abstract analysis *of* things already made? What academic perversion leads us to speak not of *materials and their properties* but of *the materiality of objects*?...The concept of materiality, whatever it might mean, has become a real obstacle to sensible enquiry into materials, their transformations and affordances.

In the workshop there is no Platonic ideal of wood; rather, there is just *this* particular *species* of timber, which tends towards a certain tightness of grain and containing a particular density of resin, which in turn is exemplified in *this* specific *piece* of timber, and which was reclaimed from *that* church. Given this fact, memorising the different woods used in the workshop, visually and haptically in concert, becomes one of the first undertakings for a newcomer to the Grassmarket workshop. The importance of this knowledge is reinforced by a prominent educational display of various timbers on the wall by the workshop entrance, as well as good-spirited educational spot tests during the working day, with, Tommy, the co-ordinator, appearing – often repeatedly over a day – to ask ‘*what kind of*

*wood is this?* Oak, douglas fir, cedar, beech; it doesn't take long for participants to instantly recognise the difference.

Aside from visual features, the diverse materiality of wood comes through in weight and feel. At the start of my time at the Grassmarket, after a morning of aching arms, lugging heavy planks of douglas fir around, Daniel handed me a block of timber – cedar, it turned out – which took me by surprise in its lightness. I awkwardly picked it up, and he laughed, saying “*looks can be deceiving!*” Similarly, newcomers are often shown a fairly ordinary-looking post of timber which is kept in a corner of the workshop for no apparent reason apart from its educational value. Encouraged to try to lift it, people are invariably taken aback by the weight and density of the post, which resembles stone more than timber<sup>44</sup>, challenging any assumptions regarding the homogeneity of the material.

Thus, once a piece has been processed, inspected, and readied for construction, timber in the abstract is remarkably rarely spoken of in the Grassmarket. As Walls (2016: 1) notes, “materials do not just passively record patterns of behavioral activity. It can be observed that they also play constitutive roles in the way that people interact with and come to perceive their surroundings.” These specific materials are always on the move, and resistance continues to rear its head as an attribute of the different woods in question. *That* particular timber then becomes memorised by participants, particularly for its possession of *that* particular attribute (See Edensor [2011] for a comparable discussion of the particularities of stone as a building material). This is the “elusive...and only partly predictable” nature of wood spoken of by famed American woodworking teacher, James Krenov (quoted in Betjemann, 2008: 188). Note, for example, the following observations:

- *A participant is drilling a round hole in a candleholder, large enough to hold a tealight, only to discover the wall and the base of the hole are rough*

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<sup>44</sup> The timber is Lignum Vitae (*Guaiacum officinale*), indigenous to the Caribbean and regarded as the heaviest wood in the world.

*to touch and, perhaps more importantly, ugly on the eye. Further sanding fails to help. A more experienced workshop member informs him that this came from a mahogany (*S. Macrophylla*) pew, in which the grain tends in two directions, rather than just one.*

- *During wood burning or pyrography, white flecks in the flesh of the oak (*Quercus*) being burned cause frustrating black lines to 'bleed' further than expected, resulting in a messy finish to the text which the participant is trying to inscribe on a plaque. The tip of the burner also catches in the prominent grain of this piece of oak, causing a bumpy, unpleasant finish. Sycamore, however, a timber used on the next day, lacks this rough grain, resulting in a much 'cleaner' burn.*
- *The dense, sap-filled form, particular of Douglas Fir (*Pseudotsuga menziesii*), regularly prevents the volunteers from getting the tidy finish, through repeated 'de-nibbing'<sup>45</sup>, that you might get, for example, from woods like *afromosia* or African teak (*Pericopsis elata*). Instead, sandpaper gets clogged and the liquid coating, which is applied as a finish, fails to adequately absorb.*

Given such instances of material resistance, of course, the volunteers try their best to accommodate. An enormous amount of time and human energy in the workshop is spent reconfiguring, rethinking and adapting to imperatives set by materials. While craft is often associated with the veneration of skilled work, David Pye (1980) hence notes that "very few things are actually made by the unaided hand...In matters of workmanship the only true antithesis is between risk and certainty." (Ibid: 4). Taking the example of making a mark with a stamp, Pye (Ibid: 5) notes that, even then, "there still is an element of risk because you can ink it unevenly or stamp it down on one corner, but it is getting pretty near true workmanship of certainty, and if you have a lever-operated stamp you get nearer still." While failure will always be a crucial and iterative part of craft, *jigs* are often employed by craftspeople to mediate the ever-present flux between risk and

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<sup>45</sup> De-nibbing involves the removal of very subtly-raised wood grain between applying coats of finish. While imperceptible to the eye, this can affect the smoothness of finish obtained as the timber absorbs the coating.

uncertainty. Jigs can be any custom-made device which guides a tool, thereby holding the possibility to reduce uncertainty, increase the speed of particular processes, and increase safety. They are basic mechanisms of stabilisation in the mangle of craft.

Pye's desire to oppose risk with certainty, rather than machine-made by hand-made, remains significant in activities across the three field sites, and will remain an important distinction when we discuss examples from the Hacklab. However, having reviewed elements of resistance, I will briefly examine techniques of accommodation and stabilisation employed in the wood workshop. In accordance with their ever-changing level of competence, volunteers regularly shared tips and demonstrated means of avoiding certain mistakes to newcomers. For instance, while using the band saw, participants employed, and shared, the common-sense tactic of keeping the saw well inside the line they actually desired to cut, before sanding the piece down to the line as needed. While increasing the total amount of work needed, this is a simple way of replacing a high-risk, high-speed manoeuvre (cutting with the fast-moving and hard-to-control band saw) with a low-risk, low-speed one (sanding gradually, by hand). As manual competence grows, however, this margin of error can be reduced accordingly.

Techniques of accommodation are further evident in the case of warping wood, already discussed above. Accepting that elm has a tendency to shrink and move more than other woods, and potentially cracking the expensive, vulnerable glass in it, a decision was taken for the mirror not be routed into, and thus embedded in, the elm surround. Construction was instead adapted to leave space to accommodate the imperceptible movement in aging timber, as it dries and finds a new 'island of stability' (Pickering, 2013), the term used by Pickering to describe temporary moments of balance between resistance and accommodation. As Edensor (2011: 241) notes in his discussion of stone as a building material, while its "destiny is partly influenced by its own properties, a complex range of biological, chemical and climatic agencies continuously amend its capacities."



Examples in the workshop multiply, but what remains clear is the unending flow of agency between and amongst maker, environment and materials.

While aiming at an ontologically ‘symmetrical’ approach with regard to the interactions between humans and nonhumans, Pickering’s ‘mangle’ or ‘dance of agency’ does maintain for humans “a planning capacity and some intentionality, while highlighting the tremendously varied capacities of diverse material and machinic agents” (Bruun, 2003: 230). The methods of accommodation which take place in the workshop, discussed above, particularly allow room for reflective cognition, whereby one consciously accommodates and adapts to the imperatives of the material and vice versa. The cognitive aspects of accommodation to material resistance, however, are only part of the story (Ahuvia et al., 2015; Ingold, 2015; Smedslund, 2015). Watson and Shove (2008: 78) clarify this distributed and performative aspect of craft competence thus:

...competence is not only an attribute of the human doing the painting. From this perspective, painting is something achieved only in the doing, only as the diverse elements involved in accomplishing the task are brought together, and only as distributed fragments of knowledge – the knowledge embodied in the human, the formal knowledge from the back of the paint tin and the embedded knowledge in the paint, the brushes and their relation to the door – are actively woven together.

Practice knowledge in this interstice of body-mind-object is context-specific and often not strictly, or easily, representable. When applying a finish to a piece of furniture, for example, a common question from newcomers to the workshop, hoping to avoid making mistakes, is “how many coats should I apply?” This is impossible to answer with precision, however, as different woods with diverse porosity, absorb the finish at different rates, while the repetitive interaction between coating and sanding plays a role too, unique to each piece of furniture, meaning definitive outcomes only emerge mid-process. Overcoming resistance is a matter of constant monitoring, rather than certain knowledge.

Perhaps the most mundane, but arguably most crucial, of workshop activities – sanding – exemplifies this imbrication of thought, sense and material. Seemingly mechanical and unskilled, getting wood from the rough finish left from a machine planer, say, to the glass-like texture which was much sought-after in the workshop’s end product is a fully embodied process. Assessing the level of sanding needed, or appraising what the current state of the finish is, is more involved than an observer might expect, with the absolute beginner (often to their initial frustration) having almost no baseline of embodied memory from which to judge the progress of a piece. In my first days at the workshop, for example, other volunteers would brush their hands across the timber I was working on, trying to show me patches which were not adequately finished. Frustratingly, all I could do, however, was to take their word for it; in spite of tracing my own hands across the same patches, I had felt no difference.

The understanding of a good finish is itself a form of gradually-acquired embodied knowledge, with beginners much less able to distinguish a good finish from a coarser one.<sup>46</sup> This is a knowledge which cannot be transmitted directly, but must instead be grown, through experience and performance, over prolonged engagement. Less experienced participants, lacking the subtlety of touch to compare different pieces, control for this lack of haptic knowledge by engaging with others, crosschecking or verifying how their work is progressing. The emergent sound and ‘feel’ of interaction between different grades of sandpaper and the wood in question gave a crucial insight into the current state of the piece, for example, while one workshop participant endorsed the trick of closing one’s eyes while testing the feel of a surface, to eliminate any possible tricks of the eye and thus more accurately infer the state of the wood purely from touch (a technique described in my field notes as “management of the senses”).

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<sup>46</sup> As Betjemann (2008: 185) emphasises, in the pre-IKEA era, varnishing and buffing were “specialized disciplines in their own right; laws passed in France in 1743 distinguished the skills of builders (menuisiers) from those of veneerists and finishers (ébenistes).”

This section has begun to outline the existence of a ‘mangle of craft’, a posthuman conceptualisation of the material-specific resistances and accommodations which emerge in the workshop. I will now map this analysis onto the particular material intra-action which takes place during the practice of wood-burning, or pyrography; the material resistance that arises, and the corresponding forms of accommodation which practitioners undertake, during this skilled activity.

#### 4.2.1 The Pyrographer’s Pen

*[Field Note, July 2016] Federica, our tutor at the Remakery, shows us how to set up and wield the pyrography pen, demonstrating how she goes about drawing lines. She then asks “does anyone have any questions?” I have done pyrography before, at the Grassmarket, meaning that I already have a sense for how it feels to sear timber. A fellow student, however, cheerily replies, “I won’t know if I have questions until I’ve tried it”.*



**Figure 17: Pyrography at the Remakery. Source: The Remakery**

Pyrography, already mentioned briefly in the previous section, relates to the decoration of any materials such as wood, leather, and bone, using a heated object. Derived from the Greek *pur* [fire] and *graphos* [writing], this has usually involved the use of fire-heated metal implements. In its contemporary form, however, pyrography involves the conversion of electrical energy into heat, which

is conducted through the metal nib of a specialised ‘pen’ to mark or burn timber for decorative purposes (Figure 17). At the Grassmarket, this technique was most commonly used to personalise plaques and awards while, at the Remakery, it served to rejuvenate, personalise and give a new lease of life to old items of furniture.



**Figure 18: Pyrography at the Grassmarket**

Pyrography certainly lies at the risk-based end of Pye’s ‘workmanship of risk’ spectrum. Pye himself contrasted the relative certainty of a printing press with the relative ‘riskiness’ of writing with a pen, and pyrography – which also entails the use of a hand-held ‘pen’ – exemplifies this well. While much contemporary commercial wood burning is completed with lasers, (usually) producing a more reliable, homogeneous and crisp finish<sup>47</sup>, pyrography remains heavily dependent on the (un)skilled hand of the practitioner, coupled with the quality of the tools and materials in the process. By adjusting the wire nib, making it thicker or thinner, and thereby modulating the type of shading achieved – while also adjusting the

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<sup>47</sup> Though this too is complicated, depending on the material, as we shall see in the discussion of laser cutters in Section 4.3.2.

temperature to the pyrographer's preference – it is possible to obtain subtle and beautiful texturing with a pyrography pen (Figure 19).



*Figure 19: Pyrography Shading. Source: [www.federaluciavinella.com](http://www.federaluciavinella.com) [Accessed 04/05/17]*

To write about pyrography in this way is to lose much of the performative complexity of it, as it actually takes place. Missing from the account is the (usually) appealing smell of the wood as it burns, the sizzle as a hot nib touches cold wood, vaporising any damp and causing fragrant – though, sometimes astringent – wisps of smoke to rise into the pyrographer's face. Indeed, the process of pyrography is worlds apart from Lemonnier's statement (quoted in Walls, 2016: 22) that "any technique, in any society...be it a mere gesture or a simple artefact, is always the physical rendering of mental schemas learned through tradition and concerned with how things work, are to be made, and to be used." Rather than pre-planned in this manner, adjustments are made mid-performance, in real time and, responding to difficulties as they occur, often at the edge of conscious reflection (see discussion of the 'flow state' in Section 2.3.4). No two pyrography manoeuvres are replicable, and no two resulting artefacts are the same.



*Figure 20: Pyrography at the Grassmarket*

Given such uncertainty, a variety of jigs are also employed here to overcome resistance, cultivate an ‘island of stability’, and ensure a desired finish, though the extent to which such jigs are employed itself has a dynamic relationship to the skill of the particular pyrographer. Prior to wood burning, for example, the novice participant will often trace the desired design onto newly-prepared wood, using carbon paper, to give guidance and avoid the need to inscribe completely free-hand (although the latter is also an option, usually for more artistic and interpretive pieces such as Figure 19). While the resulting line doesn’t act as a mechanical or physical jig, it plays the role of focusing the maker’s actions and ensuring they replicate closely the desired design. While this appears simple, taken at face value, the use of carbon paper itself introduces an element of uncertainty into the process, depending on the skill and hand-stability of the

person doing the tracing, as well as the quality of the carbon paper, which can vary significantly<sup>48</sup> (Figure 21).



**Figure 21: Subtle Variations in Carbon Paper**

During the actual burning of the design, the maker further employs a number of jigs, perhaps by simply leaning his or her hand on a wooden block to support and raise their hand to the same level as the piece under construction, thus stabilising the pyrography pen. This reduces the risk of unforeseen jerks or shakes, which can ruin a piece and require starting from scratch. The temperature of the pyrography pen's nib may also be adjusted. For example, it might be turned up to a such an extent that its wire glows red and burns more predictably, with less contact needed in order to make its mark on an almost-infinite variation of wood grain. Raising the temperature in this way also ensures that the hot wire itself is less susceptible to variations in temperature due for example to changes in ambient temperature, or to any draught of cool air which may move through the workshop,

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<sup>48</sup> Nothing is more frustrating, I discovered, than spending half an hour of intense concentration tracing a complex design, only to lift up the carbon paper and find that the outline failed to transfer.

through a window (such as that in Figure 20) or from under a door. However, this increase of heat can simultaneously increase the likelihood of making difficult-to-reverse errors.

Furthermore, the adjustment of temperature varies according to the type of wood being burned onto, with hardwoods generally needing a higher temperature and greater pressure to make the desired impression, as well as the speed at which the practitioner works, with slower motions requiring less heat to mark the timber. Having the pen at a high temperature can cause an unwanted black bleed to occur along the grain of the wood, resulting in loss of sharpness or blurring in the final image. To control, or accommodate for, this largely unpredictable resistance, the pen is therefore held at an angle to the wood and, where possible, burned from inside the line demarcating areas to be shaded, rather than directly onto it.

Such are the minute subtleties of the practice, though preferences regarding heat and hand position, of course, vary from maker to maker. The need to accord with the wood's grain when undertaking pyrography is reminiscent of an example drawn on by Ingold (2013), from Deleuze and Guattari. The duo had spoken of the need, when a skilled woodperson wields an axe, to surrender to "the variable undulations and torsions of the fibres", its lines of "tension and compression" (p. 45), bringing the tool down so that its blade enters the grain and follows a path already incorporated into the timber through its previous history of growth, when it was part of a living tree. The wielding of an axe calls for the same attention to material specificity brought into play in the skilled wielding of a pyrographer's pen.

The question remains, however, as to whether such talk of 'variable undulations' and 'skilled wielding' is relevant when discussing workshop practices in the digital age. To begin to respond to this, the next section turns to two algorithmic forms of construction – 3D printing and laser cutting – to explore whether the 'mangle of craft' holds a similar relevance in such practices.



### 4.3 Morphogenesis and Digital Fabrication in the Community Workshop

Making has tended to be examined through the lens of particular – often traditional – instances of skilled labour. The previous sections are no exception to this. As noted in my literature review, authors in this area have a tendency to fall back on what seem to be rather romantic examples when examining material engagement. For example, Tim Ingold’s 2013 text, *Making*, is filled with examples such as basket weaving and flint-knapping, stating, for example, that “a nodule of stone has become an axe, a lump of clay a pot, molten metal a sword” (Ingold, 2013: 20). This work can give the appearance that the industrial revolution either never happened, or that its happening was largely an irrelevance in the study of material culture (See Roberts, 2017).<sup>49</sup> This contrasts with the outright enthusiasm which is often expressed for “the increasingly blurry line between digitality and materiality” (Ratto and Ree, 2012: n.p.), signified with technologies such as 3D printing and laser cutting, and subsequent talk of the conversion of ‘bits’ into ‘atoms’ (Gershenfeld, 2007). Can an examination of the ‘mangle of craft’ be extended to maker practices which appear to fall outside any ‘traditional’ notion of craft? How are maker practices changing in the era of computing, and what does this mean for skill in the contemporary world?

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<sup>49</sup> Coeckelbergh (2015b), for one, critiques this romantic tendency in much environmental thought, and his work therefore tends towards an examination of how our skilled experiences occur *through* such technologies as GPS and the mobile phone. I would personally defend the value of such romanticism to a greater extent than Coeckelbergh and others. However, that’s a topic largely outside the scope of this chapter.

### 4.3.1 Algorithmic Construction I: 3D Printing



*Figure 22: Effect of Inadequate Cooling in a 3D Print*

I begin the discussion here with 3D printers, the maker technology whose “mythic importance” (Ratto and Ree, 2012: n.p.) has provoked the most voluminous speculation about the potential for a ‘maker revolution’ towards additive manufacturing processes<sup>50</sup>, local production, and rapid prototyping<sup>51</sup> (Anderson, 2012; Birtchnell and Urry, 2013). In this section, I will try to sidestep such speculation and look instead at the material processes which underlie the use of such technologies.

Vast online catalogues of schematics for printable objects are accessible on internet platforms such as Thingiverse<sup>52</sup>, a website which alone is home to almost one million objects stored under Creative Commons licensing. Coupled with the rapid development and increasing affordability of small-scale, non-industrial 3D printing, such services allow users to download plans, send them to a 3D printer, and print one-off versions of millions of items (including everything from toys, phone covers and gaming pieces, to guns, medical prosthetics and drones) which

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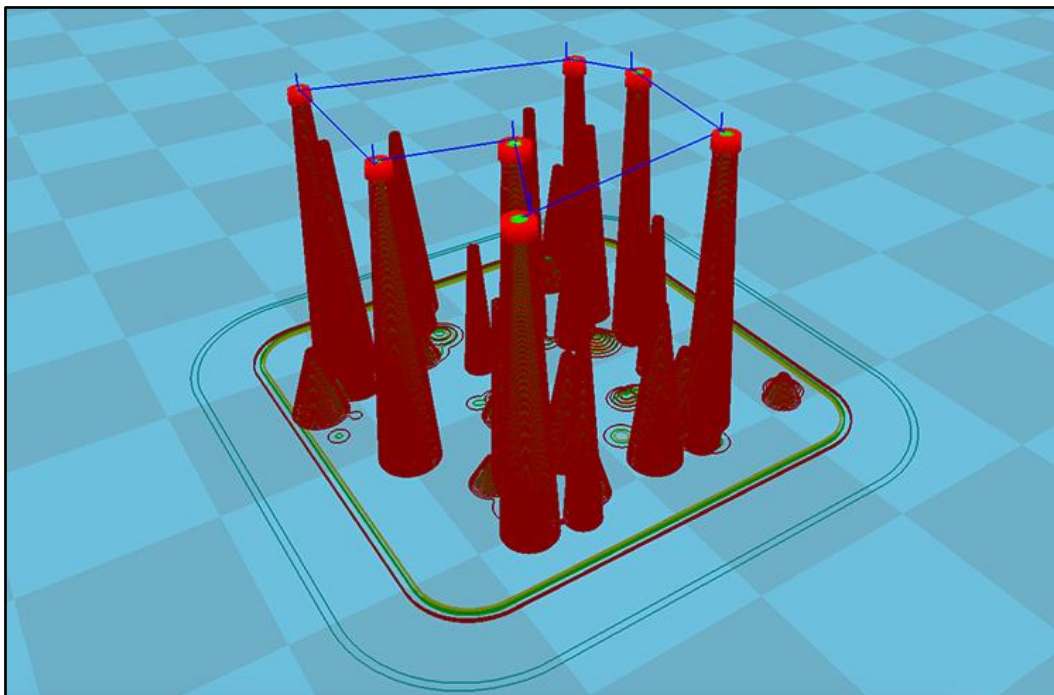
<sup>50</sup> Additive manufacturing is so-called because, as we shall see, it involves the building up of multiple, sequential layers.

<sup>51</sup> Though reports at the time of writing indicate that consumer uptake hasn’t been as strong as expected. In 2015, MakerBot, one of the 3D printer market leaders, sold fewer than half of what it sold in 2014, just 18,673 printers. Ironically, 3D printing as a way of producing items is currently of most utility, it seems, to large manufacturing corporations like General Electric and Ford.

<sup>52</sup> [www.thingiverse.com](http://www.thingiverse.com) [Accessed 16/05/17]

previously would have needed to be mass manufactured, through alternative, and expensive, manufacturing processes like injection moulding.

Users of 3D printers can also create their own designs, through digital modelling software such as Cura<sup>53</sup>, or 3D scan an object (through touch digitising with a CNC mill, photo scanning, or laser scanning, for example) to create the required schematic (Figure 23). The printer then builds up a 3D object, by extruding successive layers of material in the desired shape. The most widely-available printers print layers of plastic, but metal, fabric, ceramic and food 3D printers of various kinds, to take just a few examples, have also been developed.



**Figure 23: Screenshot from CURA Software. Source:**  
<https://ultimaker.com/en/resources/19504-how-to-fix-stringing> [Accessed 19/06/17]

The amateur community around 3D printing has traditionally been entangled with an enthusiasm for open source and non-proprietary technologies. In the late 2000s, this combination saw the much-heralded arrival of the RepRap and the MakerBot, two families of 3D printers which were notable due to their purported

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<sup>53</sup> <https://ultimaker.com/en/products/cura-software>

ability to self-replicate; that is, one printer could be used to produce the core necessary components for a second one, and so on. Hence, in October 2012, *Wired* magazine, a leading home for tech journalism, featured a 3D printer called the MakerBot Replicator 2 on its front cover, proclaiming “This Machine Will Change the World”.

However, the technology in its current form is quite widely held to be of limited utility in daily life, with claims of self-replication a gross simplification. As Ratto and Ree (2012: n.p.) note, “RepRaps are freely available to ‘anyone’ – anyone, that is, with enough know-how and drive to put one together. Successful assembly of a RepRap has been characterized as “nontrivial”: requiring local sourcing of often elusive hardware, extensive wiring and soldering of electronic components, as well as employing a decent working knowledge of software code.”

The printed objects, too, are often of questionable build quality (depending on the printing resolution and properties of the printer used), while there is limited utility for a consumer technology which can, at the time of writing, print objects from one substance only – usually plastic. As one participant put it, in spite of the hype,

*I actually think laser cutters are way more useful than 3D printers at the moment...There are so many things that you can do with precision cutting, that probably more people want to do. Yeah, I still don't see a 'killer app' for 3D printing yet. (Edward)*

This lack of a “killer app” is reinforced by the fact that the purchase of the fully-functional Ultimaker 2 – a 3D printer purchased and assembled from a commercial manufacturer as a standard kit – at the Hacklab (to replace a number of half-working donated ones) was, unlike many of the workshop’s collective purchases, not entirely driven by the needs of members. Rather, this purchase was spurred by a shared feeling that a space like the Hacklab simply *should* have something like this, for example to demonstrate to members of the public who attend the open nights:

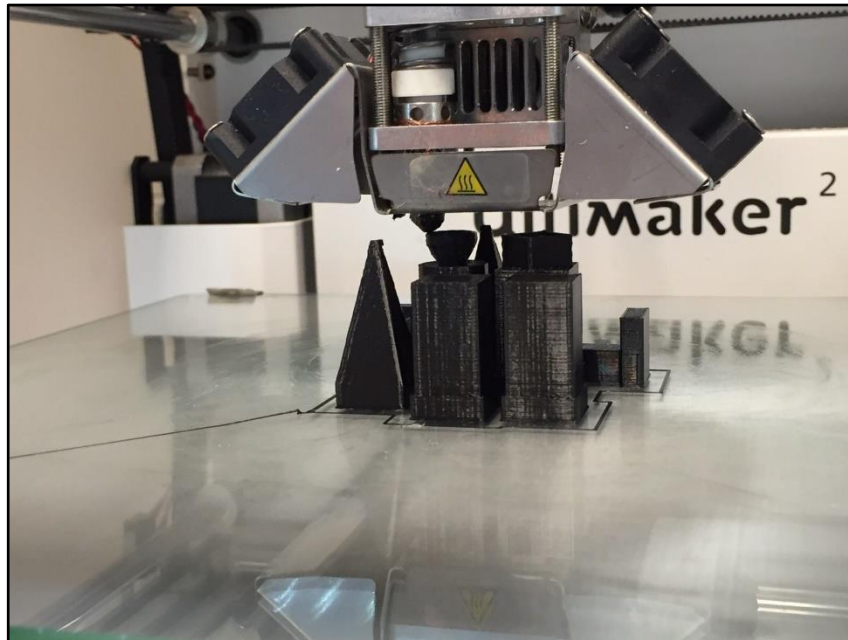
*The lab should have a working 3D printer. I'm sure quite a few of us are tired of saying the line "yeah, we have some 3D printers but they don't really work". It would be really useful to have at least one 3D printer that is a tool that can be used, rather than an ongoing project. (Discuss List, September 2014)*

This contrasts with the Hacklab's laser cutter which, as we will see later, was in constant demand during my time at the lab, while the 3D printer often stood idle. In terms of creating an object on the Ultimaker, the basic stages in the process are as follows:

*[Field notes, January 2016] The desired spool of material, known as filament, is placed onto a laser-cut stand (which has clearly been manufactured in the Hacklab) close to the back of the 3D printer and the thread of filament inserted into the feed-in mechanism. The mechanism senses the filament and automatically pulls it into the extruder. If downloading plans from a site such as Thingiverse, the user stores the file of the object they want to print on an SD card (in g-code format), which is then also inserted into the printer. The particular object file is selected on a screen on the front of the 3D printer, a button is pressed, the extruder moves into place, and molten plastic begins to be automatically laid down by a moving arm. This begins with the laying out of a base layer, before gradually building up further layers of plastic to create the desired shape.*

It could be assumed, given this description, that 3D printers signal something of a break from 'traditional' practices of making, being mechanical, algorithmically-driven, and requiring little or no practitioner skill in comparison with the woodwork and pyrography discussed above. The movement of the autonomous extruder mechanism conveys a robotic predictability, and the bare fact of the machine's execution of digital plans appears to be a near-perfect instance of 'hylomorphism' in a making process; that is, the imposition of form onto dead, inert matter. As Roberts (2017: 3) puts it, therefore, 3D printing as a technological

process “appears, at first glance, to merely reinforce the metaphysical distinction between acting human subject and passive material substrate.”



*Figure 24: Ultimaker 2 at Hacklab*

The reality is more complex, however, and affirms Simondon’s assertion that “there can be no imposition of form independent of a process of individuation that modulates between disparate material forces” (Ibid.; see also Edensor, 2013). To analyse these ‘disparate material forces’, we can ask, for instance, what or who, precisely, is the maker of the chess pieces? Is the chess set under construction here a series of objects produced by human design, or machine-derived, or neither? If the hylomorphic model rings true, then there should be a sovereign ‘imposer’ of form onto the material substrate.

While 3D printing and laser cutting undoubtedly used less direct human skill than if the pieces had been carved out of wood by hand, it raises interesting questions about the spectrum of skill embodied in the technology (as discussed in Watson and Shove’s quote in Section 4.2, above), and what we allow to be seen as a “craft” in the first place. As Ratto and Ree (2012: n.p.) note, “to account for the labour

involved in making a 3D printed object, one must consider the entire sphere of effort that was exerted by an object's making, as distributed over space and time as that may be".

Was the maker myself, the actor who used the 3D printer's proprietary software to alter the size of the chess piece, placed plastic into the extruder, set up the machine and pushed the 'on' button? Was it the machine, which precisely layered the plastic in the desired shape? Was it the designer of the original plan, who had built up skills in Computer Aided Design (CAD), understood the feasibility of the design, tested it, and placed the file online for free? Or, indeed, was it the designer(s) of that CAD software, whose (admittedly skilful) coding allowed for the design in the form it took, in the first place? It is most likely, of course, that both 3D printing and laser cutting, as we shall see below, are themselves the performative achievement of a combination of these factors – and more, including environmental/situational ones – working as an individuating hybrid, neither man-made (sic) or machine-made.

To emphasise solely the role of the designer who uploaded the plans to Thingiverse, for example, would be to make the same error which Ingold (2013) speaks of in relation to architectural designs. That is, "the argument from design explains too little because it does not account for workmanship...it pretends that all skilled practice can ultimately be factored as the sequential output of a codified system of rules and algorithms" (p. 56). Taking the example of the great cathedral at Chartres, Ingold notes, "the building...did not bring to glorious completion the speculative vision of an unknown architect. No one could have predicted, while the work was underway, exactly how it would turn out, what complications would arise in the process, or what means would be devised to deal with them" (p. 57).

Furthermore, were rules, algorithms and designs adequate to describe the 3D printing process, then failure and idiosyncrasy would be difficult to explain or justify. However, before I even began using the 3D printer, one participant warned

me of its unpredictability. I was told that because 3D printing is a slow process, larger jobs need to be left to run overnight, and the user can only “*hope it’s not a load of spaghetti in the morning.*” And indeed, from the start, my attempts at 3D printing involved significant degrees of failure. For example, the designer of the 3D schematic – whether the actual end user of the 3D printer or not – needs an experienced sense of the particular molten plastic material they’re working with, including of variables such as the speed with which that material cools, a sense which can only be obtained through experienced material understanding. This clearly wasn’t the case, for example, with an early design downloaded as a test piece from Thingiverse. In this case, no scaffolding or support was factored in on overhanging sections and the design thus failed due to the gravitational pull on the extruded molten plastic (note the deformities, particularly around overhanging sections). This collapsed the overhang and creating an unwanted loop in the design, among other visible imperfections (Figure 25).



*Figure 25: Chess Piece Imperfections*



One of the 'jigs' employed to counter failure and ensure a greater reliability of finish with 3D-printed objects, is the use of scaffolding around an object. This support structure is quite common in the additive manufacture of complex objects, being later removed by hand. The competence of the technology in this respect, is constantly expanding, with some 3D printers now able to automatically build effective scaffolding from a water-soluble corn-based material, for example, which can then simply be washed away with water to leave the desired object.

A number of other 'jigs' are employed by the user of the 3D printer, including the manual coating of the surface of the 3D printer's glass base plate with a glue stick (e.g. Pritt Stick) to help initial adhesion of the print to the glass plate. I was told it was necessary to "*use the right amount of glue or the piece won't stick*", though what this amount should be remained unclear. In their guidance notes, the 3D printer manufacturers Ultimaker make clear the material specificities and affordances of this need to use glue. As indicated by such detailed and tentative instructions, even 'mass produced' materials such as plastics have a certain unpredictability:

*For ABS and CPE we recommend to always use glue, because these materials have more "warping". This means that the plastic will curl up. Warping basically happens because of the properties of the plastic. Plastics have the tendency to shrink when cooling down fast (some plastics more than others), which could eventually lead to your print curling up (at the corners). Since ABS and CPE have a relatively big shrinkage you will need glue to prevent it from warping.*

*PLA on the other hand, has a much lower shrinkage and thus less warping. Because of this it's often possible to print PLA directly on the glass plate, without glue. In this case you need to make sure that the glass plate is completely free from dust and oil though, because plastic won't stick well to a greasy surface. There are however situations in which glue on*

*the glass plate is desired. If you want to print a model that has a big footprint, or with very thin parts at the bottom it's advised to use glue to prevent it from getting loose.*<sup>54</sup>

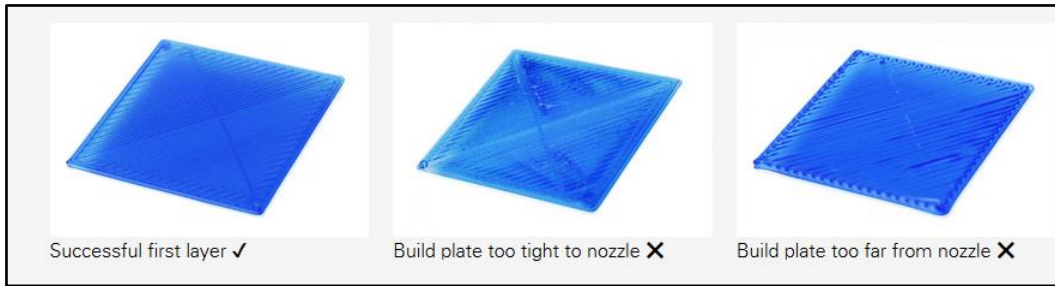
A related process failure arose, however, when some printed objects failed to dislodge from the glass plate. In part, this is likely due to the glue adhesion but the removal of the pieces itself occasionally caused damage to their bases (Figure 26), no doubt in part due to my lack of experience in judging the tensile strength and build quality of the object. Furthermore, judgement is needed regarding the calibration of the base plate to ensure build quality, with the distance of the base plate to the extruder, according to Ultimaker, also causing issues in build quality (Figure 27).



**Figure 26: Damaged Base**

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<sup>54</sup> <https://ultimaker.com/en/resources/16968-using-glue> [Accessed 19/06/17]



**Figure 27: Base Build Quality.**

**Source:** <https://ultimaker.com/en/resources/21330-what-does-a-successful-first-layer-look-like>  
[Accessed 14/06/17]

Ingold (2013: 25) states that the anti-hylomorphic thought of Gilbert Simondon, perhaps most famously evident in the French philosopher's term *individuation*, "holds that the generation of things should be understood as a process of morphogenesis in which form is ever emergent rather than given in advance." The material morphogenesis of 3D printing the chess pieces, an alchemy of heat and plastic refined from the ancient fossil life, is viscerally demonstrated in the fluid build of an early test piece (Figure 28), bursting with tensions, deformities and sedimented flows, constructed out of red PLA. Evident in the picture, to draw on Edensor (2013: 449), is a certain "material mutability", with the plastic "shedding its previous incarnations as it becomes repositioned and resituated within a host of changing co-constituents and agencies."



*Figure 28: Base of Test Piece*

3D printing then, while surely a very different achievement to the construction of furniture or pyrography, is still the result of a formidable material dance of agency. The community of practice situated around the Hacklab's printer was aware of this, not least in the various discussions of 3D printing which have taken place on the workshop's discussion list during its existence. Hacklab participants were experimenting with adaptations for their printers, which would allow the printing, for example, of foods such as chocolate and peanut butter, including one who recounted the struggles he was having:

*I have only used clay so far, but would be happy to try with other things. However, it takes a lot of fiddling to produce something half-nice not to say how difficult is to get something accurate. Perhaps with a dedicated extruder you could get better results.  
(Hacklab Discuss, April 2014)*

Further, an alternative type of 3D printer has become increasingly prominent of late, which uses UV light to cure a liquid resin and thus create layers of an object. This can result in a smoother and higher-quality finish, but can also hold its own problems depending on the printer used. On the discuss list (March 2016), participants showed acute awareness of the complex materiality of this process, including the need for substantial human intervention, for example, when discussing a \$99 DLP printer which uses the light from a phone screen to cure resin:

- *I'd have expected the light to "leak" further into the bulk of the resin and reduce the resolution. Also, because the light from each pixel is not in a parallel beam, I'd have thought that too would reduce the resolution.*
- *from what I've seen the desktop resin printers don't produce very useable prints out of the box, they need a fair bit of post-processing (post-cure, support removal and polishing).*
- *...it's a very tricky process to get right. Cure the resin too little and it ends up a sticky mess...Cure it too much and the part degrades as well...It's really a process that makes a lot more sense in a professional facility (and with much better machines, obviously).*

Such a detailed reading of 3D printed objects is reminiscent of Ratto and Ree's (2012: n.p.) research, who speak of the misconceived delight "that such a thing could be produced "automatically", without having to do any "work":

When comparing the labour and expertise involved in making an object by 3D printing versus making the same object by hand, it is incomplete to account only for effort exerted by the maker exclusively at that particular place and time. The process of creating the digital 3D model of

that object...requires skilled work, particularly to achieve the standards of “printability”.

Hielscher and Smith (2014: 33) draw on Ree’s (2011) work to conclude that for participants ““atoms”, as it turned out, did not magically replace “bits”...The workshop participants concluded that in order to print out an object a significant amount of ‘skilful human authorship’ is required, considering that ‘3D printers do not make things; people make things’”. In other words, this is what François Sigaut called the “law of the irreducibility of skills”:

The entire history of technics might be interpreted as a constantly renewed attempt to build skills into machines by means of algorithms, *an attempt constantly foiled because other skills always tend to develop around the new machines* (quoted in Ingold, 2006: 78; emphasis added)

I will now briefly examine similar debates with regard to laser cutting in the workshop, before drawing this chapter to a conclusion.

#### 4.3.2 Algorithmic Construction II: Laser Cutting

Laser cutters are an increasingly common fabrication technology found in maker spaces, enabling the cutting and engraving of a variety of materials, with high precision. The laser cutter at Edinburgh Hacklab was one of the most in-demand tools (Figure 29), used for everything from art installations, to the engraving of housing for computing accessories, to architectural models.

For example, I spoke with engineering and architecture undergraduates and postgraduates who used the Hacklab’s machine, as they weren’t allowed to directly use laser cutters in their respective institutions, without guidance from a technician. One second-year architecture student told me that only technicians were permitted to use the laser cutter at his university, which takes a few days. Then, something was usually wrong, requiring re-doing, which takes another few days. Using the Hacklab’s machine obviated such delays.



**Figure 29: Hacklab Laser Cutter.**

While seeming like an autonomous manufacturing tool, the reality of undertaking laser cutting with various materials is a little more complex:

*[Field notes, February 2016] I was shown how to use the laser cutter by William today. I found the extensive need for constant vigilance while the cutter was at work surprising. This was in part due to the high temperatures being used, and the propensity for materials to catch fire while being cut. If the laser is cutting well, he said, then there will be periodic flashes of light at the point of impact. At the same time, if all is going well, smoke should be streaming underneath the piece, rather than over it, drawn away by a set of electric fans.*

*I'm told that the particular laser cutter at the Hacklab was a low-price Chinese import with its own material particularities, not least that it had been 'hacked' in a number of ways by various members, with additional cooling systems added and the laser 'tube' changed. Designs still had to be imported into the software it originally came with, however, which, in a tellingly embodied turn of phrase, was described as particularly 'sticky'.*

As with the 3D printer, a confluence of factors – human and nonhuman – come into play when laser cutting, leading to what Schatzki (2012: 20) has described as the ‘indeterminacy’ of practices. This uncertainty is what provoked the need for such vigilance in the midst of laser cutting, and was an unpredictability which derives from the emergent nature of a practice:

The indeterminacy of activity follows from the temporal character of activity. The past, present, and future dimensions of activity are simultaneous. The past and future, moreover, determine the present – activity itself. So the determination of activity does not precede (or succeed), but instead is simultaneous with the activity determined. Until activity occurs, consequently, what determines it cannot be fixed or settled.

With this lack of fixity in mind, a keen awareness of the materials which could and could not be used on the cutter was demonstrated, and carefully policed by the Hacklab community. When one participant enquired about cutting shapes from plastic gutter pipe, another noted, *“I’ll put money on it being PVC and therefore verboten for lasering”* before someone else quickly clarified that, *“Lasers + PVC = chlorine gas”* (Hacklab Discuss, December 2011).

With regard to the materials which the laser cutter *can* cut, on the other hand, one participant stated:

*as far as I’m aware, the laser isn’t capable of cutting any metals, it’s not powerful enough and they just sink heat away too fast. It can engrave them to some degree, but that takes a whole lot of work, and possibly some special surface coating. Plastic & MDF are really all it can actually cut.* (Hacklab Discuss, January 2015)

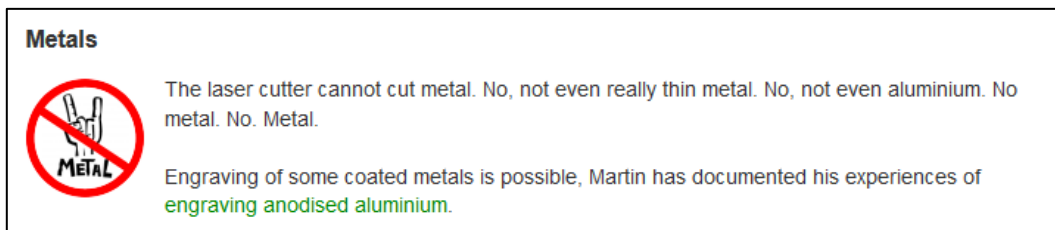
The work entailed by such engraving of metal is telling in itself. It is clear once again then, that, as Massumi (2009: 40) notes, the designer is a mere “helpmate to emergence. He can put the pieces in place, moving through a linear series of steps progressing from the past of abstract conception to a present on the brink.



But the passing of that threshold to invention depends on the potentialization of the elements presently in place as a function of their future.” This was communicated by one member following his experiments in engraving the aluminium case of an Apple Mac computer:

*This material is a bastard to engrave consistently. The relationship between speed, power and result is neither linear nor straightforward. There are effectively three layers you can expose depending on settings, and only the middle one seems to offer a consistent finish.*<sup>55</sup>

The Hacklab wiki site gives guidance with regard to the use of the Hacklab’s laser cutter (Figure 30). Figure 31, furthermore, is drawn from a table giving guidance as to the power and speed to be used for cutting various materials, albeit with unexplained issues with cut quality still noted.



**Figure 30: Laser Cutter Guidance. Source: <https://wiki.edinburghhacklab.com/lasercutter> [Accessed 08/06/17]**

<sup>55</sup> <https://wiki.edinburghhacklab.com/engravingaluminium> (accessed 07/06/17)

## Material Geographies of the Maker Movement

Material	Engrave Speed	Engrave Power	Cut Speed	Cut Power	Notes
Acrylic 3mm	200	21	8	98	From HPC Manual
Acrylic 5mm	200	21	3.5	98	From HPC Manual
Acrylic 10mm	200	21	1	98	From HPC Manual
Ply 1.5mm	200	17	10	98	From HPC Manual
Ply 3mm	200	17	7	98	From HPC Manual [Sean: 2017-02-10 - even after two passes there were some areas that weren't completely cut through]
Ply 5mm	200	17	7	98	From HPC Manual
Ply 6mm	200	17	1.5	98	From HPC Manual
MDF 3mm	200	25	5	98	From HPC Manual
MDF 4mm	200	25	4	98	From HPC Manual

**Figure 31: Laser Cutter Guidance. Source: Ibid.**

As with the examples of woodwork and 3D printing described above, indeterminacy remained a key material constraint of laser cutting, with various jigs for coping with uncertainty and failure being constructed by workshop participants for use on the laser cutter, either for holding materials in place (such as weights), or for ensuring correct alignment of the laser beam. Tips were shared on the Hacklab's wiki site, including keeping the protective film on plastic sheets on as it *"is safe to cut, and protects the acrylic from smoke and accidental scratching."* Further, for engraving, *"the top layer of film should be removed as it can affect the quality of the engraving."* Jigs were constantly being revised and the potential for more effective ones discussed amongst participants:

*I have an idea for a test jig. Make a shape which will hold small pieces of material in known positions at the outer edges of the cutting surface. Then you could run a preconfigured test job, and make sure it cuts correctly in all 4 corners. This would mean you could check quickly if your settings were going to work, without wasting lots of your material. (Hacklab Discuss, September 2012)*

The exact specifications of the jigs needed could be inconclusive, however, and the source of debate amongst participants, who called for open experimentation in this regard:

*Finally, in an attempt to kick off a really good argument about focal point and material depth, we've re-cut a guide-height template for 60mm. I'm provisionally taking a stand in the middle-endian camp for now, but more sciencing should be done.*  
*(Hacklab Discuss, January 2015)*

In spite of the sharing of such information, however, it remains necessary to provide troubleshooting advice on the Hacklab's lasercutter wiki, including the need to clean mirrors (which reflect and align the laser beam) and be aware of parts working themselves loose (see box below). Similarly, as with draughts and ambient temperature in pyrography (discussed above), this could also impact the laser cutter by warming the machine's coolant, resulting in uncut and unengraved sections.

**Wobbly cuts, intermittent cuts:** check the the circular retaining rings that secure the mirrors to their brackets. These can work loose, allowing the mirror(s) to wobble within their mounts.

**Inconsistent cuts:** if some areas on the bed are cutting better than others, the beam is most likely out of alignment.

**Unsuccessful cut with recommended settings:** Z-axis is wrong, or the mirrors need to be cleaned.

A material like acrylic (perspex) is easier to debug if you leave a sheet of A4 paper under the material that you would like to cut. From the burned areas you can see how you might need to adjust the speed to get the curves cut.

Ratto and Ree (2012) cite lively debate around whether laser cut products should be allowed to be sold as 'handmade' on online 'craft' marketplaces, such as Etsy. As this section has highlighted, this is not a topic which is easily resolved. We have seen that the close human attention which is often seen to qualify something as 'craft', even with regard to 3D printing and laser cutting, varies according to the

tools used, software deployed, materials worked on, and so forth. Given the different quality of skill and material interaction required, I similarly encountered resistance to work such as laser cutting and 3D printing from Sarah, at the Remakery:

*I'd rather be doing something where I can just grab a tool. things I like to make...I'm not looking at a screen, I'm using my hands. I did try, last year...I was like 'Right, OK, I'm going to learn because at some point I'm going to have to embrace all this' and I did try to do a little bit of laser cutting things. And I just found that I was up against it cos I had to go away and learn a computer programme, how to vectorise files, which means I would need a vector programme which I didn't have access to, and I was like 'It would be easier if I just went and get a scalpel and I cut them out myself', and it was... I do feel that [laser cutting] takes a bit of creativity away...I can see the benefits, you get a lovely sharp edge and can get very complex shapes, but it takes a little bit of it away.*

Sarah further noted a lack of ability to follow creative impulse, mid-way through construction:

*You can go off on a tangent, because when you're making something you're into it, and then you're thinking about 'that can go that way' and, you know, you're not set to a set kind of thing. You can take it off in any kind of dimension you want. There's a thought process in the problem solving of making something 3D by hand.*

In the age of algorithmic construction, it appears that the risk-laden nature of craftwork remains, albeit in modified form. The agency of machinery doesn't obviate human skill, but certainly shifts it along the risk/certainty spectrum.

## 4.4 Concluding Remarks

Vogel has asserted that all acts of making put unpredictable, more-than-human processes into play, to one extent or another. To build *any* object, he notes (Vogel, 2015: 112) “is to build something that always exceeds one’s intentions, that always possesses something of the unpredictable and unknown about it.” He concludes from such examples that “what an artefact *is* always exceeds its relation to human intention. It does so because every artefact is *real*, and not simply an idea in someone’s head” (p. 104).

This chapter has discussed the performance of practice in the field, drawing from a range of maker activities. While ‘risk’, as Pye put it, varies from project to project, whether through carpentry or 3D printing, the materials in which we are immersed exceed our control. Examining such resistance, the chapter therefore highlighted the gap between intention and the resulting artefact in what has been termed the ‘mangle of craft’. The difference between the mangle-ish activities discussed here and those of mass production, is one of degree rather than kind. 3D printing can be portrayed as either deskilling or reskilling, depending on your perspective (Hielscher and Smith, 2014), with Knott (2013: 62) noting that “whether 3D printers are empowering or just another false illusion of duped prosumption<sup>56</sup> depends on how one uses them”.

This perspective – of thinking through what counts as ‘craft’ from a more-than-human perspective – is significant on a number of fronts. Firstly, it pushes Pye’s influential analysis of the ‘workmanship of risk’ in more contemporary theoretical directions, drawing its analysis of the ‘risk’ of making into contact with work on vibrant and relational materiality, particularly the work of Andrew Pickering on the ‘mangle of practice’. Secondly, acknowledging the gap of unpredictability or ‘wildness’ inherent in our artefacts (Vogel, 2003, 2015) forces an examination of the diverse materials within which our practices are embedded and the various entanglements and agencies which are interacted with in these workshops every

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<sup>56</sup> A portmanteau of ‘production’ and ‘consumption’.

day. As we have seen throughout this chapter, things incessantly exceed human interests. Having presented the more-than-human specificities of workshop practices-as-performance, the next chapter shall zoom out from specific materials to more broadly examine the diverse 'practice entities' of the three field sites.



## 5 ‘Stand Back and Watch Us’: Elements of a Diverse Economy

### 5.1 Introduction

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“Looks like I can get everything I want from your lab or locally...one thing I love about the hacker/maker community is how everyone shares and collaborates.”

Hacklab Discuss, August 2013

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As seen in Chapter 2, the diverse spaces of the maker movement find themselves caught in a web of contradictory impulses, variously portrayed as the herald of a newly entrepreneurial and globally-distributed phase of capitalism (Anderson, 2012) or as the precise opposite, a sustainable, grassroots anti-capitalist response to globalism, rooted in the local but networked globally (Ratto and Boler, 2014a). In the eyes of the ‘innovation evangelism’ (Irani, 2015: 800) of the former perspective, the past decade or so has been about transitioning to a new mode of accumulation, enabled by a world in which information and prototypes travel around the world instantaneously. In turn, exemplifying the widespread perception of hacker and maker activities as inherently liberatory and anti-capitalist, Ratto and Boler (2014b: 1), write that “the DIY ethos has seismically reshaped the international political sphere, as can be seen in ongoing global uprisings and the uses of media and communications within a “logic of connective action” (Bennett and Segerberg 2012)...constituting new hybrid social movements and practices of horizontal, participatory, and direct democracy (Boler 2013; Boler and Nitsou 2014).”

This chapter shall cast an eye of suspicion on both of these generalisations, instead examining the *practices* taking place in contemporary community workshops. By doing so, I hope to open discussion into the leverage they do or do not offer for



fomenting pro-environmental change, which shall then be taken up again in Chapter 7. While the practice literature is often presented apolitically, practices and the spaces they constitute, are inherently political (Gibson-Graham, 2008b, 2014). As Chatterton (2016: 403) notes, work on pro-environmental transitions has been limited in its ability “to capture the practices and motives of projects that are committed to a future where features of capitalism are named, confronted and reversed.” Given the possible value, then, of a broader post-capitalist interpretation of the spaces, the chapter commences by exploring the diverse institutional arrangements of the workshops, through a diverse economies lens. The remainder of the chapter complements this analysis by outlining the elements of ‘maker practice’ evident in the workshops, focusing on the materials, competences and meanings of repair and reuse.

## 5.2 Diverse economy I: The Hacklab

*I think...a lot of people believe in this idea of a second industrial revolution, [that] this is going to lead to everyone having their own distributed manufacturing...but I don't think it's going to usher in world communism. I'm a classical Marxist, you know, and the level of manufacturing surplus that's enabled by already existing mass industry is immense, and 3D printing and laser cutters aren't going to touch the fucking size. Not in a thousand years...maybe if you give it a thousand years it'll usher in a new fundamental economy. (Jacob)*

*I'm attempting to electrify my coffee grinder, in the name of scientific progress and democratic humanism. (Hacklab Discuss, June 2012)*

As mentioned already, much of what has been characterised as the ‘maker movement’ has inherited the burden of being either the next logical step of capitalist development, or as being a new form of intrinsically anti-capitalist commons. Both narratives appear to sit side by side, in some tension, in the past

and present of the Hacklab. In many respects, the Hacklab forms a site of post-capitalist commoning. While registered as a charity, rather than formally incorporated as a co-operative, the Hacklab operates in a *de facto* mutualistic and co-operative manner. The core participants are comprised of members who each have an equal vote when they meet annually at the charity's AGM. While directors are elected to facilitate the everyday running of the space, in practice key decision-making is distributed, made consensually amongst all members where possible or, more commonly, through what Davies (2017b) has described as 'do-ocracy'<sup>57</sup>. Either way, this is most frequently facilitated through the e-mail discussion list:

*There's five directors, and kind of the buck stops there...but they don't tend to make decisions, they'll always give it to the members to make the decision, so basically we argue about it until we come up with something, or someone's like 'let's just fucking do this' and you'll go 'alright'...it's all done on the mailing list...there's so many people that you can't really have a meeting...it just kind of happens (Ben).*

Contrasting with innovation-centric characterisations of the maker movement as a site for the development of products for market, the majority of members, as well as weekly open night attendees, do not use the space for commercial ends. Instead, infused with the ethos of the open source software and hardware movements, the Hacklab operates with a conscious lack of formal hierarchy, with day-to-day interactions premised, where possible, on mutualism, friendship, trust and gift relations. As noted by Edward:

*The kind of people who are interested in this kind of thing are the kind of people who are not interested in ripping people off. These are people who are into open source philosophy and things like that, about coding, sharing and making this stuff free. It's not*

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<sup>57</sup> Whereby priority goes to those who will actually get things done, or who are actually active in working to solve a certain issue, rather than merely discussing it.

*really filled with greedy capitalists ...Spaces like the Hacklab and libraries have an important role, because they make visible those norms in society which mean that these things can function very cheaply and easily and very amicably.*

That said, while most usage is for personal projects – development of items for personal use, as well as academic, artistic and other non-market endeavours – there are “*maybe five or six people who are using the Hacklab to make stuff to sell or making things for work and that sort of thing*” (Ben). The latter had included, for example, two of the workshop’s original founders, who had used the space as a base for their robotics start-up company, as well as an Arduino-based electronics start-up, and someone who uses Hacklab equipment for the manufacture of bespoke composite skis.

The commercial/non-commercial or capitalist/non-capitalist use of the Hacklab is carefully managed and is largely viewed as symbiotic, rather than oppositional or problematic. For example, the founder members and owners of the robotics start-up helped to fund the purchase of some of the workshop’s original tools and equipment. When that company wound down, however, the equipment remained at the Hacklab for the free use of other members. Similarly, commercial use was cited as being of occasional benefit to non-commercial users in the sense that people using the space for commercial reasons were seen to often have a greater interest and urgency in keeping certain technologies and equipment in working order.

An order of priority is written into the Hacklab’s founding constitution whereby non-commercial use takes priority, reflecting the Hacklab’s self-description as a shared space “for people who mess around with technology for fun”<sup>58</sup>. If, for example, someone is using the laser cutter for a commercial project, and someone else needs to build a prototype for a university project, then the latter takes

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<sup>58</sup> <https://edinburghhacklab.com/>

priority. In this, it differs with commercially-focused maker spaces such as TechShop, in which commercial and non-commercial uses are not distinguished.

This non-commercial culture can cause varieties of confusion for newcomers who may not be aware of how the Hacklab operates or its relationship to commercialisation. One participant reflected:

*One chap actually phoned one day, and he said 'I've got a project...[a] cigarette rolling machine'. I said 'that's alright, come along, we'll introduce you to the space', 'oh no, I want to pitch it...I want everybody gathered together and see who'll take this idea on and do it'...I said to myself, this is just not the way things work. So I tried to sweet talk him again, you've got to size the thing up...and no, he never turned up. That was entirely the wrong attitude. (Stewart)*

Comparable confusion arose on an occasion when an academic from a local art school came to the Hacklab for help in creating Perspex display boxes on the laser cutter, for an interactive art project funded by a scientific conference. Attendees at an open night had spent a few hours helping her to prototype the boxes, after which she tried to find out “*how much people's time was,*” in order to remunerate them. General confusion multiplied, as members misinterpreted her question as meaning their daily work rate outside of the Hacklab, or even their monthly membership to the workshop itself. In the end she simply made a donation to the workshop, saying “*I'm not used to getting things for free*”.

There is no payment levied by the Hacklab to use the majority of equipment on weekly open nights, thereby operating as a free resource for a wide community of users. However, as is the case in many other maker spaces, to use the more energy and resource-intensive tools, such as 3D printers and laser cutters, fees are applicable to cover costs, with non-members paying more than members. A sign by the particular machine tells the user how much it is to use the particular

technology (usually based on the length of time used), and these fees are collected through honesty boxes.

What can be seen here, in sum, is a rather complex relationship with practices of the wider monetary economy, and an implicit questioning of monetised economic relationships. While this will gain further relevance in the sections below, gift-based and sharing transactions are encouraged and prioritised at the Hacklab, whether in the sharing of knowledge, or the sharing of things: A prominent 'Free Stuff' stand is located by the entrance for members and visitors to help themselves to unwanted hardware, books and, on occasion, even food; In order to acquire particular capital-intensive equipment, like the laser cutter and 3D printers, the Hacklab informally 'crowdfunds' significant cash sums amongst its community, with no expectation of direct ownership or guarantee of use of the particular piece of equipment; Should tools or equipment fail, members give freely of their time to get them back up and running. Many tools are donated by people who either don't use them anymore, or don't have the space for them at home (one participant coined the portmanteau '*to storenate*', based on storing and donating, to describe this relationship). On other occasions, when outright ownership of a particular technology is not given over to the Hacklab community, a person can at any point in the future reclaim their equipment when needed. This happens from time to time, usually with notice given so that the item can then be replaced by the community of users affected. Further reflecting an interest in alternative economic arrangements, the Hacklab had hosted discussion groups on cryptocurrencies<sup>59</sup>, as well as being the recipient of a donated Bitcoin shortly after the workshop's formation (which some participants expressed scepticism of at the time, yet which was valued in excess of £840 at the time of writing). This value is tracked on a public display screen on the wall of the workshop's main space which, while itself is ostensibly housed in a multi-purpose community arts centre, is

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<sup>59</sup> A digital form of parallel currency which uses cryptography to ensure secure transactions. Bitcoin is the most well-known example of this.

owned by a large property developer, with rent largely paid from members' day jobs.

This pluralistic relationship to capitalism, open source movements and the potentially prefigurative anti-capitalist role of the Hacklab has become a topic of discussion on a number of occasions over the years. The variety of positions taken by members became clear, for example, earlier in the workshop's history, when the use of the private social network Facebook for Hacklab promotion came up in the following Discussion List (January 2014) exchange:

*Since we've just had a giant "I told you so" moment about behaviour tracking and surveillance, pioneered by the advertising and marketing juggernauts, created by capital flows encouraging concentration and centralisation, and very much dual-use technologies used to great effect by the surveillance state, it's embarrassing to encourage people to subject themselves to it. Maybe the Hacklab ought to be a little more enlightened than that...*

To this, the member then in charge of the Lab's Facebook page responded:

*Hacklab is not a political organisation. To me, Facebook is just another tool. It's a communication medium. It is more effective than any other medium for certain classes of information...I am a pragmatist...If I can't work out a way to improve dispersion of ideas on Facebook, then it has become a less useful tool to me...Facebook is a tool of the state in the same way as the IP routing infrastructure. Both were hacked by government spies. I am appalled by NSA/GCHQ spying revelations too, but it's a much deeper problem than which web apps you use.*

In response to the assertion of the Hacklab being apolitical, another list member noted:

*Really? The acts of creating, figuring out, subverting stuff to do things that its designers may not have intended, seem pretty political to me...*

Further insight into the diversity of positions taken on the Hacklab's role in wider socio-economic debates is evident from discussions surrounding the Hacklab's involvement in the Edinburgh Mini Maker Faire, which has taken place at Summerhall, as part of the Edinburgh Science Festival, since 2014. "Independently produced celebrations of local maker culture"<sup>60</sup>, Mini Maker Faires take place all over the world and are a spin-off from the original California-based Maker Faire, which at the time of writing attracts around 150,000 visitors annually. Operated by O'Reilly Media, a publishing company who operate influential maker movement-related publications such as *MAKE* Magazine, Mini Maker Faires are franchised through a strict licensing process, about which some participants expressed concerns:

*I'm cynical about the Maker Faire brand, rather than the concept [of holding a Faire] in general. Because the Maker Faire started as a PR exercise for an events and publishing company who still control how it is managed, quite tightly, and so one lacks autonomy and sets a certain tone. I was in one once...feeling like the whole scene was window dressing, an ethical tradeshow. (Discussion List, November 2012)*

As in the Facebook discussion above, another member, involved in organising the Faire, took the opportunity to discuss whether such corporate involvement was fatal to the enterprise, whether an alternative Faire should be initiated, or if another more moderate position was feasible:

*Most things which become successful end up alienating some of their potential collaborators/fans/colleagues...I'm keen to*

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<sup>60</sup> <http://makerfaire.com/global/>

*organise a Mini Maker Faire (rather than starting our own version - always a possibility) because it is already better recognised than any other kind of makey type celebration/exhibition. I'm inspired by this whole burgeoning expression of human creativity which is being enabled by more small-scale technology and knowledge becoming available to individuals. O'Reilly's processes, which are made available for free to all potential organisers, seem to be pretty sound and as far as I can tell they have a pretty good ethos. Their 'playbook' is constantly evolving, and O'Reilly specifically ask organisers to contribute as lessons are learned. I'm interested in how I can avoid alienating potential contributors, and would appreciate help with this.*

Ben, a Hacklab member on the organising committee of the Faire, explored the nuance of their involvement in a follow-up post:

*I think this is a great thing for Hacklab to be involved in, and for Edinburgh tech/geeks/nerds in general...I think the tie up with O'Reilly is a great win-win. The Make and Maker Faire brands have great reach (certainly wider than Hacklab) and give some credibility to the event. This is in exchange for some publicity and possible sales of Make stuff, which seems like a pretty good deal to me...I've briefly dealt with O'Reilly before (to scrounge some free books for the lab and some prizes for our last birthday party raffle) and I got a good feeling. It felt like I was talking to people like me.*

This section has introduced how, far from a purist and isolated space of anti-capitalism, the Hacklab is tied, in complex ways, to the web of the broader economic system. Simultaneously, however, it provides space for debate and plurality in the values by which it is run, prioritising non-commercial use of



equipment and encouraging the free sharing of knowledge, tools and materials. This context is important for understanding the site, and the maker practices which take place there, enabling and constraining them in various ways, as we shall see in Sections 5.5-5.7.

### 5.3 Diverse Economy II: The Grassmarket

While less overtly questioning of the status quo than the Hacklab, the Grassmarket Furniture workshop was similarly hybridised into the wider capitalist economy, while simultaneously providing sheltered space for otherwise de-monetised and de-commodified practices and social interactions.

As a space focusing on a single more 'traditional' craft, the Grassmarket is free from many of the debates which, as we saw in the previous section, come with a variety of expectations around the social and political meaning regarding what it is to be a 'hacker' or a 'maker'. Instead, the economic focus tends to be on how commercial activities relate to its core social function. While operating as a social enterprise, in order to cover overheads and the expertise for workshop supervision, the workshop is mostly staffed and run by volunteers, who choose to get involved or are referred by support services.

While the Grassmarket sits at the heart of the next chapter, on wellbeing, where more detail shall be provided, these volunteers get involved for varied reasons, usually in order to provide them with a necessary social outlet, as a means through which to break a destructive habit or addiction, or to provide a protective and safe base from which to plan the next phase of their lives. In order to do this, the workshop leader, Tommy, shoulders the burden of the workshop's fundraising, stating that it's *"a challenge to bring in that money, but I try not to put that on the guys, that challenge onto the guys, I take that on board"*.

The organisation's commercial success, evident through growth in revenue, scale, and ambition throughout its history, has, somewhat paradoxically, enabled the space to develop into this social shelter, protecting volunteers from the exigencies

of a broader economy which many of them have expressly struggled to function in, or been excluded from participating in through the conventional role of consumer-worker-citizen. A large part of this success is due to the financial support the project has gained, able to distinguish itself in the market as an ethical producer of high-quality, hand-made items, underpinned by a strong social interest and ethos of care.

While tied into a broader economy in this way, the Grassmarket is, like the Hacklab, also heavily characterised by gift and voluntary relations. Using its close organisational links to the nearby Greyfriar's Kirk, it has successfully tapped into a supply chain of freely donated and high-quality waste, in the form of church pews. The workshop is now known amongst ecclesiastical communities across the UK, who will regularly inform the organisation if they are removing old pews, and donate them if wanted.

The barriers to a member's involvement at the Grassmarket are effectively the lowest of the three case workshops. To get involved you must become a member of the wider Grassmarket Community Project which, unlike the Hacklab, doesn't incur any fee. Nor are there any costs associated with attending their wide variety of workshops, and all attendees are provided with a free lunch, as part of the wider Grassmarket Community Project's provision for some of Edinburgh's more vulnerable and deprived residents. There is, however, an underlying sense of some of the contradictions of this, however, as acknowledged by one workshop volunteer:

*It's only possible, volunteering like this, because of the welfare state that we live in. Without the money that I need to survive, rent and food, then I wouldn't be able to choose this as a lifestyle, so I do recognise that this situation that I'm in is a little removed from reality and it is in danger of changing depending on the political wind. (Brian)*

Furthermore, stepping back to look at its role more structurally, the Grassmarket hybridises with the broader economy in a rather more complex way. It is explicitly there to provide a space for people who have expressed an inability to cope in the normal workplace, people who have been bullied for being different, who have fallen into destructive patterns of depression and drug use for a variety of reasons, or people who are rendered unable to 'work' due to disability, whether physical or mental. In many cases, that is to say, the Grassmarket provides a meeting space for people who have found themselves excluded from Edinburgh's contemporary economy. At the same time, it bills itself as an employment project, working to create good workers and re-integrate people into that economy<sup>61</sup>.

#### 5.4 Diverse Economy III: The Remakery

Finally, the Edinburgh Remakery, a workshop set up and run by the environmental charity Remade in Edinburgh, encompasses a range of economic forms which in many ways coalesce to produce something of a middle-ground between the Hacklab and the Grassmarket. A registered social enterprise like the Grassmarket, operating out of the rented premises of a former bank, it runs dozens of workshops every year (training around 1000 people annually), offers access to tools and bench space, sells recycled furniture, and provides popular repair services, run on a free or suggested donation basis (Figure 32), the proceeds of which are re-invested into its repair, re-skilling, and campaigning activities.

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<sup>61</sup> Though we shall see in the next chapter that it is rarely this simple.



*Figure 32: Remakery Blackboard. Source: The Remakery*

Unlike the Hacklab and Grassmarket, which for the sake of autonomy, actively remain independent from external funding, the Remakery has received temporary government support, as part of a Circular Economy fund channelled through the quasi-NGO Zero Waste Scotland. However, the organisation's aim is to be self-sufficient in funding in the short- to medium-term.

One way it intends to do this, apart from the continued running of workshops and computer repair, is through providing access to bench space and tools in its new woodwork and textile workshop spaces, which can accommodate up to six people at a time (Figure 33). Somewhat akin to the Hacklab, which is free to access on open nights, and premised on the required tool being free at a certain time, the Remakery holds free (or donation-based) repair surgery evenings, while use of the workshop space outside this time incurs charges per hour, with a discounted rate for people who have become members via a modest annual subscription.



*Figure 33: Remakery Workshop Source: The Remakery*

While not a co-operative in structure, the Remakery also constitutes something of a hybrid structure, offering membership, like the Hacklab and Grassmarket, which allows a vote at the organisation's AGM, while maintaining a director and other staff. Waged employees or volunteers operate the day-to-day running of the Remakery, staffing the shop and taking bookings for various events while, during the repair surgery, staffing is also made up by a combination of freelance employees and volunteers from the local community.

Elements of the organisation's activities also operate along gift economic lines, however, running free drop-ins and outreach services in collaboration with other charities, including IT and textile repairs at the Grassmarket Community Project. Remade has established a variety of other strategic partnerships, not just with NGOs and funding bodies such as Zero Waste Scotland, but also with the Edinburgh Furniture Initiative (EFI), Community Help & Advice Initiative (CHAI), and the University of Edinburgh, who freely supply their old computers for refurbishment and resale, saving them the cost of disposal.

### 5.4.1 Summary

By touching on the diverse socio-economic operations of these three sites, we can begin to see that concealed within phrases such as ‘the maker movement,’ ‘community workshop,’ and ‘maker spaces’ is the reality that the workshops identified in this study operate along diverse economic lines, though all ultimately provide shared workshop access for various ends, whether predominantly environmental (in the case of the Remakery), social (in the case of the Grassmarket) or just “*for fun*” (as the purpose of the Hacklab was phrased by one of its founders – though this is a simplification which I will ultimately question). In a sense, any concept of a coherent and ‘global’ maker community or movement is at best an imaginative community, imperfectly translated on the ground, a topic to be returned to below.

This discussion has provided some context for the manner in which the various spaces pragmatically navigate issues of communal workshop access, in an urban environment which for decades has been characterised by dynamics of privatisation and enclosure (Hodkinson, 2012). This is a role which has also been discussed, for example, in relation to community gardens, in terms of “reconstructing the commons, generating new public spaces in which multiple values and alliances may be formed” (Stephens, 2016: 194). Taking Gibson-Graham’s diverse economies perspective as inspiration, it has been seen that the workshops create the possibility for ostensibly community-based and post-capitalist practices, which need closer examination. Underpinned by social practice theory (SPT), then, I will examine the three practice elements of materials, competences and meanings, respectively. I will develop a theme which was shared across all three sites – repair and ‘waste’ reduction – which may provide one answer (among many, no doubt) to Gibson-Graham et al’s (2016: 708) question, “How might resilience in more than human community economies be practiced in built environments and urban systems?”

## 5.5 Elements of Practice I: Materials

*[We aim to] provide access to better facilities than we could each have at home, as well as opportunities to collaborate, learn, and socialise. (Hacklab Discuss, February 2012)*

Materials, one of the three components of practices introduced in Chapter 2, are outlined by Shove et al. (2012: 14) as comprising “things, technologies, tangible physical entities, and the stuff of which objects are made.” If, as we saw in the last chapter, craft-based work is a distributed process, emerging between a skilled practitioner, the tools he or she uses, and the material being worked on, then access to (and competence in using) different tools shifts the curve of possibilities, creating “sociotechnical configurations that would not otherwise exist” (Smith and Stirling, 2016: 16). Schatzki (quoted in Shove et al., 2012: 9) argues that “understanding specific practices *always involves apprehending material configurations*”.



*Figure 34: Remakery Workshop Tools*

Briefly reflecting on the photograph above (Figure 34), for example, taken at one of the workshops organised by Remade in Edinburgh, there's a good chance that the reader recognises the more common tools pictured: a tape measure, a ruler and a pen, for example. Four of the other objects photographed, however, are less-easily identifiable. There is an *awl*, a metal spike with a short wooden handle, affording the power and close control needed for piercing holes through a certain tough material. Another tool resembles a *hammer*, but is of a specialised variety, constructed out of animal hide. A third, more mechanical tool, located on the far left, is a *rotating hole punch*, allowing holes of varying sizes to be formed (pictured being used in Figure 35). Fourth, at the very top, there is a slab of *granite*, providing a stable, hard-wearing work surface for working on. All four are somewhat specialised tools or objects used when working with, or repairing, leather.



*Figure 35: Tools in Use. Source: The Remakery*

Now let's turn our attention to Figure 36, below, in which we can see a broken chair being re-upholstered. There is a wooden tool in the practitioner's right hand, a webbing stretcher (Figure 37), which holds and levers the webbing, with ingenious simplicity, tightening it so that it can be tacked into place. There is a further object to note here, which is unusual to encounter in daily life in 21<sup>st</sup>



century Scotland: 'webbing', the material being stretched across the frame, to form a base for the subsequent upholstery (Figure 38).



*Figure 36: Webbing Stretcher in Use*



*Figure 37: Webbing Stretcher*



**Figure 38: Webbing**

Given these atypical objects, this section examines the workshops as provisioning a material infrastructure, including tools and objects, without which a practitioner or potential practitioner may be unable, or less likely, to become enrolled in certain practices. A common theme encountered across all three sites was the spatial observation that public workshops alter the infrastructural and material capacity of a given community, providing a potentially-valuable material infrastructure for diverse maker practices which otherwise wouldn't exist. As noted by one participant at the Hacklab:

*Somebody was pointing out that the little workshop that we've got, you know the room isn't big, but it's one of the only open access workshops in Edinburgh. Any size. That's crazy that...there's nowhere else to go, so how is that? (Ben, Hacklab)*

However, Jacob, who had moved between Edinburgh, Dundee and, most recently, Athens, remarked that with the seemingly exponential spread of maker spaces of numerous kinds over recent years, the convenience and accessibility of this infrastructure is rapidly changing:

*We're getting to the point where you can go to pretty much any major city and find a maker space. I've moved twice in the last year and each time I've come across a brand new maker space, you know. And there's two other maker space-like places in Athens, but they're more along the social enterprise side of things.*

Like those encountered by Jacob, the workshops under consideration in this study are all located in, or near, the centre of a large city. At the Hacklab in particular, a common material-spatial theme arose whereby participants, who often also lived in or around the city centre in rented accommodation, lacked any spare space of their own for workshop activities, or for storage of tools and materials. Similarly, they had no access to a 'garden shed' where, it was also often put to me, many similar activities would have taken place in the past and perhaps still take place in less densely-populated rural and suburban areas:

*I moved up to Dundee and got in touch with the maker space there. I'd accumulated a lot of tools and I was moving into a wee slum flat, you know. I had a garage in Galashiels with a loom and my drop saw, pillar drill, you know. All my random kind of handy tools. Well I need somewhere to keep them, and I thought, 'you know who'll use them, I'll take them there, I'll join the makerspace and I'll keep all my tools there and they can use them, if they want to' (Jacob).*

*Sadly the majority of us don't have our own spaces, so we've all worked together to make the lab something that we can enjoy. (Hacklab Discuss, May 2011)*

*It was important because it was a physical space. Living in an apartment I didn't have enough space really to do these kind of things, without my girlfriend going crazy with like half-soldered stuff all over the kitchen table. That was a key attractive thing*

*about the Hacklab...I think Britain has always had a bit of a culture of tinkering and the kind of crackpot garden shed inventor and I think that what's happened with the way that we live and house prices and things like that. Our generation especially, we don't have access to gardens, we don't have access to spare rooms, we don't have access to garden sheds, and we also tend not to have the space or the finance for the kind of standard tool kit that your kind of garden tinkering person would've had. Like my grandfather would've had, for example. In his cellar he had a bunch of tools, like soldering irons and grinding tools for sharpening chisels, he used to do woodworking and this kind of thing. The way I live in an apartment in Edinburgh I physically don't have space for any of those things but the Hacklab does, so I can do metalwork there, I can do woodworking there, I can do the new things like 3d printing and the laser cutter for instance. (Edward)*

*I have built [a CNC milling machine] already...and am using it quite a lot [but] as I am moving into a much smaller apartment...I would love to start using the CNC at the Hacklab. (Hacklab Discuss, December 2012)*

The workshop at the Remakery was also a conscious effort, on the part of its founders and volunteers, to provide space for urban dwellers who would otherwise not be able to access anything similar nearby. For Federica, for example, the Remakery provided her with accessible and cheap space to develop her own woodworking interests, given the mess involved in many construction and maker activities, and her own space limitations at her urban home:

*I split with my previous partner, the business changed name. I couldn't use the studio any more. So afterwards I worked at home. Because of that I couldn't really create too much dust and*

*getting large timbers, splashing paint around, I think I had a bit of a limitation.*

For Edward, who would become involved in both workshops, the evolution of spaces like the Hacklab or the Remakery is not simply a contemporary replacement for what would previously have taken place in people's garden sheds. Instead, it is an active improvement on the individualism of that former set up:

*I think the most important thing is access to those tools which are expensive, require expertise and lot of space, so to me it's more awesome than that kind of garden shed mentality where everyone has their own tools... I mean you always borrowed tools from your neighbour so there was a community around that always, but this means that all those tools are in one place, so by pooling that together you can have cooler stuff. (Edward)*

There were occasional exceptions to this imperative for sharing city-centre space. One of the Hacklab founders, for example, has his own house and adequate space for carrying out his own making, but uses the space socially and out of personal preference, rather than necessity. However, he still emphasised the importance of this factor for others:

*Most of the stuff has been either brought in by a member or, to be honest, a lot of members' partners are delighted to have finally gotten rid of all the crap out of their house. Particularly people living in flats...I'm fortunate, I've got a pretty big house, I actually don't need the lab...I could do everything I do, I don't do big metalwork or anything like that, you could do everything I do sitting in my utility room, no problem at all. A lot of others don't, and it's important, for me, to have facilities like this in the city, it's an incredible resource. (Harry)*

Another makes a similar statement:

*I'm lucky enough to have most of the gear at home for doing the stuff I like to do, and I still come down to the lab when I can.*

*(Hacklab Discuss, May 2011)*

A further barrier, aside from limited workshop space, in accessing the necessary tools for maker activities, is the expense of provision of such materials:

*You've got access to all the tools which is nice, so having the laser cutter which we wouldn't be able to afford as a small company with no budget you know, so we're doing it on a budget of nothing... There's access to tools and equipment that you wouldn't otherwise get. Laser cutters are a very unusual thing to trip over in daily life, people don't see them. (Ben)*

Through providing free (or low cost) access to tools and space, it was clear that, for many, these workshops had become prominent enough to be the first port of call for any project or enterprise which required more equipment or expertise than that particular person had alone. This was the case for local users, but also those further afield:

*I'm currently cycling from Berlin to Scotland and I have some problems with my self-made electrical equipment on my bicycle: I'm charging my phone with the hub dynamo. But the charger seems not to work anymore. Maybe I could visit your hackerspace and try to get the charger fixed? (Hacklab Discuss, June 2012)*

*I'm currently mid-DIY-car-repair after the electric window mechanism bust at the weekend :( Apparently the helpful people at Skoda have chosen to rivet on the last remaining panel that I need to remove, which means I'll need a rivet gun to get it back on again. Before I spend £20 on a tool I'll probably never use again, I wondered if anyone here has one I could borrow for a couple of days? (Hacklab Discuss, August 2015)*

*I'm a student based in Edinburgh. Just finished a physics degree and will start an MSc in High performance computing soon. Somewhere along the line I decided that I want to have more blinking LEDs mounted on spinning things in my life, so why not get into electronics. Nice to see that there is a hacker space nearby!...It says on the Hacklab's site that you have a lot of this stuff lying around, I'm assuming it's a donation based system for taking some of those home? (Hacklab Discuss, August 2013)*

Such spaces provide access to tools and materials which may not be commonly found in many people's homes. This was also key at the Remakery, which had gradually accumulated an eclectic array of materials, needles, sewing machines and other tools for use by members of the public:

*Although we're trying to keep our prices as low as possible it still might be too much for someone and also someone might have the skills, but just need to use some materials or whatever...A lot of people don't know where to buy buttons, because most shirts and stuff that have buttons and stuff already will come with a spare, but obviously often you lose it and you don't have a button collection...We have quite a wide variety of things...sometimes we'll have slightly more kind of intricate ones, we've had a couple of like backpacks come in, and it's like the seams are all tearing and because the material is so different you kind of have to explain to people that there's different needle types that you can get and different thread you know. (Amber)*



*Figure 39: Deconstructed Furniture at the Remakery*



*Figure 40: Equipment at the Remakery. Source: The Remakery*



Chris, who had helped lead the renovation of the Remakery, also founded the Edinburgh Tool Library (ETL), a charity focused on providing communal access to tools for DIY and personal projects. In a statement which can easily be extrapolated to community workshops such as the Remakery and Hacklab more broadly, he explained the quantitative impact of such initiatives:

*We've completed about 700 loans, we've got 200 members, we've done work with 10 or 12 other charities or community groups...and this is a very rough estimate, but we estimate that we were saving our members about 2000 pounds a month, as compared to buying the tools themselves.*

Chris observed that sharing tools in this manner doesn't just have financial implications, particularly for the low waged or unemployed (who make up a sizeable proportion of the ETL's growing membership, alongside the workshops under study here), but also has potentially significant implications for reducing resource use and carbon emissions. This is a claim which has often been made with the rise of the so-called 'sharing economy'<sup>62</sup>, and which Chris exemplified:

*One thing that's really hard to quantify is the CO2 emissions avoided by sharing, because there's very little research done...We've had some figures from Zero Waste Scotland on cordless drills and...We've saved over two tonnes of CO2 emissions just with cordless drills, and cordless drills are less than 1% of our entire inventory...Their sort of figures were 28kg of CO2 is the lifetime cost of a cordless drill. And their research suggests that by sharing it can directly save it...If four people share it you can say that's four people who haven't bought cordless drills, therefore you've saved 4x28.*

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<sup>62</sup> Many initiatives which have been described as part of the 'sharing economy,' of course, have less to do with sharing and more to do with monetising formerly unmonetised assets, further extending the spread of capitalism in everyday life.

Writing of this material provision, Schatzki (2014: 37) notes that “the emergence of a practice-arrangement bundle can also be tied to the production and introduction of particular material entities and arrangements. A new bundle can emerge when the built environment is significantly altered...” He uses two simple hypothetical examples to clarify his point:

The construction of a lake in a park leads to evolved recreational bundles there, just as the construction of recycling facilities in a town where none existed before leads to new activities amid old and new arrangements. (Ibid: 41)

As alluded to earlier in this section, many of the tools and materials which are provided in these workshops are uncommon in daily life, existing as remnants of older (or near-extinct) practices or being too expensive for one person to purchase alone. Further, as non-profit entities run with an environmental ethos, on a tight budget and providing shared facilities for low-income participants, the materials used in these workshops – the stuff from which objects are made, and the tools used to work on them – were not just shared, but were largely re-used and/or taken from the waste-stream. More significance shall be placed on this aspect of the workshops in the Section on “Meanings” below, but this was one important material aspect of the everyday life of such spaces.

The Grassmarket, Hacklab and Remakery were therefore all largely populated with tools which had been donated, and the material practices going on using these tools was, more often than not, one of converting something unwanted into working and valuable objects, through repair or reconstruction: The deconstruction and repair of a discarded dehumidifier which had been found on the street; The construction, out of catering detritus, of a rocket mass stove to be used in the ‘Jungle’ migrant camp at Calais; A small-scale wind turbine, constructed out of industrial printing waste; Edinburgh International Film Festival awards constructed out of unwanted oak; The strap of a leather bag, re-riveted and given a fresh lease of life. As, Stewart, a Hacklab participant, put it “we’re

*doing the same as Remade In Edinburgh...Where they're upcycling textiles, we're upcycling the contents of electronica and such things. So it's very complementary."*

Given the rhetoric of innovation, 'newness,' and a focus on technologies like 3D printers and laser cutters, in much writing on contemporary community workshops, the common centrality of this material revaluation through repair and reuse was notable.

I now move from questions of tools and infrastructure, and turn my attention to the less tangible question of skill and competence.

## 5.6 Elements of Practice II: Competence

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Learning viewed as situated activity has as its central defining characteristic a process that we call legitimate peripheral participation. By this we mean to draw attention to the point that learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community.

Lave and Wenger (1991: 29)

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Competence, the second element of practices outlined by Shove et al. (2012: 14) "encompasses skill, know-how and technique." While the persistence of a practice entity "requires the endurance of material arrangements," discussed in the previous section, it also calls for "the stabilization of the practical understandings through which people perform certain bodily actions when carrying out the actions that compose particular practices...People's bodily repertoires, which are coordinated with these practical understandings, must also be stable" (Schatzki, 2014: 40). This section builds on previous discussions of craft knowledge and epistemology, exploring the workshops' role in forming 'communities of practice',

acting as crucibles of knowledge, with implications for the diffusion of more sustainable practices.

To take the example provided by Watson and Shove (2008: 75), “in the hands of a novice, an assortment of plumbing fittings represents just so much metal. For someone skilled in fitting pipes together, these same materials figure as necessary resources for the task ahead.” Relating this specifically to practical competence in the workshops of this study, a key factor for sharing and developing this competence within a community-based workshop is the mutualistic learning embodied and embedded in a community. For example, Shove et al. (2012: 66) write that “many of those who write about innovations in practice emphasize the significance of communities and networks as crucibles in which new arrangements are formed, as containers that limit their diffusion and as conduits through which they flow.” Similarly, for Smith and Stirling (2016: 14) “simply being in contact with a space of material deliberation in the form of a local food initiative or makerspace can help build greater familiarity and knowledge of the deeper and more abstract concepts and possibilities for local food sovereignty or decentralised peer-to-peer manufacturing. People can touch, see, hear and try out these concepts in embodied, and more accessible, form.”

Further to the provision of materials and tools which could otherwise be difficult to access and use, a major draw to such spaces, commonly expressed by participants, is accessing the knowledge and interpersonal connections which they house and facilitate:

*For me the hackspace was important because there was a community, cos I was new to the city, I was interested in kind of meeting people...And also the expertise that was there. Just kind of like brainstorming and thinking through different options from people who'd done similar or dissimilar sort of things before, but had some advice and was interested in what was going on.*  
(Edward)

*I'm really eager to join the community, learn new skills, share new ideas and to have a lot of fun. (Hacklab Discuss, August 2012)*

*I got interested after I visited Kwartzlab in Canada which some of my colleagues are in, so searched out local hackerspaces...I work in software security so have a decent level of software knowledge but my electronics-fu<sup>63</sup> is weak. Hoping to join the lab and work on upping my electronics skills, but mainly make some new friends. (Hacklab Discuss, March 2013)*

With relevance for discussions of the affects of workshops in the next chapter, these statements from relative newcomers make clear that the desire to access particular know-how was more than a utilitarian one, but was entangled with notions of potential friendship, interest and fun. More established participants, also recounted the importance of this:

*You end up working with people on a project or somebody will come along and say 'can you help us with this?', so just being around you pick up these weird projects which is quite nice, I like that aspect of it. I was doing a lot of web stuff and it was just getting really boring, all software, and now this LED art thing [a current project] only happened because the artist wandered in one day and said 'I want to make this' and [I said] 'fair enough, I can give you a hand with that.' ... And there are some people who come along, never do any projects, and just be part of the group which is fine again. (Ben)*

*It does foster collaboration, you know. I learned so much about programming, spending half an hour with Ross [at the workshop]. And he at the same time was trying to find a way of*

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<sup>63</sup> Internet slang for competence, derived from Kung Fu.

*twisting wires together, cos he makes amplifiers. Signalling is very important: if your wires are a mess you get very low quality signal, because the electromagnetic fields affect the voltage in the wires. So he wanted to get his wires twisted together in a sort of braid. And I come across him and I'm like 'what're you doing?' and I see what he's doing and I'm like 'you really overthought this man.' He made this device, with a stick and two things coming out here that turn independently, and I'm like, 'you know you can just jam those two wires into a drill and I'll hold the other end, you press the drill'. Boom. Because I know yarn spinning. And he's like 'I never thought of that'...He obviously thought 'that's too simple, that's not going to work', whereas I'm like 'I know that'll work.' so you get a lot of this cross[fertilisation]... there's a lot of floating artists without a job, you know. A lot of middle class people with no work. They've also got a lot of skills: they're staying with their parents until things pick up, but in the time they're at the maker space, sharing their knowledge. Which is really cool, totally awesome. (Jacob)*

These quotes reflect a common theme, foregrounding the transpersonal, community-centred nature of knowledge acquisition. The idea of stores of experience, however, begs the question of where such deeply embedded, embodied and practiced know-how originates, especially when the spaces themselves are relatively new, and, further, how they consequently become shared amongst participants.

There is a temporal aspect to competence in maker practices which must be noted, whereby “one round of DIY has implications for what might be tackled next and for the confidence, or otherwise, with which new projects are approached. As a result, practitioners’ ‘careers’ – both individually and collectively – determine related forms and types of production and consumption” (Watson and Shove,

2008: 72). A common insight which emerged across the three sites was that the 'maker' career of participants, while reinforced and strengthened by such involvement, rarely started with involvement in a community workshop. As Hargreaves et al. (2013: 406) note, the practices which someone "currently 'carries' will shape the kinds of practice she encounters in her daily life, just as they will shape her perceptions of, and ability to take up, new practices."

The workshops themselves capitalise on pre-existing skills and know-how, often picked up in other venues, such as the home, or school, or earlier in life, as part of a previous practice career. Therefore, it appeared common that enthusiasm – whether for the practical, the artistic, or the handmade – predated involvement in community workshops, and often extended back much earlier in life, perhaps, for example, cultivated and encouraged by families in the home (especially fathers in the comments below), or encountered in other life domains:

*I've always been interested in electronic stuff. My dad was an electronic engineer so there was stuff around. From about seven or eight I think, playing with LEDs, making LEDs blink and stuff like that you know. (Ben)*

*From a young age, we were talking about roundabout seven or eight, I used to get ladybird books, and certain ones were for electric motors, and microphones, so at the age of about nine, my dad was a technical person - a lift engineer - so he's often working with lift assemblies, power blocks and such things, and I used to travel with him extensively during my younger years. I had that osmotic input, I crafted a carbon fibre microphone, which was actually a little carbon rod, the ones you'd find in a battery, with a little mounting plate top and bottom, and a coil, and I took it to school, as a kind of make and show. (Stewart)*

*I remember sitting in the computer repair shop with my Dad paying a repair bill after I took the family PC apart and could not get it back together again...I've always liked understanding the mechanics of how things work, from computers/electronics to trains. My favourite books when I was growing up were the Dorling Kindersley cross-section books that were full of illustrations of cut aways of things from ships to theaters. (Kevin)*

*[I was] always artistic as a kid. It was always art, there was never anything else. It goes back to my grandparents and my cousin, they were all artistic, so nearly each of my cousins ended up in an artistic role. But then my dad was a kind of engineer, and then my sister's a scientist, and I think it's all kind of crossed over, I think that's why I like making things, cos I think I've got a bit of my dad's engineering and DIY skills. (Sarah)*

Jacob tells how his father, a teacher, had organised a 'Young Engineers' after school club:

*Kids from the local schools would go there and learn soldering, and making little devices, you know. Little things like bat detectors, things that would translate the high frequency sounds to visible sounds, little doodas like that, so I learnt to solder and was comfortable with electronics at that point, and of course I came up through school during the era of the BBC<sup>64</sup>, so I learned Basic<sup>65</sup>...It's not that I learned how to programme as such, or that I became a good programmer. [Rather] I'm comfortable with the tools, you know what I mean. It doesn't intimidate me because*

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<sup>64</sup> A BBC Micro was a computer built for the British Broadcasting Corporation in the early 1980s, with an accompanying educational TV programme.

<sup>65</sup> A programming language which was widespread in the 1970s and 1980s.



*it's something that I was used to as a little kid you know so it doesn't worry me that much. (Jacob)*

From this pre-existing practical foundation, Jacob was then converted to weaving – which would become his main craft interest, and one he would study full-time for four years – while doing security at a festival. The festival included a craft section, where he encountered the stall of the GalGael Trust, a workshop, social enterprise and community development organisation in Glasgow. The sense of growth in competence over time is conveyed in the following:

*I met this one woman and she had all these tablet-woven bands...I was like 'they're nice, how'd you make those?' So she said 'you go like so, and like so, and keep on doing that, and take this away with you'. And I spent the next six months out of a job so I just learned to do that, and then I got the loom, and then I got a bigger loom, and I learned to weave on that arse-backwards. And then I went to college and I did my four years, textile design, woven textile design. I started to get very interested in the workings of the machine you know.*

In another case, this interest and initial competence was attributed to collaboration with an ex-partner earlier in life, but was fostered during involvement at the Grassmarket during a period of homelessness, as well as prior experience studying sculpture and fine art at university:

*How did I get there? I mentioned about sculpture, [which] is very different from restoration. I mentioned about pyrography, that was learned through the Grassmarket. But really, upcycling came by collaborating with my ex-partner, who had three years' experience in furniture restoration for antiques, and he got me into traditional ways of restoring, that had nothing to do with chemicals. Using alternative ways, like broken glass instead of getting cabinet scrapers. (Federica)*

Given such eclectic and transdisciplinary endeavours, from weaving to wiring, for example, or sculpture to restoration, it appears fundamental that competence of one type tends to breed confidence and skill in another e.g. for more traditional 'craft' skills and software techniques to complement each other in such developments of practice. For Brian, for example, competence, largely in hand-eye coordination, had been built over decades of using early computer art software, with implications for carpentry know-how:

*Because I've spent so many years as my hobby messing around with art packages and stuff, and focusing on the pixels of things, I've kind of trained my mind. I used to use this old art package on the Omega called Deluxe Paint, which was advanced for its time, so a lot of kind of like pixel work and attention to fine detail. Some of those skills transfer to wood burning cos you're also looking at fine detail. You're paying close attention to the movement of a line and how the image is built up in stages.*  
(Brian)

Regarding the workshops themselves, however, the manner through which know-how and competence was shared and stabilised in the three workshops varied greatly, and warrants reflection. Generalisations are difficult to make, abstracted from particular instances, with 'sub-communities of practice' assembling and disassembling over time, depending on those involved in the particular activity in question. That said, while competence is established and shared – through various tacit and explicit means – through varying forms of legitimate peripheral participation in all three workshops, it is distributed very differently. This is worth reflecting on, in more detail.

### 5.6.1 Distribution of Competence at the Remakery

The Remakery primarily focuses on teaching people beginner's repair skills through its recurring and evolving workshop series, a series which includes computer repair, sewing and textiles, furniture restoration and upcycling,

upholstery, leather repair and more. At these, there is a clear initial delineation of student and professional teacher, with the latter demonstrating the required skills, which are then practically emulated by students through introductory projects. In practice, however, the distribution of competence is more variable, with competence varying, and students encouraging learning amongst themselves as workshops proceed. As one tutor reflected:

*...A lot of people are already crafters who have an idea of how things work but just want to come along and get that little bit of inside information, and learn a bit. And then you have some people who come along, and their friend has sent them, or they have all these bags that are broken and they really want to fix them...in three hours they sit back and go 'wow, I can't believe I did that'*

*Some people are very good at sewing, and very good with their manual dexterity. Whereas some people come along, have never sewn before or never used a hammer before, and aren't that coordinated with their hand to eye...Once people kind of learn how to do something, they're always amazed at how easy it is. Like the leather work and the riveting, people just look at it and go 'a machine made that, I couldn't possibly do that' but then you show someone how easy it is and they're like 'oh wow, that's great' and the next minute they're riveting away and riveting everything. It's good, showing people how easy these things are, and that they can be produced manually, that it doesn't have to always be a machine. (Sarah)*

				£
6	11:30 16:30	PYROGRAPHY	60	45
7	12:00 15:00	HOOKED RAG RUG	35	20
13	12:00 15:30	INTRO TO WOODWORK	40	25
20	11:00 16:30	FINISHING TECHNIQUES	65	50
27	11:00 16:30	UPHOLSTERY	65	50
28	12:00 15:00	SEWING MACHINE SKILLS I	60	45
3 JUNE	11:30 16:30	INTRO TO PYROGRAPHY	60	45
4	12:00 15:00	SEWING MACHINE SKILLS II	-	-

Figure 41: Workshop Schedule. Source: The Remakery

The Remakery also runs introductory sessions on tool use and woodworking (Figure 41) to educate those who may wish to hire workshop bench space for self-directed projects, yet who lack the confidence or know-how to do so. One-to-one computer repair workshops, run by computer technicians, are one of the space's most utilised initiatives, which place an emphasis not just on helping you to fix the computer in question, but also taking you through the cause of the problem, with the intention of leaving you with the skills to deal with any similar issues in future. Part of this is the recognition that a one-off workshop, while sometimes sufficient, may not be enough to reliably enrol someone in a particular repair practice, nor be able to embed the knowledge adequately in 'muscle memory' (Maller and Strengers, 2015). One idea to get around this is the development of workshops of increasing difficulty and skill development:

*Sewing machine basics is something we've had since I've been here, but now we're trying to do like sewing machines one and sewing machines two, so trying to build people's skills as well so that they can take on bigger projects, instead of being like 'oh I used this sewing machine one time...' which is really good. One of the guys who was on the last sewing machines basics classes came to the sewing machine skills, so I think it would be cool to see that people are actually wanting to actually continue.*  
(Amber)

Similarly, the organisation's weekly 'Repair Surgery' has both textile/sewing and computer experts in attendance (Figure 42), and the necessary materials, to fix items but focus on helping to give attendees the confidence and requisite skills to do likewise in future:

*We're like, 'we don't fix it, we show you how to fix it so you know how to do it in the future'. But then it's fine cos they're like 'oh this is so easy' (Amber)*



**Figure 42: Repair Surgery at the Remakery. Source: The Remakery**

### 5.6.2 Distribution of Competence at the Hacklab

At the Hacklab, while formal workshops on soldering and other hardware activities had been organised on an ad hoc basis, particularly early in its history, competence was usually built more informally, through networking and peripheral learning amongst participants:

*I'm really a very poor programmer you know, I'm slow, inefficient and I don't know what I'm doing. I spent a month and a half programming, making this little program to display logarithmically generated patterns right. It took me two months to make it cos I don't know what I'm doing and I was talking to Ross at Dundee, he's a sysadmin programmer type, and he's like 'oh that's interesting' and 30 minutes, there you go, and it worked better than my programme by a long shot. Managed to eliminate like ten fucking operations. So that was kind of interesting. (Jacob)*

Newcomers to an open night would spend the evening peripherally observing other people's projects, particularly when they wish to learn how to use equipment such as the laser cutter, 3D printer or CNC mill. Such occasions provided an opportunity for outsiders to cross the boundary into the space, gain familiarity with how it operates, while becoming acquainted with who amongst the 'insiders' might have the particular skills required to move a given project to completion.

While much of this learning takes place face-to-face, whether between members or on the workshop's open evenings, a vital and active resource for this, which doesn't exist at the Remakery, is the online discussion list, which operates as a forum for material problems to be posed and potential solutions discussed. As Lave and Wenger (1991: 98) note, the term 'community' doesn't "imply necessarily co-presence, a well-defined, identifiable group, or socially visible boundaries. It does imply participation in an activity system about which

participants share understandings concerning what they are doing and what that means in their lives and for their communities.” Hitchings (2014: 103) too notes that “it may not always be those living nearby who influence practices...Many of us barely know our neighbours and feel much closer to other reference groups. We might therefore benefit from conceptualising these collectives in ways other than those defined by geographic proximity.”

While in the private sector, ‘leaking’ of information outside of the organisation can be a problem, and is often actively prevented (Brown and Duguid, 2001), it is encouraged in networks of community-oriented workshops, through wikis, online tutorials and other means. As Brown and Duguid (2001: 207) note, this can be mutually beneficial, as “the lines that let knowledge leak out, also let it flow in”. The Hacklab certainly forms a much more distributed web of competence than the Remakery, through an active mailing list and website. As I was told by Ben, “*There’s shit loads of people on the mailing list that you just never see, and they’re quite active, but you never see them.*” Queries addressed here include everything from discussions about whether a broken PC hard-drive could be fixed by putting it in a freezer, how to re-flow (and thus repair) solder on a circuit board in a home oven, and the pros and cons of MIG and TIG welding, to building a low-cost photographic jig for research on plants at a botanic garden, or inserting conductive filament into clothing to produce e-textiles.

These digital fora are extremely useful for what Duguid (2005) describes as ‘leaky’ knowledge, but less so for the ‘sticky’ knowledge which travels less easily in words and diagrams. As we saw in relation to laser engraving aluminium in the previous chapter, though written material in ‘wiki’ form on the Hacklab’s website can explain some fundamentals, such explicit instruction can only be of a certain amount of use, with people pointed towards particularly skilled members for more detailed face-to-face instruction (Figure 30 in previous chapter).

For this reason, spaces like the Hacklab are often spoken of with reference to past institutions which stored and/or filtered knowledge, like libraries and guild houses (this analogy was literal in the case of the Edinburgh Tool Library, an organisation whose own workshop opened as the fieldwork for this study was coming to a close), but was also referred to by participants:

*An interesting...analysis that I read is it's actually a revival of the medieval guild movement, but in a different way. Cos the guilds acted to contain knowledge, and not let it out...also guilds had guild houses. (Jacob)*

*It's a space where people can share those tools and come together to use those tools and that's a fantastic library-like resource for the 21st century I think. (Edward)*

The principle of 'do-ocracy' was also relevant here, with the Hacklab community active in facilitating the learning of new and specialised skills, not just sharing those already present in the community. This would take place, for example, through the seeking out of workshops, including in blacksmithing, welding or the construction of wind turbines out of scrap, to take just a few examples. Indeed, responding to the comment "*Hacking, it's more than just electronics*", one mailing list participant noted (February 2011), "*Indeed, and we see similarly wide ranges of activity across lots of other hackerspaces. I think all our members would agree that these things and more are welcome and encouraged in the hacklab. They just need somebody to start them! The activities that are on at the moment just represent what current people have been willing and knowledgeable to step up and lead on. They shouldn't be seen as prescriptive.*"

### 5.6.3 Distribution of Competence at the Grassmarket

Competence building at the Grassmarket, being focused on a 'traditional' craft of one particular variety – namely woodwork or carpentry – and working mainly with one recycled material – former church pews – took place in what could be seen as more time-extensive and immersive manner than that experienced through



workshops at the Remakery or peer learning at the Hacklab. While the Remakery focused on workshops normally lasting half a day, and the Hacklab was often characterised by learning through the mailing list or chance meetings face-to-face, the Grassmarket emphasised developing skills over a much longer period of time. Key to this longer immersion, and the role of the workshop as a place of care, was the time taken to learn how to complete tasks by hand, even in situations where machinery, say, could lead to shortcuts:

*It's kind of defeating the purpose if you're doing everything by machine and the guys have nothing to do. The way that things are made, the way that furniture is made here is slightly different to the way that I would do it [commercially] (Susan)*

There is no mailing list, nor organised workshop sessions on a particular technique or material. Rather, learning takes place on the job, through gradual direct experience on different collective projects and commissions. Tommy and more experienced volunteers provide guidance, as 'old-timers', to newer members of the team where needed, with novices completing simpler tasks before graduating onto more complex ones. On particularly risky operations, such as the use of a router on the corner of a piece of furniture<sup>66</sup>, this process would take place through gentle introduction under Tommy's supervision, usually starting with inexpensive or less important projects. Tommy noted, "at the end of the day, you can't buy experience," while Susan maintained that:

*People can be interested in art, but there's much more detail, and I suppose you have to have more of a natural talent for it. Whereas with woodwork, you don't have to, anyone can do it really. Like, as long as you understand well enough. And there's nothing that can't be fixed when it comes to woodwork. If it's completely ruined, then you just get another piece of timber and*

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<sup>66</sup> Which needs particular care, due to the vulnerability of the grain at that point, which is liable to crack and ruin a piece.

*start again. Obviously when the guys start they have very little skill, but they build up the skill quite quickly because it's kind of the same rules, it's like, learn how to sand, or finish or...*

Referring to 'the same rules', Susan alludes here to the broad repetition of processes across multiple pieces, such as the particular gradations of sandpaper used to coax a piece to a smooth finish, to which the newcomer is quickly introduced. Reflecting on her own learning, through a full-time furniture-making course, Susan comments:

*When I first started doing the course, I didn't know any of the timbers, I didn't know what oak looked like, I didn't know ...it was awful. And they were like 'what kind of timber's that' and I was like 'I don't know'. But now it just comes first hand, instantly, you pick it up quickly. I suppose that's a kind of, it's not...the work's not so difficult that it can't be done by the guys, so I suppose that's quite rewarding. (Susan)*

Peripheral learning, in the vein of Lave and Wenger (1991), therefore takes place, with volunteers gradually introduced to more specialised techniques, such as routing or planing as their competence and confidence build in tandem. From time-to-time, though more infrequently, the learning would take place in a more formal manner, for example with participants standing around Tommy, who explains some aspect of more 'traditional' ways of doing things, whether the role of 'saw doctors' in saw maintenance or the fabrication of old types of nails. Brian noted of his involvement:

*The skill that goes into some of this stuff is amazing, and I think it's really about keeping alive the art form and the skills that go along with it that sometimes get lost in an industrial world, you know, where things become more and more mechanised, and mass produced.*

As this section has demonstrated, communities of practice, such as those formed in community workshop spaces are “significant repositories for the development, maintenance, and reproduction of knowledge” (Brown and Duguid, 2001: 202). What may seem immediately irrelevant has further implications for future practice. This is addressed by Watson and Shove (2008: 86), who state that “each project and each task of which each project is made is of consequence for the development of competence, skill or disillusionment, and so for the formulation, or otherwise, of new projects. Although often missed in discussions of consumer culture, this temporal aspect is vital in understanding the careers of individual consumers and the trajectories of the practices they collectively reproduce and transform.” This temporality is a reflection I will return to in Chapter 7. Now, however, I turn to the final ‘element’ of practice: meanings.

## 5.7 Elements of Practice III: Meanings

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“The part that objects play in our lives helps to make our lives culturally what they are, partly through the symbolic associations they have, but also through the gestures, actions and practices that they entail.”

Dant (2008: 29)

“Sensibility, a refinement or new assemblage of sensible primordia, is culturally encoded and temperamentally delimited, but it is still educable to some uncertain degree.”

Bennett (2001: 150)

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Hawkins (2006: 71), author of the *Ethics of Waste*, has tried to shift away from voluntaristic connotations of terms such as ‘meaning’ and ‘value’, stating that “culture, rather than being an expression of diverse human belief systems or values, emerges as a set of practices that involve multiple relations with this realm.

This non-human stuff, from eco-shopping bags to air conditioning to street rubbish, is not passive or inert in these relations...the non-human can be generative: inviting or suggesting different cultural practices.” Charles Taylor (quoted in Everts et al., 2011: 324) furthermore notes that the “meanings and norms implicit in [...] practices are not just in the minds of the actors but are out there in the practices themselves” (see also Dant, 2008). Here, then, I reflect on values and norms which were evident in, and which helped to constitute, the case study sites. I will explore these findings in relation to waste and the affective ‘enchanted materialism’ (Bennett, 2001) arising in the workshop.

Shove et al. (2012: 53) write of a revaluation which can occur, both caused by, and causing, an alteration in practice: “a process of de- and re-classification: old connotations [have] to be shaken off and new connections made”. Practices shift, that is, and related values shift too. For example, in relation to basic repair, they note, “changing systems of provision have clearly undermined the importance of knowing how to darn socks, maintain a car or bake fancy biscuits at home. But as some of these examples demonstrate, seemingly defunct skills are occasionally resurrected” (p. 44). This iterative spread of the meanings and aesthetics of maker practice is translated in the material and social infrastructure of particular spaces. The workshops could act as potent spaces of overlapping affective and ethical revaluation, providing what Bennett (2001: 152) describes as an aesthetic education. Such affective and aesthetic shifts provided a powerful backdrop to the revaluation and reuse of unwanted materials, in particular. As Kohtala (2016: 82) states:

In...spaces such as hackerspaces, ‘waste’ such as reclaimed electronics components are a valuable resource, a source of inspiration and a symbol of independence from the proprietary technologies from whence they came, thus directly representing identity in this counter-community.

Writing in *Nature*, Charter (2016) highlights the increased relevance of repair cafes and maker spaces, noting that “a few decades ago, a broken radio, fan or kettle generally triggered a trip to the repair shop. Now, it often means a journey to the dump.” Values are one significant factor contributing to a decline in recent decades of repair and reuse services in Western European societies<sup>67</sup>; whether the values of individuals, say, who view disposing of goods as preferable to repairing them, or the values of businesses, who increasingly design those products to be difficult, or impossible, to repair. Amidst “the minefield of emotions and moral anxieties that waste can provoke” (Hawkins, 2006: vii), how we value material objects appears to be at stake in many of the activities of the three case sites, though perhaps occurring with most visible affect at the Remakery. As a founder of the Remakery has speculated, the organisation could play a role in the rejuvenation of skills which are forgotten or on the way to their demise, bringing them “back into the mainstream”:

*It struck me that people with useful fixing skills, like the elderly man who fixed bikes in his front garden, should be more valued for the work they did. And this seeded the idea for creating a reuse and repair centre, with a business model of repair education... And the story of creating Remade in Edinburgh, which is a social enterprise to teach computer, furniture and repair skills and campaign for zero waste, is for me part of that alternative vision: one that creates green jobs, and fosters inclusion and community at its heart...*

*Repair isn't a new idea – a culture of make do and mend was prevalent in other generations and still is in other cultures. But we need to bring it back into the mainstream, and make it more popular to learn to fix things than opting for a shiny new*

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<sup>67</sup> <http://www.rreuse.org/wp-content/uploads/Routes-to-Repair-RREUSE-final-report.pdf>  
[Accessed 04/02/17]

*disposable upgrade. We need to think more holistically about the resources we use, where they come from and where they go to. There are huge human costs to continuing to use more and more stuff, for example the abnormally high levels of lead in Chinese communities that live next to electronic waste dumps.*<sup>68</sup>

Emphasised centrally at this workshop, for example, was the transformation of mundane objects through the trendy term ‘upcycling’ and the pull which such transformation could have, disrupting the “standard” way, and cultivating a renewed appreciation for the potential of *stuff*. As participants at the Remakery put it:

*[It] was just the standard thing...I suppose it still harks back to that era...My parents grew up like that, my parents maybe didn't have a lot, so we made things last, looking after your own car, all that sort of thing. It did, it disappeared...the old adage of a throwaway society was very, very true. And I lived through it. You can see why people are wanting to try stop that, if they can, or reduce it anyway. It's disappeared a lot, but hopefully people are trying to bring it back again. (David)*

*I think it has been fun to use pre-existing talent to use something out of...I wouldn't call it rubbish (laughs)...unwanted goods. (Federica)*

Lane and Watson (2012) note that environmental sustainability is often an external effect, rather than a motivating cause, of much reuse, sometimes doesn't even figure centrally at all. This is apparent to the extent that while the Remakery placed an emphasis on their environmental credentials, the waste reduction activities of the Hacklab and Grassmarket appeared to be more of a positive externality, monitored in much less detail. Unlike the latter two, the Remakery

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<sup>68</sup> [http://www.senscot.net/view\\_art.php?viewid=24347](http://www.senscot.net/view_art.php?viewid=24347) [Accessed 29/10/16]

carefully measured statistics such as waste diverted from landfill and carbon emissions circumvented, for example, and the space was accredited by Zero Waste Scotland as a trusted second-hand seller through its national accreditation scheme, *Revolve*. However, at the Remakery too, it was a gentler attentiveness to materials, and their potentialities, rather than a hard focus on quantitative reduction, which could play a role in this involvement:

*I haven't been a person who marches for the planet kind of thing, you know what I mean...but I've always had, in the things that I do, an awareness of waste, and things like that. So I try to use things sensibly, you know...I don't throw things away, I've always been a collector of things. My cellar's sometimes full of bits and bobs, in fact there's a whole load of stuff in at the moment, that I've been promising to get round to doing. It's that ...thinking, 'why do we waste them?' 'why do we do that'...and I'll always look to repair something, rather than just dumping, or throwing away (David)*

One long-standing participant at both the Grassmarket and the Remakery had been involved in an art exhibition in Edinburgh, to promote a series of makers who were working with recycled materials and to further portray the beauty and potential of re-engagement with discarded objects:

*I went home and I thought, I can do that myself, where should I start. Let's go on the street...Edinburgh has lots of waste, and back then, 2012, people didn't really realise that there was an upcoming movement where upcycling, furniture restoration would've been so big. So you could still find nice pieces, wooden, in good condition on the street. I found mahogany Edwardian coffee tables, Victorian chests of drawers left on the street, just because they don't look as cool as Ikea. (laughs) But they are way more durable, and the wood that they're made of can't be found*

*anywhere else now. So it was like finding treasures on the street, treasure hunting, and it became quite fun, creative, inspiring, but in Edinburgh (Federica).*

Fun, creative and inspiring; this affective description of the possibilities of materials – of the active revaluation of the devalued – found similar expression across all three spaces, pointing to a significant recurring theme in the workshop sites:

*Adding value to a discarded thing. I still face this priority/objective, I like to think there are infinite ways to transform things, just using creativity, pre-existing materials... I like to think forwards, I like to move on and complement my artistic skills with something a bit more technical. I think that would really open my horizons again, and get my creativity rolling on, discover more...there's so much that we humans can do to save the environment. (Federica)*

*One thing I've found is my ability to see potential in stuff, like you know, as you learn like bits of wood here that I now look in the bin and I'm like 'I could do something with that' so I take it away, you know, and it's like, previously I wouldn't have even known or perceived. Until you have the skills you don't know what things are useful for, and I guess arts and crafts are good that way... I like doing it and like, I'm one of these people who don't throw anything away. You can always find a use for it. And all my family used to go mad, yeah, 'That'll make a wonderful tub!' or 'that'll make' you know, never throw anything out. If it looks like it's got potential I'll keep it and use it for something. (Elaine)*

*So I suppose Remade In Edinburgh made me think that way...a general awareness, rather than having the details of how much landfill I'm saving or ...if something packs up at home do I have*



*to throw it away, can I use it in another way, does it have another purpose? Or can I just get a little bit to repair it? (David)*

*I'm a lot more likely to look at a piece of woodwork and admire the skill gone into it, because I now know how much effort that it takes. (Brian)*

While skill and materials co-constituted the Grassmarket workshop, an evident component of its day-to-day success was this sense of joy and meaning experienced by participants (Bennett, 2001); a growing ability, as they moved from beginners to competent woodworkers, to become affected in their daily interactions with lively materials. Most commonly, this would take place through an appreciation for the finish of a piece, for example when former waste timber, now transformed, is passed around for admiration, described as “lush,” while other workshop members trace the smoothness of it with their fingers; or when a volunteer beams with visible pride, caught up in the beauty of the artefact they’ve created, perhaps making sure to take photos of it to show to friends and family:

*The guys enjoy woodwork, they enjoy coming in, they enjoy learning the skill. They take pictures, you see them taking pictures...to go home and show their families and whatnot, and that's important that they do that because they're obviously taking pride in what they're doing. (Tommy)*

However, while all three spaces constructed an identity which in some way brought consumer culture into question, and emphasised creative practice, the workshops of this study appear to thrive on slightly different values and cultural energies (although, as we shall see, these are themselves contested and changing), expressed in – and forming – their material infrastructure. The Grassmarket, for example, taps into an appreciation for traditional and heritage modes of working, and the value of the handmade. As we saw in the previous section, while maintaining an element of pragmatism, work at the Grassmarket will often place hand-tools centre stage, even when a job could be completed faster, or perhaps

with more accuracy, with machine tools. Evidently, this prolonged engagement with materials, and resultant imperfection, was part of its appeal, to both volunteers and, as we saw in the previous chapter, to the customers which kept the workshop going:

*You wouldn't be able to go to Ikea and buy any type of the stuff we make here. Cos that's all chipwood, and at least we've got the joys of working with proper wood and all different kinds.*  
(Daniel)

The Hacklab, conversely, is enrolled into a wave of enthusiasm for the 'maker movement' often comprised of relatively novel digital fabrication technologies, an enthusiasm for collaborative tinkering and modification, and the open source democratisation of both hardware and software. The space was founded in 2011, at a time of great expansion and awareness of similar initiatives around the world. One indicator of the cultural cachet obtained by the maker movement, and its provocation towards thinking through our relationship with stuff, therefore, is one participant's vivid memory of the massive crowds drawn to the space's opening party in 2011:

*Something ridiculous like 300 people came up to see it. It was absolutely bonkers, because me and Harry went out to buy beer, and we got a phone call saying "come back quickly, there's like hundreds of people" ...Oh shit...so we came in and the corridors were filled and all this, people trying to get in. I think [at] that time it was new, and people wanted to check it out, and I think there were a lot of start-up type people got in on that as well.*  
(Ben)

For some, however, the existence of a discrete maker movement with a common ethos was less central:

*I didn't know anything about maker spaces, or [the] maker movement or anything. I was a guy that was building guitar pedals and amps and speaker cabinets and you name it, it's just something I've always done. Radios, all kinds of stuff, very much electronic-based, but kind of the art boundary...that interface has always been interesting but it's not been something I'd ever been able to get into...[some people] thought let's look at starting up a proper maker space, and that was the first time I'd heard of the concept of a space, a maker space, I didn't know it was called a maker, but I knew what a maker was at that point, it was what I was doing. (Harry)*

While similar workshops are much vaunted for their focus on innovation and the 'new', the Hacklab, at least as much as the Remakery, facilitated practices of reclamation, revaluation and querying the boundaries of what constitutes waste, and an implicit critique of the wastefulness of current consumer societies. This was echoed on a number of occasions:

*Nothing around here ever really dies. It can always be repaired. This monitor was broken, now it's fine. We can fix a lot of stuff, so you get people come along with broken things. We've resoldered I don't know how many USB connectors on mobile phones, that's the first thing that snaps off. (Ben)*

*It is this kind of disposable society thing to a certain extent. A lot of people will buy the latest iPhone, they'll have dropped it in two months, but you see them on the train and they'll sit there with a cracked screen for like six months until the new one gets out, whereas I buy all my gadgetry second hand, I guess for environmental reasons but also for cost reasons...A lot of the technology and a lot of the gadgetry we have seems very black*

*boxed<sup>69</sup> these days, and that's awesome for democratising technology because, you know, my girlfriend and my parents don't care how their phone works, and whether they can hack it and root it and put a new ROM on it, like I've done for all of them...and that's great but the ability to do that is like a useful skill and makes me kind of feel, closer and more engaged to not just technology, but I guess society as well, I don't like things that are black boxes, I like to know what's going on behind everything. (Edward)*

*I think that a certain amount of 'black box' is good...That being said, systems always need to be open to those who want to look or modify or extend...I like how open source software and access to cheap electronics can give individuals or small groups the power to create things such as communications infrastructure in a similar, and in some cases better class than what a company like BT can. (Kevin)*

One participant portrayed the values of self-reliance at the Hacklab by drawing a parallel between the political ethos of this kind of hacker space, and that evident at radical protest camps which he had taken part in, earlier in life:

*The nice thing about living in those places, you know, the conditions are very basic but you're not alienated from your labour, you know. That Marxist idea of the alienation of the proletariat from the product of his labour, cos he works but he never sees the result you know. You work to do something that you'll never see, to make money to get the things you need.*

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<sup>69</sup> A black box is a term from engineering referring to an object which is known for its inputs, outputs or use, with no knowledge of its actual inner workings. For example, the predominance of 'black boxed' technologies in modern life, which he called 'the device paradigm', was central to Borgmann's (1984) influential writings in which he contrasted such technologies with 'focal practices' which entail skill and collective endeavour.

*Whereas when you're living outside, when you go to get water you've got water, you go and get wood, now you've got heat, it's like that and it's a very satisfying way of doing things. And of course, you have to make all your own structures, your own shelter and everything.*

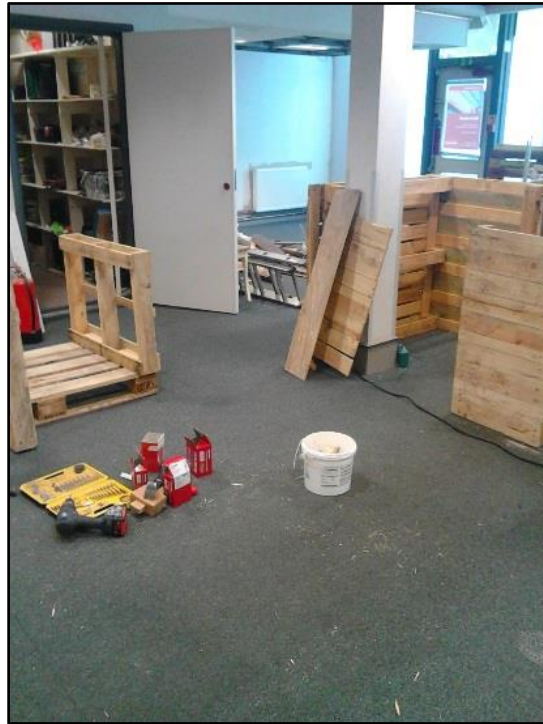
The Remakery, meanwhile, lies somewhere in between these two, actively distancing itself from values surrounding 'craft' *per se* ("*[We] tried to stay away from the word craft, because the aim is repair. So it's more traditional re-use techniques which, to be fair, they all are.*" [Amber]), while still drawing on an aesthetic appreciation for the handmade and a trend for 'upcycling', both of which have been given a boost in recent years, not least through online tools such as Etsy and Pinterest (Luckman, 2015; Levine and Heimerl, 2008). The Remakery further draws from the increased currency gained by the concept of the 'circular economy', a term which has gained increased political backing in Scotland, as well as through the high-profile work of the Ellen MacArthur Foundation, with Scotland becoming the first nation to join the MacArthur Foundation's Circular Economy 100 (CE100) programme, complementing the 2016 launch of *Making Things Last – A Circular Economy Strategy for Scotland*, by the Scottish Government.

These differences in values find themselves materialised in the physical spaces of the workshops, not necessarily signified through representational means, but imbued into the fabric and feel of the space itself. As Kohtala (2016: 84) notes, "the question of materials, how they are stored and what practices these arrangements afford in turn leads to the compelling issue of how the space itself is designed and configured." The Remakery space, for example, was intentionally renovated at minimal expense, with significant volunteer labour, and developed as far as possible using recycled and reclaimed materials, from donated paint, to shelving made of pallets, a glass former office cubicle repurposed into a transparent wall for the enclosed workshop, and work benches made from old

doors which were otherwise being sent to landfill (Figures 43-44). Display cases, boxes of components, deconstructed furniture and a prominently visible workshop, all contribute to the questioning of conventional narratives of waste and how it is dealt with, opening up objects which are normally closed, attempting to engage participants with broken things, rather than being distanced from them.



*Figure 43: Remakery Under Construction I*



**Figure 44: Remakery Under Construction II**

A different, but equally distinctive material culture was evident amidst the donated and hacked machinery – the soldering irons, oscilloscopes, and CNC mills – at the Hacklab (Figure 45 and Figure 46), as Jacob noted:

*The makerspace movement is a bit more free and...cooperative, slightly anarchistic, disorganised, messy. Very little people in paid positions. You go to a non-profit with a corporate structure and it's always impeccably tidy. You go to a maker space and the vast majority of the time it's a fucking tip.*

*The laser cutter is completely hacked, it's got various fans put into it, tubes replaced several times, and the laser has been water cooled. What happened was when a chap said 'well, there's a hack on YouTube for laser cutters'...five guys work overnight 'til two or three in the morning, come in the next day and turn on the laser cutter... (Stewart)*



*Figure 45: Hacklab Interior I*



*Figure 46: Hacklab Interior II*



Here, I would further note agreement with other ethnographic work which highlights how many hackerspaces work to promote “principles of resourcefulness, reuse, and peer production...its members [advocating] an understanding of technology innovation rooted in reuse and resourcefulness rather than building from scratch” (Lindtner, 2015: 856). Much like initiatives such as Freecycle, for example, the Hacklab mailing list is regularly used to advertise things found or unwanted, which are available for free:

- *I have a spool of conductive thread going spare if anyone wants it (it was unsuitable for my purposes) (October 2011)*
- *I’m getting rid of old mac things, from OS 7ish computers to monitors, peripherals and cables. Anyone want some today? (April 2012)*
- *I hereby donate the MakerBot CupCake to the lab, since I’m leaving for distant lands soon. If there are any questions about its care and feeding let me know – it’s in working order, just temperamental. (April 2013)*
- *I have an amount of old lead flashing and lead pipe that I’m willing to give away to someone that will use it. If you are into lead casting, or working lead alloys and you want this lead free, then please get in touch. (July 2013)*
- *Hacklab has intercepted a batch of used 15” and 17” LCD monitors on their way to a skip. We’ve put aside a few for the lab, but now it’s time to find homes for the rest (about 15 of them)...A small donation would be appreciated but is optional (we would prefer to see them put to use instead of taking up storage space or being skipped). (August 2013)*

- *There's a skip on Moray Place...with a few partially scavenged Dell PCs and some KVM-type cables. It was pretty empty otherwise so hopefully some other interesting stuff will go in over the next few days...Disclaimer for the NSA bots – taking stuff out of skips is theft, whereas throwing useful stuff into them is apparently legal. (November 2013)*
- *There's a piano by the bins down Parkside Terr. I pressed a key as I went past and it went dong. No further information. (July 2015)*

A workshop at the Hacklab in 2015 (in which commercial printing plates made out of aluminium – which would otherwise be sent to landfill – were used to construct small-scale wind turbines) provoked discussion regarding the hard-to-recycle nature of supposedly 'green' commercial wind turbines:

*Not only does it reuse a material (aluminium sheet) that would otherwise be wasted, but that material can easily be repaired when needs be, reused elsewhere, and even recycled at the end of its lifetime. All of this reduces the amount going to landfill. With the Scottish Government going all out on renewable energy, particularly large commercial wind turbines, the potential for another mountain of waste coming round in a few years concerns me<sup>70</sup> (Hacklab Discuss, February 2015).*

While providing an outlet for the practical engagement with, and discussion of *stuff* in general, and waste more particularly, material practices and discussions at the Hacklab also proceeded with an underlying excitement, enthusiasm and ethos of affirmation, with participants expressly keen to make visible the dynamic

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<sup>70</sup> This contributor is referring to fact that commercial wind turbines have a limited lifespan and the composite material from which turbine blades are constructed is extremely difficult to recycle.

potentiality of materials, whether those materials were 3D-printed plastics, an agar-based drum machine, or the artistic co-production of a slime mould (*Physarum polycephalum*). When one participant quotes an audiology professor as saying (of a new auditory aid technology) '*They are not the sorts of things you can throw together in a garden shed,*' the response, typical of the hacklab's culture of affirmation, is '*Stand back and watch us*' (Hacklab Discuss, July 2012).

It is important to note that values and meanings in the spaces differed in other respects also, with consequent implications for how people get enrolled in maker practices, or how barriers to that enrolment are reproduced. The Hacklab, for example, places fun, hanging out, and its status as a variant of members' club as central to its operating values:

*We're basically a members club with some toys, and everything we do we mostly just do for fun, or to raise a bit of money for more toys. (Hacklab Discuss, September 2013)*

*It's not always to any particular end. It's not like somebody's ambitious or anything like that. It's just the inability to not be busy, you see that in a lot of people. (Harry)*

In contrast, the Grassmarket encourages the formation of a quasi-workplace atmosphere to a much greater extent (more on this in the next chapter), while the Remakery takes a hybrid form, depending on the activities ongoing at that particular time, whether workshops, the furniture shop, or the repair surgery. The latter, while ostensibly similar, for example, differed quite significantly from the Hacklab's open nights:

*A lot of people can start to think of it as a club, as opposed to a repair surgery, where we're trying to help people who drop in and out...but when we're packed and you're trying to help so*

*many other people...and the thing is because they become like regular regulars, you can't really be like 'this isn't a club, we need this space'...it's a bit of a fine line. (Amber)*

This chapter has provided an alternative reading of the sustainability potential of community workshops, away from the sometimes technocratic and socially-abstracted analyses which have constituted the literature thus far. I instead focused on specific elements of practice in these niche spaces – materials, competence, and meanings – giving some insight into the different communities of which they are composed, and their potential implications for the recruitment to, and cultivation of, more sustainable ways of going on in the world. I will now draw some conclusions, before turning to the question of wellbeing.

## 5.8 Concluding Remarks

Maker spaces and other community workshops have become more geographically dispersed and enrolled participants at a rapid rate over the last decade or so. However, they remain a niche endeavour. As Smith and Stirling (2016: 14) note, citizens don't "need to become committed members of a grassroots initiative (or start their own), in order to experience these benefits to some extent...even the mere existence of opportunities for less intensive engagements with this kind of material deliberation can open up crucial forms of access to new kinds of capacity." This more diffuse potential was stated by participants too. For example, Edward spoke eloquently of 'cascading benefits' from this kind of know-how:

*I think it will always be a subset, but I think that's fine, because I think these things have cascading benefits, because again it's the thing that whenever I go back to my parents' house I fix the computers and the TV...I fix all those kind of things, and having space like the Hacklab or maker spaces means that the people who are interested in these things get somewhere where they can share this kind of knowledge and these kind of skills with each other. (Edward)*

Molly, board member of Skillshare Dundee, a Tayside workshop space, and participant at the Galgael Trust (which we already encountered in Section 5.6) made a similar observation:

*[This is] the social impact of making. Empowering people...and they go on to make changes in their lives because they've made one thing and it kind of escalates. So I think that's what's really awesome about Skillshare and I haven't seen that in as many places, that kind of sense that you take what you want from it, and develop.*

The idea of evolving skill and cascading benefits, is one means of reflecting on how difficult it is to measure the implications and outcomes of community workshops quantitatively. In the short term, for example, it is possible that embodying the skills of how to do certain activities may result in actually producing waste, rather than directly reducing it. For example, it is difficult to learn a skill without using certain resources to practice in the process. This was the case with fragments of webbing left over at the end of an upholstery class, for example, or the extremely cheap components used to practice soldering in the first instance.

The extent to which a particular set of competences needs to be distributed to hold implications for resource use and sustainability is thus a crucial question, and one which largely side-lined in a practice theory literature prioritising 'everyday' popular practices in a given culture, such as showering, cooking, driving and air conditioning. In synergy with the diverse economies and grassroots innovations literature, however, there is some awareness of how fringe or niche practices can influence, or eventually become embedded in the mainstream (or, perhaps more adequate to current environmental challenges, fundamentally put into question that very understanding of mainstream [Chatterton, 2016]). As Smith and Light (2017: 169) note:

The prototyping activities prevalent in makerspaces cultivate many intangibles whose movement beyond the

space can be significant for sustainable developments. These intangibles include skills, experience, knowledge, people, issues, or ideas generated through prototyping projects, relevant for advancing sustainable developments in local communities and businesses. With the example of upcycling practices, the intangible skills and ideas underpinning the practice are recognised and valued, and captured in programmes to train others in that practice. It is important to acknowledge the cultivation and diffusion of these intangible things and plan for the particular characteristics of their circulation as well as maintenance.

This chapter discussed similar findings from the case sites in order to begin exploring their potential for fomenting niche, alternative and pro-environmental practices. This took place, firstly, through an engagement with Gibson-Graham's diverse economies framework, and subsequently by exploring the specificity of maker practices in these spaces through Social Practice Theory's posited elements of materials, competences and meanings (Shove et al., 2012). Through this dual theoretical engagement, I have tried to break down a noted division between literatures of post-capitalism and the often apolitical literatures of social practice theory (Chatterton, 2016), demonstrating how they could instead play complementary roles.

The diverse economies perspective proved useful for breaking down some dualistic mythologies around the maker movement: on the one hand that they are spaces of critique existing outside capitalism, and on the other that they are hubs for proto-capitalist innovation. Instead, a more nuanced perspective was presented, which highlighted the pragmatic and sometimes contradictory relations of the three spaces, located within the broader social economy in Edinburgh. Such workshops often play a role as a shelter from the wider capitalist economy, providing space for alternative modes of exchange and social relations. Engagement with social practice theory then provided empirical detail to the diverse economy framework. It allowed an examination of the elements of practice assembled by the diverse economic spaces under question, and to begin

to think through what implications these could have for environmental sustainability, now and in the future.

Under *Materials*, it was demonstrated that the maker spaces are providing access to a community-run infrastructure which didn't previously exist, allowing access to a novel combination of tools, and providing a spatial solution for urban dwellers who often lack personal workshop space of their own. The section, *Competences*, presented findings regarding to the formation and stabilisation of communities of practice at the case sites, operating as dynamic and transpersonal stores of knowledge, embodied in the communities of makers in very different ways. Finally, under *Meanings*, discussion turned to some of the more interpretive issues brought up by the workshops under discussion: the diverse meanings attached to each one, how such meanings become materialised in the spaces themselves, and how they in turn contribute to the repositioning of meaning, particularly in relation to cultures of waste and repair. The latter didn't confine 'meaning' solely to the representational realm, but sees it as involving "perceptual engagement with objects in their current state and relations with each other... what objects mean and what they are for [arises] through engaging with them in use within the culture" (Dant, 2008: 28-29).

As crucibles of materials, meanings and competence, many of the sustainability implications of such spaces are likely to be unquantifiable, pertaining to the storage and performance of particular maker practices. Chapter 7 shall return to this theme, to reflect on the fact that many of these practices, while marginalised in western societies and which may otherwise die out, may also be revived, resurrected or fallen back on amidst turbulent futures (Maller and Strengers, 2015).

## 6 Therapeutic Taskscapes of the Workshop: Making Space for Recovery

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“When therapy is an event and not an outcome, change must be seen as process and transformation as an experience...Change takes place in relation and is, therefore, spatial...When we understand that the ‘self’ is geographically constituted, then we can accept that change and transformation cannot be engineered. They occur by chance. They are ‘lines of flight’.”

Boyd (2016: 96)

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### 6.1 Introduction

The previous chapter outlined the elements of practice which combine to allow these workshops to operate, flourish and influence broader social practices. Here, I shall examine how and to what extent that practitioners are themselves ‘made’ through practices of making. Drawing on ideas developed in the literature review of wellbeing in Chapter 2, I focus less on the individual psychological attributes of participants, instead examining some of the *spatialities* of recovery and wellbeing; that is, its stabilities and instabilities in workshop taskscapes (Dunkley, 2009). The focus will hinge on “a broader range of (human and nonhuman) material, biological, spatial, social and affective constituents of recovery, and the way these constituents cohere in the formation of a distinctive assemblage of health, a line of becoming well”, as Duff (2016: 63) puts it. Through this focus, I hope to also contribute to the existing literature gap in human geography on wellbeing and spaces of craft.



I will predominantly focus on how *atmospheres of care* are co-constructed and maintained, creating a liminal space of recovery and transition, predominantly drawing from the Grassmarket and the Hacklab. I turn to the Grassmarket initially, as this workshop placed the most emphasis on affecting lives through craft; on developing skills, increasing confidence, and purportedly contributing to wellbeing through training in carpentry and furniture construction. As such, it proved a rich site for exploring the demands of facilitating and sustaining life transitions. Towards the end of the chapter, I will more closely examine the material practices of crafting and how skilled engagement can itself reinforce therapeutic ends, drawing on the concept of flow.

## 6.2 Atmospheres of Recovery

Initial discussions with members and staff had revealed a widespread belief evident within the broader Grassmarket Community Project that its subsidiary furniture workshop was highly effective in helping people from diverse backgrounds – often characterised by social vulnerability and socio-economic disadvantage – to obtain increased social functioning<sup>71</sup> and what we could term ‘wellbeing’. This was backed up anecdotally, normally by means of stories recounting success in getting people into suitable training programmes, or into some form of employment. Indeed, the GCP itself provided employment to a number of former workshop volunteers, who, for example, had previously been unable to obtain reliable work.

Less clear from such discussions was the means by which this success occurred, and whether it had anything to do with the project’s specific focus on joinery and furniture construction. On a number of occasions, noted in field diaries, the workshop’s founder, Tommy, appeared to play down the role of woodwork *per se*, seeing it as subsidiary, a means to an end, enabling prolonged engagement

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<sup>71</sup> I will discuss some of the potentially disciplinary and Foucauldian aspects of this term below.

amongst participants, than a key player in recovery itself. To an extent, this characterisation seems fair: there was much going on outwith the project's woodwork activities which contributed to the social life of the workshop, which I will explore in this section.

Over many weeks of ethnographic observation, it became clear that much of the efficacy of the project involved the skilful everyday management of social dynamics (Brown and Pickerill, 2009), underpinned by the collectivity and social co-operation which characterises craft work. Coeckelbergh (2013: 808) has written that "skilled manual work is not only a way to avoid alienation from the world; it also helps us to avoid alienation from others", while Warren (2016: 37), in turn, writes that "performing manual craft-based work evokes close, personal interaction". I will contend in this section that much of the specific benefit gained by participants from time spent in the workshop was actively facilitated in and through collective woodwork practices.

Foremost for Tommy, this entailed managing the space and creating the right 'atmosphere' in the workshop. Atmosphere, of course, is a contested concept which has become increasingly prominent in human geography over recent years (Anderson, 2013; Ash, 2010, 2013; Duff, 2016; McCormack, 2003; Thibaud, 2015), and while this literature is often linguistically dense, a turn towards the examination of pre-personal and affective atmospheres has, at its simplest, "been a way to think about the diffuse, collective nature of affective life" (Anderson and Ash, 2015: 34). As Anderson and Ash (Ibid.) note:

Particularly intense atmospheres, such as mass panic or fear, may be easy to identify, but it seems harder to analyse and differentiate between more everyday, banal, or quotidian atmospheres, that may in fact be more important to the ongoing maintenance of social life or the performance of power and politics.

Duff (2016: 62) sees work on affective atmospheres as providing "a unique conceptual and empirical lens for delineating more of the embodied, social and

political conditions of recovery.” To this end, Andrews (2016: 4) has also highlighted the importance of such work for “illuminat[ing] the energizing passions associated with health and care that are trans-humanly created, transported and experienced,” speaking of the crucial role played by “rhythms, momentums, infectious atmospheres...and encounters” (Ibid: 13).

Tommy showed an acute awareness of this more evanescent aspect of daily life in the workshop, acknowledging the need to create an interpersonal atmosphere conducive to recovery and care, which he described as a “*comfort blanket*,” a place largely characterised by safety, openness and lack of judgement. This constitutes an attempt to “try to shape experiences and moods of selves and others through organizing objects, bodies and spaces” (Bille et al., 2015: 33).

To clarify such an elusive concept, this atmosphere was placed in contrast with what he refers to as the “normal workshop,” one dominated by the performance of a stereotypical masculinity, and which he had gained experience of during his former career as a joiner:

*What’s key for me is to create an atmosphere that’s like a normal working environment, like a normal workshop. I probably create a better atmosphere than a normal workshop. You know, you go into a normal workshop, there’ll be guys falling out, there’ll be swearing and banter...well a lot of crudeness, sexism, a lot of rough stuff going on in a normal workshop, ‘cause I’ve experienced it. In here, I’m trying to create a normal workshop atmosphere but a nicer atmosphere, I don’t want the bullying that you’ll get elsewhere, or the bad language or all the rest of it, so it is a wee bit different, and I’m doing that to try and create a comfort blanket...That’s sort of the balance I’m trying to get there, I want to make it as much like a normal workshop as I can*

*get, but I need behaviour to be really good, people to need to feel safe. (Tommy)*

The exclusionary and “blokey” tendencies of many ‘normal’ workshops have been noted in Warren’s (2016) exploration of ‘hegemonic masculinity’ in the workshops of the surfboard industry, in which “underpinning talk of women, sex and blokey surfing cultures was the intensely heteronormative construction of space”. The Grassmarket appeared to entirely avoid the worst excesses of this. Instead, two long-term participants also framed the role of the project in similar terms to Tommy, as a “mode of conviviality and social resonance” (Bille et al., 2015: 37), evidently aware of the important role played by atmospheric and trans-personal factors:

*I think this project is about giving people an environment where they can regain their confidence...It's more than just a physical space. You could reproduce this workshop, you could put the same number of people in it, but if you haven't got an understanding of what makes the heart of it beat then it's not going to end up being the same thing. It's going to be effort, you know, it's not going to be as smooth. (Brian)*

*I've taken stuff home and you do it in the house, but it's not the same atmosphere. I think it's the atmosphere you get here, the fact that everybody's so friendly, and if you get stuck with something somebody's always there to give you a hand. Nobody ever turns around and goes 'no I can't do that'. That's what's good about the place. (Elaine)*

The creation of a space with the requisite atmosphere, coupled with a distance from routines and behaviours which are detrimental to participants’ life satisfaction, is an irreducible, emergent process, as Brian’s quote on “*what makes the heart of it beat*” above makes clear. He went on to further state that positive

change must emerge, at least in part, through the web of relations and life circumstances which we happen to find ourselves in:

*It's not about eradicating sadness. You can't make somebody happy, or give them a glass of happiness. It's a consequence of something happening to them. (Brian)*

While irreducibly trans-personal, it's possible to suggest several factors which contribute to the unique therapeutic atmosphere said to exist in the workshop. One contributing factor to this 'happening', for example, was freedom from external funding. This was repeatedly referred to in formal and informal discussions with participants, and was a financial state which Tommy and the rest of the team worked hard to sustain through the meeting of monthly financial targets. Being a self-funding social enterprise, the Grassmarket manages to avoid what are often seen as some of the pitfalls of care-oriented social enterprises dependent on stipulations and demands set by external funders:

*I worked in an employability project before here, and very, very few people moved on successfully. Every month I'll be reporting to funders, 'Yep, five moved on and three in education'...but it's just one bureaucratic paper exercise, because these people I'm recording move on and I've got to give the funders some sort of figures, but what you're not recording is they're lasting one or two days and they're still working with you...whereas, in here, the figure's much higher.*

Tommy identified a general tension in the support given to vulnerable people, contrasting donor emphases (which can focus on quantitative outcomes, such as number of participants placed in work within a certain time period), with the more long-term, involved level of care with which Grassmarket Furniture operates. In not having to meet the specific stipulations of external funding bodies, Tommy obtains some degree of shelter for volunteers, and consequently much more room

for flexibility in the cultivation of atmosphere and interpersonal relationships, along with a greater understanding of, and appreciation for, the diversity of recovery experiences (Duff, 2016):

*It takes time, again probably because we're not funded and I'm not answerable to funders, and I'm not trying to churn people out, 'cause when you're churning them out...[Trails off]*

*We're much more successful in here than I was when I ran an employability project, and I won awards for running an employability project. But you won awards for outcomes, but realistically there were no outcomes. It was a successful project, but the hard outcomes at the end...but in here, you're working with guys every day, building a relationship.*

The desire for an expansive support space which doesn't try to "churn people out" has been remarked on elsewhere. As Hall and Wilton (2016: 8) note, the act of relational caring can be stymied by financial imperatives, destroying any possibility for the adequate time and security which allows "an unrushed moment of meaningful encounter". They continue that care in "relational settings open up the possibility of other forms of encounter and subjective becoming across and between dis/abled, gendered and racialized bodies constituted through the provision and receipt of care" (Ibid: 8).

Aside from freedom from funding pressures, as Anderson and Ash (2015: 42) state, "all objects have the potential to equally impact or weigh upon an atmosphere" and, indeed, the tentative creation of safe atmosphere spoken about by Tommy, required the everyday enrolment of a variety of objects, bodies and daily practices. Milligan and Wiles (2010: 737) have stated that, "Care entails a complex network of actors and actions involving multidirectional flows and connections. It is 'necessarily relational' in that it involves ongoing responsibility and commitment

to an object (or subject) of care.” Take, for example, the following early field note extract:

*The environment of the workshop itself is a bright and airy space, complete with high ceilings and white-washed walls, and kept tidy by the continual maintenance of volunteers. Tools such as hand saws, chisels, and mallets are laid out on display in an appealing manner on one wall, each having its own particular place (Figure 47), while another is filled with south-facing windows allowing in daylight and an ever-present background of noise (traffic and a flow of tourists, mainly) from the busy street below.*

*The radio is, without fail, switched on first thing in the morning, to form a further backdrop of upbeat pop music and headline news, with the latter, Tommy notes, providing one relatively innocuous focus for conversation. Tommy strikes up a conversation about what people were up to over the weekend, and asks about whether the volunteers will be attending the new choir group which the charity is organising, joking about one of the guys singing a solo. Humour and jokes provide a crucial social focus. When the chat is over, dust and the sound of activity gradually reverberate throughout the space, as people pick up where they had finished the day before. There is the rhythmic sound of hand tools, interspersed by the loud, almost deafening roar of church pews being put through the planer.*



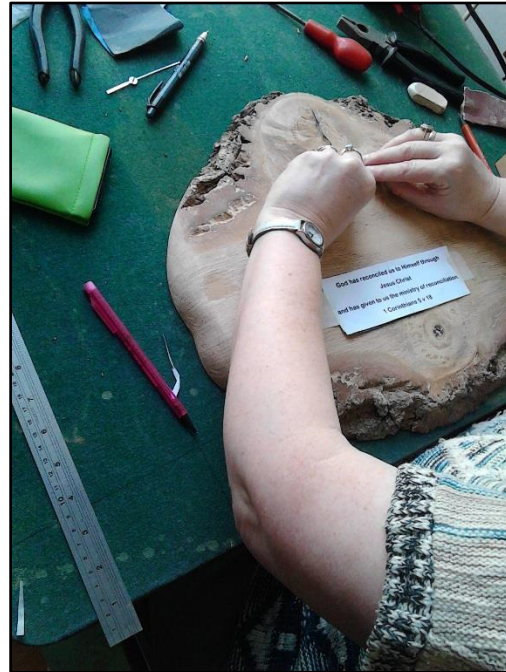
*Figure 47: Tool Layout at Grassmarket*

Atmosphere, in Anderson and Ash's characterisation, can be all these things, but is also none of these things taken individually. The noise of the active workshop, with its rhythms of sanding, sawing, or chiselling, add to the swell of feeling of taking part in, or belonging to, something productive and larger than the individual. As McCormack (2013: 112) notes, "therapeutic intervention...[takes] place within distributed, relational, rhythmic spacetimes." This is, then, reminiscent of Guattari's reflections on his practical therapeutic work in La Borde, for instance in his description of the institution's kitchen as "a little opera scene: in it people talk, dance and play with all kinds of instruments, with water and fire, dough and dustbins, relations of prestige and domination" (quoted in McCormack, 2013: 113)

Aside from the material rhythm of saws and other hand tools, this hints at a social rhythm forming the backdrop for workshop activities, as the various volunteers take up familiar roles, day after day. While flexible, according to the work that is on at a particular time, people have particular roles which they appear



comfortable carrying out, often in the same part of the workshop, day after day, contributing to the development of familiarity and resultant comfort.

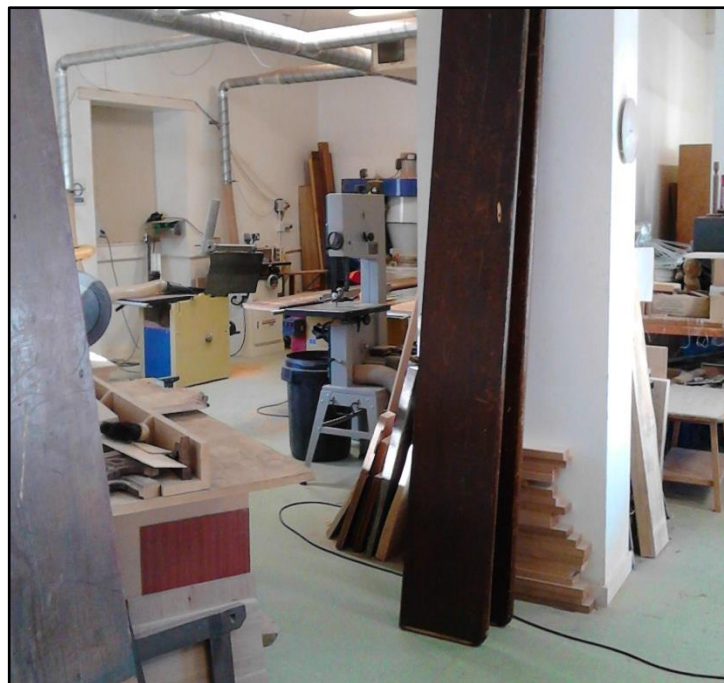


**Figure 48: Elaine Working on a Clock**



**Figure 49: Clock with Pyrography**

Elaine, for example, takes up her usual position working at a desk at the first window as you enter the workshop, burning text onto a wooden clock or trophy, her back turned to the action of the workshop (Figure 48). Brian habitually sits at the next window along, also burning. This is *his space*. Tony and Daniel gravitate towards the back room where the large, loud and mess-making machinery of planers and table saws are located (Figure 50). In one of the few hints towards stereotypical masculinity, they seem to prefer ‘big’ jobs when they are available, such as the physical work of dragging heavy pews through the planer, or clearing recently obtained wood of nails and other metal debris. Tim, on the other hand, seems to relish jobs needing an eye for detail and specialist tools – setting up and using the router, for example. The rest of us focus on finishing whatever job is the priority for that week, taking up various positions in and around the chunky wooden workbenches in the centre of the workshop, floating from place to place for advice or conversation.



*Figure 50: Machinery Room at Grassmarket*

As a performative achievement, atmospheres can be robust or ephemeral, secure or shifting, depending on the needs and characteristics of a particular participant. As such, the successful management of this particular atmosphere conducive to recovery and flourishing can be vulnerable to being interrupted at any moment. While the workshop formed a protective and closed space, hidden away on the first floor – a factor which appeared to contribute to its feeling of safety and familiarity – such apparent closedness was often interrupted by a stream of visitors. This included, for example, tourists who would read a sign at the back entrance of the workshop (as seen in Figure 14), and regularly be drawn in by noise and curiosity while visiting the adjacent Greyfriar’s kirkyard, one of the city’s top tourist sites (famous for its graves adorned with names appropriated for various characters in the Harry Potter series of books). Other disruptions took place during regular guided tours of the project, for prospective members to see the social enterprise in action.

For some participants, this stream of visitors was of no concern, or even a welcome distraction from the work at hand, not to mention a source of pride, giving implicit value to the work they were doing. The fact that, for example, a group of Danish MPs (one set of visitors), or Scottish government ministers (another group), or a team filming for the BBC were interested in the workshop’s activities was a source of novelty and reassurance. However, for other participants, such invasions of space were seen as something of a threat, and had to be carefully managed, so as not to impinge on their welfare. Tommy recounted the experience of one “*particularly vulnerable*” participant, Jane, who, prior to her engagement at the Grassmarket Community Project, had led a reclusive life for a number of years, after a family tragedy. She had refused to leave what she perceived as the safe space of her home:

*I was kind of one of the first people she engaged with and I got her coming to woodwork. It was really difficult to get her to come cos she’d been in her house for the last four years.*

Tommy recounted that on her first day, despite reassuring her that the workshop was a safe place and that he would look after her, she disappeared:

*She ran away, for an hour she was gone, and I was really worried, and she reappeared and I said 'what happened?' and she kinda blamed me. She said 'you said it was a safe place, but then a couple came in the back door'. You know, tourists wander in and I go and chat to them, she said 'these people came in and I didn't know who they were'. So she'd got used to the environment and the guys, and then suddenly strangers walked in and she'd done a runner.*

The stability of atmosphere, while crucial to creating the space for building new emotional resources and habits, could easily be interrupted, often in quite literal terms, as was the case with intrusions from visitors in the case of Jane. This interruption or 'discordance' (Bille et al., 2015) could also happen in more affective terms, however, making abundantly clear the role of a reflexive researcher, and how much of the rich texture of life is omitted from the static quantitative measurement of wellbeing. Emotions are sociable, changeable from moment to moment, and we are touched by that which is near to us. As Ahmed (2008: 10) puts it, "We feel with and for others."

This affective shift in atmosphere could occur, for example, when the energy of the workshop ebbed from an energetic one, filled with laughter, to a more tense one, when that laughter tips over into interpersonal tension, with one participant bearing the brunt of a joke too many from Brian, making it clear that he feels picked on. Or there is the unexpected end of Tony's relationship with his partner – who, as we shall see in a quote below, he credited as being a key element in his recovery from addiction – which comprised a dramatic and major event in his life, making equally clear the close relationality, or contagiousness, of affect in a closely-shared space such as the workshop. Tony, in this case, reacted extremely badly, his silence the following morning producing a palpable anxiety which hung

in the air and, when probed as to what had happened, he claimed, in what we suspected and hoped was a somewhat dramatized manner, to be considering the ending of his life. Subdued, the workshop collectively acted as a key support for Tony, and outlet of grief at this time, with most of us keenly aware of the potential ramifications such instability in his life could have for his drug recovery, and his health more broadly.

Jane's experience of physical intrusion was also echoed by Tony, who noted that "*when loads of people start coming in for events I start getting panicky cos there's loads of people that I don't know.*" Such behaviours have been of interest to emotional geographers, with Davidson (2000: 33) noting, for example, that "the boundaries of the agoraphobic self afford inadequate protection from the outside world." The safe operating space of the sufferer becomes smaller and smaller, often reduced to just the home environment. Despite Jane's initial setback, however, and in spite of an initial refusal to eat lunch with the other volunteers, in the weeks that followed the initial incident she had changed her behaviour completely, being drawn into the community, and attending other workshops throughout the charity. She shifted, in fact, from seeing her home as the only safe space available to her, to feeling isolated and alone when there:

*She's coming to other stuff and what's happened is she used to be scared to go out 'cause the house was her kind of comfort zone...She's lonely now in the house, which is a huge turnaround in a couple of months or so. (Tommy)*

For other participants, indeed, it was the home environment itself which was the opposite of safe and stable, with many coming from challenging socio-economic backgrounds, not only demonstrating the respective importance of creating a certain safe atmosphere or spatial context, but also one which is distinctly removed from the trials and tribulations of 'everyday life'. Pitt (2014: 88) asserts the important dynamic by which "*physical* distance from home or work reinforces *mental* distance from stresses to offer therapeutic place experiences." While no

absolute rule exists in this respect, and any therapeutic experience is a relational achievement (Conradson, 2005), such physical distance was held to be important for a number of participants. “*I try and keep my problems at the front door,*” noted one participant, Tony. This conclusion was re-emphasised by Elaine:

*I think the people coming here...are getting away from...if you've got any problems, getting away from that. As I say...this is kinda like my time... when I come here I can forget all that, and if the phone goes I can say 'look, I'm at woodwork at the minute, can you phone me back?' and then that gives me the whole day to do whatever I want to do without having to sort their problems out. So that helps me, once I'm here. [Elaine]*

On a number of occasions, participants spoke to me about how the act of entering the Grassmarket building itself helps to imbue people with a sense of self-worth. A building which, before redevelopment, was cramped and dark, in an inner-city area long-associated with drug addiction and poverty, is now a bright, airy building (Figure 51) which makes the most of its location in the centre of Edinburgh's historic old town which hosts many external conferences and, as a base for tour groups, is frequented by sometimes hundreds of tourists a day. While for some former participants, this might provoke discomfort and renewed exclusion, as Parr (2006: 161) notes, this “inclusion in large-scale and visible cultural developments” can allow a “way of sensing belonging in wider cultural geographies.” I would argue that a similar factor is at work at both the Hacklab and the Remakery, with a sense of being involved in cultural developments bigger than the individual, whether aligned with the ‘maker movement’ or sustainability campaigns.



*Figure 51: Grassmarket Entrance*

This section has examined the staging of atmospheres, an increased focus in human geographical studies (Bille et al., 2015), albeit one rarely linked to notions of wellbeing. I will now expand this theme by examining what Atkinson and Robson (2012) refer to as *communitas*, and the social dynamics which contribute to, or remove from, creating a site conducive to recovery.

### 6.3 Building *Communitas*

This fragility and struggle for the maintenance of wellbeing is barely, if at all, appreciated in the ‘science of happiness’ perspective. Slife and Richardson (2008: 715) have noted positive psychology’s “commitment to a kind of contextless view of human action and values” an indication of its “tacit acceptance of an abstractionist ontology”. Through this ontology “disinterested observers are detached from their specific surroundings, history, and biases, while emotional satisfaction is a subjective ‘feeling’ or ‘affect’ that is the measure of good and bad contexts without being constituted by them.” In order to reverse such tendencies, and to demonstrate a role for “an ontology of the interstitial” (Duff, 2016: 62), that is, how recovery and wellbeing is an emplaced, collective achievement, the

discussion presented up to now has focused on the staging of atmospheres in the workshop environment, atmospheres very clearly “constituted” by an array of factors, including the dynamism of very human and personal emotions and affects.

The workshop is an intensive site for such factors because, as already noted in Chapter 2, craft inherently tends towards the social. Amin and Roberts (2008: 358-359) make this very clear, noting that:

In craft/task-based activities the social dynamic sustaining knowledge is characterised by work colleagues sharing a community-specific language (including physical cues), relating stories, building strong ties of reciprocity, trust, and dependence, drawing on facial, tactile, and emotional contact; all of which lead to a high degree of mutuality born out of shared work... Knowledge of how to become a midwife, tailor, or flute maker is acquired through a period of apprenticeship involving the practice of engagement in a relatively close-knit community which, in the course of time, produces forms of affiliation that knit together objects, people, and ways of doing things.

It is due to this inherent sociality that David Gauntlett (2011: 2) titled his work *Making is Connecting*, stating that “making is connecting because through making things and sharing them in the world, we increase our engagement and connection with our social and physical environments.” In shared workshop spaces, such as the Grassmarket, the Remakery and the Hacklab, everyone’s work can be, and generally is, placed under scrutiny at all times and, conversely, advice and help is always on hand should something go wrong.

The intentional creation of an inclusive atmosphere includes the building of what Atkinson and Robson (2012; drawing on work by anthropologist Victor Turner) refer to as *communitas* – group identity founded in relative equality – and *liminality* – that is, separation from everyday routines – during creative activities. In relation to the *communitas* of the workshop, as one participant put it “*When they come in here and they're actually communicating with a load of different folk that they wouldn't normally, then they actually get a sense that it's a bit more of*



*a community. Rather than just being singled out...you get to talk to as I say folk that you normally wouldn't meet if you were to go anywhere else."* Brian emphasised that *"It's a community. It's built on the idea of a community. It's the Grassmarket Community Project. The idea that people should have a space that they feel comfortable in and they work toward a common goal"*.

Liminality occurred through the very clear spatial separation of the workshop, upstairs and away from the rest of the Grassmarket Community Project's activities, producing a "socio-spacial [arena] governed by a set of discourses and practices quite unlike those that order everyday spaces and agency" (Kesby, 2007: 2823). For example, acting as a form of 'entry ritual' for a newcomer to this liminal space (Atkinson and Robson, 2012), initial introduction to the group took place during the Friday work session only, and always with the making of a relatively simple ornament. The setting of this task, as we will also see in Section 6.4, plays a number of important social and material roles: it establishes basic skills, affords the volunteer the opportunity to design their own simple project and bring it from start to finish, while also allowing Tommy to assess levels of aptitude and pre-existing competence. All the while, volunteers to gain familiarity with each other, gradually and in their own time.

Further reinforcement of this *communitas* takes place through regular team meetings held separately to the monthly general members meetings of the Grassmarket Project, in which volunteers sat in a circle, discussing the running of the workshop, allowing for updates to be given, and any issues which had arisen in the interim to be discussed and addressed. Tommy would take this opportunity to remind volunteers of the project's targets for that month, or reinforce workshop norms, for example by emphasising the importance of wearing the workshop aprons – adorned with the workshop logo – not just for protection but for the creation of a shared identity and pride in the work volunteers were participating in (for more on the under-appreciated role of clothing in social life, and care work in particular, see Buse and Twigg, 2015; Twigg and Buse, 2013).

Lunch is provided by the charity every day, and volunteers also maintained the workshop's quasi-liminality, distinguishing themselves in the wider Grassmarket project by always eating lunch together, at a table separate from the rest of the members of the Grassmarket Community Project (though still engaging in a friendly way with other members of the charity). Volunteers would also stand together and sign in, in the morning, signifying the start of proceedings and their commitment to the workshop that day. As Parr (2006: 151) has put it, such border rituals and enactments add up to creating "the possibility of situated belonging", referring to the creation of "social insiderness". Duff (2016) too comments on the importance of bordering practices for the creation of 'atmospheres of sociality' while Ahmed (2008: 12-13) notes that the state of being an insider is often fundamental to happiness itself: "Happiness involves sharing a direction towards some things as being good. Bodies that are directed in the wrong way become causes of unhappiness." One participant, Tony, described the resultant belonging amongst participants as "*like family*".

Elaine's use of the phrase, "so that helps me, *once I'm here*", in Section 6.2, notes the significance of physical distance from a tumultuous home life, but could also potentially indicate that the therapeutic effect is a temporary achievement, obtained only when engaged in activities at the Grassmarket, with participants returning to their usual routines and counterproductive 'assemblages' of activities once the working day is over. Described as "isolated islands of empowerment" by Kesby (2007: 2825), this concern is also raised by Atkinson and Robson (2012: 1354), who note that "if the boundaries had been too tightly protected, the role of the liminal time-space would have become merely one of sanctuary with limited potential for gains to be transferred and integrated back into the everyday emotional and social worlds of the participants."

This potential duality of experience didn't, however, appear to materialise in actuality in the workshop, with the boundaries between 'work' life and 'home' life being highly porous. For example, while the workshop is intended as a space away

from habitual routines, it also acts as a space to reflect, at a distance, on what is going on elsewhere. Brian, for example, discusses another participant who had come to the project through a drugs treatment order, noting that *“he at least sees that he’s capable of being happy without relying on drugs. So the chances of him slipping back into the old behaviours are less, because he’s got options.”*

Such reflection sometimes occurred through conversation with other participants; for example, when the workshop adopted the feel of something akin to a support circle. With the topic of life challenges more easily broached than in everyday settings, discussion of often very personal life challenges, from experiences of childhood bullying to ongoing battles with addiction, is more easily broached in the workshop, without judgement, than in everyday settings. As Federica noted of her time at the Grassmarket, *“people working there all had the same amazing personality of being nonjudgemental and supportive”*. Equally as often, however, this reflection and support was provided through Tommy, who always made sure to remain aware of what was happening outside the walls of the workshop, whether through contact with support workers, families or direct discussions with volunteers. The latter resulted in the regular sight of private discussions ongoing with Tommy in his office, the only private space in an open-plan workshop. Dave, who had been jobless for more than two decades when he became involved at the workshop, explained the nature of this intervention and the positive repercussions it had:

*A lot of it's to do with the people, [but] a lot of it's to do with Tommy, because Tommy was explaining certain things to me. That you've got a goal, don't have a big high goal, just keep your wee goal, and once you get to that you can stick your goal up...Just taking wee steps at a time...that's how I ended up buying the house, getting the job, bang, that was a big thing.*

The organisation thus appears to fit well with a key feature of recent scholarly explorations of the links between creative practices and wellbeing, a literature

which Atkinson and Scott (2015: 78) summarise as highlighting how, firstly, such practices “can somehow take the participant into a space beyond the habituated routines of being and acting thereby affording openness to other possibilities,” and secondly, “can afford a space and practice in which any destabilisation of well-being is safe, being predominantly under the control of the participants themselves.”

To explore this social stabilisation and destabilisation of wellbeing, I’d like to more closely examine the case of regular workshop volunteer, Tony, in his mid-thirties, who had been a member of the workshop team for nine months when the current study began. From our first meeting, working alongside each other on the table being constructed in Figure 14, Tony spoke frankly about the long-standing challenges he had faced, and continues to face, in a life blighted by drugs, poverty and criminality. In the year prior to the fieldwork which this chapter draws on, one of Tony’s lungs had collapsed seven times in one week, a consequence of “buzzing” cans of butane gas for a high. While evidently clean at the time I met him, Tony recounted that prior to his involvement at the workshop he had been in the habit of buzzing up to 90 tins of gas per week, eventually resulting in the removal of half of one lung. Tony is also on methadone to manage withdrawal effects from heroine addiction, suffers from Chronic Obstructive Pulmonary Disease (COPD), in part as a result of smoking, and has a permanent catheter due to other ongoing drug-related health issues.

For Tommy, the genesis of Tony’s problems was largely situational. He had “*been born in the wrong place at the wrong time into the wrong family...brought up in a village where it’s been rife with drugs*”. “*That’s become his world*”, he continued, “*that’s not really his fault, you adapt to the environment you’re in, you know...it’s just Tony’s grown up in an environment he’s had to adapt to, which involves taking drugs and running with a gang, but if he was born in a different environment he’d be doing alright for himself.*” While much of the literature cited above assumes

that engagement in creative practices is automatically positive, Tony in fact described his first encounters with the workshop quite negatively:

*It was awful, I was geeting (crying) and everything, crying, cos I was nervous. I'm a paranoid person as it is anyway, do you know what I mean? ...The first week was the hardest, to make friends with everybody who works on the project, and the woodwork specifically.*

He endured the initial discomfort, however, and maintains that involvement in the Grassmarket Project more generally, and the wood workshop in particular, had saved his life: “*This place is my saviour like, if it wasn't for this place, I don't know, I might be back on the drugs. If I didn't have my partner and I didn't have this place I'd probably be dead. It's no lie, I'd probably be dead.*” In their work on arts-based wellbeing interventions, Atkinson and Robson (2012: 1349) use capabilities-based language to note that the task of the arts-and-health practitioner is “the creation of transitional spaces within which openness is enabled to explore new possibilities for identity and action, spaces in which new resources can be built and mobilised for personal wellbeing.” Tony speaks highly of the increase in possibilities (or, as above, capability) which involvement in the workshop has given him: allowing him to become a role model for his children for the first time in his life; planning to learn how to drive, something which he believed he would never be capable of; attending a trip to visit London – a place he said he would otherwise never have had the opportunity to explore – organised by the Grassmarket Community Project:

*After the first week my confidence got more and more and like now, my confidence is really really good. Especially in here, because I ken [know] everybody in here.*

In spite of his expansion of capability, and the evident wellbeing which coincides with that, Tony's increased functioning is highly dependent on the persistence of

a social and material framework of support. It was clearly a fragile achievement, never assured from one day to the next, and highly dependent on a body whose health status fluctuated enormously. Our time working together was thus split between relative functioning, with the focus and demands of woodwork clearly providing a relaxing means of taking his mind off other problems, and bursts of agony, often resulting from the newly-installed catheter tube, leading to a bag strapped to his right leg:

*I try and keep my problems at the front door. But sometimes it's quite hard cos I suffer from depression and that. So it is, plus with my illnesses, it is quite difficult but I'm getting there, slowly but surely.*

Every day at the Grassmarket, for example, contained intense periods of work punctuated by periods of chat, which varied from small talk, to a particular focus on one problem with regard to a woodwork project, whether it be a malfunctioning tool, the best way to understand a given technique, or how to correct a mistake made, for example (See also Garner, 2015). The advantage of having a task to focus on as you work alongside someone became clear, meaning that no-one is obligated to engage in conversation and no-one is judged for not partaking, so long as they are busy with their respective task<sup>72</sup>. For Atkinson and Robson (2012: 1353) this *communitas* makes creative sessions “a safe space for sharing and receiving compliments from...peers which translate[s] into a growing confidence in their ability to produce work worth the attention of others.” They continue:

An arts-and-health approach values the material world, relations with the material world and the satisfactions, through aesthetic appreciation and the recognition of

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<sup>72</sup> This appears to map well onto the Men's Shed movement, which promotes shared practical activities based on the motto that “men don't talk face to face; they talk shoulder to shoulder”.

others, that derive from using and creating good-quality artefacts. (2012: 1353)

Much of the literature on spaces of care and the contemporary deinstitutionalised landscapes of care tends to bifurcate quite strongly between those who view community-based care as Foucauldian extension of state surveillance and control, and those who view such spaces as broadly unproblematic. The Grassmarket project surely falls somewhere in between these extremes. It is certainly a place where a wide range of less 'normal' behaviours were seen as acceptable, while simultaneously justifying activities through a language of 'employability' and social integration. As Parr (2000: 231) puts it, "what makes semi-institutional places such as the drop-in havens of social inclusion for those who behave differently is partially bound up with the consensual social actions of people who access, and who work in, the centre....the ways in which members and staff collaborate to produce a place in which certain kinds of 'unusual norms' and 'unusual normal performances' are understood as still operating *within* the boundaries of acceptability."

Conradson (2003) too questions how appropriate it is to analyse health care settings using only a spatial discipline focus. He has argued that an analysis of power relations and resistance in the context of a drop-in centre, for example, "leaves little room for the relational care and support that, while not wholly altruistic, is nonetheless significant for many users of these centers" (Ibid: 510). He finds such an approach 'pessimistic' and outlines the ways in which the drop-in centre can indeed function as a genuine 'space of care'. Dunkley (2009: 95), in turn, quotes Foucault as contending that "in itself the exercise of power is not violence". She argues that it can instead "lay out a time-space architecture in which acts of care can be attempted...[laying] the groundwork for the creation of a community of care" (see also Kesby, 2007).

Indeed, while Tommy, for example, might appear in a position of 'power' in the Grassmarket, Atkinson and Robson (2012: 1352) note the importance of mentors

or guides in the liminal phase, who protect the space from, say, collapsing into chaos or becoming indistinguishable from the dynamics of everyday life. While a certain behavioural licence was accepted at the Grassmarket, there were certain exclusionary lines evident which couldn't be crossed, for the sake of maintaining a cohesive and supportive atmosphere (see also Bille et al., 2015). While such an occurrence was unusual, Tommy did recount one former participant, Frank, who had to be asked to leave the project due to repeated aggressive and threatening behaviour:

*He'd frighten people...he was always angry, but not towards anyone if that makes sense. And it's an environment, you know. We asked him to take time out, we didn't ban him or anything... We have a good atmosphere in here and everybody respects each other and they know the behaviour required, then suddenly you had Frank in here F-ing and blinding.*

When asked about Frank's behaviour, Brian (who, after two years of involvement, would himself part ways with the group when he repeatedly failed to adhere to its conventions; turning up late or not turning up at all, for example) carefully situated this particular individual's behaviour in the context of a variety of personal and health challenges he had faced prior to his involvement at the project, noting that there are "*limits to what the project can do.*" With overwhelmingly positive findings reported from across the qualitative and quantitative literature on wellbeing and craft, it's important to be aware of such limitations of craft occupations, making as a therapeutic intervention, and the exclusion of individuals from social activities. There is no panacea in complex journeys towards wellness, with both Mee et al. (2004) and Harris (2008) highlighting the potential for a particular craft activity to simply not provide the outcome which was intended, whether due to frustration, disinterest or other personal factors.

The chapter has, up to now, lent support to a developing, but still minor, vision of health and wellbeing as concepts unfolding firmly "through a complex set of



transactions between a person and their broader socio-environmental setting” (Conradson, 2005: 338). As Hall (2007: 132) states, “*spaces of wellbeing* suggests social contexts, networks and resources that allow for, encourage, develop and nurture, at the very least, bodily and mental stability, and at the very best, happiness and peace.” In doing so, it has discussed assemblages of care and wellbeing with respect to a craft space which puts care and stability at the centre of its ethos. It would be fair, however, to note that this case may have limited relevance in the vast diversity of maker spaces and workshops proliferating around the globe. In the following pages, however, I would like to temper such a limitation, by briefly analysing some of the social processes and geographies of the Hacklab (and, peripherally, Remade in Edinburgh), which demonstrates important commonalities with the Grassmarket workshop. Such commonalities arise, furthermore, in spite of the fact that care and wellbeing are nowhere articulated as a core aim of such spaces.

Stewart has been a regular participant at the Hacklab for about a year. For decades, he suffered from undiagnosed Asperger syndrome, compounded by an inability to “*cope with the work environment*,” which resulted in prolonged periods of poverty and joblessness. His condition also impeded his ability to engage in mainstream education, in part due to acute social anxiety experienced in large group settings. These factors were to come to a head in the 1990s, when he was taken into an intensive psychiatric unit and medicated for schizophrenia. When we first meet, however, Stewart appears to be well-adjusted and well-integrated into what is a very dynamic and busy social workshop space. He is the first person to introduce himself, taking it upon himself, for example, to meet and greet newcomers on busy open nights, helping them to find the equipment which they might need for the particular project on which they hope to work. This transition, from institutionalisation to social integration and broad functioning, took place in part through involvement in two of my field sites – the Remakery and the Hacklab – and is worth exploring before drawing the chapter to a conclusion.

Stewart initially became involved at the Hacklab when, having agreed to build a lightbox for an artist friend, he realised he needed access to a laser cutter, and found the Hacklab to be one of the few places in the city where he could get this access. To fully understand his involvement at the Hacklab, however, one needs to first understand his prior experience as a volunteer with one of the other field organisations, Remade in Edinburgh:

*I volunteered for them doing the upcycling, recycling and the rest of it. I was doing the meet and greet there as part of the rest of it, I did laptop repairs for the one and a half years I was there. That was my intro into community working, volunteering, working with people in public spaces: large public spaces are great for me, small spaces are terrible. I got over a bit of the social anxiety in that setting, because I was learning a set of skills, I could deploy those skills, and that's quite good.*

In spite of the initial confidence in certain spatial contexts gained at Remade, Stewart recounted his initial anxiety at entering the Hacklab, describing its overwhelming social environment thus:

*I was very frightened getting in contact with them and the rest of it. First time coming in, very anxious, it was very busy, people seem well-directed. People seemed to be knowing what they were doing.*

To manage this anxiety, and expand his social functioning in a challenging environment, Stewart engaged with learning a particular task – using the laser cutter to build his light box – before eventually broadening his involvement to perform a meet-and-greet role at the Hacklab, similar to the one he performed at Remade. In time, his anxiety had receded to the point that the Hacklab had become something of a second home. When we first met, Stewart was, in fact, spending most of his days there, a space he had come to feel uniquely comfortable

and safe in, listening to music and tidying the place up while he waited to move house:

*So I learnt to use the laser cutter. Then I thought about membership, and said, 'I'd like to be a member but I'm on the dole, I don't spend a lot of money and I don't want to socialise'. Cos I was socially anxious [but] the guys are all pretty much like me in certain ways, very bright, very intelligent, they have trouble functioning in most social environments.*

*Now, I don't work, and I'm free all day long...and because I had the experience with Remade charity, I quite happily got into the meet and greet role. And every time I did a meet and greet, somebody would come in, describe a project they were doing, and I say OK, well I know such and such does that, and I got more and more skilled at pointing people off in different directions. I took the initial thrust of people's inquiries, familiarised them with the space, set them in a direction and they were up to speed on the space, and able to communicate with the other people here.*

In tandem with our discussion of the Grassmarket, above, Stewart notes an inherent sociality attributed to the diverse maker activities going on at the Hacklab. Gifting their time and possessions, as we saw in Chapter 5, is crucial to this process, with Hall (2013: 259) citing Gibson-Graham to note that “the noneconomic exchange of creative objects bursting with emotions, embodiments, and meanings can have a resonance and long-term impact on those in receipt, establishing a lasting set of relations.” Stewart explores this set of relations, noting the importance of atmosphere as well as a very particular form of *communitas*:

*I think it's a social skill...As I say, for many many years, a good 20-25 years, I did all these things by myself. And actually, I was*

*taking apart people's Hi-Fis, dehumidifiers, washing machines...I always did it alone, always struggling to deal with the edge of things. Whereas here you might be able to pull three or four people saying 'what are you doing now?'...'oh I know a bit about that' and rip it apart. That gives the social atmosphere of it. Whilst a lot of the projects here are individual projects, self-directed, self-actualised, goal-oriented, people will come together. Like, for example, the laser cutter is completely hacked, it's got various fans put into it, tubes replaced several times, and the laser has been water cooled. What happened was when a chap said 'well, there's a hack on YouTube for laser cutters'...five guys work overnight 'til two or three in the morning, come in the next day and turn on the laser cutter...*

Like the Grassmarket, bordering practices at the Hacklab contributed to this sense of collective sociality. For example, an important part of the process of joining as a member consists of being endorsed by two existing members, to provide a “barrier to entry” before members can obtain a key. As Hacklab co-founder Ben, put it:

*What it means is you have to come to an open night, and get to know people a bit, cos otherwise nobody will sponsor your application. So that helps, you know, I think that's been good.*

This step was established at an early stage to avoid problems seen by Hacklab participants in maker communities elsewhere, whereby too many keys were given out too easily, and the space's sense of collectivity or community fragmented and suffered. The layout and infrastructure of the Hacklab similarly works to encourage collaboration, with a large table forming the focus of the main room, around which participants gather to work on their respective projects. With resemblance to the Grassmarket, the Hacklab confines visits from non-members to just one day a week – Tuesday evenings – or during public events such as the

Edinburgh Mini Maker Faire. Reminiscent of the Grassmarket members' meetings, it also holds dedicated 'members' evenings', which gather members physically in one place. As a result, Ben continues:

*It is quite nice to have people around to get ideas and see what they think, and weird kinds of relationships form as well through it, so you end up working with people on a project or somebody will come along and say 'can you help us with this?' So just being around you pick up these weird projects which is quite nice.*

The guarding of boundaries and the closure of the community was also spoken of highly by Harry, who noted the "vibe" of the place as a factor in his continued involvement:

*There's definitely a social aspect and the social benefit in bringing together like-minded people that don't really have anywhere else to go, you know. There's people I've met through it that've become quite good friends and it's just because we're nerds who are interested in the same sort of thing and didn't have anywhere else to go.*

### 6.3.1 Exclusion and Communitas

I would like to briefly touch on a final issue, to bring this section on group identity and liminality to a close. Just as community was demonstrated as being potentially exclusionary in Section 2.2.3, the maintenance of group boundaries and communitas is itself a double-edged sword, and holds the potential for unwanted side-effects. During my time at the Grassmarket, this didn't appear to be an issue. As Elaine noted:

*Even if someone comes in and you're not too keen on them for whatever reason, everybody still makes an effort and you still make that person welcome, that's just part of the place*

*here...We all understand that there might be some people that don't like us for whatever reason, and you just have to get along.*

Tommy did speak, however, of the possibility for workshop participants to cohere too much, to see themselves as differentiated from – and better than – other participants in the wider community project, to the point of exclusion. This had been evident a couple of years earlier, for example, in something as simple as the way those individuals walked when entering the organisation's common lunch room.

*We had a team where they became so confident that they think they're better. You know, 'we're woodwork'...Chests are out and shoulders are back. It's like [a] 'we're-better-than-you' sort of thing 'cos we're woodwork guys'.*

The strength of internal bonds and shared competence was also cited as cause for concern at the Hacklab, when it might lend itself to “*cliques forming*” (Harry) or the internal bond becoming so great that newcomers are ignored or made to feel unwelcome. Having someone like Stewart around, performing a ‘meet and greet’ role to integrate newcomers helped to impede this happening, but it remained a constant possibility. While admitting that most people were extremely helpful, the imposition on a pre-existing community was a cause of anxiety for Edward, also:

*I found very quickly that I was a bit out of my depth...I worried a little bit about what I was able to give back, so that was a bit of a concern at the time.*

The question of cliquishness begins to point to disparities in inclusion/exclusion, whether demographic, gendered, or otherwise. While I have previously noted the increasingly-widespread recruitment of people into maker practices, it should be noted that there has been an unwarranted ‘inequality blindness’ in much of the literature on social practices (Sayer, 2013; Walker, 2013). This blindness, for example, can be reproduced through the use of broad terms such as “typical daily

life in Western countries” (Maller and Strengers, 2015: 147) which, at the very least, lack socio-economic nuance. As Walker (2015: 52) notes, “if a potential practitioner lacks the capabilities required to perform a practice (and through that achieve related functionings), that practitioner is ‘un-recruitable’ and excluded (at that point in time) from reproducing the practice – however willing they might be and however actively the practice might seek to capture them” (See also Shove et al., 2012: 135). If, as Costin (1998: 3) noted, craft goods are “social objects”, that “signify and legitimize group membership and social roles” then this can come across in the border practices of spaces of craft also.

For example, as we saw in Chapter 2 and in spite of purported universal inclusivity, the ‘maker movement’ has something of a gender problem, and this was particularly prevalent at the Hacklab:

*If you look around [the Hacklab] it's middle class white guys, it's entirely middle class white guys pretty much. So why is this? ... I think we hover about 10-15 percent female members, it's not a big percentage and it doesn't budge. (Ben)*

*I think in general it's pretty male-dominated wherever you go, I don't think there are many [maker spaces] that are too different from that. (Harry)*

*It is essentially a guy's type space. Because of freedom of movement [and] such things. These guys are in their, well one chap's seventeen, the rest of them in their 30s and 40s...but the women tend to be 20s, 30s, they either have kids or whatever, so they have lots of domestic responsibilities, so they don't have access like our bunch of guys. (Stewart)*

With its focus on carpentry, the Grassmarket too tended to predominantly attract male participants, albeit with a higher proportion of female participants than the Hacklab, while The Remakery, on the other hand, tended to see a more balanced

attendance of workshops and use made of the space.<sup>73</sup> Such social disparities are hinted at in a 2014 survey of Repair Cafes and Hackerspaces, by the Centre for Sustainable Design (Charter and Keiller, 2014). 90% of respondents from Hackerspaces were male, while the figure was much more balanced with regard to Repair Cafes (60%). Similar numbers of respondents, however, had “Bachelors or Post Graduate” degrees, standing at around 70%.

While not representative, this could be indicative of a wider trend, which my research appeared to lend support to, whereby spaces associated with hacker culture, in general terms, were predominantly male, while other spaces (such as the Remakery and Grassmarket) achieve more balanced participation.

### 6.4 Flow and the Therapeutic Practice of Risk

While the discussion up to now speaks of the general social atmosphere and efficacy of workshop activities, it says less about actual practice. In his study of repair work in garages, Dant (2010: n.p.) states that “how the worker feels is affected by her or his sensual knowledge and will, in turn, affect how gestures and tools are employed as the work proceeds.” As we saw at the beginning of this chapter, Tommy had played down the role of crafting *per se* in the care work of the workshop. In order to bring chapter to a close, however, I will ask how, precisely, can the material encounter of the work – the merging of individual skill with material production – act as a therapy? I will here argue again that the role of ‘making’ is a fundamental constituent of the workshop’s social life and the impact it can have in remaking lives.

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<sup>73</sup> I don’t want to suggest that such disparities are *solely* the result of exclusionary group dynamics. Larger structural questions are at play. As one participant with experience across weaving, computer programming and woodwork noted: “*Every other dad does a bit of woodwork you know...I suppose all crafts have this similar problematic gender dynamic, where you say it's a man's craft or it's a woman's craft. And at the moment weaving is a woman's craft and I'll tell you why, because you can't make any fucking money from it. And that's why it's a woman's craft, 'cause in the 70s in Scotland, where I studied, it was a big booming mill town you know, from the 19th century onwards, and in the 1970s one of the older women that I met who studied in the 70s she was the only girl in her class. Now when I studied, I was the only straight man in the entire student body.*” (Andrew)



When I spoke to Susan, she had noted that *“there's just something nice about getting a plank of wood or an old church pew, and turning it into something beautiful. And I think that's quite rewarding for the guys. It's also seeing quite instant results of what they're doing and polishing something up, and finishing it, and I suppose it's good for them as well.”* During a conversation in September, furthermore, Tommy noted that if I, as a university-educated researcher, *“feel ownership and achievement over that table top, imagine how someone with support needs, who's never achieved anything in their life feels”*. As Susan acknowledged, much more of the work could have been done more quickly and probably with more accuracy, with machines, but the slower process of working by hand, with more human input, was clearly seen as an advantage and, I will posit here, not just to provide *“a tangible demonstration of their skill”*, as Watson and Shove (2008: 78) remark when discussing professional painters who continue to use traditional gloss paints over easy-to-use modern ones. Rather, it acted to greatly increase a sense of achievement perceived to be lacking in the lives of volunteers.

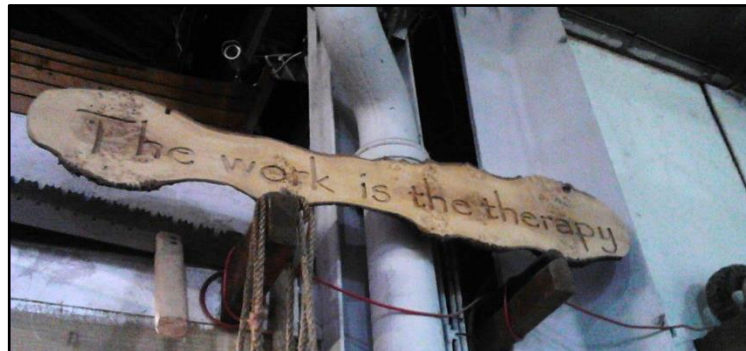
At the Hacklab, too, there were indications that it was more about the means – the process of construction – than the end. When I had a conversation with Harry one evening, he was working on a guitar amp which he said he'd been building for ten years:

*I'll never finish it but I don't care. It's just one of these projects that's a never-ending thing, there'll always be something that I want to do...some circuit typologies that I want to experiment with that you can't get from commercial amps, so it's a bit of a test.*

He pointed out that the space was really about such projects, and the process of *doing something*, rather than utilitarian access to tools:

*People who are just coming here for access to the equipment are the people you don't see very often, or even become members. They just come down on an open night, use the gear, and then bugger off again. The people that you see sitting next door tonight....[For them] it's like workaholism, it's not being able to not do something. And it's not always to any particular end, it's not like somebody's ambitious or anything like that, it's just the inability to not be busy. You see that in a lot of people.*

Framed in another way, then, “*The Work is the Therapy*,” as a sign on the wall of the GalGael Trust, a Glasgow-based workshop with similarities to the Grassmarket, explained it (Figure 52), hinting at how the workshop’s taskscape can provide “both the stage and the necessary social, affective and material resources for the everyday work of recovery” (Duff, 2016: 66).



**Figure 52: ‘The Work is the Therapy’ at Galgael**

In Section 2.3.4 I discussed how flow has become prominent in practice-based studies of wellbeing, and how its more-than-representational focus provided an apt alternative to the focus on explicit cognitive state and the survey-based measurement of wellbeing in fields such as ‘positive psychology’. Instead of generalising, through aggregations of social measures, research on flow tends to be qualitative and/or (post-)phenomenological in focus, emphasising individual experience. Parr (2006: 155) speaks of the arts as enabling “a temporarily all-consuming occupational space that distracted from negative and disruptive thoughts and affects,” echoing findings summarised by Garner (2015: 97), who

notes that crafting triggers “physiological changes commonly referred to as the relaxation response,” an effect which “brings about physical relaxation, relief from worrying thoughts, improvements in self-esteem, enhanced perceptions of control in life, and energizing thoughts”.

Indeed, this notion of flow amidst performative material engagement, and, in particular, the altered temporality entailed by the flow experience, in the workshop, was an apparent aspect of the daily experience of participants at the Grassmarket. For example, one participant noted:

*...it's kind of meditative for me, cos I kind of drift off. I mean, I used to do these plaques as well, and I remember one time when I had to do five plaques and I sat down, and I was really not paying attention to the work, I was just talking to people, and then come lunch time they said, 'well, Brian, have you done the work yet?' and I'm like 'no, I've only done three.' I looked on the table and there were five sitting there, and I had absolutely no memory of doing two of them. (Brian)*

Similar experiences were prominent for other participants, also:

*...sometimes it's frustrating 'cause you think 'I'm going to get this finished', and you get half-way down and it's 'Oh God, is that the time?' (Elaine)*

*A lot of people might think you're weird, thinking that's therapeutic, but [it] keeps you busy. You don't think about anything else, you're thinking about I need to get this bit of wood perfect, I need to get it smooth. (Tony)*

While Csikszentmihalyi's focus in flow research tended to be on individual 'expert' practitioners, the workshop allows for greater comparison between people of different experience levels and aptitudes. Different participants, for example, seem to have a different tolerance for a variety of jobs, which in turn is usually

dependent on their level of skill at a certain task. Flow, that is, is a dynamic and emergent phenomenon, troubling any notions of an 'inherent' therapeutic basis to craft activities. Hence, while one might be happy to remain on the pyrography workstation day in, day out, another participant might find it less easy to enter the 'flow' experience and need variety to ensure they don't get bored. As a long-term participant Daniel says:

*I like doing a bit of the burning, but I don't like doing too much...I tend to try and keep it a bit mixed up, and then you're actually thinking about it rather than just getting bored of doing the one thing, and then that's when I start losing concentration and stuff like that, aye.*

Further, while sanding was for many volunteers found to be a chore, it was a therapeutic process on the Friday drop-in sessions, for a couple of regular attendees with drastically limited mobility who had suffered strokes. Having limited movement on one side of their body, they enjoyed and became valued for their exceptional ability in the singular task of sanding, using their limited mobility to finish a piece off until it was "like glass," as other workshop participants would regularly enthuse, often passing a piece around for awed examination. As such, Gutman and Schindler, in their paper examining the neurological impacts of skilled activity, conclude their discussions of flow by asserting that the use of "activity to elicit flow may be able to offer patients a non-pharmaceutical means to self-regulate emotions such as anger and obsessional phobias...studies of the flow phenomenon have shown that the use of activity in human life is critical to well-being, emotional health and emotional equanimity." The variety of tasks entailed in woodwork, from the high-skill, high-risk detailing of pyrography to the relatively low-skill, low-risk activity of sanding means that all abilities are seen as valuable. However, differences in skill and embodied attunement to the task at hand, with a requisite shift in flow experience, can even arise with regard to basic activities such as sanding.

While often discussed as if they exhibit a kind of frictionless relaxation in which the body takes over, in fact, flow experiences were reported by Brian to be simultaneously relaxing and psychologically draining:

*If I'm focusing on something that takes energy to focus on, for a continuous amount of time, after a while I find I just don't have the energy to really give it a level of focus I really want to and I'll just get up and walk around and I'll just take my mind off it for a minute to give it a rest and then I'll go back...It's strange because it feels relaxing when you do it, but you kind of build up this kind of...your brain's continuously making effort and eventually it just says 'ah I need a break!' (Brian)*

Brian's remark about "*continuously making effort*" speaks to the "widespread misapprehension" recounted by Ingold (2006: 77-78) that assumes that enskilment and the training of the body through repetition leads to a "progressive loss of conscious awareness or concentration in the task." Instead of automaticity in flow, which he notes is actually only characteristic of the 'workmanship of certainty' (that is, mass production), Ingold posits skilled activity "is anything but automatic, but is rather rhythmically responsive to ever-changing environmental conditions" (see Section 2.1.2) and that "in this responsiveness there lies a form of awareness that does not so much retreat as grow in intensity with the fluency of action". That is to say, there is no monotony as skilled practice finds itself buried deep into your muscles and nerves; rather, with skill, comes heightened awareness and responsiveness. The term flow has too often been interpreted as indicating 'ease' or 'smoothness'. Instead, it should be interpreted as a balance of challenge and skill with experienced participants (and even workshop tutors) having the occasional 'off-day', whether due to materials not performing as expected, hinting at the contingent, non-linear nature of the flow experience.

It is this 'intensity' and development of 'fluency of action' which is actively encouraged at the Grassmarket (mapping over onto many of the skilled activities

at both the Remakery and the Hacklab), through the intentionally-minimal use of machinery, which was noted in Chapter 4. Given that craft is a risky endeavour, characterised by failure, the skill/challenge balance widely noted as being central to the flow experience must be carefully managed, pairing workshop participants with their emerging ability from the initial moment they enter the workshop.

Daniel noted that *“If it wasn’t a challenge, it wouldn’t be fun”* speaking to how integral ‘challenge’ is to the pleasure drawn from work, as well as the potential frustration, and the therapeutic potential of the ‘workmanship of risk’. It is, in fact, a statement very reminiscent of Juul’s (2013) work on the “paradox of failure” wherein we normally avoid failure, yet we simultaneously seek out the threat of failure in activities like video gaming. This pattern appears to transpose onto the popularity of ‘risky’ maker practices also, with the choice of simpler tasks reminiscent of the selection of a video game’s ‘easy mode’, to avoid frustration and enhance the possibility of encountering a positive ‘flow’ experience.

As mentioned above, for example, most volunteers at the Grassmarket have an initial trial session on a Friday, or over a number of Fridays, where they begin by making a basic ornament, such as a candleholder or clock. This project allows Tommy to assess the volunteer’s skills over the course of a day, while giving them a series of tasks which encompass a range of basic, achievable, yet varied, skills, including sanding, polishing, a basic use of hand tools and the use of machinery such as a drill press:

*Fridays are amazing because people come in really nervous – ‘oh, I’ve never done woodwork before’ or ‘I’ve done it at school and I was rubbish’ – and by the end of the day, through just a wee bit of support, they’ll have something really beautiful. Little bit of wood, they’ll sand it up, they’ll make something – you know, a wee clock or something – and they’ll be really proud of that. And they’ll say ‘can I come back?’ and ‘can I make something else?’ You know, you get them really, really hooked.*

While continuously performing a kind of ‘quality control’ on the workshop’s activities, shifting focus from one volunteer to the next, Tommy also makes sure that participants aren’t experiencing frustration, due to the ever-present possibility of an imbalance between a volunteer’s skill and the material challenges of the task at hand:

*Tommy, he’s brilliant. He’s a big part of why I am here and why I’ve stayed here...He wants you to do it and he wants you to learn and he wants you to do it at your own pace. He’s not behind your back, looking at you, [going] ‘come on, you need to do this, get this right’. (Tony)*

*If he can see you’re getting frustrated with something he’ll just say ‘just leave it, go on to something else’. If it’s that much of a problem he’ll tell you just to leave it. (Elaine)*

This section has drawn from one theme arising from the field work, namely the flow experience, and how it forms a crucial, albeit fleeting, part of the therapeutic basis of workshop activities. I will now draw this chapter to a conclusion, highlighting core themes and noting the role of qualitative geographical wellbeing research.

## 6.5 Concluding Remarks

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By analysing the paths of happiness we learn much about emotions, space and society. Emotions shape what we do, how we do things, what we do things with, and where we go. Emotions affect how bodies take shape in social space and how spaces cohere around bodies.

Ahmed (2008: 12)

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This chapter has, in the context of workshop spaces and craft activities, examined the potential for a more enlivened scholarship of wellbeing, one which moves beyond likert scales and surveys to be sensitive to the happenings and atmospheres of everyday life. It formulated an understanding of wellbeing as a dynamic and emplaced achievement of enlarged capability, unique to each person-in-an-environment, rather than a static attribute to be attained and quantitatively measured.

The term therapeutic taskscape, first coined by Dunkley (2009), was introduced to complement geographical work on therapeutic landscape, but placing an emphasis on “a perspective which situates the practitioner right from the start, in the context of active engagement with the constituents of his or her surroundings” (Ingold, 2000: 5). The workshop of Grassmarket Furniture formed the core of the chapter, exploring particular aspects which are purported to contribute to enrolling participants into these therapeutic taskscapes. Included in this discussion was a particular atmosphere of care and sociality, border practices of a certain liminal *communitas*, and flow experiences during an involvement in practical activities.

Particular stories were collected here, including those of Tony, Jane, and Stewart, in an attempt to demonstrate how each individual’s sense of wellness is placed within a certain biographical journey and history, which may or may not be characterised by social deprivation, addiction, mental illness, or other factors which blur the personal and the structural. This demonstration is key to moving wellbeing away from the individual psyche and re-placing it in the context of the social environment. Parr (2006: 151) has examined how “voluntary sector community arts-for-mental-health projects involve relational geographies that assist people in creating senses of stability and belonging.” She sees them as performing a role as a “protective *non-clinical*” social space within which “people cultivate positive versions of self-identity further enabled by an inclusive



sociability with others around them” (Ibid: 158). While the workshops are very different spaces to those she discusses, in many of their particulars, this study has lent support to the importance (and untapped potential) of such connective spaces in contemporary social life.

## 7 Discussion and Conclusions: Of Worlds and Workshops

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The world needs more workshops!

Hacklab Discuss, June 2011

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### 7.1 Introduction

Framed broadly, this study has been an examination of what Simone (2001: 16), in a different context, described as ‘worlding from below’: the co-creation of possibilities to be stepped into; new worlds in the form of workshops, inhabiting a context of experimental urbanism (McCann et al., 2013; Latham and McCormack, 2009; Smith, 2017). If the world needs more workshops, as the epigraph asserts, then conversely we need more worlds for them to flourish in. The thesis looked at ‘things’, how we make them, and what results as more people make or repair things collaboratively. A qualitative ethnographic exploration was undertaken to gain insight into what community workshops can tell us about the ‘double dividend’ in sustainable development (Section 2.2); that is, the ability for certain processes, practices and social environments to contribute simultaneously to sustainability and wellbeing. This, in many ways, is the desideratum of ‘sustainable development’.

In this final chapter, I briefly summarise the work, recapping the literature gaps which provoked the thesis. Section 7.2 will draw together the empirical and theoretical results presented, before I go on to make clear the specific original contribution to knowledge made, extrapolate a number of implications for policy

makers, scholars and practitioners, articulate some limitations of the study, and finally, highlight avenues for future research.

While the transition towards sustainability has been framed in terms of individualised behavioural adjustments, the case was made for more recent emphases on practices (Section 2.2.1), skilled engagement with the environment (Section 2.2.2) and community-based initiatives for sustainability (Section 2.2.3). In terms of wellbeing, a similar trend towards individualisation was identified, underpinned by various ontological and epistemological assumptions (Section 2.3.1). It was argued that more recent geographical approaches to wellbeing foreground a focus on practice and relational engagement, with the term ‘therapeutic taskscape’ introduced to supplement the wide focus in geography in recent decades on questions of ‘therapeutic landscapes’ (Section 2.3.3).

Communities of practice were noted to be understudied in the environmental social science literature (Royston, 2014), and – given that such shifts in practices are all-too-often portrayed as apolitical in the literature (Walker, 2013) – it was emphasised that unfulfilled potential exists to merge this work on (communities of) practice with more critical social theory, autonomous geographies, diverse economies and post-capitalist perspectives (Chatterton, 2016; Gibson-Graham, 2008b; Pickerill and Chatterton, 2006). These two gaps in the literature are particularly glaring, given the relatively recent rise of the ‘maker movement’ (Section 2.1.4) and the associated attention given to the potential for workshops to reconfigure unsustainable networks and practices of production and consumption (Hielscher and Smith, 2014). However, this literature has seen no work to date on maker spaces and social practice theory (SPT) specifically.

In spite of a flourishing of work on craft and making, it was argued in Section 2.1.3 that human geography has had little to say on these questions, ignoring makerspaces and workshops, both in terms of their sustainability potential, and their consequences for the lives of participants engaged in them. Amidst this gap in geographical thought, the thesis set out with four research questions. These

included the ability of such spaces to foment more sustainable practices (RQ1), if and how the spaces facilitated wellbeing amongst participants (RQ2) and how the concept of ‘making’ in such spaces dovetails with contemporary turns to new materialism and posthumanism in social theory (RQ3). These were supplemented by a methodological question (RQ4) regarding the potential for, and possible limitations of, more-than-representational qualitative research. I will now synthesise the key findings on each of these questions in turn.

## 7.2 Key Findings

### 7.2.1 Understanding Making – The Mangle of Craft

Literature around the maker movement has emphasised the views of makers or the technological potential of makerspaces, often to the exclusion of a focus on making itself (see Davies, 2017b for a prime example). This tendency precludes seeing “materials, technologies, objects and things” as “active agents and participants in practice” (Maller, 2015: 57). Chapter 4 therefore set out to examine the actual act of making, the practice-as-performance, in the context of developments in ‘new materialism’ and posthumanism.

The chapter took Pye’s influential portrayal of the ‘workmanship of risk’ as its starting point. Pye (1995) focused on the risk-based nature of craft activities, but stopped short of exploring the more-than-human elements which comprised this risk. To examine the performance of craft, then, I supplemented Pye’s work with posthuman writings on material agency, particularly those of Andrew Pickering on the ‘mangle of practice’. Close attention was paid to the skilled enactment of woodwork and pyrography before forms of making which more closely resemble ‘the workmanship of certainty’ – 3D printing and laser cutting – were introduced.

Responding to RQ3, a ‘mangle of craft’ was proposed as the most useful way of viewing technologies of making, whether ‘traditional’ or ‘cutting-edge’. In the workshops under study, this mangle is irreducibly posthuman and, depending on the particular tools, materials and practitioner making up the mangle, is located somewhere on a risk-certainty spectrum. Sigaut’s “law of the irreducibility of

skills” was emphasised in the case of 3D printing, to illustrate how, even in this ‘automated’ process, a considerable degree of human competence remains necessary. Given that the workshops are multi-disciplinary spaces which often combine the old and the new, by positing a mangle of craft, the chapter can be seen as both leading to a questioning of certain mythologies around the purity of ‘craft’, while simultaneously leaving room for the appreciation of works of skill.

### 7.2.2 Sustainability – Crucibles of Know-How

Chapter 5 zoomed out from the performance of making, to examine maker practice as an ‘entity’, that is, focusing on “the interrelated elements of a practice, as a recognisable doing that is relatively stable” (Maller, 2015: 58). There has been significant speculation on the potential of such spaces for fomenting grassroots innovations (Smith and Light, 2017) but no studies, to my knowledge, have considered how they impact and intervene on everyday practices in this manner. To address this gap, the chapter first outlined the institutional context in which such practices take place (drawing inspiration from literature on ‘diverse economies’) and then examined making in terms of the three elements of practice: materials, competences, and meanings (Shove et al., 2012).

The diverse economies approach highlighted a great heterogeneity across the three field sites, underscoring the fact that any ‘maker movement’ is a loose imaginative community. It furthermore served to bring any notions of an inherent radicalism in maker spaces down to earth, demonstrating how all three workshops created their respective spaces through a pragmatic navigation of the broader capitalist economy. In spite of such diversity, however, broader commonalities were identifiable, regarding how the three sites provisioned their respective communities with new geographies of creativity and practice:

- In terms of **materials**, the sites presented participants with new material configurations, often providing much-desired space for making at a time when people are perceived to have less space of their own, or less money to acquire that space. This space was filled with (sometimes rare and/or expensive) tools and materials, affording participants creative

possibilities which they wouldn't be able to access on their own, and could be seen as prefiguring new regimes of production and consumption.

- The **competence** to use these tools and materials was embedded in dynamic communities of practice, often face-to-face but also (in the case of the Hacklab) distributed over the workshop's mailing list and website wiki pages. The workshops harnessed previous experiences, often stretching back to participants' childhoods, demonstrating the importance of family relations and related spaces such as the home. The workshops allowed those experiences to be shared formally in workshops, or informally through ad hoc everyday interactions and conversations.
- With regard to the **meanings** which pervaded the workshops, a form of 'enchanted materialism' was proposed, drawing on the work of Bennett (2001), which brought consumer culture into question in very material terms. This was instantiated differently in each space, but largely related to repair or reuse activities, with my experiences in the field supporting the assertion of Charter & Keiller (2014: 2) that while makerspace members aren't necessarily primarily motivated by sustainability concerns, "activities pertinent to sustainability/Circular Economy; including repair [and] upcycling...are not uncommon."

Repair, in fact, is a valuable lens through which to tie together some of these sustainable practice-related themes which emerged from the research. Practices of repair have largely declined in western societies (Dant, 2010) and when they do exist it is professionalised and related to high-value items like cars and appliances. The workshops held implications for user-driven repair, not just through their public perpetuation of meaning – the emotional connection with recycled wood at the Grassmarket, the ethos of frugal electronics and hacking at the Hacklab, and the homely, twee aesthetic of upcycling at the Remakery – but through their provision of access to the materials and tools needed in repair, and the community of competence necessary to instruct in the correct use of those materials and tools. Many participants noted that such workshops acted as a sort of library, storing knowledge and materials, and I would speculate that the value of such repositories may yet increase in ecologically-turbulent and resource-constrained times (see also Maller and Strengers, 2015). As such, the spaces appeared to offer the potential for the resurrection of dying or obsolete practices, though the particular implications of, and long-term viability of this, remains to be seen.

The latter relates to a point also raised by Walker et al. (2007: 78-79) on whether small-scale projects “can add up to more than the sum of the “small parts” ...Are there impacts more subtle, distant in space and time or accumulative, which a multiplicity of small projects can help realize?” (see also El Khoury, 2015). In an age often fixated on quantifying immediate carbon emissions, the delicate question of temporally-diffuse effects must be considered, especially when this involves skills and practices which are accumulated or ‘grown’ (Ingold, 2013) over a lifetime<sup>74</sup>. As we saw, participants identified the ripple effect of their activities, for example with Daniel’s accumulated skills being put to use in repair activities for friends and family. As Walker et al. (Ibid) note, “identifying and “measuring” such categories of outcome is undoubtedly problematic”. Therefore, I would assert that a form of activism is going on in these spaces, albeit not one which is oppositional or goal/campaign-oriented. Rather, it is quiet, sociable, slow (Hackney, 2013; Pottinger, 2016), and related to environmental engagement (Vogel, 2015).

### 7.2.3 Wellbeing – Workshop Affects

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As we make, place or alter things so they, in some measure,  
make, place or alter us.

Dant (1998: 78)

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As evidenced by the diverse (and often contradictory) array of work taking place in the contested field of ‘wellbeing research’, grasping the wellbeing implications of the workshop is not straightforward. Unlike the use of materials and tools, the ‘inner state’ of participants is inaccessible to the ethnographer. This inaccessibility remains whether one uses the likert scale-based research methods of many

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<sup>74</sup> Royston (2014: 157) notes that “knowing-how is a temporally complex process, bound up with the dynamics of habit and memory, as well as with life-course trajectories and wider transitions in social practice.”

‘science of happiness’ researchers, or qualitative methods employed by geographers of therapeutic landscapes. Given that the transience of social life is often ignored in the social sciences (Bille et al., 2015; Gandy, 2017), Chapter 6 accessed the question of wellbeing obliquely, through dimensions of affectivity and more-than-representational geographies.

While autoethnographic reflections have been few and far between in this thesis, I remember with clarity the rush of energy I had, on a dark Tuesday night in December, on leaving the Hacklab and walking down Edinburgh’s Bridge St to return home. My mood was lifted out of the groggy, fatigued state which had been felt earlier in the day, and I experienced a burst of joy and energetic positivity – I could have been floating.

What took me from a feeble low-energy state at the start of the evening, to feeling this way on leaving? While difficult to answer, I can guess at a few contributing factors. For example, I had made progress on my own project that night, the chess board was coming together better than I had hoped, and this came with a great sense of achievement. I had also, that night, shown an open night visitor, who wanted to develop prototypes for a digital camera he had designed, how to use the 3D printer, taking him through the various steps required as they had previously been shown to me. He was excited by the prospect and I had felt, finally, that I was the one on the inside, rather than being an outside researcher looking in. Perhaps most crucially, we were immersed in a buzz of activity that night, surrounded by many others following their respective creative passions.

Wellbeing, then, I proposed, doesn’t emerge within a discrete individual. Flow (Sections 2.3.4 & 6.4) certainly begins to hint at one way that it emerges amid skilled practice, but even this remains too narrow. Rather, I proposed, through relational wellbeing (Section 2.3.3) and Dunkley’s (2009) notion of ‘therapeutic taskscape’, it finds its source enplaced in the envioning situation. In particular, the thesis examined such spaces as environments from which emerges a certain ‘affective atmosphere’, an amorphous term defined early on by Pennartz (1986:



136) as “a conditioning surrounding influence...[a] physical milieu viewed as having a mental or moral influence”. Bille et al. (2015: 33) note that “even though atmosphere may be *vague* as a conceptual occurrence and as an experience, atmospheres are by no means *weak* cultural phenomena.” They are an emergent process, “never exclusively a psychological phenomenon, as state-of-mind, nor solely an objective thing ‘out there’, as an environment or milieu; atmospheres are always located in-between experiences and environments” (Bille et al., 2015: 32).

The chapter focused on the staging of an atmosphere conducive to *communitas* in the workshop, a concept identified in the literature as helping individuals to integrate and find a place in urban environments from which one might be alienated. They are doorways into a community (a term which, as we saw in Sections 2.2.3 and 6.3.1, comes with risks, but also with enormous potential for finding meaning and stability in the turbulent flow of life). This won’t be felt or act the same for everyone, or even felt at all; however, it became clear that the social and bordering practices of the workshops create space not just for material transformation, but transformation of the self too.

This was particularly clear at the Grassmarket, where participants generally came from precarious backgrounds in which achievement and community were hard to find or construct. Tommy was spoken of as a ‘mentor’ who maintained the requisite space for recovery. The Hacklab’s less hierarchical organisational pattern, however, meant that mentorship was more distributed, and protection of *communitas* relied on the self-awareness and monitoring internal to the community itself. It could be the distributed nature of this mentorship which resulted in the *communitas* closing around a narrower social group (educated men in their 20s and 30s) at the Hacklab.

I would argue, from the start made in this chapter, that there is great potential to examine the dynamics and specificities of spatial atmospheres and wellbeing, with

human geographers to date giving more attention to the former, but not as it relates to the latter.

### 7.3 Contribution to Knowledge

Having summarised some of the key findings of the research, I will now outline the specific way this thesis contributes to current bodies of knowledge. While I would emphasise that the numbers of participants in these spaces are small, with consequences for the scalability of the findings, the results presented are broadly consistent with many findings in the current literature on maker spaces and community workshops (Section 2.1.4). It underlines a creative confrontation with the materiality of our world, providing an opportunity to get to grips with diverse materials and expand the potential for communities to socially make and remake their environments. It is my hope that the thesis pushes current thought on maker spaces and community workshops in relatively novel directions:

Firstly, though craft is of increasing interest to economic, historical and creative geographers (Section 2.1.3), the maker movement has heretofore been neglected as an object of study in geography, though this may change over coming years. This is the first project to focus on makerspaces and urban community workshops in human geography, amidst a predominance of work from across STS and design studies, for example.

Secondly, I emphasised the dangers of over-generalisation, and paid attention to the specificity of the workshops amidst differing configurations of communities of practice, skills and meanings. The research shows how each space is distinct and, as such, will have varied potential for fomenting pro-environmental practice. The workshops created space to experiment with making as a practice, preserving prior skills and facilitating the learning of new ones. As such, it is the first body of research to bring such spaces in contact with social practice theory and cognate developments in social thought, including the diverse economies literature.

Thirdly, the research presents an innovative interpretation of the skills, activities and practices taking place in these spaces in the form of the ‘mangle of craft’. This connects canonical work in craft studies, such as that by David Pye, with more contemporary positions on the agency and properties of nonhuman materials.

Finally, to my knowledge this is the first human geographical work to specifically examine wellbeing and (craft) workshops, examining how the latter formed a part of participants’ respective journeys of recovery and wellbeing, empirically applying relational and more-than-representational concepts of wellbeing which have only recently come to the fore in human geography (Smith and Reid, 2017; Gandy, 2017) (Section 2.3.3).

## 7.4 Methodological Contributions and Limitations

In response to RQ4, this research took an ‘enactive ethnographic’ approach, attempting to build on – and yet move beyond – the predominance of the spoken word and representation in qualitative research. Working alongside participants at the Grassmarket, Remakery and Hacklab, I both witnessed immense creativity, and partook in that creativity, resulting, I feel, in greater insight into the lived experience of the spaces under discussion than could possibly be accessed through interviews alone, say, or shorter field visits. However, as with all research, there were methodological shortcomings which need to be acknowledged and are significant findings in themselves:

Firstly, given the limits of taking a case-study approach, the conclusions presented here remain tentative. The study was conducted in just three purposively-selected spaces in one particular city, with a small, and non-statistically representative sample of formal interviewees, and immersion which differed temporally, for practical reasons (addressed in Section 3.7), across the three different field sites. More-than-representational research often entails a focus on the small and immediate and, therefore, as with any qualitative study of such a limited size, findings cannot be generalised in any strong sense, though case study

methodologies remain powerful tools for detailed exploration of social phenomena.

Secondly, and more conceptually, limitations to more-than-representational research in general became evident. For example, such work has been criticised for its tendency to prioritise present activity over broader historical and/or political context (Tolia-Kelly, 2006). As such, this type of work tends to be limited in its ability to address structural concerns, precluding “the search for *causes* of, and thus accountability for, the effects of power...especially those which might lie beyond the horizons of its individual human and non-human actors” (Kirsch and Mitchell, 2004: 692). According to Hornborg (2017: 101), the reason for this is largely methodological, resulting from “radical empiricism, advocating detailed studies of the interaction of particular humans with particular artefacts”.

The contours of this debate are well-trodden (see, for example, Hornborg, 2017; Tolia-Kelly, 2006), though I would note that such divisions can be, and have been challenged (albeit in a slightly different context) as a “false antithesis” (Castree, 2002). While it is difficult for a study to address everything, the focus on practice taken here was an attempt, in part, to confound classic structure/agent dichotomies in sustainability research. Examining the daily practices of niche spaces, as this study has done, does not preclude the importance of other more historical and/or political approaches; it is merely a choice of focus. Indeed, by introducing social practice theory’s relevance within the broader lens of diverse practices and ‘community economies’ (Section 2.2.5 and Chapter 5), an attempt was made in this study to begin drawing together theories of environmental transitions, with theories of post-capitalism, as called for by Chatterton (2016).

A third limitation which requires raising is myself. In qualitative studies, the researcher is the primary research tool and, as such, personality and the dynamic circumstances which arise play a constitutive role in qualitative research. Indeed, this role is undoubtedly more central than is normally presented in final research outputs, in which many of the cracks will have been smoothed over (Cloke et al.,

2000). There were countless moments when my introversion, anxieties and other personal idiosyncrasies impacted on the research, and it would be remiss to ignore the consequences of this. While limiting – for example, when I shied away from articulating the possible benefits of my research in front of larger groups of participants – such traits can also be beneficial in certain situations, allowing participants space to reflect and warm to the presence of a participant-researcher in their own time. However, my reticence in social situations probably prevented the research from taking some of the more innovative directions called for in the more-than-representational: For the sake of remaining discrete, for example, I chose not to film or record workshops, while also falling back on semi-structured interviews when focus groups or collective making sessions could have been more effective in eliciting shared experiences. On reflection, some of these personal limitations could have been mitigated or minimised: with a period of pilot research, for example, to ease into the field, or with greater training, for example in the practice and potential of video recording as a method<sup>75</sup>.

Limitations are inherent in all research, however, and it is my belief that the research presented herein remains valuable in spite of, and because of, these limitations. The resulting work is not the definitive statement on community workshops; however, given the relatively under-researched nature of such spaces, particularly within human geography, I believe it is an exploration which sets the scene for further work on this fascinating social phenomenon.

I will now, therefore, examine this future potential, outlining some of the research's implications and possible future directions.

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<sup>75</sup> Given the founding of a 'data club' in my department (unfortunately after the completion of field work, rather than prior to it), I am now also convinced of the value of qualitative researchers gathering together to share anecdotes and stories from the field as a form of peer-to-peer 'training' and mutual support, enabling the sharing of best practice, insecurities and foibles from the field, as well as the discussion of practical problems which can arise.

## 7.5 Implications and Recommendations for Future Study

There are a number of identifiable implications of this research which I would like to briefly outline here. Firstly, my work accords with Smith and Light's (2017: 171) assertion that "makerspaces are part of a perennial need for communal and unstructured spaces for doing things together. The continued erosion of space in public ownership or control has surely contributed to the increasing popularity of makerspaces." Participants in this research also outlined how the workshops created space which they saw as lacking in their urban lives. There are implications here for how communities conceive of, and manage, urban space in the face of economic austerity, to the benefit of those who dwell there, and advancing democratic engagement with material infrastructures (Marres, 2012).

However, in part due to my own wariness regarding state intervention in community-based initiatives, I am hesitant to suggest concrete steps on this issue, or blanket policy recommendations, for example by following Barcelona's lead in investing in (local) government-operated workshops. Much academic work becomes aimed at undifferentiated 'policy makers', excluding the rich and diverse knowledge often embedded in self-organising communities themselves. While developments such as those in Barcelona may well prove valuable, the outcome of such an approach remains to be seen. Each space identified in this research is the product of a unique community effort, and created to serve a particular social need, which indicates their value as a means of social action, as well as an end. As Kohtala (2016: 97) has written, "The contingencies, the very situatedness of Fab Labs, means that every Lab must be built anew" continuing that "there is also a need to engender balance between becoming normalized and institutionalized...and maintaining an open and fluid identity" (p. 99).

Parallel to this desire for common creative spaces, participants spoke of formative early experiences in making, often arising through experiences at home, but also through school activities which are now in decline in western society. The fall in traditional 'shop class' in schools is therefore somewhat concerning, with the

Crafts Council indicating that, between 2007 and 2015, the number of students studying craft GCSEs and Design and Technology GCSEs has fallen 23% and 41% respectively<sup>76</sup>, while digital, computer-aided design is displacing courses like ceramics, textiles and woodwork (which often require more space and dangerous/expensive materials and equipment). A similar trend has been noted in the United States (Crawford, 2009). The rise of community workshops is picking up some slack on this front, providing training not available elsewhere, the implications of which are deserving of further study.

Regarding the human geographical study of community workshops, complementary research is needed on a number of other fronts. This thesis has taken the maker space itself as the locus of research, but, in the case of sustainable practice, this could be aided in future with a multi-site examination of how the practices cultivated within these spaces ripple out into other domains, such as the home lives of makers. There will be challenges and complexities to this, but, as Shove (2017: 167) notes, “intervention at the level of infrastructural relations represents a form of intervention that matters for many practices at once.” Moving from the spatial to the temporal, furthermore, the diffuse nature of practice, developed and maintained over time, means that longitudinal research would be valuable to ascertain the longer-term practical implications of involvement in community workshops. A PhD thesis isn’t necessarily conducive to this longitudinal and complex multi-sited approach, but it could be valuable for building up a more complete picture of how maker practices spread, decline, and impact consumption.

## 7.6 Concluding Thoughts

We have grown used to sustainability being framed in terms of parts per million of carbon, international agreements, technology change, and exhortations for avoidance of ‘bad’ behaviours. However, such concerns begin far from lived social reality and reinforce a vision of sustainability as a form of asceticism. In spite of

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<sup>76</sup> <http://www.craftscouncil.org.uk/what-we-do/studyingcraft> [Accessed 09/11/16]

the lofty manner in which maker spaces and community-based workshops have been discussed in recent years – from ‘sociotechnical transitions’ to ‘industrial revolutions’ – I am left with a sense of something far more humble, yet which *could* perform a positive role in ecologically-uncertain futures. This signals a more (literally) constructive vision of ‘sustainable development’, in which we are practically, experientially, and collaboratively connected to our environment.

Is there, then, scope for a new materialism? I would argue that a growing subset of the population is already enthusiastic about, and proactive in forging for themselves, such an engagement. However niche, and demographically uneven, such participation currently is, this study empirically contributes to an understanding of social spaces which contribute to the ends of social flourishing and sustainability simultaneously, at whatever scale. In the spaces of this study, furthermore, opportunities for action and learning are provided, habits are built, and feelings of belonging cultivated. While no one can predict the future, it is well within the realm of possibility to argue that a society endowed with a greater range of material skills – both new and old – and a greater ability to freely associate, share, and work alongside one another, away from the market, will be better equipped to confront a growing suite of ecological and social challenges.





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