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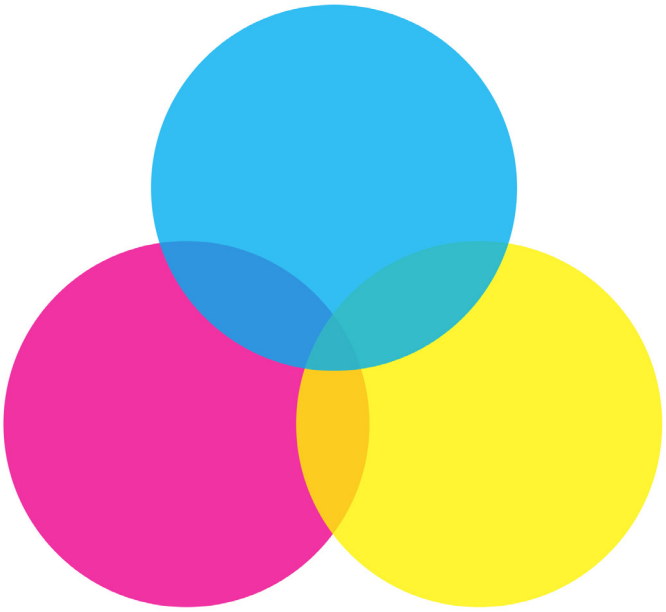

How can community-based initiatives make repairing and maintaining things a social norm in the UK?

Abstract

This thesis is based on six months of action research into the practice of repair.

The praxis aspect of the action research has come from establishing and running the Brighton Repair Café. This initiative follows the *Repair Café* model established by the Repair Café Foundation in Holland. Observations of the participants and the progress of the initiative in Brighton have informed an *action reflection cycle*; as have interviews with organisers and observations of other community-based re-use and repair initiatives in the United Kingdom and the Netherlands.

A review of literature on psycho-sociological theories complimented by *ecological literacy*, design and cultural theories has been used to appraise the praxis in the context of contemporary issues and the emergent repair movement.

These appraisals have been supported by the analysis of lectures and forums on repair, *re-use, service design, social design* and publications on new economic models to inform the generation of speculative theories and proposals for legislations, solutions in practice and further research.

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Extended Summary

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The Question

There is no straight-forward answer to the research question posed because repair is a complex practice, made up of many variables which are in constant fluctuation and are dependant on context. However, in pursuing a discourse on repair and the different issues that surround the question, it is possible to start mapping the repair territory in order to understand how it can be explored further and to expand its boundaries.

The Approach

The titles of each chapter of this thesis are derived from the extensive research undertaken. The progression of each chapter contributes to building a map of the many elements that create and affect the repair practice as a system which is constantly evolving:

> Systems can change, adapt, respond to events, seek goals, mend injuries, and attend to their own survival in lifelike ways, although they may contain or consist of non-living things. Systems can be self-organizing, and are often self-repairing over at least some range of disruptions. They are resilient, and many of them are evolutionary. Out of one system other completely new, never-before-imagined systems can arise. (Meadows, 2009:12)

Progressing from parts to the whole enables the writer to approach the complexity of the phenomenon of repair and to offer an ecological understanding of how it relates to other practices, in order to propose how, as part of a living system, it can be supported and thrive.

This year the Royal Society of Arts (RSA) published proposals for four new design models that could create a circular industrial economy as part of its 'Great Recovery Project' (RSA, 2013). This research thesis can be aligned with one of the models proposed to offer a vision of how *design for longevity* (RSA, 2013: 34) could be realised. This is with an understanding that the other models need to be addressed through future research in order for the *circular economy* (RSA, 2013) to develop.

Overview

1. Chapters one and two map repair as a phenomenon in terms of the meaning, the ways it is practiced and the theory behind the practice.
2. Chapters three and four contextualise the issues that prevent the practice of repair being a social norm in the UK.

3. Chapters five and six explore opportunities for the repair practice to develop in the UK.
4. Chapter seven addresses the limitations of the research and makes recommendations for Defra and the CIWM and for future research.

The Findings

Repair is a restricted practice that has the potential to become a disruptive practice and be used as a tool to create longer and more meaningful relationships with products. It can create new opportunities for innovation and "transitions in practice" (AD Research, 2011:53) in the move towards a *circular economy*. Currently, repairing is impaired by an image problem and access problems, which have developed through competing with other more dominant practices (like manufacturing) that are supported by the current linear growth-based economy.

In order to be repairable products need to be *designed for longevity* so that they may be taken apart and their parts can be repaired or replaced. Information on how to repair products also needs to be shared and not restricted by copyrights or licenses. When both of these begin to be normal practices in the manufacturing industry it will be possible for repairing to become a social norm – as long as it is also re-framed as a valuable practice.

Emergent community-based initiatives are beginning to create new approaches to repair and encourage greater participation in the practice. Through their activities consumers are being activated to take ownership, repair and adapt their products rather than to acquire, use and dispose of them. Whilst attempting to repair a range of products the issues that prevent access are being highlighted and the measures needed to overcome them become apparent. This awareness raising is empowering individuals to change their consumption practices and if proliferated, repairing has the potential to change other more dominant practices in the manufacturing system, such as design practices.

If *designing for longevity* becomes a normal practice again, individuals would have greater agency to repair. It would also encourage more repair initiatives and services to emerge to fill niches in their communities. *Designing for longevity* could be the first step for transitions in practice towards a circular industrial system in which products are *designed for disassembly* (Braungart & McDonough, 2009:114) and these practices have the potential to create a shift towards a service rather than a consumption based industry. *Design for disassembly* opens up the possibility for *re-use in manufacture* and *material*

recovery (RSA, 2013:34) within a *circular economy*. This type of system would need support in the form of policies, education and a shift in the end of use emphasis from recycling to re-use.

To have greater impact and become a social norm:

1. Repairing needs to develop from being a marginalised practice and to be absorbed into mainstream education.
2. Community-based initiatives need to be given greater agency to enable innovative repair practices to emerge.
3. Individuals need to be able to choose from a variety of ways to engage in the repair practices that suit their lifestyles and their values.

The Recommendations

The recommendations derived from this research are that the CIWM should work with emergent repair initiatives to support their needs so that they might discover new territory for repair. This will enable them to innovate and advance the transition to a *circular economy*.

The recommendations to Defra are to create opportunities for collaboration between the stakeholders in the manufacturing industry (who represent a range of practices) and representatives of repair practice. This could be through forums, work groups and committees to find mutually beneficial solutions for going forward. This will enable the areas that require legislation to become apparent.

The Limitations

Repair is a complex phenomenon with far reaching implications, hence this thesis is concerned with presenting initial research and identifying the next stages of research. Research is now needed to understand:

1. The effect of re-framing repair in different contexts to see how it affects our relationships with our objects.
2. How repair can be incorporated into education at different levels.
3. How the repair practice can inform design practices in the development of *design for longevity*.
4. How *design for longevity* can transform our relationships with our products from consumers to owners, and how this could be facilitated.
5. How *design for longevity* could enable repair innovations and business models to emerge, and what they might look like.

6. How *design for longevity* could transition to *design for disassembly* and other design models for a *circular economy*.
7. Whether the manufacturing industry will respond to transitions in consumption practices, or whether government legislation is necessary to incentivise re-use over recycling and change manufacturing methods to *design for longevity* rather than obsolescence.
8. The different ways in which the CIWM could support community-based initiatives in establishing, running and growing repair initiatives, and the innovations that may develop as a result.

The Efficacy

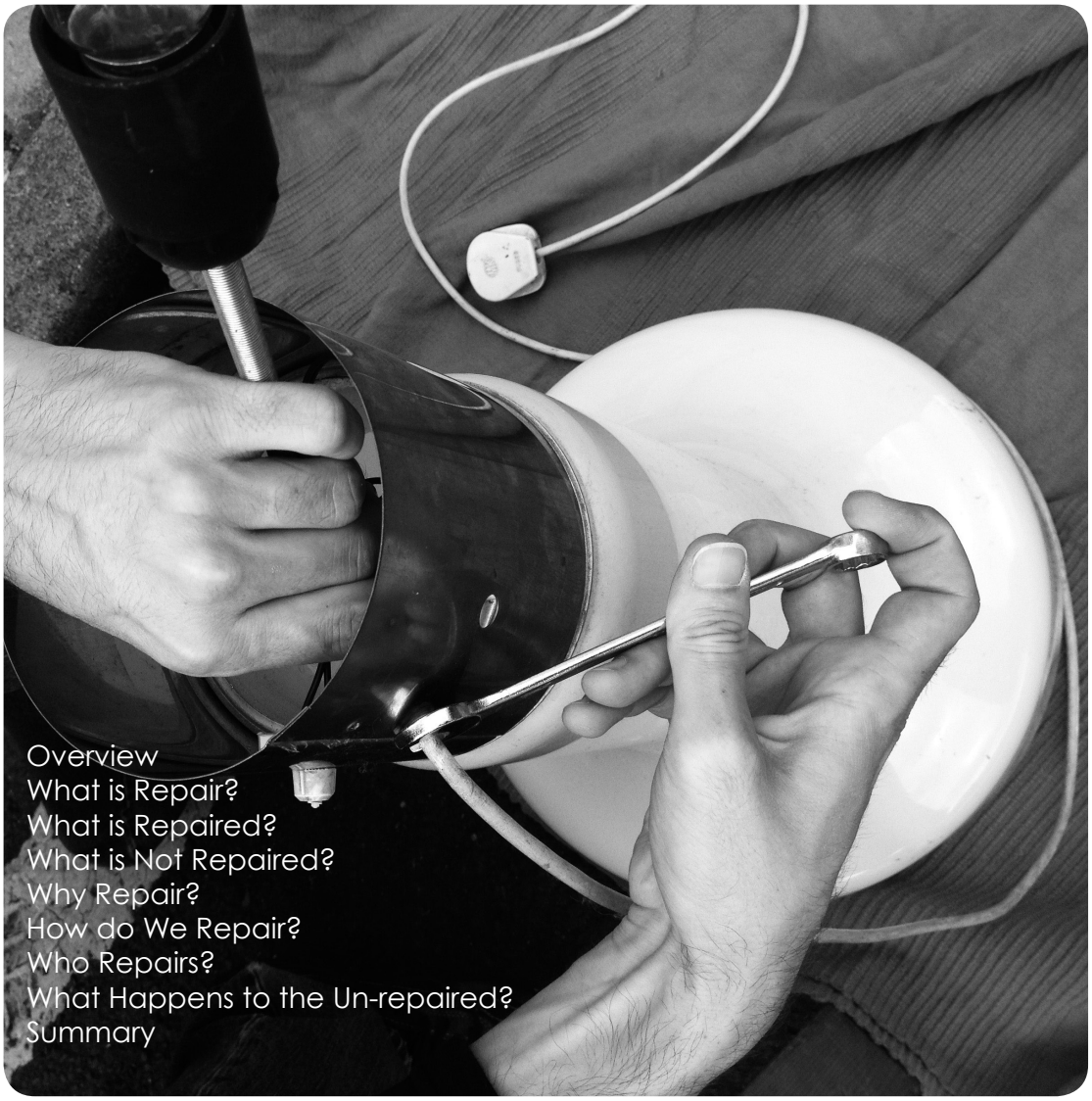
It has become apparent, through this research, that there are many complexly interlinked factors which prevent the occurrence of repair. These factors are the current growth-based economic model and the impact of repair as a practice that goes beyond the prevention of waste through the disposal of obsolete goods, and more critically prevents waste and resource depletion incurred through the production of replacement products. The wider implications of repair can be viewed in its ability to change consumption practices. The potential of repair is that it can affect the politics of inequality, our relationship to the things we acquire, the values we prioritise, the economic system and our ethics.

This research has also revealed that what happens before and after the performance of repair is equally as important, if not more so, than what happens during the act itself. This will affect whether repairing will occur, continue to be practiced and how it is valued as a practice.

In the short-term this research can benefit community-based initiatives and their communities as the value of their activities is identified and support for them is encouraged.

In the longer term if repair is understood as a tool for transition to a *circular economy*, the beneficiaries would be the "manufacturing sector [who] could realise net materials cost savings worth up to $ 630 billion p.a. towards 2025—stimulating economic activity in the areas of product development, remanufacturing and refurbishment" (Ellen MacArthur Foundation, 2012).

The Ontology of Repair



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Overview
This chapter will define the understanding of repair that will be used in this thesis as a starting point for further discussion in the following chapters.

What is Repair?
Repair is a reflexive practical response to something breaking, going wrong or no longer being useable, in other words becoming obsolete. This can be due to lack of care or maintenance, physical faults, age, use, over-use or loss of usefulness, and will be expanded upon in the chapter on 'A Restricted Practice'.

What is Repaired?
The first step in understanding the nature of repair is to consider what is being repaired during the action of repairing; what is at the centre of the performance of repair and therefore what is being acted upon.

> We are by nature a species that continually strives to repair ourselves and the world around us, whether through advances in medicine, through social, political and justice systems, or restoration and 'her-itage' projects. Philosophy, anthropology, economics, politics and ethics, they all come into the study of the nature of mending in all its manifestations. (Wall, 2012)

The main focus of repair in the context of this research, however, is upon tangible things that have been produced by human activity, i.e. things that have gone through the process of being transformed from raw materials or resources using processes of extraction, physical manipulation, design and engineering to convert them into products. Products include: furniture and furnishings, clothing, white goods, electrical and electronic items, transportation vehicles, and other goods that are not ephemeral or used up through fulfilling their purposes, e.g. ink.

According to WRAP (The Waste & Resource Action Program) 72% of small electrical goods are disposed of rather than repaired when broken. Therefore, it can no longer only be products which are depleted through use that are classified as 'consumable goods' because, according to Lawrence Carey, Chairman of the Whitegoods Trade Association, the term is now used to include whitegoods, as well as cheap electrical products, such as toasters and kettles with short lifespans (Carey, 2013). Due to these statistics there will be greater emphasis upon the repair of these types of products in the following pages.

What is not repaired?
For the most part products are designed not to be repaired and there is a lack of infrastructure in place to enable their repair to happen. The lives of most products are linear, going from *cradle-to-grave* (Braungart & McDonough, 2002:27) becoming waste at the end of their use. This issue will be explored in more detail later.

Why Repair?
In essence repair is a physical action that intends to keep something in a useable condition. For the purpose of this thesis repair and maintenance will be grouped together under the title of repair, although both could alternatively be called forms of maintenance, as they keep products in use and delay them from entering the waste stream.

Repairing can therefore be understood as a waste prevention method; but the implication for waste prevention goes beyond just preventing the product itself being disposed of. If a product is kept in use it means that it isn't replaced. The amount of waste generated in the production of new products is far more substantial when you consider that "the product itself contains on average only 5 percent of the raw materials involved in the process of making and delivering it" (Braungart & McDonough, 2009:28). Reducing the demand for new products will, through market forces, reduce their supply and therefore their production.

How do We Repair?
Restoring is the most commonly understood way of repairing something and it is an invisible act "because what you are really trying to do when you are repairing an object is to return it to its original state, simultaneously expending a lot of care, a lot of skill, a lot of time and effort, on an object and also [as the repairer goes] along they are actually erasing the process of their own work" (Glenn Adamson, 2013). However, the definition of repair can be expanded beyond restoration to include different re-use approaches:

> There are three ways to perform a repair: making a damaged object seem just like new, improving its operation, or altering it altogether; in technical jargon, these three strategies consist of restoration, remediation or reconfiguration. The first is governed by the object's original state; the second substitutes better parts or materials while preserving an old form; the third re-imagines the form and use of the object in the course of fixing it. (Sennett Together 2012:212)

This paper will use this expanded definition of repair in the following chapters to include restoration, remediation and reconfiguration.

Who Repairs?

We can either perform a repair ourselves, or have something repaired by others. There are several categories of people who perform repairs: those who repair products professionally either as an employee of a manufacturer or retailer, or as an independent repair professional, those who are volunteers for repair initiatives (these may come from the repair industry or not) or those who repair products who aren't professionals. These non-professionals can be divided into two levels of ability: skilful individuals who can repair a product themselves with expertise using their own hands to interact with and alter materials, or 'tinkerers' who try to repair products using what skills and know-how they have, or under the guidance of others.

Those who don't perform the repair themselves may seek out someone else they can employ (this may or may not be for financial return) to perform the repair (be they professionals, skillful individuals or tinkerers). This can either be due to tangible limitations, or a lack of motivation to perform the repair themselves. These issues will be discussed further in the following chapters.

What Happens to the Un-repaired?

Those who don't repair tend to either give away obsolete products (through re-use organisations like *Freegle* or *Freecycle*) to others who might fix and use them, or dispose of them by recycling, sending them to landfill or for incineration with other waste. WRAP's research shows that in a given year 12% of UK households will have a small electrical product break and dispose of it, 7% will have an appliance, 5% an item of clothing, 4% a computer/laptop/tablet and/or TV, 3% will have other textiles and 2% will have a broken sofa/armchair, a bed frame and/or a large item furniture that they dispose of (WRAP, 28.05.13).

In Brighton, due to incineration contracts, two thirds of the waste that is sent for recycling ends up being incinerated in order to fulfil the quotas that local councils have with the waste organisations, according to Robert Mantle-Jones the Director of the social enterprise 'Magpie' – a recycling co-operative that offers an alternative recycling service to the council run collections in Brighton and Hove (Mantle-Jones, 2013).

Summary
Repair is a physical response to a product that has become obsolete. It is important as a waste reduction measure not only from the perspective of preventing a product from being disposed of but also because it can reduce the necessity for a product to be replaced and therefore save on waste created in the production process. Repairing can be performed in various ways by a range of people, but can be prevented in the manufacturing stage of the product's life. Products that are not repaired may be given away for re-use, or enter the waste stream, where they may or may not be recycled.

The Narrative & the Meta-Narrative

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Overview
In this chapter an outline of repair at different scales will frame the activity and the practice of repairing, and the theory that underpins it from the perspective of this research.

The Repair Journey
The following *narrative* is a commonplace repair scenario, which will be familiar to many. It is not the only type of story; others may vary in order, opportunities or according to context, but will involve a similar need for logistic and evaluative decision-making. The intention of this scenario is to demonstrate that the physical act of repairing something is only one part of the journey we undertake with our products.

Before reaching the point at which the repair can be performed we have to make many decisions and there are various factors which will affect those decisions. These are all crossroads on the journey where we will either allow the product to continue on a path towards disposal or through our perseverance to repair will take a turning, which will enable us to put it back into use.

Whilst in the performance stage of the repair journey there are more of these crossroads and there may be dead-ends which force us to take the product down the disposal route.

Before Repairing
Before a repair can take place something has to break, or we have to deem it obsolete in its current manifestation. Then there needs to be an understanding that the product requires repairing for it to return to use.

> All repair strategies depend on an initial judgement that what's broken can indeed be fixed. An object beyond recovery, like a shattered wineglass, is deemed technically a 'hermetic object', admitting no further work. (Sennett, 2012:212)

This judgement, along with whether it is worth fixing and how quickly we need something that can fulfil its function will affect the decision of whether to repair the product or to discard and/or replace it.

Ascertaining the extent of the repair required will induce further reflection on whether the product can and is worth being fixed, or whether to discard it. Then there is the decision of whether to attempt to perform the repair

ourselves or find someone else who can (this could be someone known to us, a repair professional or the manufacturer).

If it's the former then we need to make the necessary time and space to perform the repair. If it's the latter we need to seek the necessary person to perform the repair. According to WRAP's research finding someone to perform the repair is most likely to come from our own knowledge (from previous experiences) or through word of mouth from others' experience (WRAP, 28.05.13).

Then we either arrange a time and have a method of taking the product to them and conduct the delivery ourselves, or find someone else who can and arrange a time for them to collect the product and be available for that collection. Or, if we make an arrangement for the repairer to come to the product, we must be available to receive the repairer and ensure there is space for them to perform the repair.

Performing the Repair

During the performance of the repair, whoever is doing the repairing needs to establish why it has been deemed as obsolete, and be able to access the necessary information (from their own knowledge or other sources) on how to repair the product. They also need to be able to access the necessary tools (from their own tools or other sources) and engage with the material components of the products in order to diagnose the problem before deciphering the best course of action to solve the problem.

There must be some way to access the components of the product that needs to be repaired and the tools and materials to repair it. The components can then be repaired or replaced (then the product may need to be put back together) before deciphering whether the repair is complete and putting the product back into use; if it isn't fixed the performance can be started again depending on the strength of the motivation and limits to time.

The Practice of Repair

The repair journey with its many stages and crossroads sits within and is affected by a much larger territory of repair as a social practice and a psychological behaviour.

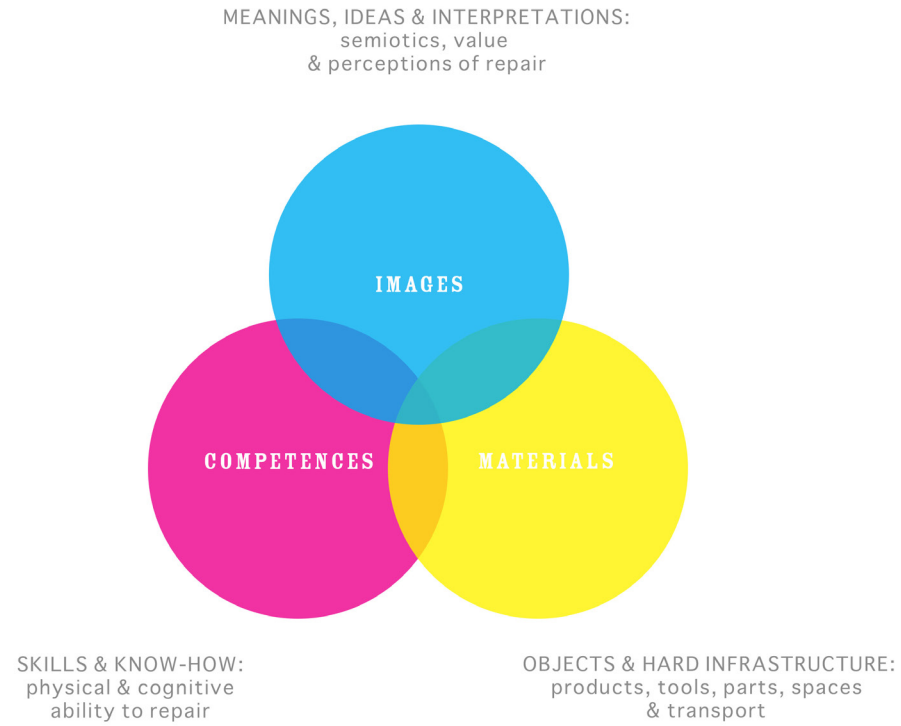
> Practices are psychosocial phenomena, ways of living that people in a community share. The component norms of these practices, including ethical norms, are also psychosocial in nature. The norms as they exist in individuals consist in know-how, tendencies to act, generally tendencies that are complexly organized in groups. The activity that expresses these tendencies is typically participation in a practice. (Wallace, 2009:2)

The norms of the repair practice are demonstrated in the participation in repairing.

Practices are made up of:

> Materials (objects, hard infrastructure), Competences (skills and know-how) and Images (meanings, ideas and interpretations)… the practice is emergent, and represents the coming together of those elements in the moment at which the individual reproduces the practice.' (AD Research & Analysis, 2011:4)

This means there isn't a rigid definition of the practice and how it is formed but that it is constantly changing.



Within the practice of repair the materials are the products and their components, the tools and space needed to fix them and the means of transportation that bring the repairer and the obsolete product together e.g. trolleys, cars, buses, bags etc.

Competences are the skills and the know-how required to repair something. These competences are developed through observation, experience and education and "since practical knowledge that constitutes practices is based upon the experience of people, it is a body of empirical knowledge" (Wallace, 2009:2).

The images referred to can be understood as the *semiotics* of repair. What the term repair signifies for each of us will vary according to our understanding of the practice and our personal experiences. This can be our understanding of the physical act: what is repaired, by whom, and how. WRAP warns that in the communication of repair we should "use the term 'repair' with caution, as the act of repair means different things to different people - from DIY maintenance to instruction of professional repair services' (WRAP, 28.05.13). The images also consist of our concepts of what it means to repair something or why we repair; as with the practice as a whole, none of these meanings are fixed. How these images are created and altered will be addressed in the following chapters.

The Motivation to Repair

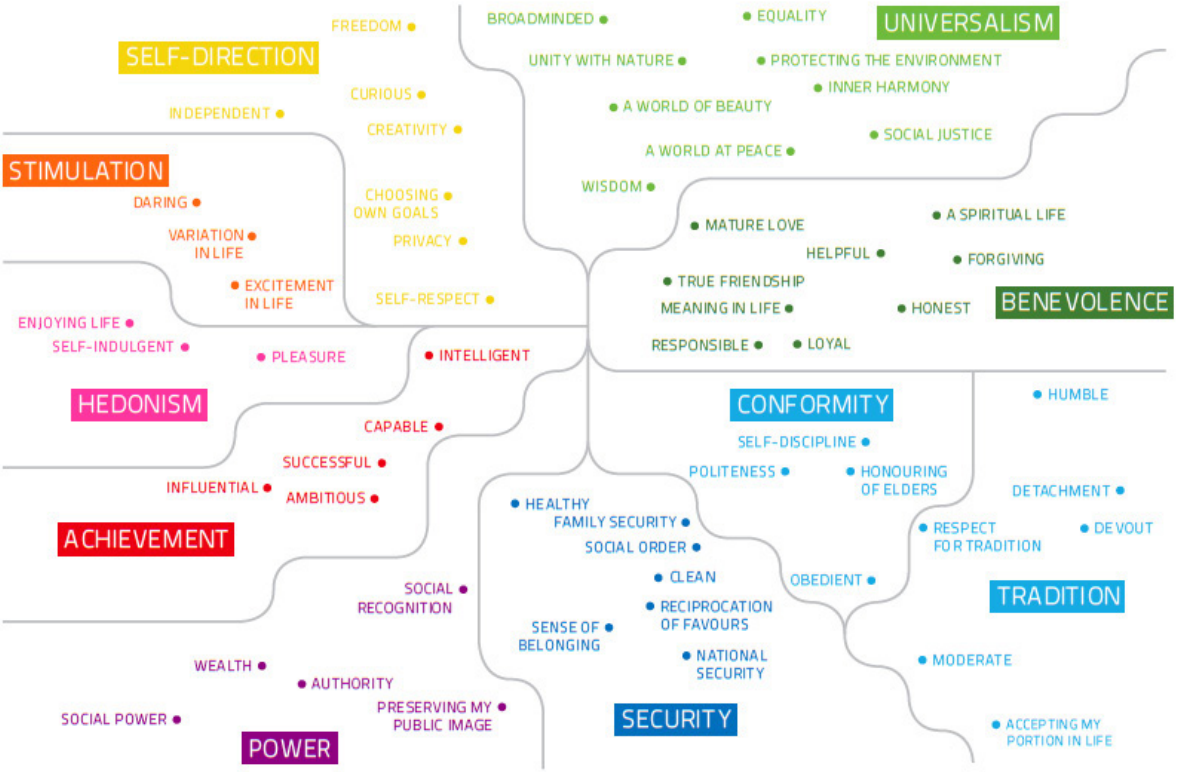
Repair is a practice in which the participants demonstrate "'responsibility' towards certain products and may have an 'ethic of care'" (Brook Lyndhurst, 2011:20). This sense of responsibility is often demonstrated when there is a perceived value in the product. According to one of the organisers of the Repair Café Foundation, participants in the *Repair Cafés* in Amsterdam over the past five years have tended to bring products that they have an emotional attachment to (Buenting, 2013).

The motivation to repair varies between individuals, and although repairing is a method of waste prevention, "environmental benefits are neither spontaneously thought of nor perceived to be especially motivating" (WRAP, 28.05.13). It is the need to have something working again, the costs (absolute and relative), convenience and, to a lesser extent, enjoyment that drive individuals to repair products (ibid).

It is apparent in the behaviour of Brighton Repair Café participants that the products brought to repair are those that are highly valued in use and are

deemed as difficult to replace either due to emotional attachment (the memories or people associated with them), access to replacements (rarity or difficulty of exact replacement) and/or the cost of professional repair or replacement.

> In both action and thought, people are affected by a wide range of influences. Past experience, cultural and social norms, and the money at our disposal are some of the most important. Connected to all of these, to some extent, are our values—which represent a strong guiding force, shaping our attitudes and behaviour over the course of our lives. (PIRC, 2012:8)



(PIRC, 2012:13)

According to the PIRC (Public Interest Research Centre) (2012) cross-culturally we have consistently occurring human values (see illustration above); we all share the same values but differences in behaviour occur through the variation in our prioritisation of them.

If we perceive that a practice embodies values that resonate with our prioritised values, it is more likely to be a behaviour we will participate in. The images, or what repair signifies to us, in terms of values will therefore affect whether we will participate in the practice. For example, if repair represents waste prevention for us and therefore "protection for the welfare of all people and nature" (PIRC, 2012:14) it may appeal to our 'Universalism' values (ibid). If however disposal and replacement are symbols of 'pleasure and sensuous gratification for oneself' (ibid) then repairing our products could contradict our 'Hedonism' values (ibid).

In the context of the repair narrative, our decisions over whether something is worth fixing, or not, would therefore depend not only on whether 'Hedonism' or 'Universalism' (ibid) were our priorities, but also on what repair represents to us. In other words, it is our perceived image of repair and whether that image is aligned with our heightened values that will affect whether or not we are motivated to participate in the practice of repair. Whether we are then able to participate will be addressed in the following chapters.

The variation in our prioritisation isn't as a result of inherent individual values, as "we tend to do what those around us are already doing" (Dolan et al., 2010:7). If we see or hear that others are throwing things away when they are broken and buying newer versions we are more likely to do the same ourselves. Equally, if we see others repairing things to keep them in use we are more likely to be motivated to follow suit. Also:

> Our experience of various aspects of our society will help strengthen particular values… Communications, policies and institutions that embody particular values are likely to have the effect of cultivating those values (and discouraging opposing values) and associated behaviours over time. (PIRC, 2012:30)

These aspects along with exposure to what other people are doing create social and cultural norms:

> Social and cultural norms are the behavioural expectations, or rules, within a society or group… People often take their understanding of social norms from the behaviour of others, which means that they can develop and spread rapidly through social networks or environmental clues about what others have done. (Dolan et al., 2010:7)

The Ethics of Repair

Because our experiences cultivate particular values the participation in any practice can be self-enforcing. The more we engage with repair the more our values will be aligned with those values repair practices embody and this will affect how we view (or the image of) other practices.

> Prioritising intrinsic values such as freedom, creativity and self-respect (self-direction values), or equality and unity with nature (universalism values) is closely related to political engagement, concern about social justice, environmentally-friendly behaviours, and lower levels of prejudice. (PIRC, 2012:24)

This can be understood as a shift in *paradigm* or *ethics*. Therefore at a *meta-narrative* level repair could be seen as an ethical approach to life embodying and promoting *eco-centric* rather than *anthropocentric* values with "a worldview that acknowledges the inherent value of non-human life. All living beings are members of ecological communities bound together in a network of interdependencies" (Capra, 1997:11).

Summary

The repair narrative involves negotiating a complex journey. There are many opportunities on this journey for a product to take the path to disposal, avoiding this may involve finding and embarking on new and unfamiliar routes.

The decisions made at the crossroads on our journey with the products are based on and affected by the materials, competences and images of the repair practice. Our values will influence whether we undertake the repair journey with that product in the first place and will affect how tenacious we are in negotiating a more complicated journey rather than taking the product down the (often more convenient) disposal route. These values are part of a broader ethical understanding of the world and our relationship to it.

A Restricted Practice

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Built for the Grave
Taking Secrets to the Grave
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To undertake the repair journey the image of repair needs to resonate with our values. Once on the journey we need access to the materials and competences of the repair practice, otherwise we come across dead-ends.

However, repair has an access and an image problem. In this chapter the causes of those problems will be identified in order to understand how they block access and create detours to restrict the repair journey.

Whereas the previous chapters gave an overview of how repair can be understood, this and the following chapter begin to map the current context of repair. Suggested solutions to the problems raised in this chapter will be offered in later chapters.

In Pursuit of Economic Growth

In post-World War II Britain, the push for economic growth created a post-austerity celebration of consumption that began to erode the *make, do & mend* practices that had developed out of necessity during a period of austerity. This drive for increased consumption was echoed in other western countries, like the United States where economist were critiquing mass advertising and mass consumption which promoted products to be "consumed, burned up, worn out, replaced, and discarded at an ever increasing pace" (Lebow, 1955:7).

Increased consumption was prioritised because, as Vance Packard wrote in 1960:

> During the post-war years, the amount of goods and services that one man can turn out in an hour has increased about three per cent every year. This increased output can be absorbed if each citizen consumes more, or if there are, each year, more citizens. Otherwise there will be less work. (Packard, 1963:22)

The increased supply, as a result of mass production, required increased demand to prevent saturation of the market. This would ensure the economies in these countries continued to grow "thus the challenge was to develop a public that would always have an appetite as voracious as its machines" (Packard, 1963:32).

As a response to mass production, premature obsolescence of products became a necessity in order to encourage more purchases. Vance Packard

called this "Progress through Planned Obsolescence" (Packard, 1963:57).

Designed for the Grave

We currently have "an industrial system that is designed on a linear, one way *cradle-to-grave* model. Resources are extracted, shaped into products, sold, and eventually disposed of in a "grave" of some kind, usually a landfill or incinerator" (Braungart & McDonough, 2009:27).

Planned obsolescence is designed into the manufacturing processes of many products and it is evident that the reduced lifespans of products are ever shortening. Lawrence Carey has witnessed this first-hand:

> When I first came into this industry… you could expect 10-20 years from a washing machine then in the 1990s it got down to 10-15 years and then in 2000-2005 you were coming down to 7 years then from 2005 to now… we are actually writing machines off at 2.5 years old. (Carey, 2013)

This could be seen as creating opportunities for repair practices to thrive. However, there are other factors at work in the way the products are made that prevent this from happening.

Built for the Grave

Obsolescence can be built in to the life expectancy of a product as well as through the restriction of access to the materials and competences to repair them when something 'goes wrong'. "If the country of manufacture by design carries out repairs on their own products then you will find that the product which is imported into the UK will be repairable" (Dales, 2013), in other words *designed for disassembly*. If not it will be designed to have a short lifespan, it will be difficult (or impossible) to repair and it will need replacing sooner.

The restriction to the individual's ability to repair may not be the primary intention, but access issues are created as a result of production methods. Using sealed units on the assembly line is perceived as the most efficient approach to manufacturing. However, sealed units restrict access to repairing parts and require the replacement of whole units within a product:

> Because the machine is being built from the perspective of the manufacturer who wants to get that machine built as quickly as possible and as cheaply as possible the production processes actually prevent the repair of the product in the long term. (Carey, 3013)

Taking Secrets to the Grave

With technological advances and the transition from mechanically to electronically produced and functioning products, the complexity of products has increased. The alienation of the individual from the workings of their products echoes this trajectory, making access to information increasingly important for the competences of the practice of repair.

In the past a repair manual would come with new electrical goods; this is no longer the case, and according to repair engineers much of the information about how to repair specific products are well guarded secrets within the industry. According to Graham Dixon, Technical Director of EEESafe, in the past "you could repair a lot of other people's products but [now] you are restricted with any technical information from doing so unless you have been authorised by them" (Dixon, 2013).

Kyle Weins, Founder of iFixit, believes that in order to create access to the materials and competences to repair:

> Service and repair information needs to be free. The world desperately needs to know how to fix these products. Electronics repair is critically needed to solve the e-waste crisis; it helps bridge the digital divide by keeping secondhand electronics and developing countries' markets alive; and it accounts for hundreds of thousands of jobs in the United States alone. (RSA 2013:10)

The Ghost in the Machine

Another (and somewhat more prolific) way that product churn is created is through "planned obsolescence of desirability" (Packard, 1960:58) which entails shortening the life of a product through the perception of its worth. Making a product lose its worth faster will ensure it will be perceived as obsolete before it is physically.

Our "values can be temporarily "engaged", when brought to mind by certain communications or experiences – and this tends to affect our attitudes and behaviours" (PIRC 2012:18); thus advertising on behalf of brands and companies has been a powerful force in affecting which values we prioritise. "Extrinsic values [that] are centered on external approval or rewards" (PIRC 2012:20) are promoted, enhancing values like 'social status', 'prestige', ' material success', 'wealth' and 'concern about image' (ibid). By linking the purchasing of new products to these values the practice of consuming has become prolific.

"Individuals are locked in to their current practices not just by the infrastructure but by the practice itself, which at the same time they help to (re)produce" (AD, 2011:40). This *ouroboros* loop has made consuming the social norm.

As Lebow wrote in 1955, "The measures of social status, of social acceptance, of prestige, is now to be found in our consumption patterns. The very meaning and significance of our lives is today expressed in consumption terms" (Lebow, 1955:7).

Re-enforcing the image of the practice of consuming through mass advertising has tarnished the images of money-saving, resourcefulness and repair practices. "Ask your Grandma, in her day *stewardship*, resourcefulness and thrift were valued… so how did this happen? It didn't just happen it was designed" (Leonard 2007:10).

The values associated with the practices of consumption and repair are in opposition and "a value must not be in competition with another value that is more strongly held, more strongly engaged, or seen as more relevant at the time" (PIRC, 2012:40). Therefore the promotion of consumption has given repairing an image problem.

The Economic Divide

Because of the physical nature of performing a repair there is a necessity to access the materials to do so. These require access to the time, space and tools to repair, and can create economic divides between those who do have access and those who do not. The costs of tools and space to perform repairs and the cost of the time, which could otherwise be spent earning money, dictate whether it is possible for an individual to perform repairs themselves.

These financially-driven access issues make individuals more dependant on professional repair services. However "It is often cheaper to buy a new version of even the most expensive appliance, than to track down someone to repair the original item" (Braungart & McDonough, 2009:27-28).

Exacerbating these issues is the quality of the product the individual can afford in the first place. Cheaper mass produced products, which tend to have shorter lifespans are generally sold to people with lower incomes who are prevented from acquiring better quality products with longevity (deemed worth repairing) due to price. Those who can afford to make a choice to buy better products are also more likely to be able to buy warranties and have products serviced regularly (Fletcher, 19.03.13).

The Elephant in the Room

Within the arena of waste prevention and reduction "repair is the *elephant in the room*" (Fletcher, 7.7.13) according to Cat Fletcher, National Representative of Freegle and Resource Co-ordinator for the Brighton Waste House. But perhaps this could be viewed the other way round; it is actually the prevalence of recycling that is the *elephant in the room* and this in turn is restricting the practice of repair.

There has been a strong drive to promote recycling over the past decade through campaigns and government directives. Despite the 2011 EU Waste Framework Directive prioritising prevention and preparing for re-use above recycling in the waste hierarchy, recycling is still regarded by the general public as the waste prevention alternative to landfill or incineration (WRAP, 21.06.13).

"The issue that [the Whitegoods Trade Association] have with recycling is that the consumers' perception of recycling is that I've handed my product over and it's going to go to a good cause" (Carey, 2013). This image alleviates any concerns over waste an individual may have and can encourage us to waste and replace more of our products. It also has implications for the image of repair.

Recycling is more convenient than repairing due to the ease of access to recycling routes compared with the access problems and economic motivations that discourage repair. As recycling appears to be doing the same thing as repair – essentially putting our old goods back into use – recycling is the preferred option for those who don't want to 'bin' obsolete products (Carey, 2013). However, the recycling process is more resource hungry and less efficient than re-use.

The lucrative economics of recycling are restricting the practice for repair professionals:

> Electricals are worth so much as scrap, it's really very hard to stop it going down the scrap route which means it ends up travelling the world in the process. It's really hard to break that because it has become so valuable and because of the legislation to encourage the collection of it not the repair of it. (Mantle-Jones, 2013)

According to Robert Mantle-Jones, the contracts (with private waste companies like Veolia), which bind local councils to recycle and incinerate,

are preventing re-use and repair from ever becoming more prevalent.

> To keep that recycling machine going there has to be a short lifespan because what you actually want is that product to fail to a degree where it is not worth repairing, so that it can get into the recycle stream, which is the scrapping stream. (Carey, 2013)

The 2006 WEEE (Waste Electrical and Electronic Equipment) Legislation requires that manufacturers take out of the market the same number of products they put into it (Carey, 2013). In order to keep putting new products into the market, producers have to recycle those that have already been put into use. Therefore legislation is creating more motivation for producers to create barriers to repair, "with the products going out there's very little technical information and repair availability and parts availability, so actually they are getting to the end of their life very quickly then entering the recycle stream" (Carey, 2013).

Summary

The drive for growth in the current economic system has led to the creation of access and image problems by the manufacturing, and the advertising industries. Legislation on recycling has exacerbating these problems. Altogether these influences restrict the ability of individuals to embark upon repair journeys with their products. Access issues must be addressed if it is going to continue to be possible to take the repair journey.

A Lost Practice

Overview
A Loss of Competence
The Educational Hierarchy
The Breakdown of a Community
The Loss of Habit
Summary

Overview
This chapter will identify some of the main implications the restrictions discussed in the previous chapter have had on the repair practice.

A Loss of Competence
Practices are empirical knowledge, as established in the chapter on 'The Narrative & the Meta-Narrative of Repair'. They "have a history. Generally they exist before we come on the scene, and we are inducted into them by others" (Wallace, 2009:1). Practices exist because they are passed down from previous generations (traditionally through family structures in western societies).

As the practice of consumption has become more prolific, the practice of repairing began to be lost and with it some of the skills and know-how competences). According to current research only older age groups now have the skills required to repair clothes (Fisher et al., 2008; Tonglet et al., 2004). This deskilling has had a ripple effect as "learning the practice is both acquiring practical knowledge and acquiring norms. The knowledge acquired is based on experience—for the most part it depends on the experience of others that is then passed on to us" (Wallace, 2009:1).

The rapid decline in the practice has had a cumulative affect. It has lead to a situation where the competences of the practice of repair are not being transferred between individuals, and are in danger of becoming extinct.

Surveyed members of the Brighton *Freegle* community are already involved in re-use practices (giving them away when they are no longer wanted or needed) and are motivated by the drive to reduce waste. When asked about their repair practices, the majority of the respondents expressed that although they occasionally knew how to repair their things themselves, they would like to be able to fix all of their things. The biggest barrier for the overwhelming majority was knowing how to.

The Educational Hierarchy
Compounding the issue over the transfer of competence is an image problem that exists in education. The hierarchy of mind over body has meant a prioritization of thought put into words, over "the intelligent hand" (Sennett, 2008:149) and this has de-valued practices of the hand (Lucas, 2013 & Francis, 2013).

This hierarchy was made especially apparent last year by the announcement

by Michael Gove, the Education Secretary, of plans to remove art and design subjects from the curriculum as part of the move towards the English Baccalaureate system in which only 'academic' subjects (English, mathematics, history or geography, the sciences and a language) would be graded for the qualification (Department for Education, 2013).

This is a sign of the continued de-valuing of hand skills considering:

> The original meaning of [the 3Rs] was completely different in Regency times, at the beginning of the 19th century. The three Rs were reading, wroughting and arithmetic – in other words, literacy, making things and numeracy…And then in the era of Mr Gradgrind and the Great Exhibition of the 1850s, the wroughting got dropped in favour of writing. (Frayling, 2004)

Because manual problem-solving skills have been de-prioritsed in education there has been a further loss of know-how, skills and value in repairing. This is evident in the difficulty there has been in finding individuals with repair competences to volunteer at the Brighton Repair Café, which has been one of the biggest issue in attempts to scale up the initiative.

The Breakdown of a Community

In the previous chapter on 'The Narrative & the Meta-Narrative' it was established that practices are made up of three elements: materials, competences and images. However, this is not the whole picture, as no practice can exist without a community of individuals keeping it alive.

The repair community can be understood as one formed around a common practice but made up of different ways of practicing repair by a range of practitioners. Manufacturers, repair professionals, repair initiatives and individual repairers (experts and tinkerers) create a global community of repairers.

Because "trust requires reciprocal respect" (Burnham, 2011:5) the access issues such as built-in obsolescence have reduced the trust we hold in manufacturers and also in the repair professionals who are either unable to repair our products, or have to charge prohibitive fees due to not having access to materials and competences to perform the repairs.

A community of repairers can also be localised around a geographical area. One participant in the Brighton Repair Café recalled her childhood street

where it was commonplace to ask a neighbour to help repair their things. Each neighbour would have a different area of expertise and could be called upon when required. In this situation the community supported an individual's repair practices.

However, due to the dominance of extrinsic values promoted by mass advertising (as discussed in the previous chapter on 'A Restricted Practice') we have become more concerned about our individual needs than the needs and interests of our community. Repair, like most "waste prevention behaviours [is] largely unseen and undertaken in the privacy of our own home" (Defra, 2011), making it a private practice when undertaken by skilful individuals or tinkerers. When products are repaired by repair professionals, and especially by manufacturers, the repair is also normally performed behind closed doors, making it a private practice even when it isn't a domestic one.

Putnam speculated that as our pursuits shift from public to private the trust in society decreases (Putnam, 2000). This loss of trust has caused a breakdown of repair communities both locally and globally.

With mass production, globalised communities and privatised pursuits has developed a loss of personal interactions and responsibility. Whereas:

> Going back 20 years, if your washing machine broke then your local guy came out and fixed it, and if you decided to buy a new one, you would buy it from the local guy who would take away your old one, fix it and sell it again. (Dales, 2013)

Now we generally buy from faceless companies, through big warehouses. When something goes wrong with our products, we often have to phone call centres that could be anywhere in the world to find out whether it can be fixed, or source a professional repairer with the specialism to deal with the problem through internet searches.

However, as professional repairers find it harder to access products, materials and competences to repair, they go out of business, resulting in a scarcity of professional repairers and therefore less repair choices for individuals:

> In the last 10 years our industry has gone from approximately 15,000 independent service companies down to 7,000. In the last 10 years we have lost 50% of our ability to repair the appliances. There are a number of aspects involved in this: built in obsolescence, the ability

> to get spare parts, the ability to repair things and many other little things that have slowly pecked away at the system until we find ourselves almost redundant and if something isn't done shortly, you as consumers will find yourselves in the position where you won't have the ability to get a repairer. (Dales, 2013)

The Lost Habit of Repair

A practice "regarded as practical knowledge in individuals, is a complex instance of what John Dewey called a "habit"" (Wallace, 2009:16). Habits are "barriers and drivers" (AD Research, 2011:20) which determine how we behave. They can override our intentions (ibid) and be out of line with our values in certain contexts (PIRC, 2012:2).

Beyond the competences, materials, images and community of a practice there is a necessity for regular participation and habit-forming for an individual to develop that practice. Habit, however "requires frequency, automaticity and a stable context" (AD Research, 2011:3): the problems with access and the image problem of repair, along with the loss of repair communities, create an unstable context. This prevents repairing from being an automatic reflex and it also prevents frequent participation in the practice.

Summary

The restricted access and image problems of repair have created a situation where the routes to repair are being wiped off the map. This is leading to a situation where we no longer know how to go about embarking on the repair journey let alone overcoming the barriers and diversions that are in place along the various routes.

Occupying Our Objects

Overview
Re-territorialisation
The Right to Repair
Empowerment of the Individual
Co-evolving with Our Things
Overcoming Addiction
Re-making versus Repair
Re-making is Thinking
The Role of Design
Summary

Overview
This chapter outlines proposals to change our relationship as consumers with our products, in order to find new ways to embark on repair journeys.

Re-territorialisation
The majority of products reach the individual through their purchase, others may be received as gifts, hand-me-downs, or through *re-use* channels, at which stage they become the possession of that person.

The word 'consumer' is often used to describe us as people; "our primary identity has become that of being consumers, not mothers, teachers, farmers, but consumers" (Leonard, 2007:9). Consumption, the behaviour of a consumer, implies the 'using up' or depleting of a product and communicates that this is normal behaviour.

> Consumption may be viewed as a process in which we attempt to know, familiarize and ultimately, outgrow the wonders of artefacts… Waste, therefore, is as much a part of the consumption experience as are purchase and use, since it is evolution made tangible. (Chapman, 2005:48)

Ownership, however, implies an on-going responsibility for a product rather than the depletion of it. Shifting the label of individuals from 'consumers' to 'owners' could be pertinent to how we understand our roles in society and our relationships with our products. After all an "important aspect of any discourse is its vocabulary" (Krippendorff, 1995:139) and it can reveal a lot about how we understand the world around us.

The Right to Repair
Before a product becomes obsolete, it functions. This doesn't mean that it simply performs some kind of action or task like keeping us warm, boiling water, getting us from A to B, etc. Its function can also be its aesthetic or symbolic (or *semiotic*) value i.e. what it says about the person who owns, uses or wears it. Products function through both their ability to perform an action or task and their symbolic value. When a product becomes obsolete, we still own that object and its materials components and we have the right to take it apart and make changes. That right is discouraged through the issues of image and access as discussed in the previous chapters.

In attempting to perform repairs ourselves the restrictions placed on access to the competences and materials becomes *visceral*. This realisation has the

potential to activate individuals to challenge manufacturers who have taken away those rights, voting with our choice of purchases. These monetary votes can apply pressure on manufacturers to change their methods of production and make products repairable.

Empowerment of the Individual

According to WRAP when asked about why they were discouraged from giving away their obsolete furniture 31% of those surveyed felt that "it wasn't broken but wasn't in good enough condition to be used by someone else" (WRAP, 14.05.13). Whilst 22% responded that it was both "broken/in need of repair and I did think anyone else would want this item" (ibid). These figures demonstrate a perceived loss of value in the obsolete products.

Engaging physically with the make up of our objects through repair means that our understanding of the material components that make them is increased. This has the potential to heighten our sense of responsibility for them, increasing their value even after they have become obsolete and this may encourage other re-use practices (like passing on to others) to proliferate too. According to WRAP, currently *Freecycle* has some popularity amongst the younger and middleclass demographics but is not used as widely as expected (ibid).

Insights that are gained through the performance of repair can transform a product from an object with a static identity into materials and components with agency to become something else. These insights challenge the *taxonomy* of products, but also the concept that they can be 'used up' or lose all value, turning them instead into objects that have the potential to evolve with parts or components that are resources and not waste.

> The spectacle of dead goods coming back to life isn't just useful—for the locals, it's transformative. "I was a totally different person after they fixed my laptop," says Nicole DeLuca, a filmmaker who had her MacBook repaired last year. "It made me realize I didn't need to buy new every time something breaks." (Thompson, 2013)

This transformative effect on individuals has been observed repeatedly in the Brighton Repair Café participants, as the practice of repairing turns them from passive consumers of products into owners of objects and enables them to *re-appropriate* their objects.

> If you can't open it, you don't own it; and what's worse is that if you can't or won't open it, then you're not fully grasping the actual impact of and potential for that device. What is more, your creativity and inventiveness is tossed aside and you are told what you will want, when you will want it. (Heimbuch, 2013)

Repairing is therefore a disruptive practice that can have a transformative effect on the person participating in it. It has the propensity to create a power shift from the designers and manufacturers of the products to the owners who through repairing are able to make decisions about the products, reducing the dependency of the owners on the manufacturing industry.

Co-evolving with Our Things

> Most products within the current model of design are static, possessing non-evolutionary souls; we as users, on the other hand, are anything but static and exist within a restless state of continual adaptation and growth. (Chapman, 2005:67)

This disparity is the cause of much waste through perceived obsolescence. Repair in terms of reconfiguration, however, can overcome this. In performing repairs we evolve as owners through the transformative effect mentioned above. Ownership can also become a process in which our products evolve with us as they are adapted through repairing. This evolution can reflect the change in needs of the owner over time and therefore owner and object are able to co-evolve.

> Objects capable of sustaining long-lasting relationships with consumers are rare. Most emotional attachments are withdrawn once the honeymoon period draws to a close. This is largely because the evolution that takes place is
> grossly polarized, occurring almost exclusively within the user. (Chapman, 2005:66)

This co-evolution has the potential to increase the "emotional durability" (Chapman, 2005) of the objects we share our worlds with and fulfiill "the enduring human need for the absolute ownership of things" (Chapman, 2005:182). Embedding our stories into our objects as we repair them, we begin to occupy our objects. This personalised experience of a product can improve its longevity, not just because it can function and therefore be used for longer but also because it has the potential to be an on-going process and "consumers will continue to mine the experiential layers of an object just as

long as there are further layers to be mined" (Chapman, 2005:37).

This evolutionary process could be a powerful waste reduction method considering that keeping something in use for longer will prevent replacement and it is actually the amount of resources wasted in the production of goods, rather than the disposal, which has the greatest environmental impact through resource depletion. For example, "innocuous objects such as plastic toothbrushes are heavier than expected, with more than 1.5kg of raw material used in production" (RSA, 2013:8).

Overcoming Addiction

Consumption suffers from "hedonic adaptation" (Irvine, 2009:66) whereby the increase in levels of happiness or satisfaction felt by purchasing new products soon return to lower levels after "the honeymoon period" (Chapman, 2005:63) creating an addictive cycle through the pursuit of further fixes from further new products. According to Jonathan Chapman:

> Material consumption is driven by complex motivations and is about far more than just the acquisition of newer, shinier things. It is an endless personal journey toward the ideal or desired self that by its very nature becomes a process of incremental destruction. (Chapman, 2005:30)

This insatiable thirst could be quenched, at least in part, through co-evolution with our products. If products are no longer static and are instead in an on-going process of evolution, when satisfaction with a product diminishes that product could then be reconfigured. This has the potential to break the destructive cycle of addictive consumption.

Re-making versus Repairing

The products we surround ourselves with are symbols of how we see ourselves and how we would like others to see us, and "the covetous search for the ultimate expression of self as mediated through manufactured objects appears to be endless" (Chapman, 2005:30).

The desire for self-expression is fulfilled through opportunities to express ourselves creatively. If repair is re-framed as a creative activity rather than a duty, or a chore, it could become more prevalent. "Ultimately, the real challenge here isn't technological. It's cultural. Can fixing be made sexy? Can we make it delightful to preserve things?" (Thompson, 2013)

The global *Maker Movement* is doing this by encouraging and sharing experiences of hacking objects at *hackspaces, Maker Faires* and through an active online community. However, they have a tendency to use new products and technology rather than hacking products that have become obsolete.

> Creation and engagement in practical activities, particularly the promotion of creativity for its own sake (and not for rewards or recognition), are often strongly related to self-direction values, which in turn tend to be strongly related to values supportive of social and environmental justice. (PIRC, 2012:50)

The self-direction values which emphasise "independent thought and action - choosing, creating, exploring" (PIRC, 2012:15), can be aligned to the empowering and creative act of repairing products. By re-framing repair as re-making the image of creativity and problem-solving attached to the making process (which are also essential for repairing) can be transferred through association to the image of repairing.

Additionally, through participating in the creative act of repair or re-making, self-direction values can (temporarily) be prioritised to affect attitudes and behaviour around repairing and "over time, repeated engagement of values is likely to strengthen them" (PIRC, 2012:30).

Re-Making is Thinking

The next stage then is to overcome the hierarchy of head over hand. If, within the education system, the image of manual work was improved, then values like "concern about image" (PIRC, 2012:21) that are attached to the image of consuming could be associated with the image of making.

Making is strongly linked to *kinaesthetic* learning styles (Flemming, 2001); as such re-introducing wroughting as a fourth 'R' in education would ensure a more inclusive program of study that catered for a greater range of students in which making resumes its rightful place as a foundation skill for educational development as an important aspect of an all-round education.

Richard Green, Chief Executive of the Design and Technology Association, believes that the recommendations made by his organisation and Education for Engineering which have informed a revised programme of study for Design and Technology for Key Stages 1-3:

> will provide an impetus to move the subject forward, for the benefit of individuals and business and industry. This is a curriculum that challenges children and young people to design and innovate, providing the essential knowledge and skills to participate successfully in an increasingly technological world' (Design and Technology Association).

Previous to these recommendations, repair and maintenance were to be incorporated into the same curriculum in the 2014-15 academic year. However, they "have been replaced by an increased level of technical sophistication" (ibid). This revival of the image of making is valuable in redressing the educational hierarchy. However, to ensure that design and innovation is taught with an awareness of the wider implications of generating new products the design process needs to be contextualised to consider what happens at the end of products' lives as well as where the resources to make products come from. This is a much more intellectually challenging and important process that would embed *ecological literacy* into the learning process (see next chapter).

If one follows the premise that occupying our objects is one of the ways to counter-balance the increasing rates of product churn and create longer lasting and more meaningful relationships with our products, then the repair and maintainance of products need to be taught in schools. Because (unless there are rapid changes in manufacturing and consumption practices) the generation who will engage in this program of learning will need the skills and competences required to repair, to deal with products becoming obsolete more than any generation before, as advances in technology increase the rate of product churn.

The only way for repair to become a true social norm is to raise its image through the education process. As Alison Winfield-Chislett who runs The Goodlife Centre and *Repair Café* believes:

> The more we elevate lateral problem solving ability as being part of a well rounded person, the quicker the recent association with mending being a resource of the poor will recede. Fixperts are quick, nimble, clever, resourceful, artful and smart. All things we want to be. (Winfield-Chislett, 2013)

The Role of Design

In order for owners to be able to occupy our objects there needs to be a move towards *designing for longevity*. The designers of our products need to design:

> products that last, are well crafted and well made so that people don't want or need to throw them away. Products on this loop should be designed to have a long life span, extended through user action of upgrade, fixing and repair. (RSA, 2013:34)

The role of the designer is essential as:

> Products on this loop should be designed to be desirable in their continued workability and trusted as something that has a long and adaptable life span. They should also be designed with consideration as to how users attach themselves emotionally, highlighting a key role for anthropological insight. (ibid)

The insights from the transformational effect of repairing can be used to reconsider the design process and the on-going interactions between owner and product. Designing for repairability and adaptability will be essential for continued desireability.

Summary

In becoming owners – rather than consumers – of products, it will be possible to occupy our objects in new and creative ways to form more satisfying, lasting relationships; which in turn will change our understanding of our relationships with the things we share our world with.

These new approaches to how we take our products on the repair journey have the capacity to raise awareness of the factors that restrict them, and to create new motivations to embark on the journeys and to continue on them. The insights from these journeys can also inform design practices in the move towards *design for longevity*.

The Ecology of Repair

Overview
An Ecological Approach
Ecological Literacy
Nested Systems
Networks
Cycles
Flows
Dynamic Balance
Development
Summary

Overview

In the previous chapter it has been suggested how we, in becoming the owners of our products, can be empowered and gain greater satisfaction from our relationships with our products.

In this chapter an *ecological* approach will be used to propose how repair can be understood as part of a larger system of practices, and to find alternative routes for repair journeys that bypass some of the dead-ends and diversions that currently restrict them.

An Ecological Approach

> With any system, the whole is different from the sum of the individual parts. By shifting focus from the parts to the whole, we can better grasp the connections between the different elements… In systems, the relationships between individual parts may be more important than the parts… the "objects" of study are networks of relationships. (Centre for Eco-literacy, 2010)

As discussed previously there are many different ways in which repair can happen: it can be public or private, be performed by ourselves, or others for us, it can be complex and involve a long diagnostic process, or simply require parts to be tightened or cleaned. All of these and many more variations in the practice are part of the repair *ecosystem* and they are affected by their social, economic and political context. An *ecological* perspective can be used to understand the relationship between the different approaches to the repair practice and its context. For example, there is a very different *ecosystem* of repair in developing countries, where repair practices thrive through economic necessity, compared with the UK. However the current economic crisis in the UK creates the ideal conditions for re-activating the repair *ecosystem* as prioritised values are affected by the economic climate.

In order to understand how the repair practice can, and is, being re-activated and to build new relationships and *resilience* it will be considered as part of a larger *ecological* system.

Ecological Literacy

Ecological principles (Centre for Eco-literacy, 2010) will be used as a framework for addressing this complex dynamic system – which is constantly evolving – to highlight the connections between the stakeholders that influence the practice of repair, in order to propose methods for encouraging the practice to thrive.

According to Firtjof Capra there are six principles of *ecology* which need to be considered for *ecological literacy*. They are: nested systems, networks, cycles, flows, dynamic balance and development. They will be considered below in further detail within the context of the repair practice.

Nested System

> Nature is made up of systems that are nested within systems. Each individual system is an integrated whole and — at the same time — part of larger systems. (Centre for Eco-literacy, 2010)

The repair practice can only be understood in the context of the other practices it co-exists with within the UK.

A range of different people use different approaches to repair, creating the repair community and keeping the practice alive. The practice is in turn nested within the practice of waste prevention along with other re-use practices. Waste prevention practices are nested within the practice of consumption along with acquisition, use and disposal (nested within disposal there are the practices of recycling, incinerating and burying in landfills).

The practice of consumption sits within the larger system of manufacturing, where according to the RSA it is joined by design, education and research, investment, policy making, resource management, materials, manufacturing and branding/companies practices (RSA 2013:34). All of which are affected by the structure of the economic system they are nested within and have various practices nested within them.

As established previously, the repair practice conflicts with both the practice of the economic system it is nested within and the other practices that sit within the economic system.

> If the practices in a community reinforce one another so much the better. Norms that contribute to the harmony of one practice with other practices and with the larger life of the community will be among the norms of the more important practices. To the extent that a practice cannot be harmonized with other practices in a community it is a bad practice. (Wallace 2009:15)

The issues repair has (access to materials and competences and its image) are caused by this conflict. However, "changes within a system can affect the sustainability of the systems that are nested within it as well as the larger

systems in which it exists" (Centre for Eco-literacy, 2010).

Emerging waste prevention practices (re-use and repair) are appearing within the practice of consumption. They offer new approaches to the acquisition, use and disposal practices that waste prevention sits next to; the shift in one practice is beginning to disrupt other practices around it.

In order for the practice of repair to be sustainable it could either be aligned with the images, competences and materials of other more dominant practices like consumption (e.g. self-expression through re-making); or the repair practice could be disruptive, to affect change to the larger system of the economy. But for greater resilience it needs to do both so that if one approach fails the other can sustain the practice; "diversity means many different relationships, many different approaches to the same problem. A diverse community is a resilient community, capable of adapting to changing situations" (Capra, 1997: 295).

Networks

> All living things in an ecosystem are interconnected through networks of relationships. They depend on this web of life to survive. (Centre for Eco-literacy, 2010)

A practice needs practitioners to keep it alive. Middlemiss uses the example of football to explain that "so long as someone somewhere keeps playing, the practice lives on" (Middlemiss 2009:20). However, (as established in 'A Lost Practice') the practice of repair is under threat of becoming extinct as access and image issues cause less people to participate.

Community-based repair initiatives like *Repair Cafés* are beginning to emerge and are creating new opportunities for individuals to participate in repairing. In recruiting new people to the practice they are creating new practitioners and new repair communities (therefore new stakeholders). The initiatives facilitate networks to form in which people support each other in their pursuit of repairing.

> Different groups of people in a single community cultivate different practices, and the resulting division of labour generally contributes to fulfilling the myriad of needs and interests of the community at large and its members. So practice needs a community. (Wallace 2009:14)

Globally, the *grassroots* repair movement is beginning to gain momentum as

more communities of repairers are established and they begin to create new networks (Restart Project, 2012). These initiatives are changing the image of repair as they turn it from a private to a public practice by creating on and off-line spaces for participation in repair. They make use of social media networks to publicise their events and successes. For example, the Brighton Repair Café has a global network through its Facebook group, Twitter account and blog site (Brighton Repair Café, 2012). These communication tools extend networks beyond the local community who meet face-to-face.

Emergent community-based initiatives create new relationships with local repair professionals and individual repairers, and these open up access to the materials and competences to repair. They also create new relationships with individuals who don't repair to recruit more people to the practice. This is done by expanding the image of repair in accordance with the initiative's approach and image that appeals within its context (where it's physically ocated or where it publishes on-line).

As mentioned previously repair practices are beginning to affect consumption practices. However, the repair community needs to build new relationships with the other more dominant practices that sit alongside consumption and affect the survival of the repair practice.

New relationships between designers and repair communities could inform the development of *design for longevity*, but it is the brief setters in the manufacturing industry who ultimately have control over what is designed. Networks between all three would have greater impact on the products designed but need to extend out to the other practices within the manufacturing system. Because:

> In the design and manufacturing world there are many segregated roles that are surprisingly not properly networked together. The client who sets the brief, the designer who selects the materials and creates the aesthetics, the policy makers that dictate the value of the materials, and the manufacturers who make designs a reality. Now, more recently, added to this line up is the end of life materials recovery role taken up by new entrepreneurial facilities. (RSA 2013:23)

Cycles

> Members of an ecological community depend on the exchange of resources in continual cycles. Cycles within an *ecosystem* intersect with larger regional and global cycles. (Centre for Eco-literacy, 2010)

Repair practices are restricted when materials and competences aren't shared within the manufacturing system (see 'A Restricted Practice'). Within the repair practice, relationships between members of the community are creating networks of trust through which materials and competences are being shared.

> Our societal trust – our social capital – is finding new stores of trust outside existing top-down models and is being redefined, perhaps re-distributed, to numerous micro-communities of trust created by open systems and peer-driven resources. The secret to these systems is one of the oldest human traits essential for trust – they share. (Burnham, 2011:5)

With the advent of social media and new technologies:

> the ecosytem for fixing has never been better. YouTube has plenty of how-to-fix-it videos; sites like iFixit sell parts and post repair guides for tech new and old. Better yet, the advent of cheap 3-D printers makes new types of repairs possible. (Thompson, 2013)

The *emergent* repair communities are taking advantage of on-line global networks that are creating opportunities to share materials and competences. For example, The *Restart Project* who run:

> fun and free community events where volunteers experienced with electronics help others learn to repair and perform maintenance to their broken or slow devices, as well as share tips on how to take back control of what they buy. (Restart Project, 2012)

At their "restart parties" (ibid) they show people how to fix their electronic products, making use of online resources to access the competences and materials for performing repairs.

Not only are these new communities changing the image of repair through their activities, they are also affecting the norms and ethics of the practice of repair:

> Because a practice will be a group undertaking, some of the constituent norms will concern how practitioners should act towards one another to foster the attainment of their collective purposes. Norms pertaining to cooperation, trust, and mutual aid will be prominent

> among the norms of practice. (Wallace, 2009:14)

To begin rebuilding the loss of trust between individuals and businesses (Burnham, 2001: 4-5) these new norms need to be taken on in the practices that make up the larger manufacturing system.

Flows

> Each organism needs a continual flow of energy to stay alive. The constant flow of energy from the sun to Earth sustains life and drives most *ecological* cycles. (Centre for Eco-literacy, 2010)

The sharing networks created by the emergent small-scale communities enable the barriers to access that are created by producers to be bypassed, however they still exist and in order for repair to proliferate, access needs to be free flowing. This can prevent the "abuse of copyright law as a weapon for planned obsolescence" (Wiens, 2012).

The new repair communities are beginning to challenge the power imbalance that exists in the relationships between consumers and producers. Their activity enables more owners to occupy their objects and highlights the barriers to access.

Through its events the Repair Café Foundation in Holland is building a database of commonly malfunctioning and un-repairable products so that they will be able to present their findings to the manufacturers of goods and pressurise them into changing the way they are producing them (Buenting, 2013). This is done in the hope that in the future these barriers will be removed. However, there are limits to the impact these types of challenges can have as they are working against the powerful restrictions to flows that are created by the more dominant practices in the manufacturing system.

New networks to connect the various communities of stakeholders could be more effective in opening up flows of materials and competences. For example: resource management organisations giving repair initiatives access to tools, spaces and other resources, or the repair practice being incorporated into mainstream education to create new repair communities.

In some cases this may need government legislation:

> Laws could mandate that goods be designed with swappable parts. But perhaps more feasibly, we could institute fat tax incentives for

> those who design for fixing. We should mandate longer warranties, which now often last only weeks. (If manufacturers are on the hook for extended periods, they'll have to make stuff that's easier to repair—benefiting pro and amateur fixers alike.) (Thompson, 2013)

However, new legislation has huge implications for industry and may cause more barriers to flows somewhere else within the system. This can be seen in the impact recycling legislation has had on repair and *re-use*. Instead what is needed are more opportunities for transitions in practice:

> Mapping the practice in question is only the first step. Having convened a set of stakeholders who each have some role in determining how the elements in a practice are set, it should then be relatively straightforward to encourage them to begin to take action on that practice, tweaking and tuning the elements which they are responsible for. (AD Research, 2011:53)

Dynamic Balance

> Ecological communities act as feedback loops, so that the community maintains a relatively steady state that also has continual fluctuations. This dynamic balance provides resiliency in the face of ecosystem change. (Centre for Eco-literacy, 2010)

The global repair movement is new and in some ways fashionable as it is a novel approach to repairing, but as the novelty wears off the popularity will plateau. That is unless new approaches to the practice adapt in response to the limitations, demands and the diversity of their communities, and new communities are formed.

> Practitioners have and exercise a critical attitude that is necessary for the growth of a practice and its adaptation to changing social and physical circumstances (Michael Walzer Just and Unjust Wars 1977, 11). If a practice is to be vital, it must be possible for participants to disagree; if the practice is to be viable, it must be possible for them to agree. The result, if the practice flourishes, is a moving, changing consensus, often accompanied by considerable noise and some confusion. (Wallace, 2009:15)

This critical evolution can only come from the repair practice itself as the communities observe the patterns of behaviour in their members and the successes and failures of images, events and approaches offer them

feedback. Only the repair community itself is in the position to respond to the feedback in an on-going process of observation, reflection, action and evaluation.

> Because of continually changing circumstances, any harmonization, any successful adjustment of practices to one another, is temporary; the need for readjustment is never-ending... the more we know of other communities and their practices, the larger our potential re-sources for altering our own practices. (Wallace, 2009:17)

Through networking communities of practitioners, good practice can be shared then adapted to the context. The Repair Café Foundation offers a model for others to use to set up their own *Repair Cafés* and these vary according to their location.

The ecology of repair in Brighton where the Brighton Repair Café is based is very different to the ecology of repair in the West Midlands where the Malvern Hills Repair Café is based. In turn they a very different to the Dutch *Repair Cafés* and this is evident in the variation of approaches, structure and popularity of each of the initiatives. Culturally all three locations are very different; by comparing the two UK initiatives the importance of the localising practices is highlighted.

Malvern Hills has an older demographic due to it being a popular area for retirement (there are over 11,000 members of the University for the 3rd Age). Due to being situated in the heart of the West Midland's technology belt the *Repair Café* is able to procure a high number of volunteers with these skills to offer. They also hold their *Repair Café* in a very active community centre with support from the local transition movement community and their community development & social enterprise officers. They run their sessions more like a service than an educational initiative and can perform an average of 50 repairs per event. The success in terms of the number of participants as explained by Chris Dyer, one of the organisers, could come down to the fact that when they hold it "on a Saturday morning, it's the only gig in town" (Dyer, 2013).

In contrast, the Brighton Repair Café is a pop up repair initiative, which takes place in different venues around the city. It has a large social media following and a younger demographic being in a University city. Despite links to the local permaculture association, the University and the local Freegle network, an average of 7-8 people attend the events (excluding organisers &

volunteers). This could be explained by the notoriously transient population of Brighton, the number of other competing activities in the area and time poverty of those studying or in employment. Brighton is also dominated by the retail and tourism industries which have a strong and well-established presence in the city.

The circumstances in which the Brighton Repair Café exists means that for long-term survival, the community will need to adapt its image to appeal to the local population and align itself to other practices. For example, Brighton is known as a creative city and so reconfiguration events may be more popular than the restoration and remediation events that the *Repair Café* model promotes.

Emergent repair initiatives can capture the interest of individuals to encourage greater participation through creating new images of repair. The question is how to make it a habit. The frequency, automaticity and stable context required for habit forming can only be offered by repair initiatives if they adapt to establish permanent spaces with regular access to competences and materials for their community. *Hackspaces* are doing this for maker initiatives. Repair initiatives either need to work with existing organisations or institutions who can host their activities or establish their own repair spaces like the 'Remakery' in Brixton is in the process of doing (Remakery, 2013).

The image and approaches created by *grassroots* repair initiatives appeal to their communities. These initiatives need to adapt, or other approaches that bring them into the mainstream, need to emerge so that repair doesn't remain as a marginalised practice. As new networks develop to extend the repair community into the mainstream these emergent initiatives may become less popular with new approaches shifting the emphasis and the manner in which repair is practiced. This is part of the dynamic balance.

Development

> All life — from individual organisms to species to ecosystems — changes over time. Individuals develop and learn, species adapt and evolve, and organisms in ecosystems coevolve. (Centre for Eco-literacy, 2010)

Short-term:
The dynamic balance as mentioned above will affect how the practice of repair evolves in different places. The big issue is how to get more people to engage with repairing in the first place, in order to re-activate the repair

community and for the practice to evolve. The first step is to realise that there is no one-size-fits-all solution just as there is no 'normal' re-use behaviour (Jones, 2013) and that different images of repair will appeal to different people. This means encouraging more emergent self-organising communities to develop their own models of practice through communicating what others are doing; "behavioural interventions using social norms have been successful in a number of areas, and most are based on telling people what other people do in a similar situation" (Dolan et al, 2010:7).

Through more communities emerging, the practice will develop and evolve. "Going over an action again and again… enables self-criticism" (Sennett, 2009:37-38) and through "the experience of studying their own ingrained practice" (ibid) an individual can begin "modulating it from within" (ibid). This will enable them to adapt to the needs of the communities enabling them to grow.

Aligning repair initiatives with other communities like educational institutions will make the impact of the practice more widespread; if it has more prestige it could become a social norm. *Emergent* repair initiatives may be succeeded by more mainstream businesses and institutions, or they could, with support, develop into such organisations. Either way this will be a testament to their success as part of a natural evolutionary process.

Long-term:
The potential for long-term development of the practice has a far greater reach. Repair as a disruptive practice can be used as a tool to transition to a *circular economy* if it becomes a social norm.

There are many organisations such as WRAP, the Ellen MacArthur Foundation and the RSA that are trying to find ways to transition to the *circular economy*. Again there is no single way to do this; the proliferation of repair through emerging community-based initiatives could be one part of the approach.

By creating new images of repair and encouraging greater participation, discussion and awareness around the practice will develop. As we begin to occupy our objects, the access issues and the measures needed to overcome them are highlighted. This awareness is a form of education and can activate individuals to change their consumption practices putting pressure on producers to make products repairable and *designed for longevity*.

(RSA, 2013:34)

Designing for longevity is one of four design models proposed by the RSA Great Recovery Project (RSA, 2013:34) for making it possible to move towards circular system (see illustration above). The smallest loop, and therefore potentially the most resource efficient model requires "*design for longevity*: This route is closest to the consumer/user and must therefore be designed to maximise the embedded material and energy from production stages" (RSA, 2013:34).

As products begin to be *designed for longevity* again and therefore made to "last, are well crafted and well made so that people don't want or need to throw them away… have a long life span, extended through user action of upgrade, fixing and repair" (RSA, 2013:34). It will necessitate them being *designed for disassembly*. *Design for disassembly* is also required for the *design for service* model and so practicing repair (which is the first steps towards turning us from consumers to owners) could then pave the way for turning us into users.

In the **design for service** model "The material stays in the ownership of the

manufacturer as the product is never sold, so value is kept within the system" (RSA, 2013:35). This means the control over our products would further shift to those who produce them. In this type of system regulations would be needed to ensure this power wasn't abused. Also, as users rather than owners, our alienation from products would be exacerbated and there would be no individual responsibility towards them. This could cause product churn to increase further and although products would be reprocessed in a circular system, this would require the use of further resources.

Therefore, "the sentiments of leasing might be better expressed through a deeper after-sales relationship between producer and consumer, which essentially enables the ownership of longer-lasting things" (Chapman, 2005:185).

Summary

In order for repair to thrive as a practice there needs to be an array of diverse approaches to the repair journey, which vary according to their context. The people in each location (be it on-line or off-line) are best placed to find the routes which would best suite their context and how to embark upon them.

These many different journeys need to be mapped and shared amongst a network of other localised communities in different contexts so that they can learn from each other.

New networks between the repair community and other communities could enable the access issues on the repair journey to be removed. Through making many repair journeys in varied ways new routes are created that could alter the terrain entirely.

The Map is Not the Territory

Overview
The Map Cannot Represent the Territory to Scale
The Map is not the Whole Territory
Pioneering
Summary

Overview

This chapter explains the limitations of the research, before making recommendations for policy and future research.

The Map Cannot Represent the Territory to Scale

> We say the map is different from the territory. But what is the territory?...Always, the process of representation will filter it out so that the mental world is only maps of maps, ad infinitum. (Bateson, 1972:460)

Through the constraints of time and the written word the entire breadth and implications of the complex practice of repair and its nuances couldn't be addressed in full. The attempt to present repair as a whole system rather than in its parts has, as with any instance of representation, meant some eductionism. This research is presented with the knowledge that a perfectly accurate map that describes the territory at a scale of one-to-one would itself be useless.

Thus, there are a few dispensations that need to be made in the evaluation of this research. It is acknowledged and understood that:

1. Not everyone will be able to perform repairs themselves: not everyone will have the time, capacity or inclination. However, in order for repairing to become a social norm, not everyone needs to if there is access to other means of having products repaired.
2. There is a greater range of repair activity than could be addressed within the limits of this paper e.g. car mechanics, DIY and home improvements, regeneration projects etc.
3. Changing people's consumption practices is no small feat when challenging ingrained habits within an economic system that dominates our culture, politics and society and affects our values, and that awareness raising through both formal and informal education spaces can be equally as powerful.

The Map is Not the Whole Territory

The impact of repair reaches far beyond waste prevention as an environmental measure, into the realms of economics. Its affect on the larger system has implications for all the other practices that nest within it. As the economic system itself nests within the system of ethics, economic practices can create a transition in the ethical system – or vice versa – to enable *eco-centric* values to become the overarching ethical norm.

> The current economic and environmental challenges of take, make, dispose manufacturing are becoming apparent. Increasing supply risk and rising costs of materials is putting pressure on businesses to change. We need to shift towards more circular systems and good design thinking is pivotal to this transition. The Great Recovery is building new networks to explore the issues, investigate innovation gaps and incubate new partnerships. (RSA, 2013)

This thesis is written from a consumer perspective and as such the manufacturing industry wouldn't necessarily support the findings of this research as they challenge the profits made through mass production and:

> There are big barriers to overcome before longevity becomes a mainstream design option again. The biggest obstacle sits within the business model that creates profit from selling more units and where unit costs must be as low as they can, making material choice and quality suffer. (RSA, 2013:34)

However, the increase in cost per unit necessary for *design for longevity* could slow down product churn whilst enabling the manufacturing industry to continue to make profits. It would also create greater motivation to repair; adapting obsolete products to respond to needs. An example of this can be drawn on from the Cuban oil crisis when scarcity and inaffordability encouraged ingenuity and resourcefulness. This sort of challenge can encourage new business models to develop through the production of parts and services that enable repair. This may re-distribute business away from big corporations and back onto the high-street.

If repairing is understood as a tool for transitions in practice in a move towards a *circular economy*, the long-term incentives for industry become apparent. The Ellen MacArthur Foundation argues that if there is a transition to a *circular economy*:

> A subset of the EU manufacturing sector could realise net materials cost savings worth up to $ 630 billion p.a. towards 2025—stimulating economic activity in the areas of product development, remanufacturing and refurbishment. (Ellen Mac Arthur Foundation)

The danger would be that in the short-term repairing becomes inextricably linked to poverty, and this image overrides other attempts to re-image repair.

Pioneering

Innovation is often found at the periphery of a society (like emergent repair projects) and it is up to the communities of the dominant practices to recognise their potential and enable them to develop and create new practices, or in some cases to transform the more dominant practices.

The recommendations that are derived from this research are that the CIWM should work with emergent self-organising groups to support their needs so that they might discover new territory for repair to innovate and advance the transition to a *circular economy*.

Ultimately, what is needed from Defra is the creation of opportunities for collaboration between the stakeholders in the manufacturing industry who represent the full range of practices: consumer (including the practices nested within the practice), design, education and research, investment, policy making, resource management, materials, manufacturing and branding/companies practices. This could be through forums, work groups and committees, which bring representatives of these practices together to find mutually beneficial solutions for going forward and will enable the areas where legislation is really needed to become apparent.

In order to understand how repair can help the transition to a *circular economy* and encourage *design for longevity* there is a need for further research to test:

1. The effect of re-framing repair as re-making in different contexts to see how it affects our relationships with our objects. This could be done through workshops across different demographics and using different approaches.
2. How repair can be incorporated into education at different levels and to observe the effect it has on individual's images of consumption and understanding of resources and waste.
3. How the repair practice can inform design practices in the development of *design for longevity*
4. How effectively *design for longevity* can transform our relationships with our products from consumers to owners and how this could be facilitated.
5. How *design for longevity* could enable repair innovations and business models to emerge and what they might look like.
6. How *design for longevity* could transition to design for disassembly and other design systems in circular manufacturing systems.

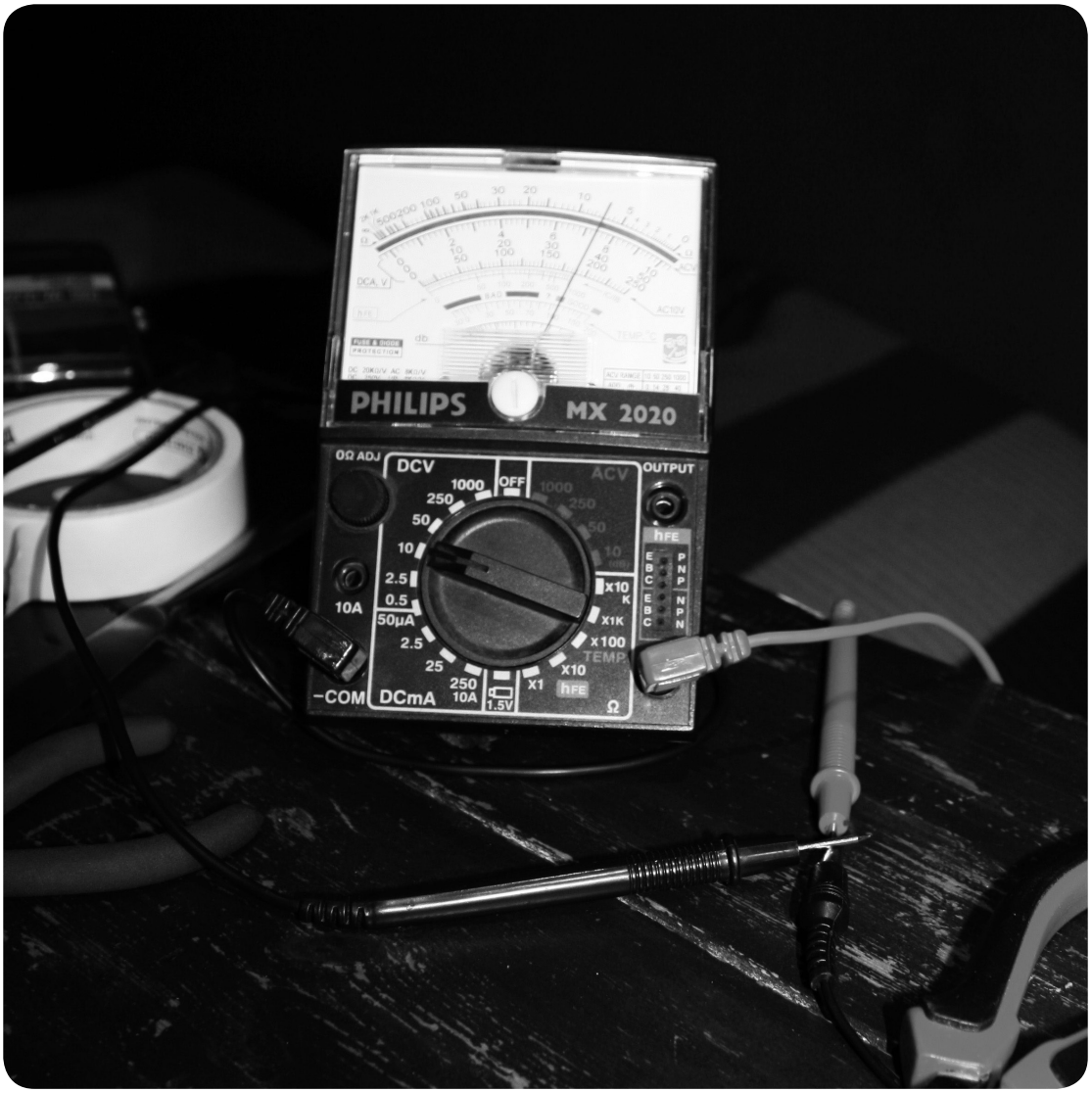
7. Whether the manufacturing industry will respond to transitions in consumption practices, or whether government legislation is necessary to incentivise re-use over recycling, and change manufacturing methods to *design for longevity* rather than obsolescence.
8. The different ways in which the CIWM could support community-based initiatives in establishing, running and growing repair initiatives, and the innovations that may develop as a result.

The observations and feedback from the above could inform further recommendations.

Summary

The complexity of the system that the repair practice sits within means that there is a need for further research and multi-disciplinary collaboration across all of the elements of the terrain in order for repair to stay on the map and for the terrain to evolve.

Glossary & Bibliography



Glossary

action reflection cycle – a research process that entails observation, reflection, action, evaluation and modification before moving in a new direction and beginning the cycle again (McNiff & Whitehead, 2010)

agency – the ability to act in some way to produce a particular effect

anthropocentric – regarding humans as central to everything in existence

Brighton Waste House – a project in which a house is being built in collaboration with Brighton University to research the use of waste materials in architecture

circular economy – a restorative industrial economic system in which resources are kept in circulation in a cycle of production and consumption, so that there is minimal waste

cradle-to-cradle – a circular life cycle proposed by Michael Braungart and William McDonough in their book of the same title, in relation to an industrial system and its products.

cradle-to-grave – a linear industrial system in which "Resources are extracted, shaped into products, sold, and eventually disposed of in a "grave" of some kind, usually a landfill or incinerator" (Braungart & McDonough, 2009:27)

crowd-mapping – an open source method of mapping what is happening in the world whereby anyone can add to the map

design for disassembly – a design approach which ensures products can be taken apart easily and cost-effectively when they have become obsolete

designed for longevity - a design approach which ensures products "last, are well crafted and well made so that people don't want or need to throw them away… have a long life span, extended through user action of upgrade, fixing and repair." (RSA, 2013:34)

design for service - a design approach which enables products to be leased rather than purchased. This requires products to be robust to endure multiple users, and to be designed for disassembly so that parts can be reconfigured and put back into service; it offers usership as an alternative to consumption of goods

Glossary

eco-centric – an understanding that the biosphere is at the centre of existence and that all inhabitants on earth are dependant on its resources

ecological – as with ecology, is the study of the relationship of organisms to one another and their environment

ecological literacy – "Understanding the patterns and processes by which nature sustains life" (Centre for Eco-literacy, 2010)

ecosystem - the network of relationships between organisms and their environment

elephant in the room – an obvious issue that is present and known about, but is overlooked or ignored because of its awkward nature

emergent – coming into existence or becoming noticed

emerging – as emergent, newly-formed or coming into prominence

ethics – guiding principles for conduct

Fixperts – a projects that "creates [video] content that encourages people to use the power of fixing to solve everyday problems" (Fixperts); also a term for a repair expert

Freegle & Freecycle – national re-use community-based organisations with localised on and off-line networks

grassroots – a movement made up of community level activity (usually) politically motivated to empower the community

hackspaces – community-run workshop spaces

kinaesthetic – a learning style motivated by tactile activities

make, do & mend – a thrifty approach to living encouraged by the British government during the Second World War in response to shortages and rationing

Maker Faires – events to showcase the activities and outcomes of maker activities

Glossary

Maker Movement – a community of people making new products in small workshops, usually involving hacking and adapting new technologies

material recovery – reclaiming materials that are in products when they have become obsolete

meta-narrative – the overarching story which contextualises the narrative or the theory that underpins the narrative

narrative – the story or account of something

ouroboros - an ancient symbol of a serpent swallowing its own tail, representing continuous repeated cycles

paradigm – a set of concepts, values and practices that uphold a way of living for a community of people who share it

praxis – the putting into practice

re-appropriate – to take back possession of something

recycling – the industrial re-processing of materials

Repair Café – community-based event usually held monthly which encourages people to share repair skills, knowledge and tools in a social setting

resilience – the ability to recover quickly from misfortune

Restart Project – a community-based initiative which encourages people to repair their electronic products at social events called restart parties

re-use – putting something back into use without industrial re-processing

re-use in manufacture – "The re-capturing of material through new system designs that guarantee the return of the product into their material stream reduces a company's risk to increased price volatility." (RSA, 2013:34)

semiotics – a system of signs and their meanings

Glossary

service design – a design approach which encourages service-based production and consumption

social design – a design approach to the social world with the intention of improving human experiences and well-being

stewardship – a belief that humans are responsible for the world and should take care of it

taxonomy – the classification of something according to a system of relationships

up-cycling – converting waste into something better than the original without putting it through industrial re-processing

visceral – instinctive

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