"My sofa has the mark of my ass"

Urban nomads, furniture waste, and emotional durability design as a strategy for the circular economy

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Abstract

Within the context of the circular economy, ensuring that materials and products are in use as much as possible is an achievable design goal, where enhancing the relationship between product and user through EDD, or emotional durability design (Chapman, 2008), and reducing product replacement (Mugge et al., 2005), is cited as an area of research.

Research on affective persistence design is still focused on the theoretical stage, and the application of the theory to specific groups, lifestyles and products is not fully explored. This study attempts to make EDD more applicable through the study of specific groups and products, so that the industry can have different solutions to EDD strategies for different user groups and products. This aims to influence mass-production furniture companies, and other mass-produced manufacturing, to innovate sustainably, achieve rational use of resources and reduce waste generation.

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Declaration

I, Jie (Crystal) Zeng, declare that this submission of a full dissertation for the degree of Master of Research (MRes) complies with the regulations set out in the course handbook. I declare that this dissertation is my own work and has not been submitted for any other academic award.

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Glossary of Key Terms

Urban Nomads

Urban nomads are an urban social group who move frequently between or within cities and accommodation, for reasons such as education and job opportunities. They form a transient section of their host communities, supporting certain aspects of local economies such as leisure and food, but also having a longer lasting impact on infrastructure, housing, and (the focus of this study) domestic waste.

Emotional Durability Design

Emotional Durability Design is an approach that focuses on the emotional dimension of design to provide a set of sustainable design strategies. It attempts to make products capable of both establishing and sustaining a relationship with users through design. For example, a possession that has meaning, such as a story of how it was acquired or a connection with a loved one, is more likely to be kept (i.e it is 'durable') than one that has no emotional value at all.

Furniture

Things such as chairs, tables, beds, cupboards, etc. that are put into a house or other building to make it suitable and comfortable for living or working in.

Mass-produced furniture industry

All companies and activities related to the design, manufacture, delivery, and sale of functional and decorative products for household equipment. In the context of this study, the process of production is more mechanised mass production than handcrafted.

Circular Economy

Circular economy is a regenerative system that reduces inputs, waste and emissions by slowing, closing and reducing material and energy loops.

Preface

As a young person who moves frequently, from city to city and flat to flat, I have a strong connection to the concept of urban nomads. With globalisation, more and more young people, like me, are moving between and within cities in search of opportunities to make their mark. We are 'urban nomads'.

My personal space in the city, and the objects within it, (for example the furniture), are usually my strongest connection to each city; they are the evidence of my presence in this time and space, the objects that bring a sense of home and identity. However, my lifestyle of frequent moves has made me use often unsuitable furniture provided by my landlord, or encouraged me to buy cheap, disposable items that I will eventually trash before my next move, because it's easier and cheaper than transporting it. For a young person, this is a considerable financial burden, and for an environmentalist, as for most young people, I feel very guilty about creating more avoidable waste.

In this study, I build on Jonathan Chapman's research to understand the connection between urban nomads, like myself, and the furniture they use, and to enhance the emotional relationship between urban nomads and their furniture by exploring the value and application of emotionally sustainable design strategies with mass-produced furniture industry practitioners, thereby reducing furniture replacement and waste and supporting circular economy strategies.

Chapter 1 Introduction

1.1 Problem statement

The need to consider the impact that furniture waste has on the environment and economy, and the potential that strategic approaches can bring, is well-understood. Scotland produced 2.41 million tonnes of household waste in 2018, of which a considerable amount is furniture, which is often the cause of fly-tipping (European Commission, 2014; Scottish Environmental Protection Agency, 2019).

As well as an immediate drain on local authority budgets and a negative contribution to communities, these discarded resources and materials pose a challenge to our sustainable survival (Ellen MacArthur Foundation, 2013). Although much of the discussion in this area focuses on electronics and fast fashion, furniture is also a major contributor to waste (Royal Society of Arts Great Recovery, 2015).

Furniture is a necessity for people's lives that also plays an important part in the major rituals of life (moving away from home, living with a partner, buying a house, having a baby). In the past, these might be heirloom items meant to last and be passed on. However, the growth in mass-produced cheap products and the prevalence of consumerism has led to a lack of durability not just in terms of materials but also meaning. So, furniture becomes disposable, frequently littering the streets of towns and cities and causing pollution as well as being wasteful (European Commission, 2014; Scottish environmental protection Agency, 2019).

Early discussions in this area focused on better disposal or recycling, and debates on reducing the negative ecological impact of consumption through more durable or easily repairable goods, even though it emerged that initiatives such as recycling, repair, etc. may be inefficient at times and use large amounts of energy (Morseletto, 2020). More recently, attention has turned to the concept of the circular economy (Ellen MacArthur Foundation (EMAF), 2013) in which products are designed to be regenerative, seeing new life either through extending or repurposing the usefulness of consumer items.

One of the essential strategies for designing products and business models for a circular economy is to slow down the resource cycle (Stahel, 2010), which involves improving the utilisation of products, either by extending their life, through durable design, designing for maintenance, etc. (Bocken et al., 2016). However, this often involves a user discarding something they no longer want, and somebody else realising its inherent value. This is still open to producing waste. Another approach would be to help owners build a stronger emotional connection with items, to encourage repair, upgrade, or repurpose of their possessions.

To support such an approach, Chapman (2005) proposed the concept of emotional durability design. Haug (2018), Mugge et al. (2005) and others have also contributed theoretical research in related fields, such as 'psychologically durable design' and 'Slow Design'. These concepts call for users to establish a deeper connection with the product and provide guidance for extending the life of the product and resources, as part of the realisation of a circular economy. Reflecting on the negative impact of the consumerism wave that has arisen since the Industrial Revolution with globalization on the environment and society, this thesis seeks a new relationship between products, industries, and users.

1.2 Targeted Group and Location

This study focuses on Glasgow in Scotland and young people, aged 18-35, who move frequently from location to location, accumulating or disposing of possessions such as furniture as they go. These are referred to in the study as 'urban nomads'.

As the largest city in Scotland, Glasgow has many migrants, from within and outside the UK. According to the National Records of Scotland (Gov.UK, 2020), the City of Glasgow has the highest level of net mobility of Scotland's 32 council areas in 2018-19, expanding from 8.6 per 1,000 people in 2017-18 to 9.9 in 2018-19.The mobile population is projected to expand by around 10% over a further 20 extended periods as a result of globalisation.

The impact on local resources caused by short-term migration is also noteworthy. According to Hebrok (2019), the prevalence of usable furniture in recycling centres is mainly caused by the changes in the owner's life, such as moving to a new house, or financial promotion. Most of these "urban nomads" are moved from place to place, house to house, due to education (e.g. students) or for job-related reasons. The instability of life increases the tendency toward furniture waste, compared with less itinerant groups.

According to official information, there's a 'clear age-pattern' within the likelihood of moving in or out of Glasgow. 'The probability of moving is the most elevated in late high schoolers and in twenties, and it altogether decreases over age, as way of life stabilises' (Gov.scot, 2021).

Due to the limited time available, the study necessarily excludes landlords who remain an important stakeholder especially in cases where tenants rent furnished properties. For future research, landlords will be a group of interest.

1.3 Research Context

Although many articles around emotional durability design theory have been published in recent years, relevant practice-oriented research is still lacking. The Dutch technology company Philips funded Haines-Gadd et al. (2018) to explore the application of the theory to the design of domestic electrical products. Lacey (2009) presents a case study of the design of emotionally durable ceramics, providing inspiration for commercial ceramic design. However, there are few practice-based studies on the field of furniture products, especially mass-produced furniture.

Focusing on select individuals from Glasgow's sizeable "urban nomads" group and the huge reality of furniture waste, in response to the circular economy plan issued by the Scottish Government in 2019, this research enquiry will focus on design practices, especially within the mass production of furniture. Working with urban nomads, furniture designers, emotional durability design experts and other participants, with emotional durability design related theories as a guide to think about a more comprehensive design method to give the industry, society, and individuals a more sustainable future.

1.4 Research aims and questions

The research aims and questions were not fully defined from the outset. I left space for research aims at the beginning of the project, and through literature review,

fieldwork, and discussions with supervisors, I iterated on the final research aims and research questions.

I have focused this research progressively on the interpretation of emotional connections between urban nomads and the furniture they use, as well as on the potential application of EDD in the mass-produced furniture industry. The research aims and research questions proposed for this study are as follows:

Research aim 1: To explore and understand the emotional connection between urban nomads and the furniture they use to identify the impact that relationship has on their behaviour towards furniture use.

Research question 1: What makes urban nomads develop a lasting emotional connection to their furniture?

Research aim 2: To uncover the potential value and application of EDD to the mass-produced furniture industry and urban nomads in a way that could reduce furniture waste.

Research question 2.1: How do urban nomads and mass-produced furniture designers see the value of EDD to the mass-produced furniture industry?

Research question 2.2: How can EDD be applied in the mass-produced furniture industry in a way that could reduce furniture waste?

Chapter 2 Literature Review

2.1 Introduction

This literature review concentrates on four key areas derived from the work of the Ellen MacArthur Foundation (2013) in which enhancing the emotional connection between users and products is seen as an effective strategy to influence user behaviour and reduce product replacement. This approach involves research topics such as the emotional study of durable design and user behaviour analysis. These areas are: the mass-produced furniture industry, consumer behaviour, Emotional Durability Design, and urban nomads. These terms proved useful parameters within which to search the growing literature on the circular economy that exists in a range of sources, for example business studies, economics, politics, environmental studies, design studies, sociology, psychology, town planning, and beyond.

The review of the mass-produced furniture industry reveals the scale of the industry in the UK, the current state of furniture waste, solutions to furniture waste, the furniture recycling dilemma, and the UK government's expectations for the future of the mass furniture industry.

For consumer behaviour, my attention is focused on the drivers of consumer behaviour, the impact of user sentiment on consumer behaviour, the impact of the market on consumer behaviour and the significance of extending product life.

For the literature review on Emotional Durability Design, I primarily reviewed examples of product-service systems related to product life extension, Emotional Design by Norman (2007) and Van Gorp and Adams (2012), Emotionally durable design by Chapman (2005) and Krieken et al. (2011) on Emotionally durable design explored in practice, Mugge (2005) on strategies to enhance the emotional connection between product and user, and product design directions related to Emotional Durability Design. Finally, I was able to understand the origin of the term urban nomads, the characteristics of young immigrant group in Glasgow, and the life patterns of urban nomads in relation to the state of life of the targeted group and their use of furniture.

Other related topics such as the industrial structure of the large-scale furniture industry, Slow Design, consumer psychology, and Digital Urban Nomads are all covered briefly.

I searched for literature by identifying key words and radiating outwards, making it easier for me to get some targeted information about the literature (Hebrok, M., 2019).
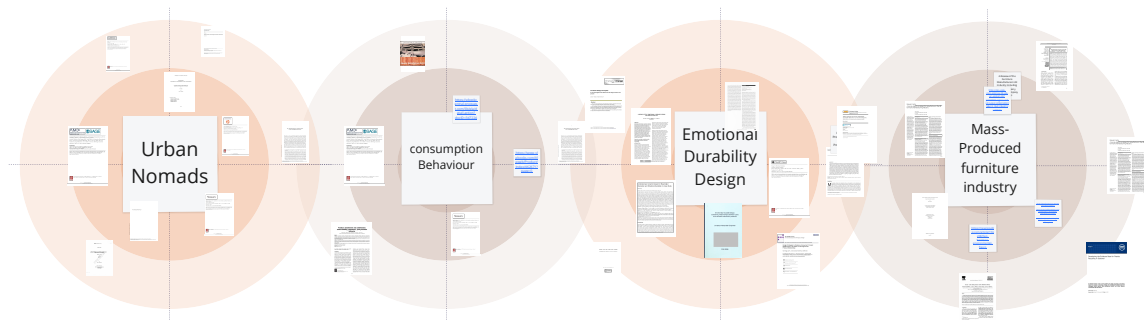
Figure 1: Literature Review Overview

2.2 Mass-produced furniture industry

Modern furniture manufacture is a global mass-production industry. The growth of furniture consumption alongside the expansion of mass-production processes has led to the rise of the mass-production furniture industry (Hayward, 2001). The UK mass-manufactured furniture industry is an important contributor to the economy. The most recent confirmed government figures from 2018 put add up to customer use on furniture and decorations at nearly £17 billion, which represents a rise of 10.5% from 2017 (British Furniture Confederation, 2018).

However, this comes with costs: 1.6 million tonnes of bulky squander – 42% of which is furniture – finished up in landfill each year, with the rest generally containing materials (19 per cent, counting sleeping pads) and electrical or electronic squander (19 per cent) (Royal Society of Arts Great Recovery, 2015). This may be due in part to an expansion in industry, a saturated market, and a new generation of throw-away consumers.

Furniture waste is causing a burden on the environment. Furniture squander basically incorporates diverse made wood sorts, such as plywood, melamine fibreboard and painted wood, and upholstery froths (primarily polyurethane froth). The oils, pastes, paints, and chemicals utilized in furniture creation makes the reusing of furniture squander greatly troublesome (Khalfi et al., 2000).

The impact of furniture waste is not only in terms of pollution, but also in waste of resources. More than 90% of the resources, such as wood, metal and other synthetic compounds is turned into waste within only three months (Chapman, 2005). A study conducted by the furniture company AHF found that, compared with the lifespan recommended by the watchdog guide, there is a big gap in how long people keep their furniture. Their research inquired about British sofas, bed frames, mattresses, washing machines, dining tables, ovens, and dishwashers and found that the service life of furniture and household appliances was on average 6.52 years shorter than consumer recommendations (Atkin, 2015). Short furniture lifespan is one of the fundamental reasons for resource waste.

To reduce the ecological impact of furniture waste, several recycle, repair and reuse models have been proposed in recent decades. WRAP (Waste & Resources Action Programme) reported benefits of reuse for domestic furniture: providing 1 tonne of sofas for direct reuse can save 1.45 tonnes carbon dioxide equivalent; providing 1 tonne of dining tables to a preparation for reuse network can save 0.76 tonnes carbon dioxide equivalent. Along with carbon benefits, there are corresponding resource and energy savings by virtue of this 3R activity (WRAP, 2011).

The rise of end-of-life legislation and recycling policies, such as Scotland's zero waste plan, have encouraged the industry to rethink the potential value of product longevity. Nonetheless, the commercial model of shifting from the waste of raw materials to waste of recycled materials is questionable. "Many researchers are beginning to suspect that recycling actually provides an ethical 'get out of jail free' card, liberating consumer conscience and generating even more waste." (Chapman, 2008). And the root reason for the ecological crisis our society faces is still under-covered (Chapman, 2009).

2.3 Circular economy in the furniture industry

The circular economy is a concept that is currently being promoted by several countries and industries, including the UK, EU and China, and is recommended as a fundamental strategy for sustainable development and economic growth (Ellen MacArthur Foundation (EMAF) et al, 2015). It is estimated that a circular economy-based economic transition could bring an annual economic benefit of £500 billion to the EU manufacturing sector (European Commission, 2014).

The Ellen MacArthur Foundation (2013) identifies three basic principles for moving towards a circular economy: eliminating waste and pollution, keeping products and materials in use, and regenerating natural systems.

The furniture industry is a highly resource-dependent industry. Furniture manufacturers process raw or semi-finished products from wood or other natural materials into products with higher added value and benefits. The high consumer demand may lead to problems with waste as consumer demand is increasing annually (Adi Wicaksono and Ahmad Kadafi, 2020). IKEA (2021) has recently adopted the slogan "Making the things we love last longer" to extend the life of furniture products and materials in the face of the environmental impact of the furniture industry.

Emotional durability of products (Haines-Gadd et al., 2018) is seen to extend the life of products, and materials. Although some may argue that a longer product life is not better, from an environmental perspective, for most products, a longer life is considered a desirable sustainability move by most academic experts (Haug, 2018).

2.4 Design Shifting

The British philosopher Iris Murdoch worried that the development of rationality might surpass human creativity and spiritual reflection, leading to the exodus of something "deep" in the diversified world (Browning, 2018). In a world dominated by

reason, science, and logic, it is not surprising to find the neglect of emotion, another side of nature, searching for meaning and higher truth (Walker, 2006).

In recent decades, with society's reflection on pragmatism and rationalism, the role of emotions between users and products has gained wider attention. Desmet (2002) believes that our emotional and social reactions when using products and software are similar to interacting with the real world. People will subjectively form a "personality" for items based on the feelings they deliver and tend to have a relationship with this "personality" (Reeves and Nass, 2006). Such a relationship is considered part of a person's self-expression. One of the fundamental premises behind people building connection with an item is argued to be the desire and indication of self-exploration (Solomon, 2011).

Positive emotions contribute to a benign relationship between the user and the product. Norman (2007) noted that positive emotions can easily stimulate the attractiveness of products to users, just as people like to be friends with someone who can provide them with emotional value. At the same time, when people have a positive emotional connection with a product, they are more inclined to take care of their product and postpone its replacement (Mugge et al., 2005). On the contrary, waste can be seen as nothing but a failed relationship (Chapman, 2005), just as people will stay away from those who bring negative emotions to them and find someone to replace them.

Chapman (2008) also pointed out that most products can have empathy with users in the early stage of being purchased, and the lifespan of the product depends on the sustainability of empathy. Usually, when empathy recedes, the desire to establish new connections will be stimulated; it is when people tend to acquire new products. Marketing encourages growth and promotes an endless quest to satisfy needs and desires, with users constantly buying and wasting because they are bored and seem to believe that resources are always in abundance (Swim et al., 2011).

Therefore, extending the psychological life of the product and strengthening the person-product relationship is proposed as effective way to increase the service life of the product, which not only keeps products and materials in use, but also effectively reduce consumption (Krieken et al., 2011). It is for these reasons that emotionally durable design has gained greater attention in the field of circular economy and sustainable design.

2.5 Emotional Durability Design

With increased awareness of sustainability movements and the circular economy, product longevity is becoming more valued. Product-service system strategies are becoming a trend in the industry, with products expected to have a longer lifespan with the support of service systems. At the same time, enterprise revenues can benefit from longer-term services (Brown and Katz, 2009). EGG Lighting, an LED lighting company funded by Zero Waste Scotland, is a successful case of using a product-service system to reduce waste. They provide the service of replacing the LED and driver components to upgrade the lamps to the latest LED technology, instead of replacing the entire unit, which saves resources and builds a lasting relationship with consumers (Zero Waste Scotland., 2021).

Policy support has also increased the lifespan of products. The European Commission (2021) has been supporting the promotion of furniture lifespan to benefit the process of circular economy. When the physical life of a product is secured, then the psychological life of the product, which can also be described as the emotional life, becomes crucial in determining the life of the product (Chapman, 2008).

It is essential to understand how to design for and with emotions or products before designing the durability of emotion. Norman (2007) summarizes the process into visceral design, behavioural design, and reflective design. Visceral plan is all approximately prompt passionate affect, such as physical characteristics, such as see, feel, sound, fabric. Behavioural plan is pertinent to utilize, such as work, understandability, convenience, and physical feel. The meaning of reflective design is broader, it is about message, culture and the meaning.

Emotion does not only influence people's behaviour towards products, but also highlights the significance of products for users. Norman identifies strategies for designing for emotion, which has brought more attention to the importance of emotional design for product design and provides the basis for emotional durability design.

Van Gorp and Adams (2012) propose the A.C.T. MODEL to help create relationships between products and users. "A" stands for Attract, and attraction is usually the beginning of the relationship. In the early stage, colour, smell, movement and other characteristics of the object often trigger people's subconsciousness. Inspired by the subconscious, people often choose products with similar personalities to themselves. "C" stands for converse, which means that design is all about conversation. Humans are very concerned about practicality when using tools, so products need to be trustworthy and dependable, and they need to be aware of and meet the needs of users. Finally, "T" stands for Transact. Transactions are the level of consciousness for decision-making. When the attraction and conversation are established between the user and the product, the user will strengthen the establishment of the product personality in the process of continuous use, thereby establishing a deeper emotional connection.

After understanding the emotional design, this section will present the important factors that make the emotional connection between people and products more sustainable. The concept of Emotionally Durable Design was further investigated by Chapman in a six-point empirical framework including: narrative, disengagement, surface, attachment, fiction, and consciousness.

Each of these points represents a key area for exploring EDD theory：

Narrative

This represents the story of the user's relationship with the product, which often has a lot to do with where the product came from and who it came from.

Disengagement

Low expectations and low emotional connection to the product are to some extent beneficial to the user's perception of the product, since excessive expectations generated by attachment can sometimes be counterproductive

Surface

The unique imprint of time, use and misuse that a product leaves with use, but which requires good physical ageing.

Attachment

The strong emotional connection a user feels with a product through its service attributes, information attributes, and the meaning it conveys.

Fiction

The pleasure and intoxication felt by a user at the beginning of a purchase due to an incomplete understanding or awareness of the product.

Consciousness

The free will that the product is given to create a unique interaction between the object and the user, although interaction is an essential skill that can only be totally mastered through practice.

In a study in collaboration with (Krieken et al., 2011) also discussed the qualities required to extend the emotional durability of products:

Involvement

Products need to attract users' attention through novel and interesting functions, interactive forms, etc. But from a long-term perspective, users will be immune to such stimuli, and the product seems to lose its fun. Therefore, the product need continuing stimulate and intrigue the user for a long time, so that the emotion between the product and the user can be more lasting.

Adapt to the user's identity

People express themselves through products. The symbolism behind the possession is who we are, what we have been, and what we attempt to become (Solomon, 2011). But self-awareness is not permanent, so products need to be able to adjust over time.

Animacy

If a product has a soul, users are more likely to cherish this relationship. Some designers will deliberately add flaws to the product to combat the "perfection" of mass production and give the product its soul by personality.

Evoke memories

Products can awaken memories, just as heirlooms often represent metaphors of family inheritance. Although it is difficult to give memory before the product is used, it can be made to carry some metaphors related to memory.

Rewarding

An item-individual relationship is strong when it is fulfilling (Russo, 2010). Common benevolence seems to back the building of a relationship with a product.

Several studies published relating to product longevity and the relationship between products and users to explore the value and methods of generating product-user connections. Authors have observed that users are less likely to abandon or replace

a product if they have established an emotional connection with it (Bocken et al., 2016; Jonathan Chapman, 2008; Mugge et al., 2005). There are several initiatives to build and strengthen this emotional bond that have been studied in more depth.

Mugge et al. (2005) proposed the following methods to enhance the relationship between products and users:

Design shareable products to stimulate the social value of the product. Users can gradually build the relationship with items by using it with specific people or in activities, which make products irreplaceable.

Implementing odours may stimulate the user's memory of the product. The sense of smell has been proved to be able to arouse the corresponding pleasant memory. Therefore, giving the product smell can effectively allow users to remember the joyful experience while they were attracted by the product.

Make the product highly unique and personal. Exclusive products can stress users from others, which meet the purpose of self-express. It is conducive to improving the uniqueness of the product.

Users participate in the design process. The touch and self-expression in the process of personalization products make the product a symbol of the user's personal cognition, representing the user's skills, talents, and personality, which helps the connection with the user.

Finally, Show the life of the product. When a product can show its use history, it is also showing the history between it and the user.

The framework proposed by Chapman (2008) provides designers with elements to refer to when conceptualising the relationship between product and user. Krieken et al. (2011) further translate Chapman's framework into specific requirements for products. Mugge et al (2005) suggest specific strategies for enhancing the emotional connection from the perspective of the product-user relationship. It is unclear how stable living situations or changing living situations can affect these ways of understanding emotional durability, thus building an argument for this study, focusing on urban nomads' relationship with their furniture.

There has been much research into strategies for extending product life through emotional sustainability design and these concepts have been used by others in research and practice, with some authors using the concept of EDD as a driver for innovation in product development. Lacey (2009) explores emotional durability design in professional ceramics practice to try and determine what constitutes meaningful experiences with such products, and whether this stems from design or happens regardless. She believes that making design that subverts form or function and encourages users to interact with and experience objects on a conscious level is key to emotional durability. Russo (2010) examines the user experience of love for a product based on Chapman's observation that 'love for a product cannot evolve and grow with each other because it lacks reciprocity'. In a research project with Phillips, Haines-Gadd et al., (2018), in collaboration with Jonathan Chapman, developed a toolkit for practicing EDD from the product-service system level consisting of nine themes and thirty-eight strategies. It supports multiple points of application in the new product development process to enable the integration of 'emotional building' functionality into the final product. The exploration of EDD in real products has focused on the design of products, or for that matter product-service systems,

without taking much account of the difference in situations of their users, such as this study does for urban nomads.

It is worth noting that the value of EDD in the furniture industry, particularly in mass-produced furniture, has been little studied. There has been little research either exploring the emotional connection between furniture and users, or the potential applications of EDD in the industry. While it seems reasonable to assume that, if furniture is viewed simply as a 'product', the lessons from the studies listed above can be transferred to furniture, the lack of specific reference suggests an opportunity to explore the specific application of EDD to both furniture and urban nomads.

2.6 Furniture Waste and Urban Nomads

The term "urban nomads" was first coined in the 1960s by Canadian communication theorist Marshall McLuhan (2013). In his description, urban nomads are a group of people who travel around the world constantly, meaning that they do not have a fixed place of residence. In the 1980s, the French economist Jacques Attali used the term 'urban nomads' to predict an era in which wealthy and restless elites would fly around the world in search of pleasure and opportunity, while poor workers would likewise migrate and leave their homes to make a living (Marolda, 2014).

With globalisation and digitalisation, the definition of urban nomads is still being updated. It represents a highly mobile group in the city, who are neither seen as refugees nor homeless. It is no longer a concept linked to digression or unconventional living, making it an anthropological phenomenon (Digital Nomads Lifestyle, 2021).

According to the Scottish Government's analysis of the UK census (Gov.UK, 2020), there is a clear age pattern in the rate of people moving into or out of Glasgow and three other major cities of Edinburgh, Aberdeen, and Dundee, with the likelihood of moving highest in the late teens and twenties and due to partnership change, education and employment opportunities. This significantly declines with age. The 'millennial generation', those born around the year 2000, is currently the main group of urban nomads. This migration is also more common within a city, meaning urban nomads are more likely to live in several places within Glasgow than their peers in smaller towns.

Studies have shown that with the progress of technology and globalisation, as well as the central pillars of the EU's migration policies, mobility has become almost normative in young middle-class Europeans' discourse (Frändberg, 2014). The main reasons for moving between cities are education and work opportunities (AIESEC, 2017). In 2018-19, Glasgow City had the most noteworthy level of net movement out of the 32 board ranges in Scotland, expanded from 8.6 individuals per 1,000 in 2017-18 to 9.9 in 2018-19 (Gov.UK, 2020).

When the well-known lifestyle of a new and nomadic generation coincides with global production changes, its impact on the environment is an issue worthy of attention. Interminable leaseholders with pitiful investment funds, millennials—or anybody with a moo wage who moves frequently—understandably decide on cheaper choices such as Ikea. When it is time to migrate, it is regularly more helpful to hurl your rotting rocker or banged-up bookcase and begin over from scratch than

pay to move a huge thing to a modern domestic (Cummins, 2021). Therefore, the life situations of urban nomads can be seen as a likely high contributor to causing more furniture waste.

Emotional Durability Design increases products' longevity by establishing the emotional connection between products and users. However, there are few applications of EDD in the literature, especially when we consider applying this theory to urban nomads in unstable living conditions. Indeed, it will be a challenge. It is also worth mentioning that this research is not intending to explore a brand-new explanation of the relationship between people and objects (furniture) but apply an interpretive dimension of EDD to challenge urban nomads' current behaviours and support circular economy in mass produced industry.

2.7 Summary

Furniture waste is gradually putting pressure on the environment. Most furniture still has a use value when it is discarded, which means a large amount is wasted material. In addition, the chemicals used in the production of mass-produced furniture, such as glue, make it difficult to recycle the materials.

With the ease of travel and migration, urban nomads are becoming an important group in the composition of society. The fact that they are constantly on the move makes urban nomads more wasteful of furniture than other social groups. Therefore, the design of furniture that enhances the relationship between the urban nomads and their furniture, or their patterns of use, may help to reduce furniture waste.

EDD is considered by many scholars as a strategy to change the user-product relationship and extend the life of the product, which echoes the principles of the circular economy to extend the life of products and materials. It is thought to be applicable in strategies such as product maintenance and repair design, by influencing users' positive emotions towards the product and thus their behaviour towards it (den Hollander et al., 2017).

Wastling et al. (2018) also point out that if maintaining the product can be seen as the responsibility of the user, then we should not ignore the level of user engagement and should consider how to allow for user involvement through motivational design.

Although Chapman proposed the Emotional Durability Design Theory in 2008, during its development over the past decade similar theories have been proposed by researchers, such as research on strategies to enhance the emotional connection between products and users, psychological durability design, etc.

However, there is very little research data on EDD in mass-produced furniture companies and in social groups with certain characteristics, such as urban nomads. It is worth discussing the fact that different groups have different emotional needs for different products, and therefore it is necessary to apply the Emotional Durability Design theory in an innovative way to the study of specific groups and specific products.

In the next section, I will discuss the research methodology and research methods used in this study.

Chapter 3 Methodology

3.1 Introduction

After conducting a theoretical study of the literature and defining the current gap in academic research related to EDD, field research becomes necessary. In this section I will discuss the methodological approach I will adopt and the specific research methods that will be used to address the research aims:

> **Research aim 1:**
> To explore and understand the emotional connection between urban nomads and the furniture they use to identify the impact that relationship has on their behaviour towards furniture use.

> **Research aim 2:**
> To uncover the potential value and application of EDD to the mass-produced furniture industry and urban nomads in a way that could reduce furniture waste.

The theoretical and methodological positions I have chosen from research theory are mainly Social Constructivism as Ontology and Symbolic interactionism as Epistemology. Their choice is related to the object of my project, which values human narratives and emotions, as well as the connection between people and objects.

To gain exploratory, reflective insights into people's behaviours and motivations, challenge the existing emotional relationship between people and furniture, and suggest the value of EDD in mass-produced furniture companies, the research adopts Phenomenology as the main research methodology.

The rationale and value of each specific research method is discussed in the text, where my role as a researcher in the project is also discussed separately.

3.2 Theoretical and methodological position

A qualitative philosophical statement guides the paradigm and worldview of the research project, which shapes the researcher's perspective and design choices (Gray, 2014). This study is to understand how emotional connection can affect the behaviour of urban nomads towards their furniture, considering their lifestyle of moving from city to city, flat to flat, and to evaluate the potential value of EDD in furniture design and the circular economy for urban nomads in the mass-produced furniture industry.

In this chapter, I have chosen to articulate the philosophical perspective through the structure of Crotty (2020), including the epistemology and ontological theories that underpin this research, as well as the methodological approach.

Ontology	**Social Constructivism**
Epistemology	**Symbolic interactionism**
Methodology	**Hermeneutic phenomenology**
Methods	Interview Focus Group Co-Design
Analysis	Thematic analysis Visual analysis
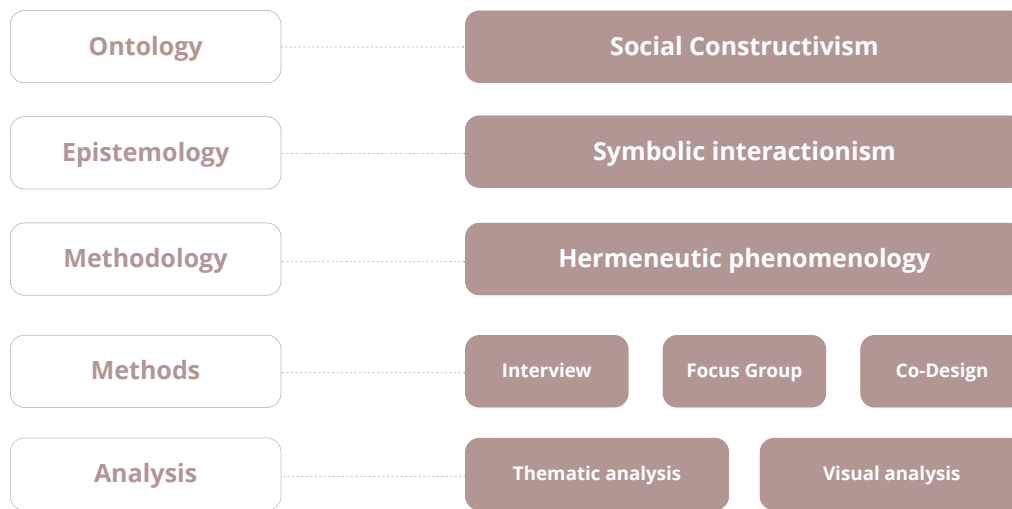
Figure 2: Theoretical and methodological overview

3.2.1 Ontology

This study employs Social Constructivism as ontology, which focuses on the interaction between subject and object, and supposes that there exist multiple, contradictory but equally valid statements in the world (Elder-Vass, 2013). In opposition to scientism, which overly focuses on rational thinking, this project recognises the importance of emotions to the acquisition of experience (Goleman, 1996) and argues that people are capable of creating meaning through active interaction with others in society and the environment in which they live (Vygotsky et al., 1962), in this case, the furniture they use.

3.2.2 Epistemology

Symbolic interactionism holds that human beings interpret the meaning of objects and behaviours in the world from interaction, and determine their behaviours based on the interpretation (Gray, 2014). Good interaction often leads to positive behaviour (Norman, 2007), which thoroughly supports the potential role of positive emotion in the relationship between people and furniture and its potential influence on people's behaviour. Carter and Fuller (2016) also argue that the meaning of interpretation is not fixed or stable but are revised on experience. Therefore, understanding the impermanent and fluctuating nature of emotional meaning becomes an essential challenge in sustaining this bond.

3.2.3 Methodology

Hermeneutic phenomenology was applied as the methodological standpoint of this research, as it focuses on people's 'lifeworlds' or human experiences, illuminating the details and seemingly insignificant aspects of our lives that may be taken for granted, and to create meaning and a sense of understanding for them (Laverty, 2003). Heidegger argues that we understand the world of life, and experience, and

give it meaning, not just as the way we perceive the world, but also as the way we exist (Polkinghorne, 1983).

The value of furniture as an indispensable, everyday interactive product in people's, or more specifically urban nomads', lifeworlds is often overlooked in relation to its users. Studying the emotional connection between users and furniture will help us to reinterpret the meaning of furniture and give insight to the furniture industry, providing guidance to users on sustainable behaviour through EDD. It is worth noting that this research is not about exploring new interpretations of the relationship between people and things (furniture), but rather about applying the explanatory dimensions of Hermeneutic phenomenology and EDD to challenge current behaviours and support circular economy processes.

As a branch of Interpretative Phenomenology, Hermeneutic phenomenology research also requires rich data, which means that participants need to be given the opportunity to tell their stories and to reflect on their understanding of a phenomenon or perspective. Generally, interviews, unstructured or semi-structured, are seen as one of the most appropriate ways to collect data, but in some specific contexts other methods such as focus groups can also be used as a way to collect data (Smith et al., 2009). As this research is based on the experiences between urban nomads and furniture, it explores the potential application of EDD to the mass-produced furniture industry. I used interviews to examine the relationship between urban nomads and furniture, and focus group discussions to explore the views of urban nomads and practitioners on EDD based on their understanding of the relationship. Finally, I applied co-design to further validate the participants' interpretation of the focus group experience.

Furthermore, Hermeneutic phenomenology is not only concerned with whether the interpretation of the phenomenon clearly expresses the participants' views, but also with the relationship between the context in which the text is interpreted and the context in which it is interpreted (Smith et al., 2009). Therefore, in this study, in addition to examining the participants' interpretations of their relationship with furniture and the industry practitioners' interpretations of EDD, as a researcher and an urban nomad, I also need to reflect on the potential impact of my own interpretations of furniture and EDD on the interpretation of the research data. During the data analysis phase, I used reflexivity as a way to understand my own bias towards the research topic.
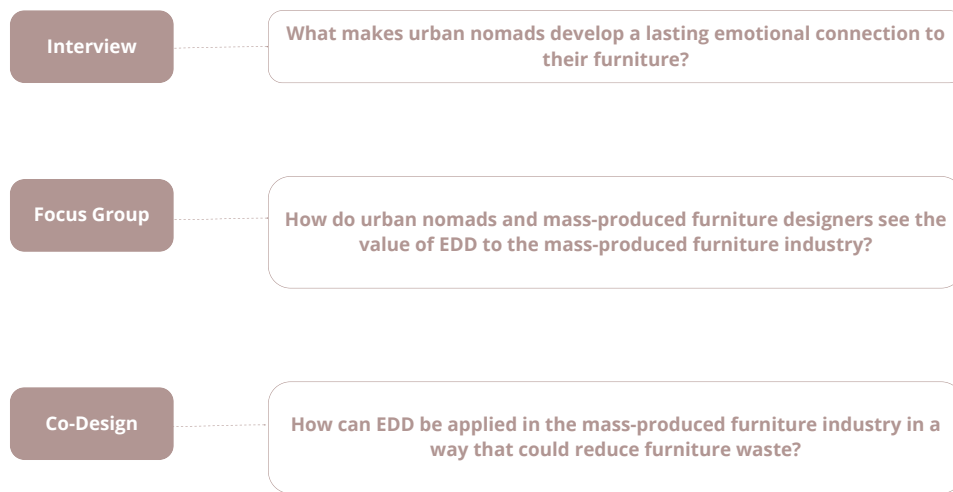
3.3 Methods

Interview	What makes urban nomads develop a lasting emotional connection to their furniture?
Focus Group	How do urban nomads and mass-produced furniture designers see the value of EDD to the mass-produced furniture industry?
Co-Design	How can EDD be applied in the mass-produced furniture industry in a way that could reduce furniture waste?

Figure 3: Methods overview

3.3.1 Interview

"If the objective of the research, for example, is largely exploratory, involving, say, the examination of feelings or attitudes, then interviews may be the best logical technique." (Gray, 2014, p. 434).

Interviews are applied in the first stage of this research fieldwork to understand how emotion affects the relationship between users and furniture, and thus how to potentially influence user behaviour with furniture. Interviews are mainly used to probe for more detailed responses than other methods, such as observation and a survey. It is more useful to understand the experiences of others and the meaning they make of the experience (Hollingshead and Poole, 2012).

Since this research aims to explore the relationship between participants and furniture, and involves exploring deep emotions, I decided to use reflexive dyadic interviews. This follows the typical way of interviewers asking questions and interviewees answering, but interviewers usually share personal experience and the information relevant to the topic, or reflect on the communication process of the interview, which puts the researcher and participants on an equal position. The mutual disclosure of the researcher and participants is not only to encourage each person to communicate desires, but rather, it creates an atmosphere of intimacy to enable participants to share more of their stories (Holstein and Gubrium, 2003). This project explores emotions over facts and the reflexive dyadic interview provides participants a more comfortable communication experience and facilitates understanding of their rich inner feelings.

A semi-structured interview is used to enable the interview to be in-depth enough to address the research objectives, but flexible enough to adapt to each person's situation. The researcher lists open questions in advance and conduct once with one person. The best duration of the interview is 30 minutes to one hour (Holstein and Gubrium, 2003). To achieve optimum use of interview time, interview guides, which are composed of several main questions and many associated questions, can enable

research to have a more overall perception of the interview content and keep researcher's focus on the desired line of action (Hollway and Jefferson, 2013).

During the interview at this stage, I expect to get rich data to help analyse how emotional connections influence the relationship between urban nomads and their furniture, as well as how emotional connections influence urban nomad's behaviours towards their furniture.

3.3.2 Focus Group

Group settings may be better at generating discussion around shared and unshared attitudes and experiences (Seal et al., 1998).

Focus groups permit for the synergistic building up of information as respondents are able to see what others are communicating, which allows analysts to investigate the sentiments, states of mind, convictions, prejudices, reactions and encounters of the subject, which is through perception, interviews or studies, and any other strategies cannot be gotten (Gray, 2014).

Although Webb and Kevern (2001) believe that phenomenology requires participants to explain their experience in as uncontaminated a way as possible, a research method involving groups such as focus group seems inappropriate because individuals will be affected by the views of others. But Bradbury-Jones et al. (2009) argue that focus groups can also play a role in phenomenological research. Participating in a process of "interpreting each other with participants" is able to help researchers divide participants' ideas into categories when challenged by other group members and enable researchers to have a clearer and richer understanding of the phenomena in the research, which bring together the multiple points of view, as Social Constructivism required.

At this stage, I invited 3-5 participants, including 2-3 urban nomads and 1-2 mass-produced furniture designers to share their experience of emotional connection with furniture in a group, and discuss the value of emotional durability design in mass-produced furniture industry. The furniture designer is not necessarily experiencing an emotional connection with the furniture, but is interpreting them through different perspectives, to bring these different perspectives together, according to social constructivism.

I expect to achieve what Lindlof and Taylor (2002) call the knock-on effect through the conversation, that is, listening to the memories and experiences of others and stimulating the ideas of other participants. Especially when participants realize that they have shared experiences and feel that their opinions are verified and supported by others. In the end of discussion, I expect these conversations will cultivate the participants' inspiration for the co-design workshops to be conducted.

3.3.3 Co-Design

Co-Design is about involving people in design for refinement, innovation and impact, which combines people's collective experiences to construct the best possible outcomes (Nimkulrat et al., 2020).

Interpretative phenomenology plays an important role in co-design, when it is used as an interpretive and generative process that focuses on the end-user's experience (Monash University et al., 2016).

There is growing evidence that co-designing with users can lead to more innovative ideas that better meet their needs (Chang and Taylor, 2016). However, co-design itself is a complex, contradictory, and sometimes antagonistic process (Björgvinsson et al., 2012). In this process, different stakeholders (including design experts) bring their specific skills and cultures to the table. It is a social dialogue in which everyone can come up with ideas and act, although these ideas and actions can sometimes create problems and tensions (Manzini, 2016).

Co-design can be construed as an experiment to facilitate creative collaboration between diverse people with varying backgrounds and skills, such as users, researchers, and designers, so that they can explore and conceive ideas together, produce and discuss sketches, and refine models or prototypes (Steen, 2011). Co-design practice gives users the opportunity to become part of the design team as 'experts of their experience' (Sanders and Stappers, 2008), which also requires all stakeholders are willing and able to understand each other, change their minds and move towards a common view to get some tangible results.

To motivate users to express and understand the views of others, I act as a facilitator for the participants' collaboration. I invite participants to co-design some prototype and give each stakeholder enough time to present and talk about their reflections on the values and roles of EDD during the process. To better understand user perceptions of the role of EDD in the mass-produced furniture industry, based on the focus group phase discussions, I ask participants to work with mass-produced furniture designers to select several pieces of furniture that are important to urban nomads and, based on their own experiences, to try to apply EDD to the production and design engineering of these pieces of furniture. Ultimately, they evaluate the role of EDD for the mass-produced furniture industry and its potential value to the circular economy process.

3.3.4 Researcher's role

Using phenomenology as a methodological guide, the project's main tool for data collection was the linguistic interview. Thompson (1997) suggests that in interviews seeking interpretation, rather than being guided by prespecified questions, the researcher's questions should be set to the maximum extent by the participants themselves. Therefore, in both semi-structured interviews and focus groups, I start by talking about the participants' subjective experience of furniture and, asking further questions based on their answers, gradually uncovering their interactions and behaviour with furniture and their expectations of the mass-produced furniture industry.

As a researcher one should attempt to provide an environment that facilitates entry into a descriptively focused, non-judgemental dialogue (Colaizzi 1978). I try to assume the role of a listener, as well as facilitator during fieldwork, when necessary, I will also share experiences as a participant to provide a comfortable and equal environment for participants to communicate.

Reflection also plays a vital part of phenomenological research. For the linguistic reflections in the interviews, I mainly reflect on the dynamic combination of the participants' interpretation of their own experiences and my interpretation of their narrated experiences to iteratively confirm the adjustments as well as to obtain rich data (Stern et al., 1998).

3.4 Analysis

3.4.1 Thematic analysis

Thematic analysis is used to identify and analyse patterns (topics) in qualitative data or pattern recognition in data. Since my project is practical research based on EDD theory, theoretical thematic analysis is carried out from the theoretical standpoint of the researcher. This type of thematic analysis provides a more detailed description of certain components of the data analysis rather than a broad overview of the data (Braun and Clarke, 2006).

Where do the themes come from? They 'exist' in our minds. The themes that emerge from the analysis come from our thinking about the data and create links between them as we make sense of them (Ely, 1997). Braun and Clarke (2006) similarly note that it is important for researchers to acknowledge their own theoretical positions and values in relation to qualitative research.

The concepts of meaning and action, interaction, self, and perspective are important themes in symbolic interactionism (Chamberlain-Salaun et al., 2013). I will use an inductive approach to gain insight into the data derived from participants' experiences rather than EDD theory. In terms of practical approach, I will use the six-stage approach proposed by Braun and Clarke (2006):

Stage one: Familiarising with the data

Most of the research work will be conducted online, which means video/voice record would be the most efficient way of recording data. I will transcribe the data by watching/listening repeatedly and recording the initial thoughts in understanding data.

Stage two: Generating initial codes

systematically code the valuable data in the entire dataset and classify other data related to it.

Stage three: Searching for themes

Sort out potential topics from the classified data blocks, and collect all data related to each potential topic.

Stage four: Reviewing themes

Check whether the selected potential topics are related to the coding extraction and the entire data set and generate a topic "map" for analysis.

Stage five: Defining and naming themes

Continuous analysis to improve the details of each topic, but also pay attention to the overall story narrative of the research project to generate a clear definition and name for each topic.

Stage six: Producing the report

Extract and summarize excerpts or examples from the research, combine the themes obtained in the research process with the literature, and produce an academic report of the analysis

3.4.2 Visual analysis

Visual images are no longer restricted to specialized forms of expression in art classes and museums but are a fundamental form of everyday communication that reflects multiple ways of knowing and expressing (Johnson et al., 2019). Hermeneutic phenomenology research, in its analysis of content, focuses on the interpretation with the participants and the researcher's understanding and reflection on the participants' interpretation, a feature that is demonstrated in the process of visual analysis.

Indeed, in the co-design process, interviews with participants about the process of generating visual materials, rather than the visual materials themselves, were particularly helpful in exploring what was taken for granted in the lives of the participants, such as the design of furniture (Rose, 2014).

Rose (2016) refers to three criteria for dialectical interpretation of image information:

Valuing image information. Image information has its own effects and when analysing it, we should look carefully at the content of the image information.

Understanding the social context of the image, the effect of the image and the modes of distribution. The analysis of the content of images requires us to consider cultural practices, as well as the inclusiveness and exclusivity of a particular cultural context.

Reflect on the ways in which one interprets images. A dialectical understanding of one's own way of interpreting information about images can lead to a further understanding of images.

I integrated the analysis of image information with the analysis of textual contexts to validate participants' interpretations of focus group discussions.

3.4.3 Reflexivity

Reflexivity is primarily concerned with the relationship with the researcher and participants (Brannick, 2007), which is used to collect qualitative data, usually through interviews (Ryan and Golden, 2006).

Reflexivity requires the researcher to be aware that he or she is not a disinterested bystander to the research; instead, the researcher makes subjective and selective observations and often receives one-sided and biased interpretations (Gray, 2014).

For researchers not to lose sight of the bulk of the data and to draw conclusions about the research, Mauthner and Doucet (2003) note the importance of not only establishing reflexivity in data analysis methods, but also the need to create dedicated time, space, and environment to stimulate reflexivity.

In line with the form of reflexivity noted in Gray (2014), I choose personal reflexivity where the researcher reflects on how personal values, attitudes, beliefs, and goals will have an impact on the research, which also requires the researcher to reflect on the impact of the research process on their personal perspective. I was inspired by an example from Mauthner and Doucet (2003) regarding the practical aspects. In practice, the researcher places the participant's words in one column and the researcher's own responses and interpretations in an adjacent column, so that the

researcher is able to examine how and where his or her own assumptions and opinions influence the interpretation of the participant's words. When analysing data, I will adopt this model to reflect on the impact of personal perspectives on the research.

3.5 Ethics

This research focuses on the emotional connection between users and their furniture and attempts to explore the application of EDD in the group of urban nomads. As the researcher for this project, I have a responsibility to keep the information of the participants safe and to provide them with a harmonious and positive atmosphere of participation. Therefore, in line with the GSA ethics policy, I have considered the following security and ethics issues in the project.

Participants' personal information is kept private at all stages of the project. They will also receive an information sheet in advance, which describes the project and the researcher's data storage and protection measures. Participants will be asked to sign the consent form before the project, and this will be verbally reconfirmed before their participation. Participants have the right to withdraw from the project at any time and to ask the researcher to delete any data associated with them.

During the Interview phase, all interviews are conducted one-to-one on the Zoom platform logged in by the researcher's GSA account. Participants have the right to request not to be recorded and to be able to keep their cameras off. Recorded interviews will be stored in an encrypted file and only the researcher and supervisor will have access to them. Video and audio data will not be made public in any way.

During the focus group phase, the discussion will take place via the Zoom platform and the Miro platform logged in by the researcher's university account. Participants have the option to keep the camera off. The Miro board will be encrypted and only the researcher and participants will have access to the Miro board during the discussion. Data, images on the Miro board will be used anonymously with the participant's consent.

The workshop is held on the Miro platform, logged in by the researcher's university account. The participants will be able to see each other's ideas in addition to the researcher's. Thus, before starting, the researcher will confirm via the consent form whether the participants are willing to share data with other participants. The Miro board will be encrypted and only the researcher and participants will have access to the board during the workshop. Data, images on the Miro board will be used anonymously with the consent of the participants.

3.6 Recruitment

The project involved mainly Glasgow-based urban nomads and mass-produced furniture designers.

There is no clear academic definition of urban nomads. According to literature review, urban nomads are generally in their 20s and 30s and often move from city to city, flat to flat, for education or employment reasons. Therefore, when recruiting, I wrote a call for participants, which described the content of the project and the characteristics of urban nomads, so that participants could determine for themselves

whether they were interested in the project and whether they belonged to urban nomads.

The call for participants sheet was posted on online social networks such as LinkedIn and Instagram to recruit suitable participants. I also recruited participants by distributing call for participants sheets through Glasgow community sustainability events such as a local zero waste market.

My contact details are available on The Sheet and participants who are interested in this research study and fit the profile of urban nomads can get in touch with me by email.

The recruitment of mass-produced furniture designers is mainly done through referrals and searches on LinkedIn. I contact them by sending them an email and presenting my project. Designers will be given the option to participate in the project once they know what it is about.

3.7 Summary

In the section on methodology, I consider the research position, methodology and research methods used in this study. In addition, the analysis of research data, reflection, ethics, and recruitment methods are also discussed.

Guided by the research methodology of Phenomenology, I used reflexive dyadic interviews to understand the participants' lasting emotional connections with their furniture and their behaviour towards furniture with emotional connections. Focus groups were also used to understand the value of EDD in the eyes of urban nomads and mass-produced furniture designers, and the potential applications in the mass-produced furniture industry.

Finally, I attempt to verify the participants' understanding of the potential applications of EDD in the mass-produced furniture industry through co-design. For the interview and focus group phases I will use Thematic analysis, while for the co-design phase I will use visual analysis.

To clarify my personal bias towards my understanding of the data analysis, I decided to disclose my understanding of the research by keeping a reflective diary during the data analysis process. In addition, the ethics of the research were carefully measured at this stage to ensure that there was no harm of any kind to all participants, and any form of disclosure of information.

In the next section I will discuss how I have applied these research methods and analytical tools in fieldwork.

Chapter 4 Fieldwork

4.1 Introduction

This chapter describes the process of fieldwork undertaken from June to September 2021, which will be based on the methods planned in the methodology section, and due to the impact of COVID-19, the methods will be applied online and with more flexibility.

The main fieldwork is divided into three sections, interview, focus group and co-design. Interviews are divided into two sections in which the reflexive dyadic interviews are with recruited urban nomads, while the parallel scoping interviews are with furniture designers, journalists who write about urban nomads and EDD research experts.

The interview and focus group were preceded by a participant recruitment exercise, the details of which are discussed below. The Co-design participants were the same group of urban nomads and mass-produced furniture designers as the focus group participants. This section will also show the process of data analysis, and the methods I used in the data analysis process, which are thematic analysis, and visual analysis respectively. The specific analysis steps will also be discussed separately.

4.2 Phase one: Interview

4.2.1 Recruitment

To recruit participants for the interviews, I created a call for participants sheet and posted it on social media sites such as Instagram and Facebook. At the same time, I went to local markets, such as Zero Waste Market and second-hand furniture markets, to hand out to potential participants.

In the call for participants, I included a short description of the project and a brief definition of urban nomads. Potential participants can read the project information and the urban nomads criteria for themselves to determine whether they belong to the project's target group and whether they are interested in the subject of the project. If a potential participant confirms their interest in taking part in the study, they could confirm their participation by emailing me.

Here shows the codes for all participants:

Participant Code List			
Participant Code	How long have you been moving to Glasgow?	Recent Status	Do you consider yourself an urban Nomads ?
C	Moved out 1 year ago	Working	Yes, Frequent travel to different countries
L	About 8 months	Looking for job opportunities	Mostly Agree
A	2 months	Student	Yes
X	About 7 months	Just Graduated	For nearly my whole life
Y	2 months	Student	I think so
S	More than 3 years	Working	I used to be
V	Moved out 3 months ago	Working	A solid yes

Figure 4: Participant code list

4.2.2 Interview

During the interview phase I recruited a total of eight participants and I tried to understand the emotional connection between their furniture and the participants through my communication with them.

Humans are driven by a constant search for meaning, and that meaning is often experienced through interaction with objects (Chapman, 2008). To explain the emotional significance of the furniture, then, it is important to begin by understanding the stories of the interactions between the furniture and the participants. I asked participants to identify one or two pieces of furniture that stood out to them, and then explored the stories of the participants' interactions with these pieces of furniture and their behaviour towards them through dialogue. At the end, I asked participants to reflect on the dialogue to interpret the meaning of their relationship to the furniture.

To give participants space to tell their subjective stories, I used a semi-structured interview with a list of open questions (see the appendix for details). After drafted my first question list, I did two interview pilots to test the feasibility of the questions and then iterated on the question list to make the dialogue more dynamic and to ensure that I could get enough data. The interviews went very well, and I had pleasant conversations with the participants. When talking about their relationship with furniture, they told many stories about their experiences with furniture, such as the first time they bought furniture, the pleasant times they had with their housemates and so on.

Figure 5: Interview (Illustration: Zeng, J/Ruslana. (2021))

Interestingly, more than one participant mentioned that discussing their relationship with the furniture made them realise for the first time that they had given so much meaning to a piece of furniture. Perhaps this kind of emotional neglect is common for a product that is used on a daily basis but being able to make the participants of some of the neglected emotional links made me feel that the interview had value beyond the research.

During the interview process, I encountered a lack of participant motivation. There were repeated instances of potential participants expressing interest in the project but losing contact afterwards, which caused a great deal of frustration in the early stages of involving participants.

To maintain an active and close relationship with the participants in preparation for the rest of the research, I participated in the STBY reactive work workshop, learning from experienced researchers how to motivate participants as well as building a friendly online interview environment through Zoom.

Researchers from STBY mentioned that keeping in touch with participants by email and updating them on the status of the research would help to keep their attention longer. I found this tip very valuable, as participants often lack an overall sense of engagement if I just contact them when I needed. In the workshop, researchers also pointed out that, unlike offline where you can demonstrate body language to create a friendly atmosphere, 'exaggerated' facial feedback is more important in an online interview, to make participants feel more secure and willing to share. In addition, recapitulating the participants' responses and asking about the correctness of the summaries builds an interactive conversational environment that more easily puts the participants on an equal footing with the researcher.

All these suggestions were very helpful in making my interviews run successfully.

4.3 Phase two: Focus Group

After the interview analysis and understanding the relationship between the participants and the furniture, I tried to focus on the value and potential of emotionally sustainable design for urban nomads and the mass-produced furniture

industry. In this, I explored two groups, the users and mass-produced furniture designers, from the perspective of the consumer and the industry respectively.

4.3.1 Recruitment

After the first phase of the interview, some participants were unable to continue with the study. So, I went through the recruitment process again, both online and offline, I ended up with five participants, as urban nomads. The recruitment of mass-produced furniture designers was mainly done through LinkedIn and through referrals from acquaintances. I posted the need for a furniture designer for the project through social media and expected my network to help me reach out to the right person, at the same time, I also tried to contact furniture designers via LinkedIn. Eventually, I managed to find a bespoken furniture based in Glasgow, as well as an IKEA furniture designer. The bespoke furniture designers are not technically part of the mass-produced furniture industry, but the diversity of participants facilitated a reflective dialogue.

Figure 6 shows the codes for all participants:

Participants Code List			
Participant Code	How long have you been moving to Glasgow?	Recent Status	Do you consider yourself an urban Nomads ?
X	About 7 months	Just Graduated	For nearly my whole life
V	Moved out 3 months ago	Working	A solid yes
P	About 10 months	Student	Have moved from different cities
D	More than 2 years	Working	Since University, yes
E	Almost 3 years	Being student soon	I don't think I am, but I'm interested in the project
Mass-produced furniture designer	N/A	N/A	N/A

Figure 6: Participants code list

4.3.2 Focus group

The focus group was held with Miro through Zoom. I designed the focus group engagement tool in advance and shared the Miro board whilst the focus group was taking place. Initially I planned to bring together five participants and mass-produced furniture designers to stimulate conversation and discussion from the different perspectives of users and designers. Due to the inconsistency of participation time, I ended up having separate discussions with the furniture designers and held three focus groups to suit the different schedules of the participants.

Figure 7: Focus group (Illustration: Zeng, J/Seahorsevector. (2021))

The engagement tool presented on Miro (Figure 8) is a map that participants can follow. At the start, I give details of the project and the flow of the discussion. Before each discussion I explain the process in advance and ask the participants how they understand the process and finally ask each participant to choose a colour of sticky note that best represents them. I used this as an icebreaker.
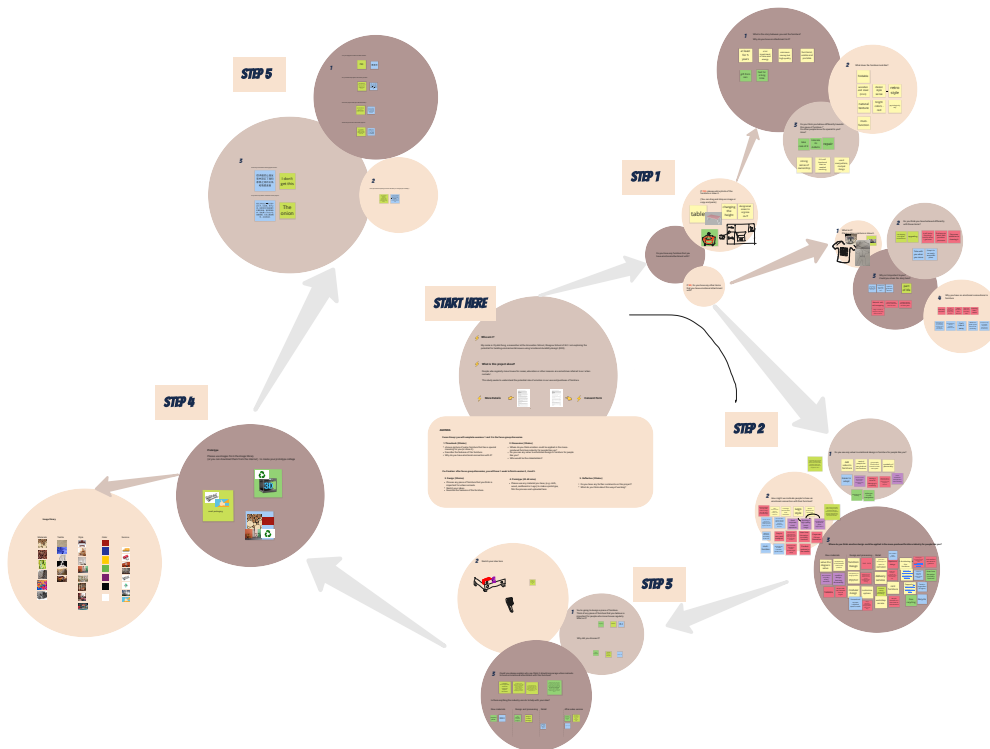

Figure 8: Engagement tool 1

START HERE

⚡ **Who am I?**

My name is Crystal Zeng, a researcher at the Innovation School, Glasgow School of Art. I am exploring the potential for tackling environmental issues using 'emotional durability design' (EDD).

⚡ **What is this project about?**

People who regularly move house for career, education or other reasons are sometimes referred to as 'urban nomads'.

This study seeks to understand the potential role of emotion in our use and purchase of furniture.

⚡ **More Details** 👉   👈 ⚡ **Consent Form**

AGENDA

Focus Group: you will complete sessions 1 and 2 in the focus group discussion

1.Throwback (20mins)
- show a picture of some furniture that has a special meaning for you (or draw it).
- Describe the features of the furniture
- Why do you have emotional connection with it?

2. Discussion (20mins)
- Where do you think emotion could be applied in the mass-produced furniture industry for people like you?
- Do you see any value to emotional design in furniture for people like you?
- Who would be the stakeholders?

Co-Creation: after focus group discussion, you will have 1 week to finish session 3, 4 and 5.

3. Design (30mins)
- Choose any piece of furniture that you think is important for urban nomads.
- Sketch your ideas.
- Describe the features of the furniture.

4. Prototype (40-60 mins)
- Please use any material you have, (e.g. cloth, wood, cardboard or Lego) to make a prototype, film the process and uploaded here

5. Reflection (20mins)
- Do you have any further comments on this project?
- What do you think about this way of working?

Figure 9: Engagement tool 2.

As the new participants did not have the same deeper understanding of the project as the old participants who had participated in the interviews, I split the dialogue into two parts in the focus group discussion. For the first step, I continued to shape the conversation by exploring the connection between the furniture and the participant, but this time I did not only limit the story between the furniture or household object with the participant. I encouraged the participant to describe the details of the shape, material, and colour of the specific object, as well as the interaction behaviour between the participant and the object driven by the emotional connection.

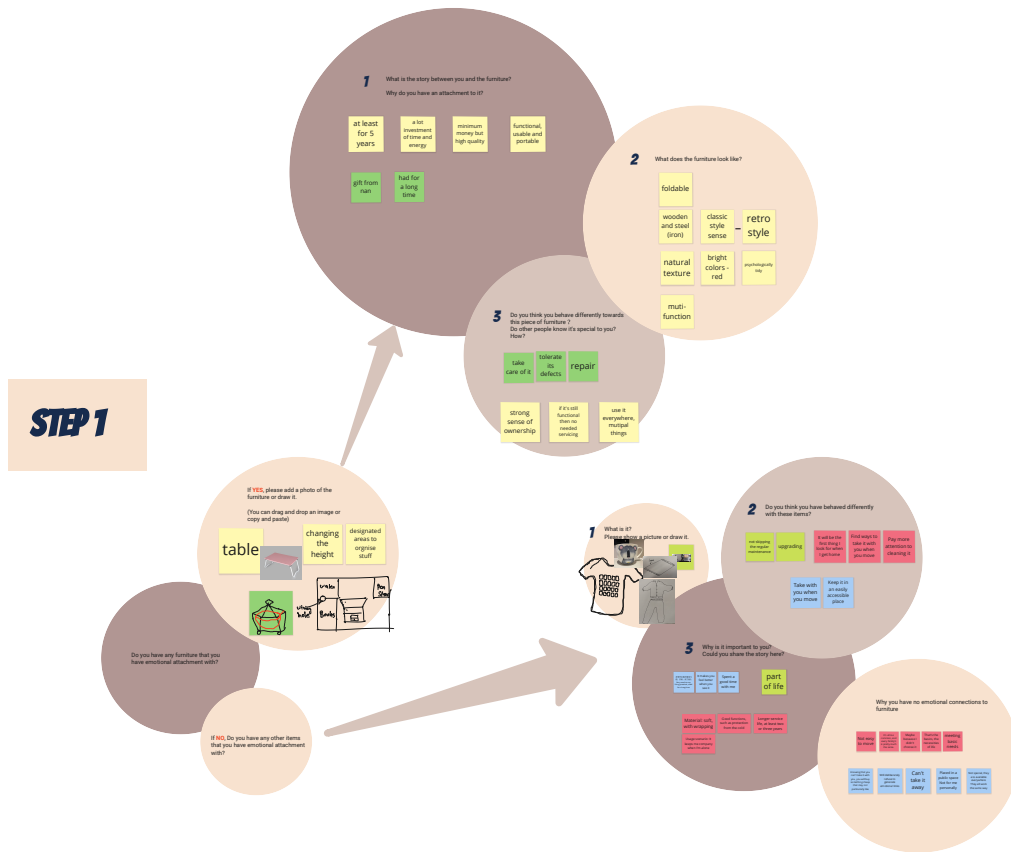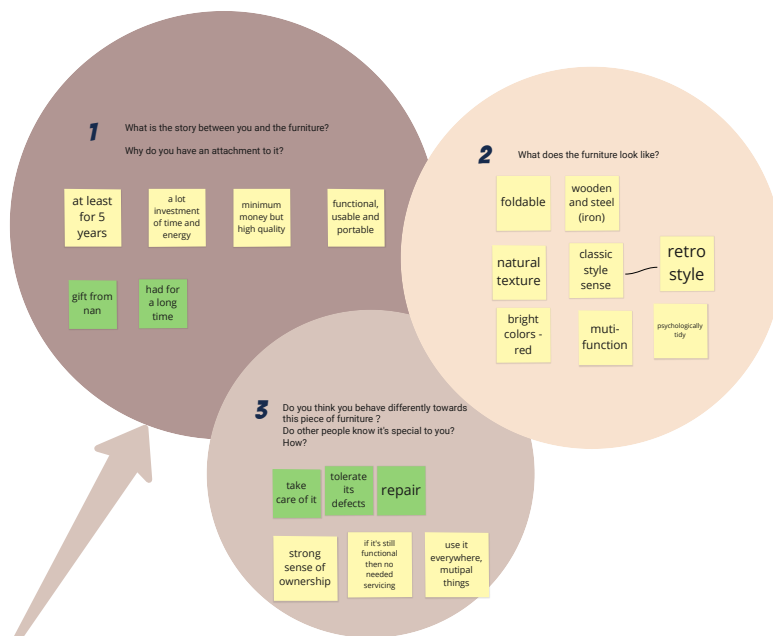**Figure 10: Engagement tool 3**

Figure 11: Engagement tool 4.

In the second section participants were asked to discuss the benefits of emotionally durable design for the urban nomad community, as well as its value in the mass-produced furniture industry. I have divided the mass-produced furniture industry into three parts based on IKEA's industrial structure: the raw materials sector, the

manufacturing sector, which includes furniture design and production, and the retail sector, which is the retail and after-sales service sector. By refining the structural chain of the industry, participants were given more space to discuss the potential opportunities for EDD in the mass-produced furniture industry.

In the session with mass-produced furniture designers, I focused more on the second part, the exploration of EDD in the industry. Understanding the initiatives of modern mass-produced furniture companies under the circular economy approach and the focus on the emotional lifespan of furniture from a designer's perspective. The IKEA designer gave examples of the many actions that are taking place at IKEA to support the longevity of furniture, although not all of them are related to EDD. The bespoke designer, on the other hand, analysed the potential of EDD in terms of the art of furniture and what it means to the user. It is clear that the two designers have different approaches and perspectives in describing the furniture industry, but both reveal the value of EDD.
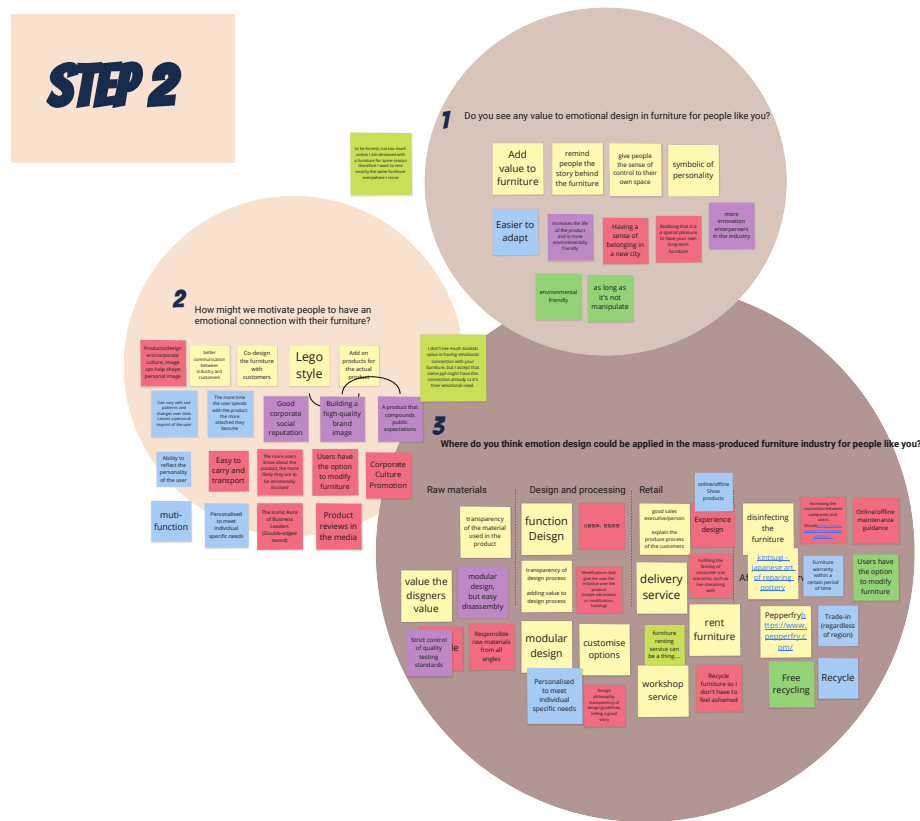
Figure 12: Engagement tool 5
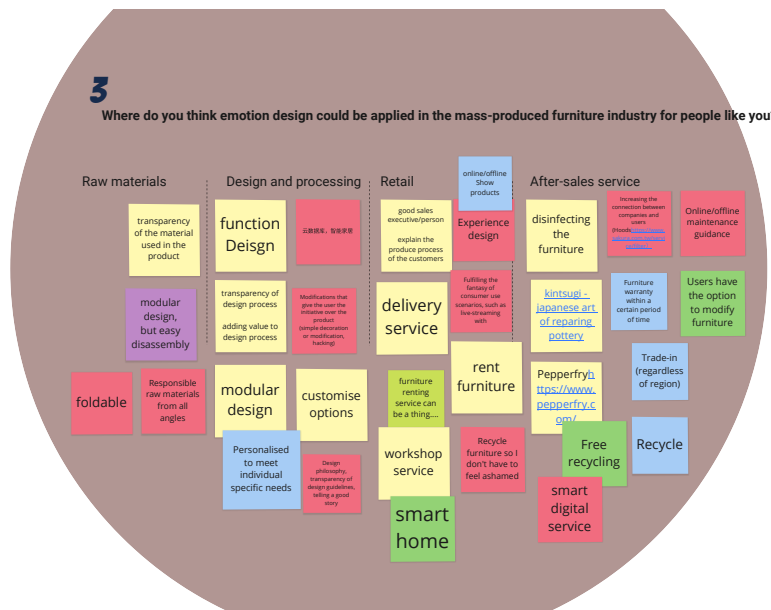
Figure 13: Engagement tool 6

4.4 Phase three: Co-Design

Co-Design was closely linked to the Focus Group discussions. I asked the participants directly about their willingness to participate in the Co-Design phase after we finished the Focus Group Discussion. As the time available to the participants was not aligned, I tried to give them the freedom to experiment with the use of EDD in mass-produced furniture design.

Figure 14: Co-Design (Illustration: Zeng, J/ Visual Generation. (2021))

In the Co-Design process, I acted more as a facilitator, than a co-designer. At the end of the focus group, I discussed a design brief with the participants, trying to get them to choose a piece of furniture that was important to urban nomads, and to try to apply EDD to the mass production process of this piece of furniture, inspired by the discussions in the focus group. In addition to simple sketches and text, I also prepared an image library to facilitate participants' use the images to make puzzles

as design prototypes. Finally, participants are asked to complete a feedback survey for the focus group and co-design participation.
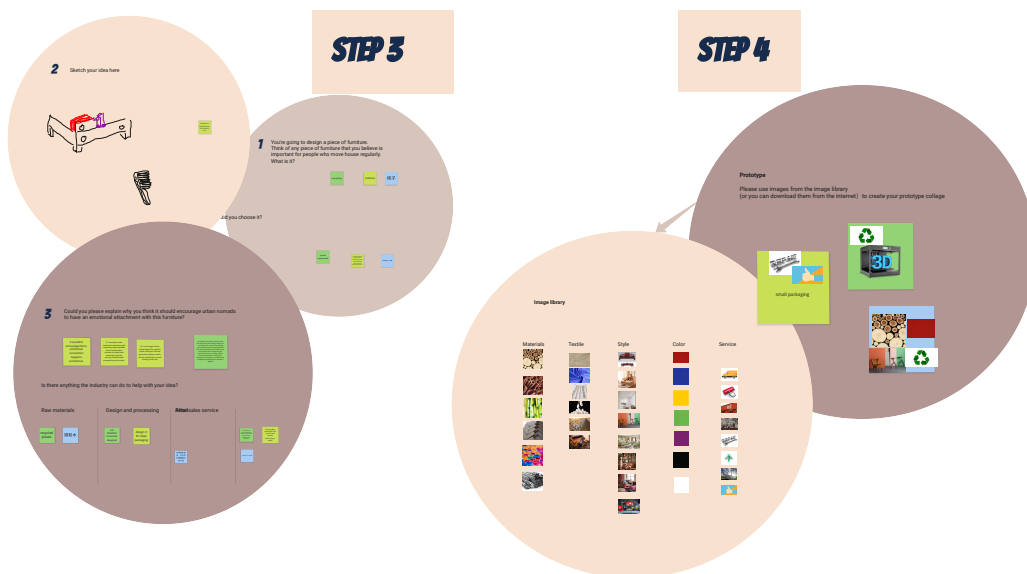
Figure 15: Engagement tool 7

Co-design was mainly done on Miro, where I shared a pre-designed tool that was open to all participants, so they could see each other's ideas and designs to get inspired. Participants had a week to complete all the session in the tool. My contact details were also in the brief, so participants could contact me at any time if they encounter any problems.

The advantage of sharing the free-form design space with the participants is that they can dictate their own participation time and they will have more time to conceive their ideas and participate more freely in the schedule. However, this approach also brings with it some problems. The lack of researcher control over the progress of the participants, many of whom appeared to be unmotivated to participate, by quickly completing the task on the last day, which can lead to less-than-ideal quality of data obtained during the Co-Design phase. To address this challenge, I tried to re-engage with the participants on their answers, trying to get more data by listening to their explanations of their answers and giving them more interpretation of their designs.
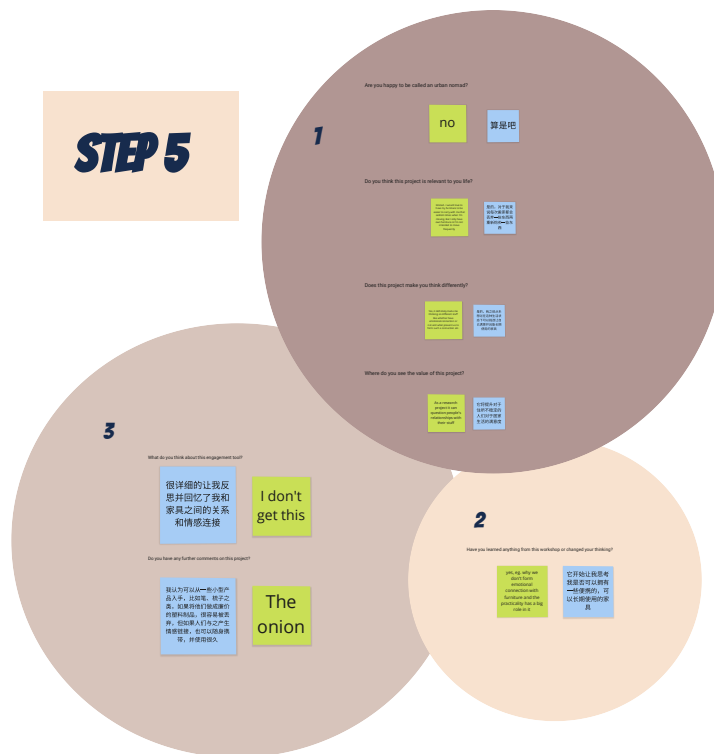
Figure 16: Engagement tool 8

4.5 Parallel Scoping Interview

Although my participants were mainly urban nomads and mass-produced furniture designers, a more diverse range of participants brought a different viewpoint to the research. Therefore, during fieldwork, I also conducted parallel scoping interviews. The interviews were conducted with journalist specialising in the field of urban nomads, sales manager of mass-produced furniture and expert with extensive research experience in the field of Emotional Durability Design. Interviews were conducted on Zoom.

Participants Code List	
Participant Code	**Fields**
journalist	specialise in the field of urban nomads
sales manager of mass-produced furniture	mass-produced furniture industry
Experts	Emotional Durability Design

Figure 17: Participants Code List

About a week before each interview, I sent my project description and informed consent form to the experts to give them an initial overview of my project. The questions were based on the project process and asked for their opinions on the research phases. The interview with journalist was carried out in parallel with the first phase of the interview, the interview with the sales manager of mass-produced furniture was conducted during the second phase of the focus group and the interviews with an expert with extensive research experience in the field of Emotional Durability Design was undertaken during the Co-Design process.

4.6 Data analysis

4.6.1 Thematic Analysis

Thematic analysis began towards the end of the fieldwork, guided by Braun and Clarke's (2006) six-step process of familiarizing oneself with the data, generating initial codes, finding themes, reviewing themes, defining the name of themes, and writing a report.

In the step of familiarizing myself with the data, I listened to all the recordings. As my fieldwork lasted for about three months, this step helped me to re-familiarize myself with the past data and gave me an initial systematic understanding of the whole data. Next, I used the Otto. AI tool to translate the voice messages into text conversations and systematically coded the data.

Having determined the division of the data blocks, I named the themes presented in the different blocks and tried to assess whether the thematic 'maps' identified by the data blocks could answer the questions of this study.

Figure 18: Thematic map

In the process of thematic analysis, I found it difficult to thematise urban nomads and furniture, as each participant's story was unique and summarising many participants' stories into a few highly condensed themes was a huge challenge for me. In contrast, it was much easier to analyse the values of EDD and the themes applied.

4.6.2 Visual Analysis

The visual analysis will primarily focus on the sketches and prototypes made by those who participated in the workshop. According to the guidance of Johnson Museum of Art, the visual analysis will focus on the information in the images, and then combine the themes and interpretations through the information in the images.

During the workshop I mentioned that I had made the workshop a time-limited task for the participants to complete, but in this way, I did not get a quality of rich image information. Therefore, to make the interpretation of the visual analysis richer and to ensure that my analysis was not misinterpreted, I discussed with some of the participants their sketches and prototypes and combined the information from the discussion with the visual information and wrote a report.

Not all participants were involved in the interpretation of their 'work', and some expressed a lack of interest or time to participate, which meant that not all visual analyses were validated by the respective participants.

4.6.3 Reflexivity

I discuss the value of reflexivity for research in the methodology section and show that I was inspired by an example from Mauthner and Doucet (2003) on the practical aspects inspired. In their practice, the researcher places the subject's words in one column and the researcher's own responses and interpretations in an adjacent column, so that the researcher can examine how and where his or her own assumptions and opinions influence the interpretation of the subject's words.

I applied this practice to generating initial codes phase of my thematic analysis. As I converted the video and audio data into text transcripts and coded important information, I re-read the discussion of that part of the information during the interviews and focus groups and wrote my personal views on that information on post-it notes to discern my potential influence on the participants' views during the dialogue.

As a researcher, I personally have a very distinct personal bias towards the subject matter under study. In general, I am relatively positive about the value of EDD for urban nomads and mass-produced furniture. Therefore, in the practice of fieldwork, especially during the interview and focus group sessions, my views were to some extent influential in the participants' understanding and interpretation of the project. Interestingly, some of the participants' responses also challenged my views.

4.7 Summary

In this section, I explain in detail the entire process by which fieldwork is implemented. All the work started in mid-June 2021 and ended in early September, but the impact on the project during the COVID-19 global pandemic cannot be ignored.

As all the fieldwork was conducted online, this affected my interaction with the participants and we were unable to meet face to face to develop a closer connection,

which also affected the level of participation in the long term. Ideally, participants would be expected to be involved in the whole process of fieldwork, from interview to co-design, however the reality is that I have had to repeatedly recruit participants due to a constant flow of participants opting out. I realised that it was important to encourage participant motivation, for example by making participation more interesting and keeping the fieldwork practice flexible, given the constraints of the research scenario.

In fact, repeated recruitment of participants left new participants with a less in-depth understanding of the project. Those who participated in the first interview had a more detailed understanding of the terms urban nomads, Emotional Durability Design and Emotional Connection, and a more personal and subjective view of the research concerns than those who joined the discussion later. However, this does not mean that the ideas presented by those who joined later were not valuable; rather, they raised many questions to challenge the research itself, which brought a more critical perspective to the study.

In the next chapter, I discuss data analysis in response to my research aim and the corresponding research question.

Chapter 5 Data Analysis

5.1 Introduction

In this chapter, I will describe the data analysis. The analysis is divided into two main sections, thematic analysis, and visual analysis. The thematic analysis is for data collected in relation to the interview and focus group process and the visual analysis is for data collected in the co-design process.

5.2 Thematic Analysis

In an in-depth thematic analysis based on Braun and Clarke (2006, pp. 87–93), I will describe the questions that were distilled during the interview and focus group phases.

Q1: What makes urban nomads develop a lasting emotional connection to their furniture?

A satisfying choice	Emotional Narratives	Investment
Functional (for a mobile lifestyle)	Positive memories	A good find
A personalised but adaptable look	Rich in fiction	High investment
	Value attachment	

Figure 19: Themes 1

Theme 1: A satisfying choice

Functional (for a mobile lifestyle)

The basic service function of furniture means that a bed should satisfy the function of sleeping and a table should be able to satisfy the function of office, dining, etc.

> "The furniture must meet the basic functions of use and needs to be comfortable...." ——L

As furniture is a necessity for everyday life, participants suggested that being able to meet their usage needs is the most basic requirement for furniture.

> "Furniture is an item that is used daily. Like any other item, it needs to be usable... My landlord once provided me with a very dilapidated chair. I had to fix the back of the chair with tape to use it normally. I think it should go to the garbage dump. . . It is very painful to use non-functional furniture every day, both physically and psychologically. "——X

At the same time, some participants also suggested that as they move around a lot, furniture is expected to meet higher expectations than just meeting the basic service functions. They suggested the following features that make furniture more appealing to them: ease of installation, ease of transport, multiple ways of use, changeable shapes, ease of storage and foldability.

> *"I would be more likely to choose furniture that is easy to set up and easy to transport if I knew I was going to be moving a lot."* ——C

> *"I have a table that I particularly like. I will take it with me wherever I move... It is foldable and I can put it on the back seat of my bike... I can use it anywhere, like working on the floor, on the bed . . . "*——P

A personalised but adaptable look

Participants mentioned that their changing lives give them the opportunity to be constantly exposed to new social circles, and that personalised furniture allows them to quickly show their personality and aesthetic to guests invited to their homes.

> *"You know, because ultimately, why do we style our apartments, furnish our apartments in a certain way? Is it for ourselves? Partly! I think it's mostly to do with showing others what an expression of yourself basic through furniture, the style choice of furniture, like the style choice of clothing. "*——C

> *"I particularly like furniture in minimalist grey tones, they can adapt to any kind of space... Sometimes the furniture you use can tell people about your personality."* ——X

However, they also suggested that furniture is a spatially specific product, and they would prefer it to be universally adaptable to any style of space, so that they do not have to keep thinking about whether the product will fit in with the new space as it changes. The participants suggested that materials with natural characteristics such as wood, copper and leather are very adaptable to the environment.

> *"One of the reasons I like it is because it is very bright red and has a retro style... It is made of wooden and steel, very natural materials, which makes it look very neat... it can with any space, there is no sense of violation"*——P

Theme 2: Emotional Narratives

Positive memories

One of the words most mentioned by the participants about the relationship between furniture and urban nomads was memory, and there were often special stories behind the furniture that they were unwilling to part with even when they kept changing places. Sometimes the stories relate to the origin of the furniture, such as the first time they picked out their own furniture. Sometimes it is a story about the use of a piece of furniture, such as a happy time spent on a sofa with a friend, or the marks left by a beloved pet on a chair. They also reported that memories associated with furniture gave them emotional support when in a new city, a new flat.

"I went to like a second-hand shop with my mum and we purchased it together. But I always have that memory associated with it of buying it was her, it was just like a positive association. always kept it."——Y

"Before, I would watch a movie on the sofa with my roommate every Sunday night. This is what I look forward to most every week... We curled up on the sofa, covered with blankets, very comfortable... That is my favourite sofa, it even has the mark of my ass, I can sit on it perfectly to rest, when I move out, I am very sad to leave it... For me, it is very important to have some form of connection with the past. Changing the city means separating from the past. Some old furniture is like a heart anchor, reminding me of many stories in the past, and I will feel warm and safe." ——V

Rich in fiction

In addition, the participants suggested that they would use, for example, repainting the furniture to change the colour, or changing the fabric of the outer shell, to satisfy their fantasy of matching the furniture to the new space.

"I loved this bed from the first moment I saw it and kept imagining where I would put it once I had it, what kind of mattress and decor I should choose for it... Every time I move, when I come to a new space, I start imagining again how I should place this bed and what kind of bed linen I should buy to match the room. I enjoy the pleasure these imaginations bring me. "——L

Participants say they have fantasies about how the furniture will be used before they buy it. They also suggested that the often-changing life scenarios help them to perpetuate their imagination about furniture, as they can fantasise about using it in new spaces again. The imagination of the unknown made the participants more willing to keep the furniture.

"I sometimes repaint my cabinet to make it look more fit with this space"——D

Value attachment

Most participants indicated that they were more likely to develop long-lasting emotions when furniture was connected to something they valued. Participant P felt that his sense of ownership of the furniture made him attached to it because it was important to him to feel ownership of the object:

"I think because it is linked to people getting older and being self-conscious. When you move into your own flat and it's unfurnished, you have to buy the furniture you like to make the space look stylish... In my case, without the furniture I liked, the house was like a place to sleep and put my clothes. Again, there's no emotional attachment if it doesn't really belong to me."——P

Another participant used an old chair as an example of a piece of furniture that he felt had a unique 'soul' due to the traces of use it had left over time. This is because time is the most valuable thing to him, so he prefers to keep his old chair than the new, soulless one.

> *"I think the computer is important because it has always been an important object in my life. I owned computers at a very young age and both my parents did computer-related work."——E*

Values were also sometimes reflected in the fact that some participants would perceive certain pieces of furniture as more important than others, sometimes the table, sometimes the mattress sometimes the computer. The source of such perceptions often relates to what is valued by their culture, family, and educational background.

Theme 3: Investment

A good find

High quality but inexpensive pieces of furniture will make participants more likely to keep and take them with them when they need to move, as such a good deal may be hard to find again. These pieces of furniture are also usually found in second-hand shops or community furniture markets where they are not commonly found. From a trading point of view, these pieces of furniture are exceptional deals.

> *"it's like a large, enclosed cabinet. It's from just kind of a normal store. But we had gotten a really good deal on it a long time ago. And that was something that we've just kind of kept because even though it's also kind of big and awkward and kind of hard to move around but we just we got such a good deal on it and it's kind of a nice, sturdy piece that we thought we didn't want to let it go. It's like we keeping it looks nice, but it's also it was such a good deal." ——A*

High investment

Furniture that makes participants invest more time and money inspires a deep emotional connection. This could be the effort and money spent in finding the right furniture, the effort and money spent in repairing and caring for the furniture, or the effort and money spent in remodelling and making the furniture themselves. Often, the more time and effort invested, the more irreplaceable the furniture becomes and the stronger the emotional connection the participants have with it.

> *"I was looking for a table that I could use in different scenarios, and I wanted it to be bed-ready so that I could occasionally sit in bed and work.... A table that I spent about three months looking for.... I found it in a second-hand shop, and I took a long ride to that home shop to buy the table."——P*

> *"If it was something I spent a lot of money to buy, I would be more connected with it."——C*

Q2: How do urban nomads and mass-produced furniture designers see the value of EDD to the mass-produced furniture industry?

Theme 1: A sense of belonging

> *"I think EDD makes furniture special, it adds more value to it."——P*

As urban nomads, participants felt it was important to have an emotional connection with certain pieces of furniture that they could take with them when they moved to another home. They have an unsettled life, which means that their connection to many people and objects is temporary. But furniture, as an essential item that they use every day, is more likely to create a more permanent connection with them than other items. Such a connection gives participants a sense of joy, a sense of belonging in a new city, a sense of control over a new space, a new life.

In addition, furniture with a special meaning can remind people of the story behind the furniture and remind participants of their self-worth, as articulated by Participant V:

> *"Actually, after moving so many times, I find it very pleasing to realise that I can stay connected to something. If I change to a new environment, many of my friends from the past will slowly lose touch with me, but my own furniture is different, it will give me a sense of familiarity in a new environment and help me adapt."——V*

Theme 2: Duty of care

> *"From a sustainable point of view, a longer service life means less waste"——V*

The environmental value of emotional connection with their furniture was regularly mentioned by the participants. Most said that they also try to help furniture last as long as possible for environmental reasons, until it loses its functionality. Once they have become more emotionally involved with a piece of furniture, they are more willing to extend the life of the furniture. They will try to repair and upgrade the furniture to ensure that it remains useable. Even if the participants eventually must get rid of the furniture, they will attempt to donate or give it to a friend to extend the life of the product.

> *"When I moved out, I thought about how to deal with it (a sofa) for a long time. It was difficult for me to discard it. Emotionally... Finally, I decided to donate it out, hoping that someone could use it again. It feels like giving it another life, of course I am sure it will be a more environmentally friendly choice."——Y*

This tendency is recognised by manufacturers, according to designers who participated in the study:

"Companies are increasingly focusing on the sustainability of their designs. Increasing the lifespan of products and avoiding premature waste are current design goals for many companies, and some are already designing products and services to increase the lifespan of products, such as free repair services"——Mass-produced furniture designer

Theme 3: Potential for innovation

There are sound financial reasons for industry engaging in practices that encourage sustainable use of furniture, rather than encouraging constant repurchasing:

"while the mass-produced furniture industry is still profitable through the number of products sold, there is more awareness that a good emotional experience can be more profitable in a longer turn."——mass-produced furniture designer

The mass-produced furniture designers and EDD expert believe that EDD is important for innovation in the furniture industry. The emergence of services such as furniture recycling, furniture refurbishment and furniture rental, for example, can bring more opportunities and economic benefits to the industry.

"EDD can stimulate the emergence of innovative industries such as repair, recycling, and reverse logistics, providing more jobs."——EDD Expert

The participants also suggested that in modern cities, there are many young people staying for short periods of time, and they would like the industry to understand the needs of young people for furniture and provide a variety of services such as logistics and furniture rental to support their lifestyle, which they believe will bring convenience to the user's life while creating an ongoing emotional attachment to the furniture company, as typified by Participant E:

"I would like a business to ship my mattress permanently and I would be willing to pay for their product."——E

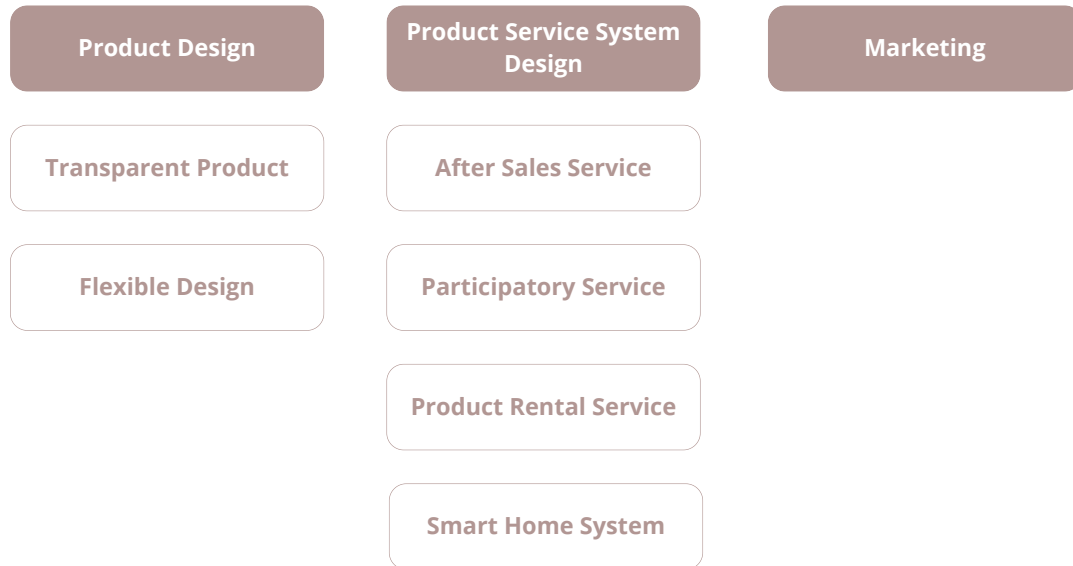# Q3: How can EDD be applied in the mass-produced furniture industry?

Product Design	Product Service System Design	Marketing

Transparent Product	After Sales Service

Flexible Design	Participatory Service

	Product Rental Service

	Smart Home System

Figure 20: Themes 2

Theme 1: Product Design

Transparent products

Most of the participants suggested that they would prefer furniture made with responsibly sourced raw materials. They believe that being responsible means not only choosing sustainable and green materials, but also the responsibility of raw material suppliers towards their employees and nature, including the safety of the materials after processing. They believe that companies being open and transparent about their material sources demonstrates that they are trustworthy, but many large furniture companies choose not to be open about their raw material sources.
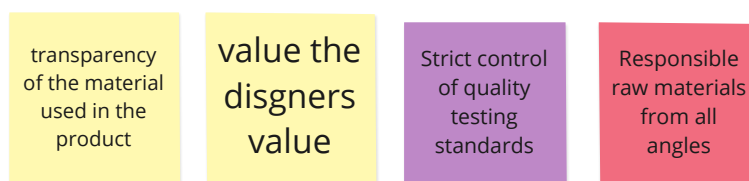
transparency of the material used in the product	value the disgners value	Strict control of quality testing standards	Responsible raw materials from all angles

Figure 21: Data 1

"A reliable and transparent source of raw materials will make me more trusting in this furniture. I think trust is the basis for any emotion."——P

"I know that many merchants will only consider the price of raw materials. They will not consider the impact of felling trees on the local

environment or whether to hire child labour... Merchants should be more transparent about the source of their raw materials."-V

"Do you know that some furniture production produces formaldehyde? I think we have the right to be informed of the materials used to make the furniture and the potential impact on us"-X

Flexible design

In line with the lifestyle of urban nomads, participants felt that furniture that is flexible in design enhances their relationship with it, as it is easier for them to carry and transport it. They also suggested specific solutions such as modular design, multi-purpose furniture, folding and easy disassembly.

"I need furniture that can be easily taken away."-E

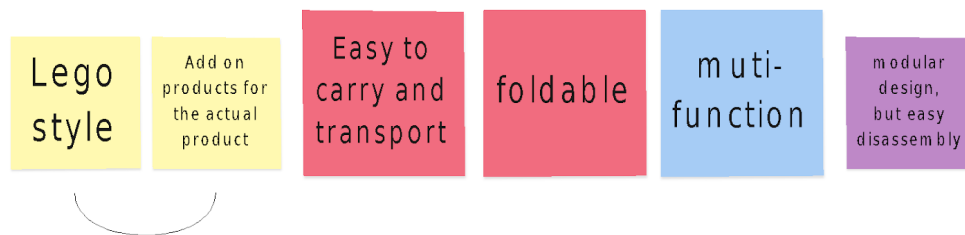*"Maybe designers can consider different solutions, such as modular design."-X*

Figure 22: Data 2

Theme 2: Product Service System Design

After Sales Service

All participants agreed that for urban nomads who move frequently, the recycling and transport services for old furniture avoids waste, and they prefer to choose furniture that is offered for recycling and transport services. But furniture designers also mentioned that after recycling furniture, many furniture companies rarely reuse them, but sell old furniture again. And large pieces of furniture are expensive to transport, and furniture companies are not willing to take on the responsibility of bearing the high costs.

"More companies are launching recycling programmes for old furniture, but only few of them will recycle and refurbish the furniture...they usually sell their recycled furniture to other used goods manufacturers. " ——mass-produced furniture designer

"Which large furniture companies can provide recycling services after the sale will reduce my guilt of discarding furniture... I don't like to throw things that have a strong connection with me in the trash can."——D

"The most important thing for me to keep my favourite furniture is a transport service, which is affordable and ensures that I can keep using the furniture…The more time the user spends with the product the more attached they become"——X

Figure 23: Data 3

The participants felt that in addition to recycling furniture, the ability of a large multinational company to offer trade-ins might not create a deep emotional connection to the product, but it would certainly create an emotional connection to the brand.

"You know a Japanese brand SAKURA; their company provides a trade-in service for every purchase of its range hoods. Such a service means that you can use this kind of furniture for a lifetime, and the old products will also be recycled, in any city! I don't mind paying a higher price for such a service."——V

Participatory service

"I think personalised design is the way to make the user feel unique."——P

Most participants felt that participatory services, like personalising their furniture, gave them a longer-lasting relationship with it，They gave examples of participatory services such as being involved in the design process to make furniture more personalised and offering workshops to enable them to transform furniture products, giving them the opportunity to interact more with the furniture.

Participants found that there were many workshops in the Glasgow community and online communities that offered them the opportunity, ideas, and techniques to personalise their furniture, as well as a tool library where they could borrow tools to transform furniture, but due to the epidemic at the time of interview, this was not happening anymore.

"many furniture companies now offer a bespoke furniture service, but that this is very expensive and not suitable for young people like urban nomads…. some websites, such as IKEA Hacker, already use the online medium to inspire participants to personalise their own mass-produced furniture. IKEA in some regions is also running offline workshops to provide users with the facility to personalise their furniture." ——Mass-produced furniture designer.
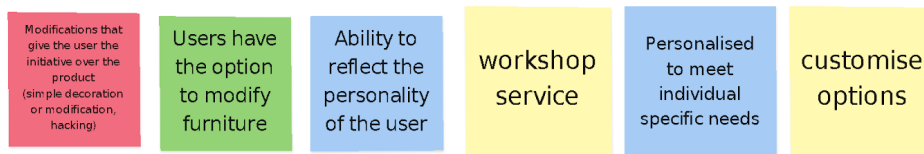
45

Figure 24: Data 4

Apart from being involved in the production and design of the product, both participants and designers agree that a good participatory service experience during the furniture acquisition process will give the user a better impression of the product, and the product brand, and that this good memory will have a beneficial effect on both the life of the furniture and the user's loyalty to the product.

> *"I think the IKEA experience store model is good. You not only buy furniture, you can also experience the product before buying it, and feel how to make a space match for the furniture... And you know that there are vloggers now, they can do live broadcasts in their channel, and tell you in detail about the product experience and collocation. Again, all such interactive services can stimulate the imagination of users. "——V*

Product rental services

> *"Furniture rental service can be a thing..."——E*

Participants felt that rental services were more suited to the changing lifestyles of urban nomads, who did not need to think about the transport and maintenance of their furniture. This to some extent affects the emotional sustainability between urban nomads and the furniture itself, as the rental service makes them feel less ownership of the furniture but increases their emotional connection to the company providing the rental service. However, the emotional connection is related to how the individual feels about the rental service experience.

> *"Furniture rental service must be a good choice for me. In fact if you rent a furnished house, it means you rent its furniture, doesn't it? But landlords generally do not provide particularly comfortable and beautiful furniture., Although I don't want to call them rubbish...If you rent furniture, you can choose according to your own preferences and needs, and you can return it when you use it up...What I want to say is that it's important to know the history of the furniture being rented. "——X*

> *"Furniture rental service can help users have a healthier relationship with furniture. This is a management right rather than ownership."—— EDD Experts*

> *"I have heard many companies that are currently developing furniture leasing, but I think that furniture leasing companies will face greater challenges in the quality of products and services..."——Mass-produced furniture designer*

According to the designer, the most important aspect of the rental service is the control of the quality of the product and the quality of the service, which is always the biggest challenge for any furniture company.

Smart Home Systems

The application of smart home products is seen as a future trend by many participants. This includes not only understanding the real-time needs of urban nomads through data analysis, but also the use of smart 3D printing technology to build customised furniture products.

> *"This is a bit like an illusion about the future. Imagine if you don't need to carry any furniture, you only need a smart phone, you conceive of the ideal furniture style and collocation, and the furniture robots will automatically transform into what you want. It looks like...hahahahah, or even no furniture is needed, just a VR glasses, have you seen a certain episode of the first season of Black Mirror, people live in virtual reality houses..."—V*

> *"3D printing can be used to print houses, maybe it can also be used to print furniture, you can also design the furniture you want through digital software."——D*

Furniture designers also said that many high-volume furniture companies are looking for opportunities to transform from traditional manufacturing to digital businesses, and smart furniture systems are a big hit in the transition, since intelligent furniture can provide a more personalised experience for users.

> *"Many furniture companies are looking for opportunities to transform from traditional manufacturing to digital business. Smart furniture systems are a big hit in the transformation of companies, allowing machines to learn user needs and build unique relationships with users."——Mass-produced furniture designer*

Theme 3: Brand Marketing

Although brand marketing is not related to furniture, participants believe that a good brand name can add additional value to a product. In other words, they would be more open to creating an emotional connection with a product from a credible brand. Brand marketing includes brand storytelling, brand image communication, celebrity effects, etc.

> *"I think corporate culture promotion is also very useful. A good corporate image, or an entrepreneurial role model image actually affects everyone's views on the company's products."——V*

> *"Marketing design concepts and company designers are also a good plan. Young people now especially like distinctive brand design concepts. Such as environmental protection, charity, etc.... The promotion of design concepts can also promote designers." ——P*

"I like those brands with stories" ——D

"You know that some fashion brands now cooperate with well-known designers to launch some low-priced designer products. If you buy designer furniture at a low price, you will not only like this furniture, but you will also trust this brand. Isn't it?" ——V
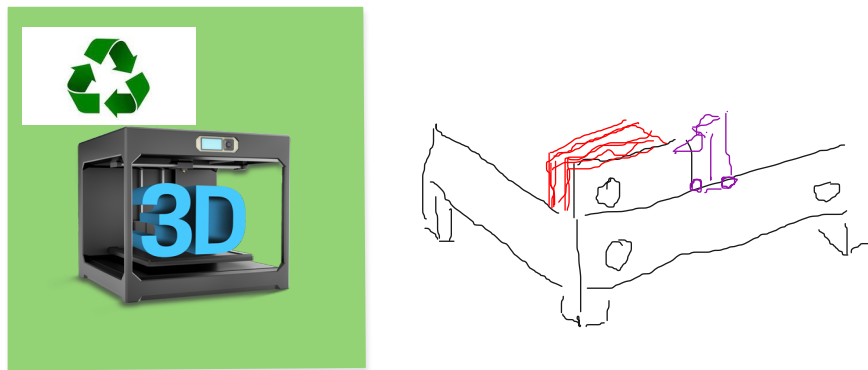
5.3 Visual Analysis

Figure 25: Data 5

"If there is a portable 3D printer, people can carry their digital furniture on a USB drive or in the cloud. They can melt the furniture when they move and wait for the new residence to reprint the furniture. The materials can be recycled plastic."

"I think printing furniture by myself is a very interesting thing"

"You can design the shape and size of the furniture yourself, the colours. Everything is self-help, digital and intelligent. Even the materials can be recycled after use."

Participant D has built an intelligent system for 3D printed furniture. In D's design, the design process of the furniture is participatory and digital and will be saved on a hard drive or on the cloud. Users only need to buy reusable plastic raw materials and whenever they move to another city or flat, they can adapt the look and size of the digital furniture themselves and then print out the real thing for use via a 3D printer.

Figure 26: Data 6

"a good mattress can be such a miracle, long-term investment and quite a personal piece of furniture。"

"This may not encourage emotional connections to occur, as I think the creation of feelings is full of chance. If I wanted a more likely emotional connection with matrasses, then I would look for a solution that made them very small and easy to move around, which would make shipping easier. Or I could imagine a brand that could offer something specific, like having a lifetime warranty on the mattress and free assistance with shipping."

Participant E chose to design a mattress because he considers it to be a very important piece of furniture. He thought that if the mattress was folded very small to make it portable, or some other after-sales service, such as a lifetime warranty, free shipping, etc. might help the emotional connection to be created. But for him, the creation of an emotional connection with the furniture does not necessarily always happen.

Figure 27: Data 7

"I will design a table. You can sit on the floor without a chair, you can sit on the floor without a bed, but you can't do anything without a table."

"I like natural materials and the colour and texture of copper, and it gets shinier the more you use it."

"Actually, I may not be willing to buy it. The wood and copper materials should make it heavy. I don't think it is easy to take away. I might rent it. If there is such a service, it is best the rental company can provide transportation services so that I can continue to use the same piece of furniture."

Participant X chose to design a table because he thought it would be easy to find replacements for all other furniture, except for the table. She chose wood and copper, two natural materials, and she really likes copper furniture because they get shinier as they are used. However, as copper furniture is heavy, she would prefer to rent the table rather than buy it. Her greatest expectation was that the rental service would also offer a furniture delivery service to ensure that she could always use the same table.

5.4 Summary

The content of the data analysis chapter will be used as insights gained from the research to support the discussion in the next chapter.

Chapter 6 Discussion and Conclusion

6.1 Introduction

In this section I will describe the support and complementarity between my findings and the existing research in a discussion that will be divided into three sections corresponding to the three questions of the study. I will also refer back to the literature review to draw connections between my analysis and previous studies on EDD and related topics.

In addition, the validation, limitations, and reflections of the study are also presented in this section. Finally, I discuss the possibilities for future design and my summary of the research.

6.2 Discussion

Relationship

This research is primarily an attempt to understand the emotional relationship between urban nomads and their furniture, explored with people staying in Glasgow, alongside the potential value and application of EDD in the mass-produced furniture industry.

This discussion chapter will focus on the parts of my study that support Chapman's view, the parts that are discrepant, and the parts that are complementary, corresponding to Chapman's (2008) six-point empirical framework: narrative, disengagement, surface, attachment, fiction, and consciousness respectively. It is worth highlighting that this EDD framework does not describe specific groups of people or products, whereas my study looks at urban nomads as well as furniture products.

In Chapman's theory, narrative represents the story between the user and the product, mostly related to the source of the product. Similarly, the participants in my study discussed the contribution of the emotional narrative to the emotional connections of their relationship with the furniture, and these narratives are also mostly stories between them and the furniture, with anecdotes about the origin or use of the furniture.

The same is evident in the rich fiction that the furniture provides for the participants. The participants corroborated the value of imagining owning the furniture before they buy it as an emotional connection to the product. People's aspirations come before they own the furniture, when they imagine how the furniture will be used, how the space will look, and so on. Chapman argues that the fiction diminishes after the user gets the furniture, but in my research, the multiple changes in life scenarios help them to maintain their fantasies about the use of the furniture to some extent.

In the EDD framework, attachment represents the product service attribute, the information attribute, and the meaning of the product. In this study, this was distilled into two components, Service Attribute as well as Value Attachment. This is because the participants in the study emphasised that the characteristics of living in a frequently relocated home made them focus more on the service attributes of the furniture product, such as whether the product meets their service needs and whether it functions well. Value Attachment represents the value and significance of the furniture to the participants, and the attachment behind this was often found to

be related to the ownership of the furniture and the information that the participants personally valued.

The other three themes in the EDD framework are disengagement, surface, and consciousness. The unique traces of use represented by surface were mentioned by one participant, but the context of the conversation was more directed towards the participant's personal understanding of the meaning of a piece of furniture:

> *"Those marks of use on the chair are a testament to the time I have spent with it... Time is the most important thing in my life"——D*

However, the data that emerged from this research was not sufficient to justify the surface being summarised as a theme. Perhaps the way in which I discussed this with the participants somewhat overlooked the impact of the physical nature of the furniture, such as the surface, on the emotional link. Or it was the limitation of remote engagement preventing material interaction with furniture as part of my methods.

Similarly, consciousness, which means a unique interaction between the object and the user that forms with use, was mentioned by one participant that：

> *"It was one of my favourite sofas, it even had the imprint of my bum, I could sit on it perfectly and relax and when I moved out, I was very sad to part with it."——V*

However, there was not enough evidence in the study to suggest that consciousness could influence the relationship between urban nomads and the furniture they used.

Finally, in relation to disengagement, which implies that a state of low expectation of furniture increases emotional connection, there is no direct discussion in this study to demonstrate that these two factors can influence the affective persistence of urban nomads in relation to their furniture. However, I believe that the participants' reference to 'a good deal' is consistent with the nature of disengagement and could provide an explanation for disengagement. When an inexpensive piece of furniture is of such a high quality that it is considered impossible to come across a similar good deal, it provides a more meaningful value to the furniture itself, especially when urban nomads are in the early stages of their education or career, and most are in a situation of financial deprivation, for whom a good deal on furniture is a very lucky thing.

Two other factors that affect the emotional durability of urban nomads and their furniture are offered by Philips and Krieken et al.'s (2011) EDD product qualities of a personalised but adaptable look and high investment. The idea of a personalised but adaptable look was raised by the participants when they discussed their favourite furniture. Mugge et al. (2005) argues that personalised design enhances the emotional connection between the user and the product, and participants emphasised the importance of high adaptability of furniture products based on personalised design from the perspective of urban nomads. I think this is related to the fact that they move around a lot and that furniture that is adaptable can be matched to any interior design style. It is clear from the participants' perception of the adaptability of furniture that the urban nomads' emotional connection to furniture is still based on the product's attributes.

High Investment is also an important factor in the participants' perception of their long-term emotional connection to furniture. Investment here refers not only to the

investment of money, but also to the investment of energy and time. Generally speaking, the more investment, the deeper and more lasting the emotional connection.

Added Value

This study found that the values of EDD as perceived by the participants and mass-produced furniture designers can be divided into three kinds of value: emotional (through narratives), sustainability (through care) and commercial innovation (through potential).

The emotional value and sustainability value of EDD has been discussed by many researchers. For example, Rodrigues (2010) describes the happiness, security, and sense of belonging that the experience of love with a product provides to the user: the feeling of belonging.

Such fragments of emotional narratives have often emerged in my research, even more so than in the wider context of users, where I found urban nomads value the emotional connections to furniture. Because of their precarious state of life, everyday objects that are their own and familiar can give them a greater sense of security and control, as well as a connection to memories of the past.

Interestingly, a participant also offered a questioning voice about the emotional value of EDD:

> *"It makes me think of people who have a hoarding fetish, who are so emotionally attached to what they have that it's so hard to let go. Does EDD then influence people's perceptions of furniture through the way it is designed, creating an unhealthy emotional connection between people and furniture?"——D*

I think there is value in questioning this; just as toxic relationships can exist between people, we cannot subjectively assume that toxic relationships do not exist between people and objects. In my interview with EDD expert, she gave her view:

> *"I think such relationships exist, and we cannot ignore the potential ethical problem of EDD. The second-hand market encourages stewardship rather than ownership of furniture [...] encourage some trading services and make it easier for people to let it go, so that the relationship is healthier."——EDD expert*

Regarding the sustainability value of EDD, Wastling et al., (2018) highlight the impact of EDD on user behaviour and argue that EDD can increase the utilisation of products and slowing resource loops by influencing user behaviour to reduce resource waste, a view that is directly supported in this study. Due to the growing climate crisis, many younger people are highly environmentally conscious and most participants in this study showed an interest in reducing furniture waste and supporting sustainable development.

One participant said:

> *"I am very concerned about sustainability issues. Any action related to environmental issues I am interested in learning about.... I think EDD can bring some benefit to environmental issues, or at least I will keep a certain piece of furniture because I like it."——P*

One participant also argued about the sustainable value of EDD:

"There is no denying that such a design strategy does keep people from replacing their furniture, but I think companies also need to provide services to support such behaviour. If I move, I can only take things that are easy to take with me, not things that I like but can't take with me."———X

As can be seen, participants support that EDD can reduce waste, but they also believe that businesses need to make more supportive actions rather than leaving all the responsibility of keeping furniture to the user.

The Mass-produced furniture designer also cautioned that:

"furniture is not like a car, [...] perhaps the act of switching from a fuel car to an electric car is more environmentally friendly, but it's not the same as buying and discarding furniture frequently." ———Mass-produced furniture designer

Lastly, the value of commercial innovation in EDD has rarely been discussed. Mass-produced furniture designers and EDD experts believe that EDD can bring innovative opportunities and increased revenue to the traditional mass-produced furniture industry, for example by encouraging furniture recycling, furniture repair and rental services. Participants also believe that a more nuanced approach by the mass-produced furniture industry to the needs of urban nomads would promote their emotional permanence with furniture and would strengthen the urban nomads' attachment to furniture brands, attracting more loyal, long-term customers.

But there were also critical voices raised against the value of commercial innovation in furniture:

"I think it's another way for capitalists to manipulate the public's emotions through design, which is essentially the same as Zuckerberg's desire to keep you active on Facebook (and the renaming of Meta), but no user wants to be manipulated." ———D

I think there is value in such critical views, and we must also consider the impact it will have on users as we stimulate progress in the industry through EDD.

Application

The discussion of the use of EDD in the mass-produced furniture industry attempts to provide guidance on the application of EDD in specific phases of the industry. At present, academic research on EDD remains conceptually theoretical and exploratory, with a lack of concrete practical applications, especially for specific groups of people and specific products.

Exceptions to this are Lacey (2009) who explores emotional durability design in professional ceramics practice and Haines-Gadd et al., (2018) who developed a toolkit for practicing EDD from the product-service system level for Philips electronics. The application of EDD has mainly focused on product design and product-system service design, a finding that is borne out in this study, while expanding on how this can apply for specific groups of people, such as urban nomads.

To make the guidance more accessible, I visualise the research and make recommendations based on the existing mass-produced furniture industry, considering IKEA's delineation of its furniture industry chain.
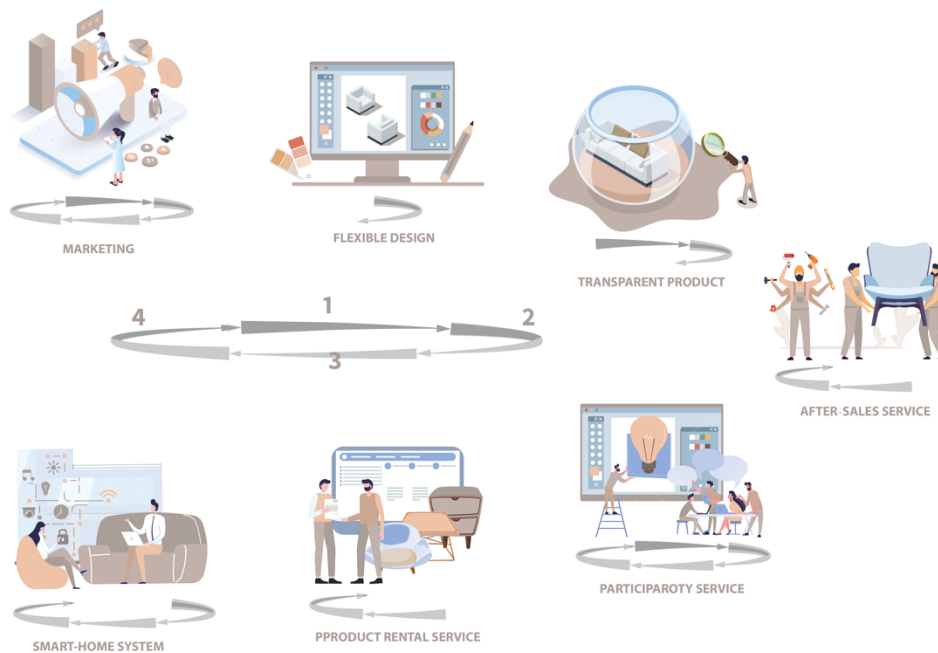
Figure 28: Guidance Map (Illustration: Zeng, J/ Visual Generation/ darkovujic
/ artinspiring/ Golden Sikorka/ TarikVision/ Seahorsevector/ TeraVector/ Ruslana. (2021))

After identifying the value of EDD for the mass-produced industry, the participants and I discussed the use of EDD in the mass-produced industry to support the emotional connection between urban nomads and their furniture. There were three broad areas of application: product design, product and service system design, and marketing. Within each of these broad themes there are also several corresponding secondary themes.

Product Design

Mugge (2015) gives some ideas to support the use of EDD from a product design perspective, suggesting ways to enhance the emotional connection between users and products through product design.

Some of the themes in this study also echo Mugge's ideas. *Transparent products*, for example, are very similar to Mugge's 'show the life of the product' strategy in that both encourage the industry to show enough of the product's history to cause an emotional engagement.

In this study, in addition to transparency of product history, participants added that transparency of raw materials and manufacturing processes of furniture products and transparency of design concepts can provide users with more detailed information about the product and increase trust between the product and the user, relational trust is the one of the key to build an emotional connection.

Participants also expressed their needs for *flexible product design* based on their specific requirements for furniture products, such as modular design, multi-purpose furniture, folding and easy disassembly.

Product and Service System Design

Wastling et al. (2018)highlight the impact of EDD on user behaviour and argue that EDD can extend the life of a product by influencing this. How, from a product and service system perspective, can appropriate support be provided to enhance and extend the emotional connection between products and users, and more critically, furniture and urban nomads?

The *after-sales service* of the product offers participants the opportunity to repair, recycle, transport, and refurbish their own furniture to support the extension of their emotional connection to it. The *participatory service* partly responds to the strategies proposed by Mugge for users to participate in the design process and Philips and Krieken et al.'s (2011) for Involvement, but with more additions. In addition to the participants' perception that participation in the design process of furniture, such as personalisation, can increase their emotional attachment to the furniture, there are more participation services mass-produced industries can offer to achieve this, such as participatory workshops, product experience shops, live product experiences, etc.

Rental services are an innovative model for the urban nomads' demand for furniture. The participants believe that EDD does not necessarily have to be used only for products, but also for services and the emotional durability of the brand. And there is potential for a more joined-up approach between furniture manufacturers, sellers, and repair services to grow such approaches culturally.

Brand Marketing

Haines-Gadd et al. (2018) suggests that marketing could also be seen as influencing the emotional life stage of a product. This view was confirmed in my research. Participants suggested that in the information age, brand image has a huge impact on their perceptions of furniture products. They are more likely to trust a product from a company with a good marketing strategy and brand image and are more likely to be happy with the brand or product to establish and maintain an emotional connection.

6.3 Validation

During the interviews, I used a summary of the participants' views, which can be recognized as communicative validation (Gray and Malins, 2004), to verify that my understanding with them. Also, I communicated to them that they could always adjust my words if there were problems with my understanding. Similarly, in the Focus Group sessions, I phrased the participants' views and helped them to write them down on post-it notes. At the end of the Focus Group, they were informed that they still had a week to access the Miro board and revise their ideas.

One of the major benefits of qualitative research is the ability to validate results (Creswell and Miller, 2000), so following the results of the thematic analysis of the data, I contacted three participants and a mass-produced furniture designer to give feedback on the themes and to find out what they thought of them and what further comments they had，they gave their opinion on the summary and modification of the theme.

6.4 Limitation

The lack of landlords as a key participant was a limitation in the project, although I was aware of the importance of landlords early in the project.

When urban nomads move to a new house/city, several urban nomads choose to live in a furnished flat for short-term living reasons. Two participants revealed to me that in some of the cities they had lived in the past, landlords would not provide furnished flat. However, in Glasgow the situation is different, as there are many semi-furnished or furnished flats to choose. Several participants indicated that they preferred a flat that was offered fully or partially furnished to one that was unfurnished, due to their lifestyle patterns of frequent moving. But it is difficult for them to make any kind of emotional connection with the furniture provided by their landlord, although they do behave protectively towards it for the sake of the deposit, which has nothing to do with emotions.

The journalist from the urban nomads research argues that furnished flats are much more expensive than unfurnished ones, although landlords rarely provide very satisfactory furniture and tenants have no choice but to live with it.

Clearly, landlords are a stakeholder in this study, but due to the choice of focus on urban nomads and the length of the research project, the dialogue from the landlord's perspective was not pursued much.

In addition, I believe that the narrow age distribution of participants and their life status is another limitation of the study.

Considering that the 'millennial generation' is currently the main group of urban nomads (Gov.scot, 2021), the age requirement for recruiting participants was 18-35 years. However, most participants are concentrated in the 23-28 age range, with most having just finished school or in the early stages of their careers. It is worth noting that 18-35 is a period of intense change in young people's lives, not only in terms of further education and work, but also in terms of marriage and childbirth. Those participants who had a stable partner showed a distinctly different attitude when talking about their relationship with furniture. One participant who had just entered marriage said that when she was younger, she would have cared more about the functionality of the furniture, but after marriage, as they lived with their husband, they would care more about how the furniture made them feel.

I think if the participants had a richer diversity of states, it would have brought more different perspectives.

6.5 Reflection

When conducting literature research, I used keywords to find relevant information, but later I realised that there were limitations to this approach to literature review. I was overly focused on my own area of research and was slow to get a holistic and macro perspective to gain other perspectives and develop critical thinking. This also meant that before the fieldwork began, I had subjectively presupposed the relationship between urban nomads and furniture and the value of EDD for mass-produced furniture industry.

I became aware of my own strongly personal views on EDD because one participant said to me that she didn't think it had any value to her. My personal relationship with furniture and literature review had made me not think too much about the significance of EDD itself, but the subject of emotions is inherently personal, just as some people will love pets and others will not or even hate them. I began to realise that perhaps the same is true for the emotional relationship between people and

furniture, we need to identify and believe that many people do not have any emotional connection to the objects they use.

In addition, I recruited participants from a variety of cultural and linguistic backgrounds. Although there were a few native English speakers, English was not the first language of most participants. I, as the researcher, am a native Chinese speaker and English is my second language.

During my research, I became aware of the important value of language as a research tool. Language, as the central modern medium for conveying meaning, provides a methodological direction for phenomenology that focuses on the relationship between the language one uses, and the experience being described. However, such research is based on the premise that the fundamental task of language is to convey information and describe 'reality' and that there is a degree of commonality among participants, meaning that they experience the world in essentially the same way and share the same meanings (Goulding, 2005).

Interestingly, during the interviews, I found that the participants did have some commonalities in language and experience, but their understanding of language was also not all the same. For example, some participants thought that furniture referred only to traditional wooden furniture, some thought that home appliances were also furniture, and some even considered combs and cups as furniture.

I was curious as to whether these different understandings of language were culturally relevant, but there does not seem to be evidence of this in this study. What is clear is that the different understandings of language influenced the participants' descriptions of their experiences to some extent.

6.6 Future Research

This is an important topic, and one that is deserving of further research to investigate the application of EDD to everyday items of design. Much of the discussion of sustainability tends to focus on 'big I' innovation – for example new technologies – and ignores simpler changes to the more mundane, but just as impactful, aspects of life.

Future research should consider other stakeholders such as landlords, letting agents, housing associations, and local authorities.

Furthermore, in the process of my research, I found that innovations in the design of product systems for traditional furniture manufacturing, such as smart homes and furniture rental, are very much in line with modern urban nomads' vision of future living patterns and can also effectively reduce furniture waste generation. Therefore, in my future research, I will also focus on the innovative design of product systems for the traditional furniture manufacturing industry.

In my study, participants also raised potential negative emotions that could be triggered by the use of EDD, such as guilt and loss caused by discarding furniture that had a strong emotional connection but was no longer of use. In existing research, researchers have almost always focused on positive emotions to evoke positive impacts on people's behaviour and intentions, but in future research I believe that there is a need to learn about the potential of negative emotions and how these can be carefully and constructively dealt with through EDD.

I also hope that my research will inspire and inform the thinking of other researchers in EDD for specific people and products.

6.7 Conclusion

This study explores the emotional connection between urban nomads and their furniture, and the value and application of EDD to the mass-produced furniture industry. It responds to the principle of EDD as a circular economy strategy to extend the emotional life of products to prolong their lifespan and explains the application of EDD to a specific population - urban nomads - and a specific product - furniture.

When I started this research, I believed that extending the psychological life of products could support the circular economy by extending the life cycle of products and materials. I was gratified that other researchers had looked at similar issues but noted that this was often theoretical, with no substantive consideration of how EDD might be applied to specific groups as well as products. The lifestyle of urban nomads presents interesting challenges to the framework presented by Chapman and given their growing prevalence in many of our cities, and the environmental impact they bring, it is important to consider ways in which they can be supported, while reducing the waste they create as they move from home to home not through recycling schemes, but by considering the circular economy or finding ways to encourage them to hang on to their furniture because it means something to them beyond its practical value. Design offers this, and design innovation approaches to understanding and enhancing people's attachments to 'things' reveal possibilities that I hope future research and practice will make real.

This study does not attempt to provide a new theoretical explanation of the relationship between urban nomads and furniture, but it attempts, through the study of specific groups and products, to make the application of EDD more practical, so that the industry can have different solutions for EDD strategies for different user groups and products, in order to inspire sustainable innovation in traditional furniture companies, to achieve rational use of resources as well as to reduce waste production.

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