A dematerialised approach to sustainable fashion design

ABSTRACT

The role of the fashion designer could be developed beyond material garment design, and their skills and influence could be applied to dematerialised approaches. Research into post-purchase garment behaviour suggests that a dematerialised approach could have a more significant impact on consumer behaviour than material-focused sustainable garment design.

KEYWORDS

Sustainability; Fashion Design; Post-Purchase; Consumer; Dematerialisation

INTRODUCTION

The intention of this paper is to explore the case for a dematerialised approach to sustainable fashion design. The case is made as one outcome of a study into post-purchase consumer behaviour. Examining how consumers interact with their garments post purchase is a burgeoning area of research, as consumer behaviour first needs to be understood before change is considered. This paper discusses how the results of the study support a dematerialised approach, and what this could mean for fashion design.

It is increasingly important for all disciplines to consider their impact on the environment; fashion design is no exception, as garment consumption behaviour has significant environmental impacts (Tukker & Jansen 2006). Initially, efforts into making the fashion industry more sustainable were focused on the impacts of material production (Fletcher 2008). More recently, life cycle thinking has grown in prevalence, and there is an increasing awareness of the environmental impacts that occur at other phases in a garment's life (Chapman 2010). This has increased research activity in the post-purchase phase, which is currently not well documented or understood.

Within the post-purchase phase certain behaviours have been identified as environmentally desirable. Environmentally desirable behaviours are the consumer behaviours that, based on the knowledge available, we currently understand to be preferable for the environment. Within the post-purchase phase examples include behaviours that extend the life of garments, such as repair, and behaviours that lead to re-use and recycling, such as donating unwanted garments to charity (Allwood et al. 2006). Influencing consumer post-purchase behaviour could have a significant impact on developing a circular economy in the fashion industry.

Fashion designers have begun to work with a range of design approaches to changing the impacts of the garment life cycle. Many of these approaches attempt to influence consumer behaviour; examples include design for durability, design for modularity, and design for reuse (Gwilt 2014). This is summarised in the life cycle diagram by Gwilt (Figure 1). However, despite considering the garment life cycle, these

approaches often still rely on the design and production of new garments, rather than working with existing materials and garments.

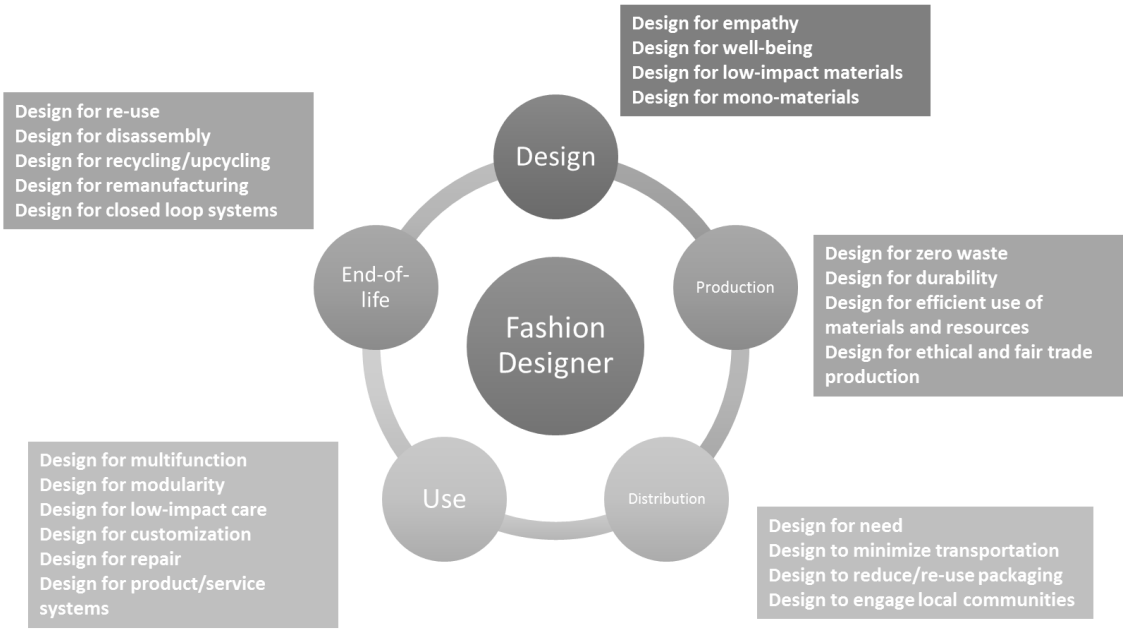

Figure 1 Design strategies focusing on specific phases of the garment life cycle (Gwilt 2014)

There is a significant opportunity to rethink how consumers behave with their existing garments. There are an estimated £89 billion worth of clothing in the collective British wardrobe (WRAP 2012). This is an existing resource that could be utilised to increase material efficacy, and develop a circular economy. In addition to existing materials, existing user practices could be nurtured and developed; but this would require a development in the understanding of post-purchase behaviour.

This paper looks to dematerialisation as a further approach to reducing the environmental impact of fashion design. Dematerialisation in product design refers to using less, or no, physical material to deliver the same functionality to the user (Thackara 2005). In the context of fashion, functionality comprises of a complex interlacing of physical and psychological needs. Within this context dematerialisation could refer to a range of practices including service design and social marketing, which promotes ideas and behaviours rather than material products (Geller 1989). Dematerialised fashion is not a new concept. Fletcher introduced the idea of Negademand in fashion in 2008, which advocated system and service design (Fletcher 2008), and 'Design to Dematerialise and Develop Systems & Services' was included in TED's strategy toolbox for textiles designers (TED n.d.). However, relatively few have adopted these strategies in their practice.

METHOD

The aim of the study into post-purchase garment behaviour was to gain insight into the factors influencing consumer behaviour. More specifically, the motivations and barriers to environmentally desirable behaviour were examined. The study was undertaken with a non-representative sample of women living in the UK. Seventeen women, aged between 18 and 65 years old, took part.

The study was conducted in the format of a 'wardrobe study'. There were 3 stages to the wardrobe study: a questionnaire, a wardrobe audit and a garment interview. Details of each stage are given in Table 1.

Table 1 The 3 phases of the wardrobe study method

1. Pre-Audit Questionnaire	The pre-audit questionnaire collected information on the participant's demographic information (e.g. age, ethnicity, income), garment purchasing habits, and environmental viewpoint. The pre-audit questionnaire was used to categorise participants, and examine the influence of contextual factors.
2. Wardrobe audit	Following the pre-audit questionnaire an audit pack was posted to participants. Participants were asked to complete a wardrobe audit worksheet at home. This involved self-auditing the garments that they wore regularly using a wardrobe audit worksheet. The worksheet asked them to record garment type, brand, fibre content, fabric, colour, pattern, details, cut, age & damage.
3. Interview	Participants were asked to bring 6 garments from their wardrobe: i. A garment they have owned for a long time ii. A garment that they are emotionally attached to iii. A garment that they never wear iv. A garment that they wear frequently v. A garment that they recently purchased vi. A garment that they are likely to discard soon These garments were selected to give an overview of the wardrobe including active (frequently worn) and inactive (infrequently or never worn) garments. Participants were questioned regarding the wardrobe audit before being asked open-ended questions about each of the garments they had brought to the interview.

RESULTS

It was observed during the study that a complex, and highly individual, set of factors influence post-purchase behaviour. Personal context factors, such as age, occupation, family situation, relationship status and recreational activities, were one group of factors that had a significant influence on post-purchase behaviour. Such factors are inherently changeable, transient and varied widely between participants. Changes in any of these factors could result in changes in garment use, which may, or may not, be environmental desirable. For example, an individual who retires from work would have a change in personal context that could act as a barrier to them continuing to wear the garments they previously wore for work. This may result in discard of garments. Conversely, they may have more available time, which allows them to engage in repair.

It was interesting to note that a change in garment preference based on style was more likely to be based on personal context than the wider context of fashion change. This supports the findings of other consumer studies that suggest that fashion change does not have as much of a bearing on consumer behaviour as previously thought (Klepp & Laitala 2015; Woodward 2015).

The physical characteristics of garments did impact on consumer behaviour, but as a subsequent influence to other factors. In terms of longevity of wear, it appeared that the style of a garment did not just have to be liked; it had to be right for the context of the individual's life and physical characteristics. In some cases, garments were kept for aesthetic value, but these garments were not necessarily worn. The physical characteristics of a garment could motivate a behaviour such as repair, but only if context and personal capability were supportive.

The results of the study build on Stern's Attitude-Behaviour-Context theory (Stern 2000). This theory suggests that behaviours are influenced by four types of causal variables; habits and routines, contextual factors, personal capabilities, and attitudinal factors (Table 2). These variables are hierarchical; certain variables have more influence on the resulting behaviour than others. For example, if an individual does not have time to repair (context), they will not, regardless of the intent to do so (attitude). From the results of this study the theory was developed to make it more applicable to post-purchase garment behaviour (Table 3). Two changes were made; the context of the behaviour was expanded to include personal context factors, and another type of variable, garment characteristics, was added.

Table 2 Stern's causal variables from the Attitude-Behaviour-Context theory

Habits	Routinely undertaken behaviours	Most influence ↓ Least influence
Context	Community expectations, social norms, material costs, laws, social context, political context, economic context, capabilities of technology	
Personal capabilities	Behaviour specific skills and knowledge, availability of time, social status, income, age	
Attitudes	Values, norms, beliefs	

Table 3 Adapted causal variables for post-purchase garment behaviour

Habits	Routinely undertaken behaviours	Most influence ↓ Least influence
Context	Community expectations, social norms, material costs, laws, social context, political context, economic context, capabilities of technology **Personal context: occupation, family situation, relationship status, recreational activities, housing situation, physical characteristics**	
Personal capabilities	Behaviour specific skills and knowledge, availability of time, social status, income, age	
Garment characteristics	**Size of garment, style of garment, age of garment, condition of garment**	
Attitudes	Values, norms, beliefs	

DISCUSSION

The results of the study indicate that post-purchase behaviour is influenced by a range of variables, many of which are antecedent to the physical characteristics of a garment. This indicates that changing the physical characteristics of a garment at the design stage would only have a limited impact on influencing consumer behaviour. A range of approaches to change are needed in order to foster a more sustainable fashion industry (Fletcher 2008). However, as previously mentioned, many design strategies still aim to change the physical characteristics of new garments, rather than influencing other factors such as personal capability.

One of difficulties in using garment design to change behaviour are it is difficult to predict changing contextual factors, such as the economy, which impact on use (Bras 1997). Garments are trapped in their physical fabric from the point of construction (Chapman 2005), whereas dematerialised fashion could be responsive and adaptive dependent on changes in context. It would be very difficult to change or influence the contextual factors and personal capabilities influencing garment use, but dematerialised fashion design could develop an awareness of these factors and work with them.

Current perceptions of what constitutes fashion design need to be expanded into a more diverse breadth of approaches, including dematerialised fashion design. The findings of the consumer study support a dematerialised approach to fashion design because many of the factors influencing consumer behaviour went beyond the material characteristics of their garments. Although garment design can impact on how a consumer uses a garment, other, dematerialised approaches, may be more successful in overcoming the barriers to environmentally desirable behaviour.

It is perhaps understandable that the dominant approach in sustainable fashion design is to design garments. The approaches outlined in Figure 1 do not prescribe a garment outcome, but for fashion designers who might be accustomed to solving design problems with garment outcomes, this might be their instinctive response. Of the causal variables impacting post-consumer garment behaviour (Table 3), garment characteristics are also the easiest the change, so an obvious choice when considering influencing consumer behaviour. However, sustainable fashion design will not be able promote and maintain environmentally desirable consumer behaviour without considering the other variables influencing behaviour.

Designers in any discipline have specialised materials knowledge, skills and creativity that are needed both to understand the complexity of consumer use, and to apply this understanding with new innovative approaches to sustainable design (Mellick Lopes & Gill 2015). Utilising the designer's inherent skills for problem solving has been recognised in the field of design thinking. Design thinking uses the designer's intuitive sensibilities and methods to solve problems (Brown 2008). Apart from being creative and imaginative, designers have skills in empathy that can be applied to thinking about situations other than garment design; they are used to approaching things from different perspectives, and they are observant and notice details that others may not (Ritchie 2015). Dematerialised fashion design still values material understanding, and may be part of a mixed-approach method.

Dematerialised fashion design could include the design of workshops, experiences, events, campaigns and services. Examples include the Leeds Community Clothes Exchange, and the work of the Stitched Up cooperative in Manchester, who organise events such as repair cafes and film screenings (Van Der Zee

2014; Stitched Up n.d.). Dematerialised fashion design could utilise existing and emerging technologies, such as mobile technology apps, to rethink consumer interactions with garments. Such technologies have changed the way individuals experience 'products' in industries such as film and music. Dematerialised fashion could also build on the sharing economy; clothes exchanges, peer-to-peer resale, and garment rental schemes are examples of existing garment 'sharing' that increase material efficiency.

Fashion designers may find it challenging to move away from the design of garments. Many designers will be motivated by the physical characteristics of garment design, the sensory experience of working with fabric, aesthetics and a sense of accomplishment from the creation of a physical output. Fashion design education also encourages this focus on the physical garment as the assessed outcomes of projects are often physical garments (Grose 2013). Expanding the definition of fashion design needs to be pervasive throughout the industry, including fashion design education, in order to work towards creating a circular economy.

CONCLUSIONS

Despite the prevalence of life cycle thinking in sustainable fashion design, the design of new garments remains the dominant strategy in consumer behaviour change. In order to change consumer behaviour factors beyond the physical design of garments needs to be addressed. Designers working within sustainable fashion design could be applying their skills in alternative ways to work with existing garments and behaviours; dematerialised fashion design is one way they could do this.

Not all fashion designers will be attracted to working in a dematerialised way, and it would not be appropriate for all fashion designers to stop designing garments. But, it is necessary and timely to expand the thinking about sustainable fashion design beyond simply the design of garments.

This paper recommends that further research needs to be undertaken to investigate how dematerialised fashion design may be applied in practice, and to determine its impact on consumer behaviour.

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