Can gamers save fashion?

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Thesis Project – Interaction Design
Master at K3 – Malmö University – Sweden
May 2017
CAN GAMES SAVE FASHION?

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Date of examination:
29/May/2017
To my mom,
with whom I share the passion for sewing,
and with whom I could write a book about our adventurous fortunes and misfortunes with sewing machines.
Abstract

Driven by an envisioned potential of merging theories and practices of play with studies of fashion sustainability, this research went through a play-centric design process to explore the question of *How can play and games help reduce fashion waste?* Seven design experiments investigated different game impact goals that could have a positive effect on the pursuit of fashion sustainability.

The main research findings show that games can create a safe space for players to challenge their own conceptions of fashion. The results also show that games have great potential to assign meaning to garments through shared memories, secrets, stories and meaningful words. Furthermore, the study shows that modular clothes designed as games have the potential to playfully engage their wearers for long, sparking social interaction and inspiring new playful ways to engage with fashion. Additionally, beyond the design process results and actionable insights, this research considers the exposure of its framing to be a crucial contribution. Fashion sustainability is, therefore, a pressuring topic that needs people to be engaged in what they do and know best, in order for transformation to happen. Can games save fashion? The answer is probably no, but this research has proven that play and games offer a fruitful path to start trying.
# Contents

ABSTRACT ......................................................................................... 4

CONTENTS ....................................................................................... 5

1. INTRODUCTION ............................................................................. 7

2. BACKGROUND ................................................................................. 8
   2.1 Life and Fashion .......................................................................... 8
   2.1.1 From couture to fast fashion ..................................................... 9
   2.1.2 Fast fashion and sustainability ............................................... 9
   2.1.3 Approaches to fashion sustainability ................................. 11
   2.2 Life and play ............................................................................... 13
   2.2.1 The social magic circle .......................................................... 14
   2.3 Fashion sustainability and play .................................................. 15
   2.4 Types of play ............................................................................. 16
   2.4.1 Playing and learning .............................................................. 17

3. RELATED WORK ............................................................................ 19
   3.1 The Fun Theory .......................................................................... 19
   3.2 The 30-day Wardrobe Challenge ................................................. 20
   3.3 LENA Library ............................................................................ 21
   3.4 Unmade ....................................................................................... 22

4. RESEARCH FRAMING ................................................................... 24
   4.1 The research focus ..................................................................... 24

5. METHODOLOGY ............................................................................. 26
   5.1 From lab through field to gallery ................................................. 26
   5.2 A play-centric process .............................................................. 27
   5.3 A combined approach ............................................................... 28

6. DESIGN PROCESS ........................................................................ 29
   6.1 Wear What? ............................................................................... 30
   6.1.1 Player experience goals and mechanics ............................... 30
   6.1.2 The prototype and the play-testing ....................................... 31
   6.1.3 Results .................................................................................. 32
6.2 Pattern War ................................................................. 34
  6.2.1 Player experience goals and mechanics ..................................... 35
  6.2.2 The prototype and the play-testing ............................................. 37
  6.2.3 Results ........................................................................ 38

6.3 Pattern War Collections ................................................................. 41
  6.3.1 The prototyping and the play-testing ............................................. 41
  6.3.2 Results ........................................................................ 45

6.4 We Said You Said It ................................................................. 48
  6.4.1 Player experience goals and mechanics ..................................... 49
  6.4.2 The prototyping and the play-testing ............................................. 50
  6.4.3 Results ........................................................................ 51

6.5 Velcro Play Parade ................................................................. 54
  6.5.1 Player experience goals and mechanics ..................................... 56
  6.5.2 The prototyping and the play-testing ............................................. 57
  6.5.3 Results ........................................................................ 60

6.6 We are Malmö ................................................................. 62
  6.6.1 We are Malmö – Collective Drawing .......................................... 62
  6.6.2 We are Malmö Exhibits ......................................................... 73

7. DISCUSSION ........................................................................ 80

8. CONCLUSION ........................................................................ 82

9. REFERENCES ........................................................................ 83

APPENDIX A ........................................................................ 87

APPENDIX B ........................................................................ 89

APPENDIX C ........................................................................ 90

APPENDIX D ........................................................................ 98

APPENDIX E ........................................................................ 101

APPENDIX F ........................................................................ 103

APPENDIX G ........................................................................ 106
1. Introduction

The current approaches to clothing manufacturing position the fashion industry in an unsustainable cycle of production and consumption. The aim of this research is to investigate the role of play and games within the fashion field with the ultimate goal of assisting the quest for a more sustainable future.

One of the main problems around fashion sustainability is textile waste – from the production leftovers, where pattern cutting is a great source of waste, to the wastefulness in consumption, where garments are disposed in replacement of new ones. Waste is an unavoidable byproduct of systems, be it biological, social, technical or industrial. However, in the context of human systems, and specifically in the context of fashion, waste results almost always in pollution and biodegradation (Binotto & Payne, 2017).

Because the problematic around sustainability is so established in the fashion industry, progress can only be made if changes are applied to the entire cycle of production and consumption. Better choices of fiber won’t make a real difference if the business model where fast and ever shorter trending cycles still generate tremendous waste. Following the idea that “transformation will need to commence everywhere by people engaged in what they do and know best” (Fletcher & Grose, 2012, p.4), this research introduces the initiative of connecting fashion and games in order to activate interaction designers in the cause.

This research is a continuation of the author’s previous study (Barbosa, 2016) in which she explored self-expression through textile painting. Through the painting of their own product textiles, the consumers took part in the product design process, fostering stronger emotional bounds between the wearer and their garments. Exploring the emotional bounds between users and products is one of the many approaches to fashion waste reduction, and therefore fashion sustainability improvement (Fletcher, 2013).

As a next step, the current study explores the role of games in fashion design processes as means to the end – can games result in fashion design, or can fashion be approached as game, and what meanings does this approach can produce to assist fashion sustainability? Furthermore, other approaches to fashion sustainability suggested by Fletcher & Grose (2012) – such as the design of modular garments – are also explored through play lenses.

Following a play-centric design process, and guided by an expansive Research through Design methodology, the current study prototyped and play-tested the design of six different games, and exhibited the outcome of one. The design efforts aim at uncovering knowledge through the exploration of the main research question: How can play and games help reduce fashion waste?

In the context of this research, the intersection between fashion and games has its starting point from Sicart’s rhetoric on play (2014), which suggests that play is rooted in the human nature. This mindset can be a constructive way to look at different aspects of the personal and social life – including the act of getting dressed – in order to leverage the benefits of
play. The fundamental aspects of play and its transformative aspects on personal and societal levels (Salen & Zimmerman, 2004) are believed to be a good base for the exploration of fashion sustainability approaches. The understanding of what happens when humans play can provide great insight into how users could engage differently with the consumption, wear and even production of their garments.

2. Background

As this research works in the intersection of play and fashion sustainability, a theoretical framing will be defined in the following chapters through the examination of play and fashion sustainability studies. Firstly, an overview of definitions and relevance of fashion studies is reviewed, opening up the stage to the introduction of the topic of fashion and sustainability – after which the reader understands the importance of the current study. Secondly, the topic of play and games is introduced and motivated as an important aspect of people’s lives. Key concepts to this research are also presented, e.g. the magic circle and serious games. Finally, after probing the territory of play and games, this study explores how the theories and practices of both worlds can work together in order to inspire design efforts.

2.1 Life and Fashion

To dress is to expose one’s identity. According to studies of phenomenology, one learns about the world through their bodies, by positioning it in places and social contexts (Entwistle, 2015). It can be understood, therefore, how the interface between the body and the world, i.e. dress, is carried with great meaning and importance for the development of the self. The Trinidadians, for example, consider that the true character of a person is seen from what’s on the outside, rather than the inside, for it can be exposed to and scrutinized by the social. For them, “clothing is the best route to finding out who a person really is” (Küchler & Miller, 2005).

While studies of dress are concerned with the “situated bodily practice” of getting dressed (Entwistle, 2015), where meaning is created when clothing meets the body; clothing addresses the material production of dress, where human functional needs are met. Fashion, on the other hand, is rather concerned with the symbolic production of dress, or, as better defined by Fletcher and Grose (2012):

“fashion brings together creative authorship, technological production and cultural dissemination associated with dress, drawing together designers, producers, retailers and all of us who wear garments.” (p.8)

Even though fashion is so important for both individual and social formation, it suffers from unsustainable practices that challenge the industry from moral to ecological levels (Fletcher, 2013). The evolution of how the industry produces and how people consume clothing puts the fashion industry at a spotlight, where the complexity of production,
transportation, consumption, after-care and disposal makes it difficult to assess whether the different components are ethically sound (Joy et al., 2012). Sustainability offers, therefore, “the biggest critique the fashion sector has ever had” (Fletcher & Grose, 2012, p.8).

2.1.1 From couture to fast fashion

It is important to highlight that there are different “types” of fashion: couture, ready-to-wear and mass production. These types are distinguished by their manufacturing process. Garments from couture are produced by skilled labor, tailored to one client, and produced by the dozens; ready-to-wear works at a high-level industrialized manufacture, producing garments by the thousands; and mass production is the cheapest and most industrialized type, where garments are produced by the hundreds of thousands of pieces (Waddell, 2013).

The different levels of fashion work as a chain, where each level depends on the former. The original design ideas start at the couture level, where design experimentations are at its core. Then, through ready-to-wear, these designs are transformed into marketable pieces, where the couture ideas are translated into “wearable” fashion. Finally, mass production fashion copies the ideas from couture and ready-to-wear for the production of pieces for the mass market (Waddell, 2013).

Mass production fashion defines what is known as fast fashion – fashion that is cheap and mass produced by global brands, which retail garments on cycles that are ever-shorter, some as short as a few weeks (as seen by companies such as H&M and Zara) (Joy et al., 2012). The high-speed production and high-speed and high-volume consumption that is characteristic of fast fashion result in an unsustainable fashion model.

2.1.2 Fast fashion and sustainability

Sustainability is a broad term that can be studied and implemented through different typologies and strains of thoughts. An overall and modern understanding of the word comes from the World Commission on Environment and Development (UN Documents, 1987), which states that “humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN Documents, p.16). On the same report, the commission introduced the idea of the sustainability triad – environment, economy, and equity – where the three e’s are equal parts of the sustainability whole. It is suggested that sustainability can only be achieved if there’s an equilibrium between environment protection, economic growth and the promotion of equity.

The three e’s provide overarching categories that can house different definitions of what it means to be sustainable. One definition points to different targets of sustainability that goes from sustainable agriculture and sustainable energy, to sustainable development (Portney, 2015). The concept of sustainable development raises a discussion about the balance
between economic growth and environmental exhaustion that “focuses on whether and to what extent there is an explicit tradeoff between economic growth and environmental protection” (Portney, 2015, p.16). This discussion, almost as broad as the word sustainability itself, is especially important in the context of this research. Fashion, or more specifically fast-fashion, hits critical aspects of consumerism that lay at the core of economic growth at the costs of the biophysical environment.

Producing enough to satisfy the masses, requires high demands of energy and material, which in turn degrades the world’s finite natural resources. Mass producing for a consumerist mass, therefore, does not go hand-in-hand with the concept of sustainability. According to Portney (2015), “issues of consumption represent some of the most important elements that the pursuit of sustainability must confront” (p.87). The exact same statement can be extended to the pursuit of fashion sustainability.

Being at the core of the problem that concerns the fashion industry, fast-fashion needs an overhaul. It needs to connect with today’s reality and mentality and catch up with the sustainability conversation that is happening around the world. Any significant change, however, demands efforts from various fronts, from the way fashion is produced to the way it is consumed. In order to keep up with the sustainability agenda, change needs to take place personally, socially and institutionally, in a long term commitment (Reiley & DeLong, 2011).

One of main problems of fast-fashion is the issue of equity, which concerns human well-being and sustainable societies. The Rana Plaza tragedy, which killed over 1000 people when a factory building collapsed in Bangladesh (The Guardian, 2016), sadly illustrates the safety and working conditions that most of the fast-fashion retailers employ. Over 70% of the textiles and clothing imports in the EU comes from Asia, where the prices are lower, the production is run on tight timeframes and at many times the safety of the workers are put at risk (European Parliament, 2017).

Another important element involved in fashion sustainability is the issue around textile waste – the leftovers of the production and consumption process; the discarded excess matter. Waste is an unavoidable byproduct of systems, be it biological, social, technical or industrial. However, in the context of human systems, waste results almost always in pollution and biodegradation (Binotto & Payne, 2017). In the fashion cycle, the excess matter arises from the production of garments – where pattern cutting on textile, for example, is a great source of waste – to the consumption and disposal of clothes, where garments are disposed in replacement of new ones.

The disposal of garments by consumers can be a matter of product durability, yet Fletcher and Grose (2012) argue that it’s due to a lack of emotional bounds between the mass-produced products and the consumer (combined with the ease of purchase and low-prices). Because clothes no longer carry culture, stories or meanings, they are prone to be discarded and replaced by new ones. Statistics show that the average woman keeps a piece of clothing in their wardrobe for only five weeks (True Cost, 2015) and that more than fourteen million tons of textile are landfilled per year (in the United States) (EPA, 2016). These numbers
indicate that the shorter a person wears a piece of clothing, the more expensive is the cost for the environment.

Beyond the biophysical issues that fast fashion raises, it also fuels the consumeristic society that’s turning homogeneous (Busch, 2008). The same dress that is important for the definition of the self, is now the reason for peer-pressure and insecurity. People believe they need to dress similarly, and constantly redefine their selves in order to keep up with the current trend (Fletcher, 2013). The same dress that is the primary interface between the body and the world, now lacks of meaning because of a vicious cycle of purchase and disposal.

### 2.1.3 Approaches to fashion sustainability

There are a number of ways through which fashion sustainability can be approached. The “slow fashion” movement is an example of initiative that aims at changing people’s attitude towards fashion, the same way that the slow food movement does for the food industry. Slow fashion is a mindset that encourages people to take time to appreciate the fashion they design and the fashion they wear, in a more sustainable manner (Clark, 2008). It advocates a more ethical approach to fashion, which, according to Joy et. al. (2012) is “the positive impact of a designer, a consumer choice, a method of production as experienced by workers, consumers, animals, society, and the environment” (p.280). Clark (2008) suggests that slow fashion can be addressed through three lines of reflection:

- The empowerment of local resources for an economy that is less centralized and more distributed;
- A more transparent process, where there’s less intermediation between producer and consumer and
- Sensorial products, which is a way of understanding the product from its raw material to how it was made, which, in turn, “demands design that generates significant experiences, which are not transformed into empty images for rapid consumption” (Clark, 2008, p.440).

Furthermore, the work of Fletcher and Grose (2012) is heavily influential in this context, as they are long time researchers of fashion sustainability. In their work “Fashion & Sustainability: Design for Change”, they suggest a number of approaches that could change the fashion industry at different levels. Their suggestions are directed for a design-led intervention, where change is powered by design efforts. Some of them are:

- **Take-back schemes:** To oblige companies to take back products for reuse or disposal, making them accountable for the future of the garments they produce, and therefore altering their choices in the process.
- **Reconditioning:** Reusing, reshaping, re-cutting and re-stitching entire garments from disposed ones, in order to bring them back into fashionable and good condition;
• **Trans-functional garments:** The design of a garment that replaces several others due to its multiple functions;

• **Trans-seasonal garments:** The name says it – the design of garments that permeates the different seasons, with the potential of overriding the current seasonal trends logic;

• **Modular garments:** The design of garments that allows the wearer to playfully engage with them, modifying them according to their personal preferences, thus extending the interest on the garments for longer;

• **Empathy:** Bring back meaning to the garments and an emotional connection between the wearer the product through narratives, memories or any significant emotional bound that might be developed over time;

• **Metabolism of a wardrobe:** New approaches to understanding one’s wardrobe as part of an ecosystem that is in need of equilibrium. This is done by the acquisition of knowledge around tools that one can use to achieve the optimum lifetime of wardrobe pieces, such as reuse, rework, lease, share, recycle.

• **Co-design:** Here, designers apply their skills into facilitating the design and making of garments by the consumers. This process “positively engages people emotionally, practically and politically with their clothes and that is brought to bear on each piece worn” (Fletcher, 2013).

Beyond conceptual frameworks for fashion sustainability, there are many real world examples that illustrate the design efforts towards the cause. Fashion Revolution (2017) for instance, is a global movement that spreads the sustainability message across the world through social media and events. In April 2017, during the Fashion Revolution Week (which happens on the anniversary of the Rana Plaza factory collapse), a campaign was launched in social media channels to encourage brands to respond to consumers’ hashtags #whomademyclothes with a counter hashtag #imadeyourclothes (Figure 1), in an effort to promote transparency in the supply chain – thus connecting to the slow-fashion mindset. During the same week, in Malmö, a discussion panel was promoted by the movement, where concepts of clothing swap and repairing where respectively presented on a panel by the Swop-shop (n.d.) and the Repamera (n.d.) initiatives. The Swop-shop, as its name suggests, is a fashion shop where the consumers can “buy” new clothes by swapping with their used ones. In turn, the Repamera project provides an online repairing service, driving people to repair their garments instead of buying new ones. Both are successful cases that fit with Fletcher and Grose’s (2012) concepts of wardrobe metabolism and reconditioning.

As a further example, the Swedish sportswear retailer, Houdini, collected used clothes from their customers (which were developed with biodegradable material) and created compost from it (AdAge, 2017). From the compost, vegetables were grown and served in a dinner cooked by a Swedish celebrity chef to the Houdini customers. Through an exercise of upcycling and take-back-schemes, the Houdini brand displayed a creative engagement with
the sustainability issue that exposes to the public the importance and effects of their approach.

Figure 1. Fashion Revolution social media campaign that encourages brands to respond to consumers’ hashtags #whomademyclothes with a counter hashtag #imadeyourclothes, in an effort to promote transparency in the supply chain (Fashion Revolution, 2017).

Exposure to real-world sustainability efforts and their positive influence is key for the spread and communication of the problematic. Portney (2015) puts that “there is a need to understand the role of communications in converting research and knowledge into attitude and behavior change among the broader public” (p.202). Figuring out what will take for people to make sustainable choices, he says, is one of the answers that will ultimately define the future for [fashion] sustainability.

2.2 Life and play

Play is a modality of living. It’s a way of engaging with the world and with others. Through play, one can explore aspects of the world and themselves, and discover or rediscover things within. Play evokes freedom. To play is to change and challenge the way the world is set to work, and turn it upside down (Sicart, 2014). Challenging the norms is a key aspect of play, and, as Sicart (2014) puts it, “we need play precisely because we need occasional freedom and distance from our conventional understanding of the moral fabric of society” (p.13).
Sicart’s abstract rhetoric on play, even though doesn’t pose a clear definition of it, certainly sets a mindset for grasping the importance and impact of play in people’s lives. It challenges common understandings of play as frivolous activities and opens for reflections of how play is a mode of being a human. Bogost’s (2016) definition of play, on the other hand, proposes a more concrete understanding of Sicart’s rhetoric, for it suggests that play operates on self-made systems, which are subsets of the world created through rules imposed upon it. The perceived free openness of play, therefore, is a paradox – it arises not from the freedom of doing anything at all, but rather through constraints and restrictions created to the world (Bogost, 2016).

To illustrate his argument, Bogost talks about the world subset created by his daughter as she moves through a shopping mall, being dragged by her father’s hand. By creating rules that wouldn’t allow her to step on tile cracks, and by using tools in her disposal – such as her feet, the crowd and her father’s pace pulling her – she decides to reconfigure the context around her and use it for play. As Bogost puts it, one plays “in order to find and experience the deep nature of ordinary things in the universe” (p.114).

The idea that play happens through the appropriation of ordinary things in the universe complements Salen & Zimmerman’s (2004) suggestion that “play is a free movement within a more rigid structure” (p.304). The rigid structure, as they point out, is the real world and its characteristics available for manipulation – e.g., to whistle with the mouth is to play with the air resonance that creates sounds according to lip and tongue positions. Play exists, therefore, because of the more rigid structures.

To understand play as a subset of the world, that operates through exploration of systems, is to understand the world itself differently; is to understand that play is in fact a way of being, and that many aspects of one’s life can be compared to or even defined as play. The same way that legs, tiles and a crowd can be reconfigured for play; air, mouth and tongue can be explored for whistling, and textile and bodies can be arranged for fashion.

### 2.2.1 The social magic circle

The magic circle is a useful term to describe the difference between play and non-play. It illustrates the physical and psychological boundaries of play and how temporary worlds are created within the ordinary world (Bogost, 2016).

The concept of magic circle and how it’s been introduced and positioned by Huizinga (1949), however, have been strongly criticized due to its emphasis on how play exists in an artificial world, separated from reality. For Crawford (2009), for example, the concept of magic circle is useful to understand what happens within it, “but it does not recognize, or have the capacity to understand that specific rules apply to all aspects of life” (p.2). Overall, the critics attempt to expand on the definition of magic circle and establish that play happens in the context of an already defined social structure, and that rather than being apart from it, the magic circle is one part of it. The expanded definitions of magic circle, such as puzzle
piece (Juul, 2008) and frame (Crawford, 2009), indicate that play and games are influenced by the social dynamics it is a part of, and in some cases, vice-versa.

The rise of the magic circle originates from a formal agreement of the rules chosen to govern play. From a player perspective, this social agreement can only be attained if an important element is present in that particular instance of play: the adoption of a lusory attitude by the players. The idea of lusory attitude was defined by Suits (1978) and used by Salen & Zimmerman (2004) – as similarly suggested by Stenros (2014) through the psychological bubble – to illustrate the personal choice of each player to accept and give importance to the rules of the game. The magic circle, therefore, whether or not it does enough to “locate gameplay within a wider social context, and understand this as just one form of social encounter” (Crawford, 2009, p.12), still addresses social agreements and lusory attitudes as play elements. This research, therefore, deems it obvious that if social and psychological elements are present in an equation, the result will most probably influence or be influenced by the social context around it.

Above all definitions and critiques, it can be agreed that the magic circle defines the creation of new meanings within the real world, that might (or might not) be separate from reality, but still references it (Salen & Zimmerman, 2004).

**Circle of freedom**

According to Stenros (2014), the socially constructed special space defined by the magic circle is the originator of a “protective frame which stands between you and the ‘real’ world and its problems, creating an enchanted zone in which, in the end, you are confident that no harm can come” (p.10). Although this premise seems to be generalizing, it is in tune with Sicart’s rhetoric on how play is a carnivalesque activity. The protective frame between the magic circle and the real world creates a safe zone that allows for play to take control and subvert moral conventions – hence the carnivalesque aspect. In this safe zone, the players feel free to explore and challenge the social status quo, while exploring and challenging ideas of their own selves. The space for play is, therefore, a space for self-expression.

The concept of the psychological bubble and lusory attitude, which are elements of play that compliments the social agreement required for play to exist, can therefore be explored further through the carnivalesque lenses of Sicart. Play is not only a personal choice of accepting the new rules that govern the temporal reality, but it is also an experience that effects each player’s individual being. As Sicart puts it “who we are is also who plays, the kind of person we let lose when we play. Our memories are composed of these instances of play, the victories and defeats, but also the shared moments” (p.23).

**2.3 Fashion sustainability and play**

The qualities of play that involve the exploration of social and personal boundaries and their influences in one’s life are comparable to how one experiences fashion. If analyzed from the
consumer point of view, the relationship between people, wardrobes, garments, designers and shopping windows creates a complex network that can be experienced in a similar way that games are played. In their book “Rules of Play”, Salen and Zimmerman (2004) introduce the rhetoric question of:

“How can we use games as a way to understand aesthetics, communication, culture, and other areas of our world that seem so intertwined with games? Conversely, how can we use our understanding of these areas to enrich our practice of designing games? (p.3)”

While acknowledging the symbolic and cultural predominance that fashion carries, this research believes that fashion has a foot in the game world. To assume that fashion carries game traits is to allow this “rigid structure” to potentially be appropriated and played with. To combine fashion and play is to create a safe space around fashion, circumscribed by a magic circle that allows for greater means of self-expression and the pushing of boundaries of the current social norms that govern the fashion systems. Relating fashion to games is, above all, an attempt to apply game and play research knowledge towards the conception new play designs – and rules – within the acts of getting dressed, on the attempt to change key issues in the design and consumption of fashion products. Such play designs should, then, introduce and permeate mechanics and dynamics that are in line with fashion sustainability approaches.

From a consumption perspective, the rate of disposal of garments is an example of a key aspect in fashion that can be explored through the aforementioned play qualities. The approaches to the design-led intervention introduced by Fletcher & Grose (2012) can be applied to play mediums – e.g. the design of modular garments – in attempts to fight fashion waste. Another way to address fashion sustainability is through the re-definition of the designer’s role and the involvement of the consumers in the process as co-designers. Such participation and co-design methods can be explored through play in a way to evoke emotions and memories, which can result in greater emotional connection between the wearer and their product – thus resulting in its greater life-span (Fletcher & Grose, 2012).

From a game perspective, the fundamental aspects of play and its transformative aspects on personal and societal levels (Salen & Zimmerman, 2004) are believed to be a good base for the exploration of fashion sustainability approaches. The understanding of what happens when humans play, and, in special, of the rise of the magic circle that circumscribes and protects play, can potentially provide great insight into how users could engage differently with the consumption and even production of their garments.

2.4 Types of play

Up until now, this research has been using the words play and game without a formal introduction to the difference between them. It is time for the reader to get a proper sense of the relationship between the words, which is rather simple to introduce – according to
Salen and Zimmerman (2004), play is both a bigger and a smaller term than game. This research is interested in the former.

Play can be used to describe different situations, like doodling while watching a lecture, playing with food, flying a kite or playing a game of chess. Playing a game, therefore, is only one of the instances of play. The other instances are: ludic activities, which are systemized activities that can be thought of as play but are not game (such as flying a kite); and being playful, which broadly encompasses a state of mind, of appropriating things of the real world and playing with them (like playing with words through puns) (Salen & Zimmerman, 2004).

From defining play and the three forms that it manifests itself, a definition for games can be presented. Dozens of different definitions can be found in the literature, but Salen and Zimmerman (2004) propose a short and concise version of them that says: “A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome” (p.80). As an addition to the definition, Suits’ (1978) emphasizes the fact that the playing of a game and the following of rules happen solely in order to make that game activity possible. However, recent years have shown an increasing trend of games being applied to different contexts (Susi et al., 2007), where the game agenda is not simply entertainment, but other outcomes such as education are pursued.

2.4.1 Playing and learning

Games that are designed for other purposes rather than entertainment are often called serious or educational games. These types of games are applied to a number of different contexts, such as the military, healthcare, education and government (Susi et al., 2007), and they capitalize on the transformative aspects of games in other to retrieve different – quantifiable – outcomes. According to a detailed ground work on educational games by Whitton (2014), there is evidence that this type of play can improve visual perceptual skills; attitudes and behavior towards health; motor skills; factual knowledge; problem solving and cognitive skills. The mobile app Elevate (n.d.), for example, is a game played by more than 10 million people, which comes with a series of games that aim at training the brain in cognitive skills. Duolingo (n.d.) is another popular app that teaches languages through games.

Because this research aims to work with the design of games with the ultimate goal of not only entertaining players, but assisting fashion sustainability, it is fair to position it within the category of serious games. This positioning, however, is not as straightforward. This research believes the combination of non-serious (entertainment) play and fashion sustainability has the potential to address issues as a consequence of play, and not by explicitly framing it under a fashion sustainability rhetoric. As an analogy, one can consider the design of video games that take body movement as input. Such games can be created by the designers with the goal of promoting exercises, but they are sold and framed as entertainment games – e.g., the game Mario Power Tennis for the Nintendo Wii (Nintendo, n.d.). Exercising is then a consequence of “fun”.
Furthermore, it is important to point out that the games of this research will be designed as games from scratch, and not as game elements applied to an already existing system. This distinction is crucial, because one could think that the approach of this study is gamification. This research, however, is in line with Bogost’s opinion (2014) when he vehemently condemns the popularization of the term gamification in defence of a more serious approach to game design. According to him, “gamification offers a simple way to cover over more complex problems” (p.69) – e.g. trying to fix low-engagement with a tool by incorporating badges and pointing systems – which is not the present case. In fact, Bogost puts that the term gamification has been used more and more in replacement of serious games, which he claims to diminish the importance of games. If a game is designed and developed from scratch, then it’s not a case of gamification, but simply the case of a game.

When positioning this research within serious games, the classification suggested by Whitton (Whitton, 2014) becomes useful to clarify how learning and playing relate to each other. According to him, there are eight different ways in which one can learn from serious games:

1. **Learning with entertainment games** – The explicit repurpose of non-serious (entertainment) games for a learning setup;
2. **Learning with educational games** – The play of games designed explicitly for the purpose of learning;
3. **Learning inspired by games** – Using non-serious games as a way to learn real-life skills, e.g., playing chess to develop one’s algorithmic thinking skills;
4. **Learning within games** – The informal learning that occurs when someone plays a non-serious game;
5. **Learning about games** – Learning about the cultural and social impacts of games;
6. **Learning from games** – Understanding the theory and principles behind games and applying them in learning contexts;
7. **Learning through game creation** – The game designer’s gathered knowledge throughout the creation of a game;
8. **Learning within game communities** – Learning about social interaction within the communities of play.

With the eight learning methods, one can grasp the intention of the games experimented within this research. First of all, the player’s intentions are different from the designer’s intentions: the games are designed for sustainability impact while the player should want to play the games for entertainment. Thus, the designer is working with the concept of “learning from games” and “learning within game communities” in order to gather knowledge and apply it back to the creation of the games. The players, on the other hand, are playing in the intersection of “learning within games” and “learning inspired by games”, which suggests
that the players intentionally play the game for the sake of entertainment while unintentionally impacting fashion sustainability.

Following Hudson’s (2016) idea, this research will call this positioning “non-serious serious games”, which better illustrates the work: entertainment games designed to assist a serious goal. In summary, this research aims to create non-serious serious games by learning from and within communities of play, in order for players to learn within and inspired by games.

3. Related work

This research has chosen to examine four different projects that connect with the current study in different aspects. The Fun Theory explores how play can change people’s habits; the 30-day Wardrobe Challenge is an entertainment game that shows potential to work in favor of fashion sustainability; the LENA Library is an example of a design-led intervention that fights for the fashion sustainability cause and, finally, the Unmade project invites consumers to customize their knitwear.

3.1 The Fun Theory

Exploring playfulness as a way to change people’s habits towards better choices is not a new concept. The Fun Theory (Volkswagen, 2009) is a project driven by Volkswagen in Sweden that became popular around 2009 with their popular appearance with the Piano Stairs. An interactive piano was installed at a staircase next to an escalator (Figure 2), luring people in with “fun” in an attempt to make them choose the stairs. Analogous to this study, The Fun Theory project believes that play has a greater transformative power than guilt or shaming – if not greater, then healthier. From watching the video of the Piano Stairs, it becomes clear how the installation causes an instant change of behavior. People become more attracted by the “fun” premise of the staircase rather than the convenience of the escalator.

The Fun Theory is a great example for this research, for it engages people with playful activities and games in order to create instant changes of behavior, while focusing on sustainable and healthy outcomes. The project, however, acts more as a disseminator of the message rather than an actual “fix” to the problem at hand. In the long-term application of such games, it can be questioned whether they would still keep the same engagement level from the citizens. Do the games have enough replayability value to carry the engagement for long? This research believes that the value in The Fun Project lies in its power of “converting research and knowledge into attitude and behavior change among the broader public” (Portney, 2015, p.202).
3.2 The 30-day Wardrobe Challenge

The 30-day wardrobe challenge is a game in which the online fashion magazine *Who What Wear* releases a new rule of what to wear to its readers, every day, for a month (*Who What Wear*, 2016). The rules go from overall outfit combinations to accessorizing ideas (Figure 3). To play the game, the participants must follow the rules and post their outfit pictures on social media.

The 30-day wardrobe challenge explores the play nature of fashion, and how it’s governed by unwritten rules. Typing “fashion” on Google and getting “fashion rules” as the first autocomplete search suggestion implies that there are many people out there looking to “play” fashion by regulation – which shows how the magazine *Who What Wear* was on point when they explored this reality.

To create a game that requires the participants to explore their wardrobe, and combine their garments in ways they perhaps haven’t tried before, is an effort that is in line with fashion sustainability. It drives the players to rediscover their wardrobe and their style through the game, instead of buying new garments. The 30-day wardrobe challenge, however, doesn’t completely follow this line of thought. Part of the game is, in fact, designed to inspire the players to buy new key pieces of clothing through rules that require specific outfits to be worn.

The combination of both types of rules, however, might still have an impact on the player that favors sustainability. As Salen & Zimmerman (2004) put it, “sometimes, in fact, the force of
play is so powerful that it can change the structure itself” (p.304). As playing chess might transform one’s thinking skills, so might the 30-day wardrobe challenge change the player’s relationship to their clothes. When daring to follow new dress codes, the player might learn to be more playful with their wardrobe and appreciate their garments wear-value for longer.

**Figure 3.** Examples of rules from the 30-day wardrobe challenge *(Who What Wear, 2016).*

Furthermore, the protective magic circle concept might also be a strong source of transformational value. On the 30-day wardrobe challenge, however, one might question whether the use of public social media as the sharing platform for the game breaks the safety of the magic circle space; whether peer-pressure and social anxiety might keep players from engaging in the game; whether the game creates a space where the only players are a niche group of people that already feel free to experiment with and expose their fashion choices.

### 3.3 LENA Library

The LENA Library is a Dutch physical and online store that exists with the purpose of combating the negative outcomes of modern consumerism, while acknowledging and even praising the pleasures of wardrobe renewal. LENA Library is space for borrowing clothes and returning them in exchange of new ones *(LENA the Fashion Library, 2017).* Through the subscription of different membership types, the clients of LENA are granted points that they can spend on borrowing outfits in the store. The outfits are carefully curated by the LENA “librarians”, as they ensure quality and good taste (Figure 4 shows some of their products).

The LENA library is a real-life example of a design-led effort that leverages the driving forces of the problem situation – consumerism – and turn it around in favor of sustainability. Furthermore, the LENA library is a frontrunner when it comes to combating the negative perceptions that sustainable fashion might still invoke. According to Joy et al. (2012), “the term ‘eco-fashion’ conjures up the hippie and environmental movements of the 1960s and 1970s, during which ecologically sensitive fashion often meant shapeless recycled clothing”. In her study, she identified four obstacles to bringing sustainable fashion to the masses – lack of awareness, negative perceptions, style, high prices – all from which LENA
works with. The initiative, however, can be questioned on one important aspect that the slow-fashion movement goes against: the idea that fashion relies on the “new” and on image (Clark, 2008) – which LENA capitalizes on.

Because this project was such a big inspiration for the current study, one of the co-founders of the LENA library was contacted and asked whether she could be interviewed about the initiative. The reader can read the full report of the interview in Appendix A, and too get inspired.

![Figure 4. Screenshot of the LENA Library website (LENA the Fashion Library, 2017).](image)

### 3.4 Unmade

Unmade is a service that enables customization of knitted fashion products at an industrial level (Unmade, n.d.). By combining advanced software programming with traditional knitwear processes, Unmade allows consumers to have a say in the design of their garments, fighting the homogenization that fast-fashion introduces in the sector. Furthermore, because the Unmade products are produced on demand, the ecological factor shines through the lack of overproduction and fashion waste.

The interaction with Unmade happens over online shops, where the consumers can adjust a small set of parameters of the knitwear’s design (such as colors and direction of the
pattern), in slightly playful interactions. Figure 5 shows how the scarf’s pattern gets disordered by dragging it with the mouse.

Unmade’s initiative should be praised for fighting the homogenization and wastefulness of modern fashion. When it comes to its customization concept, however, there’s a lot of room for improvement. The customization of the patterns feels like a gimmick due to its lack of depth and purpose. It’s hard to say how the rotation of a pattern and the choice of pre-defined colors, for example, can bring any more meaning to product. The space for self-expression is so little that one can hardly call it that. However, Unmade is a platform where this research sees much potential of growth if combined with game design.

**Figure 5.** Screenshot of Unmade’s website showing how the user can adjust the knitwear's pattern through the product page. In this example, the pattern gets disordered by dragging the mouse over it (Unmade, n.d.).
4. Research framing

From a broader perspective, this research works in the intersection of fashion and interaction design studies. This is a well-known intersection, for it has been extensively explored through wearables – microcontroller embedded in garments or accessories, worn or implanted in the body. The field of wearables poses an advancement to the “language of dress in specific ways that converge with the cultural dimensions of technology” (Ryan, 2014). The cultural importance of wearables is strengthened by its also important advancements in fields like health and sports, where embedded microcontrollers and smart textiles are being developed for applications such as body monitoring (Persson, 2013). However, the design efforts applied to this known intersection of fashion and interaction design, in spite of their importance, have not yet reached the everyday consumer. This research, therefore, proposes the exploration of these two fields from a rather new perspective. It proposes the exploration of the fields through the lenses of ludic interaction, where games can be leveraged in order to advance the language of dress in ways that can assist fashion sustainability – a topic that affects and is affected by the everyday consumer. Ultimately, this thesis project aims at exploring the proposed topic to open up the eyes of the interaction design research community to new ways of addressing the “wicked problem” (Zimmerman et al., 2007) of fashion sustainability.

4.1 The research focus

As sustainability is a subject that challenges the fashion industry at different levels and steps in the production and consumption cycle, this research will focus on stages of the cycle where the interaction between the product and the wearer is concerned. More specifically, this research is concerned with the problematic around fashion waste, which fuels the ever-shorter cycles of buy and disposal of products. This waste, as suggested by Fletcher & Grose (2012), is a result of a lack of meaning that garments carry; they are products of a system that is only concerned with economic goals.

As a starting point, therefore, this project probes the topic through the research question: How can play and games help reduce fashion waste? The focus of this first framing of the problem aims at exploring different possibilities within fashion to which play and games can be applied in order to bring greater meaning to garments, thus reducing waste.

Furthermore, different qualities of play and games were defined to guide the exploration of the research question. Each of the qualities show potential to address the fashion waste problematic through different angles:

- The transformational quality of games: As Salen & Zimmerman (2004) put it, “sometimes, in fact, the force of play is so powerful that it can change the structure itself“ (p.304). As playing chess might transform one’s thinking skills, games in fashion might also change how one approaches their wardrobe and perceives their
garments. From this quality, this research aims to explore the question of “How can games change people’s attitude towards their dressing habits?”.

- **The creation of meaning through games**: Sicart (2014) says that play “is a string with which we tie our memories and our friendships together. Play is a trace of the character that defines us” (p.23). Drawing from this point of view, this research aims to explore whether games can create an environment through which memories and emotions can be transferred onto pieces of clothes. The question of “How can games assign greater meaning to garments?” can be explored in different contexts, such as in a product co-design practice (which in itself already is considered to produce meanings), or in a play-while-wearing context.

- **The immersive engagement through games**: Apart from the potential that games have to spawn memories, tie relationships and evoke freedom of expression, games have, in its very fundamental understanding, the ability to pull people in (Whitton, 2011). When well designed, games can engage people through long periods of time, throughout various gameplays sessions. Thus when applied to fashion, this characteristic of game is believed to also provide garments with extended desirability. This research, therefore, aims to explore the question of “How can garments spawn a long-lasting sense of delight through games?”

The research question, therefore, guided the definition of game qualities that show potential in addressing the problematic around fashion waste. The qualities will be referred to as game impact goals. The different goals, in turn, developed into yet more focused questions – creating thus a guide for the exploration of the overarching research question. View Table 1 for an overview of the research guide.

<table>
<thead>
<tr>
<th>Game impact goal</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>The transformational quality of games empowering behavior change</td>
<td><em>How can games change people’s attitude towards their dressing habits?</em></td>
</tr>
<tr>
<td>The creation of meaning through games</td>
<td><em>How can games assign greater meaning to garments?</em></td>
</tr>
<tr>
<td>The lasting engagement through games</td>
<td><em>How can garments spawn a long-lasting sense of delight through games?</em></td>
</tr>
</tbody>
</table>

**Table 1.** List of the game qualities to be explored through RtD, and their respective research questions
5. Methodology

As an overall framework, this study follows a Research through Design (RtD) approach, in which designerly activities are executed in order for a topic with theoretical grounding and opportunities to be explored. Such exploration aims at fostering the design of efforts that illustrate possibilities of addressing a situation or a problem (Gaver, 2012). The premise of RtD is that of the framing and exploration of a design space, which is a complementary concept to RtD. Design spaces, according to Botero et al. (2010), is “the space of potentials that the available circumstances afford for the emergence of new designs” (p.2). By setting a theoretical framing around fashion sustainability and studies of play, therefore, this research aims to explore the potentials of the design space through activities that inspire meaningful (Westerlund, 2009) design proposals.

Starting from the initial research question “How can play and games help reduce fashion waste?”, a series of experiments were carried through and reflected upon with the aim to follow an “expansive” RtD approach, as introduced by Krogh et al. (2015). In an expansive approach to RtD, different areas of the design space are explored in order to broaden perspectives, rather than to explore one domain in depth. This is a fitting approach to this research, since it aims to probe different angles of the design space guided by the previously introduced games impact goals and their accompanying research questions.

The different approaches to the design experiments implemented by this research were inspired by the suggestions of the design-led interventions to fashion sustainability proposed by Fletcher and Grose (Fletcher & Grose, 2012). Furthermore, ideas of slow-fashion were also disseminated through the conducted design activities.

Implementing designerly experiments with an expansive approach to RtD is the first step to comprehending the methodology implemented by this research. How and where these experiments were conducted are follow-up questions that must be addressed to help further clarify the approach.

5.1 From lab through field to gallery

Research through Design is an way of doing Interaction Design research that “stresses design artifacts as outcomes that can transform the world from its current state to a preferred state” (Zimmerman et al., 2007). Transforming the world through the design of artifacts is a task that requires the understanding of contexts and people and, above all, the understanding of how new designs can impact those. This necessary knowledge requires a direct involvement from the designer with the circumstances of the design space at hand, and the iteration of designs that, in turn, are exposed to people, their contexts and imaginations. Design experiments, therefore, become tools to probe into the lives of people and things, exploring unknowns and unveiling potentials.
According to Kozel and Koefoed Hansen (2007), there are generally two approaches to designing artifacts for people’s lives: one that brings the project space to the people, and one that invites the people into the project space. This simple but clarifying categorization can be further explored through the work of Koskinen et al. (2008), which states that there are in fact three ways to probe the design space: lab, field and gallery. Lab brings people to the project space through pre-arranged environments, where chosen variables are set up to identify casual mechanisms (Koskinen et al., 2008). Different formats of design workshops – such as future workshops (Kozel & Koefoed Hansen, 2007) – are examples of lab approaches. Field is the opposite; it brings the project space to the people, where design activities are placed in people’s natural settings. An example of such approach is the cultural probe method introduced by Gaver et al. (Gaver et al., 1999). Finally, the third way of probing the design space if borrowed from the art world, where designs are showcased in a gallery setting and “new ideas are tried out in the imagination of visitors” (Koskinen et al., 2008, p.53). The gallery setting can be considered a half-way between bringing people to the project space, and bringing the project space to the people – it’s a space where reality is tested through finished conceptual designs and aesthetic experiences.

In the expansive RtD approach to exploring the design space that revolves around fashion sustainability and studies of play that this research employs, the whole spectrum between lab, field and gallery was tested through the design of games. Designing games is finally the final cue to introducing the methods applied by this research.

5.2 A play-centric process

The process to designing games is a similar process to designing any other product: the experience (play experience) must always be the in the center focus of the designer, as much as the desired outcome. It requires that the user (player) is involved in the design process, from concept to completion, assuring that the created set of features (rules) are suitable for a motivation to engage (play) (Fullerton, 2008).

In games, the desired outcome is what Fullerton calls the “player experience goals”. He states that these goals must always be set up front in the design process, so that ideas aim at reaching that one desirable outcome. “Players will feel like they trust no one, but will still have to cooperate in order to reach a pleasant output” – that’s an example of one experience goal used by this research to guide the creative process of the design of a game.

Designing games is a complex task because it is hard to foresee how a set of rules will reflect on the player’s experience. Fullerton thus suggests that as soon as potential ideas emerge, playable prototypes should immediately be built to test the game core features, in what he calls a play-centric design process. The core features, in the case of games, are the core game mechanics: the main guiding elements that dictate the player experience, or, as defined by Hunicke et al. (2004), “the various actions, behaviours and control mechanisms afforded to the player within a game context” (p.3). Because play-testing prototypes of core mechanics is a crucial method for a game design process, it was the main method adopted by this research.
On top of assessing player experience goals through prototypes, this research also works with another layer of complexity; a layer that explores the game impact goals and their accompanying questions. How can play and games change people’s attitude towards their dressing habits? How can play and games assign greater meaning to garments? How can garments spawn a long-lasting sense of delight through games? Through the early testing of game prototypes, therefore, research questions and player experience goals are assessed.

5.3 A combined approach

Using a play-centric approach on a RtD process offers an interesting point of view on the lab, field and gallery concepts. The tweaking and testing of game prototypes on the one hand, is similar to how a lab approach works: the artificial staging of an environment, where different variables are expected to yield different results (where, in games, the variables are the mechanics and rules). On the other hand, games can happen not only in an enclosed environment, but also throughout the player’s natural setting, for perhaps the duration of days. This is where this research explores a space in-between lab and field, where lab goes to field through the tweaking and testing of variables that follow people in their natural settings. In addition to lab and field, this research also finds interesting the exploration of the values that a gallery approach can bring to a play-centric design process. How can the experience from the visitors in the gallery be extracted and serve as input in the design of game?

As a summary, the design experiments expected from the exploration of the framed design space were guided by an expansive RtD approach through the execution of game prototypes that went from lab, through field to gallery. The game prototypes, in turn, explored the main mechanics of game ideas with the aim to fulfill the player experience and the game impact goals.

Figure 6. The representation of the methodological approaches adopted by this research.
6. Design process

How can play and games help reduce fashion waste?

The main research question and the problematic around fashion waste is the ultimate guide for the present design process, together with the three sub-questions that explores different angles and game impact goals:

- How can play and games change people’s attitude towards their dressing habits?
- How can play and games assign greater meaning to garments?
- How can garments spawn a long-lasting sense of delight through games?

Through the design process, the research questions were explored with the design and testing of seven experiments – six game prototypes and one gallery exhibition. Furthermore, apart from referring directly to a game impact goal (Figure 7), each prototype tested their respective player experience goals defined at the start of each game exploration. The recipe for each game prototype, therefore, can be said to consist of: a game impact goal, the player experience goals and the game core mechanics.

Overall, each prototype went through a complete (or partial) process of: player experience goals definition – core mechanics definition – prototype building – prototype play-testing – results analysis – mechanics tweaking – prototyping play-testing. The experiments are explained and analyzed in the following chapters.

Figure 7. This image shows how each of the prototypes (referred to by their names) explore the different game impact goal questions. The only prototype to explore two goals at the same time is the “We Said You Said It” game.
6.1 Wear What?

The first game prototype of the design process, *Wear What?*, explores the play nature of fashion to create a sub-game with its own rules. This experiment was inspired by the 30-day Wardrobe Challenge, previously assessed in the document. The game emerged when the potential of the wardrobe challenge was recognized for the exploration of the question of How can play and games change people’s attitude towards their dressing habits? Furthermore, the game is an experiment that follows Fletcher and Grose’s (2012) idea of “metabolism of a wardrobe” as a way to fight fashion waste.

*Wear What?* tries to use the potential of dressing-rules to inspire the participants to explore their wardrobes and combine their garments in ways they haven’t tried before. The game also explores how the rise of the magic circle through the sharing of experiences amongst friends can create a safe space to experimentation and self-expression.

6.1.1 Player experience goals and mechanics

As part of the game recipe, the player experience goals was set in advance: the players should feel like they are in a competitive environment, where they feel challenged by the other players and by their own selves, while feeling no sense of intimidation. The mechanics of the game should ensure that the players feel engaged and motivated to play each iteration of the game, and that they can play the game no matter what they have in their wardrobe.

The chosen game platform for the prototype play-test was a WhatsApp group chat. The mechanics and rules of the game works as listed on Table 2.

<table>
<thead>
<tr>
<th>Wear What?: Rules / Mechanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every morning, a new rule for what to wear is released by the game master.</td>
</tr>
<tr>
<td>Each participant, dressed according to the rule, takes a picture of themselves and shares it to the group until 6PM.</td>
</tr>
<tr>
<td>If a player claims they can’t follow that day’s rule, another player is randomly assigned the power to create a new rule that will only apply to the exception players.</td>
</tr>
<tr>
<td>After 6PM, each player is anonymously asked to vote for who they thought dressed the best (based on their own criteria).</td>
</tr>
</tbody>
</table>
Each player gets 2 points for participating each day, and 2 extra points for winning the best look of the day.

After 7 days, a winner is announced (there can be more than one).

**Table 2.** Mechanics and rules of the *Wear What?* game prototype.

### 6.1.2 The prototype and the play-testing

The most important aspect of the prototype involved the creation of the dressing rules. These were critical, since it could make the difference between empowering a wardrobe exploration versus empowering the purchase of new clothes. The rules needed to be simple and not too specific on pieces of garment, ensuring most players could follow them. Appendix B shows the list of rules created for the game.

Eight women play-tested the *Wear What?* prototype. The steps of the game – such as introduction, rules and voting prompts – were carried out through game “cards”, which were images designed for the purpose of the game (Figure 8).

![Figure 8. These are some examples of game “cards” posted to the players throughout the game.](image-url)
After playing Wear What? for the course of 7 days, the players shared nearly 100 pictures amongst themselves, alongside inspiration, fashion tips and compliments. Figure 9 shows some screenshots of the WhatsApp chat group. A survey was handed out the day after the game was over, in order to gather thoughts on the players’ experiences (view Appendix C for the full answers).

![Figure 9](image)

**Figure 9.** Screenshots from the chat room in WhatsApp, which was the hub of the game. The images, from left to right, show: 1 – the introduction of the game; 2 – the posting of the first rule; 3 – conversation about fashion-blogging; 4 – sharing of inspirational pictures for a challenge and 5 – culture sharing on different ways to wrap a hijab.

### 6.1.3 Results

Overall, the results show that a game like Wear What? has the potential of reviving forgotten clothes and raising the level of appreciation for the players’ own wardrobes. During the game, a player said “I think I have never actually worn that “sweater”. Bought it around 6 years ago 😂”. She was one of the many players that reported they had rediscovered pieces of clothes from their wardrobe they haven’t worn in a while. The game not only unburied clothes, but also changed the way the players approached their wardrobe. Some of the participants revealed that the game made them look at their garments with different eyes. As one player mentioned: “I never knew my wardrobe had so many combinations”.

Apart from uncovering hidden garments and combinations, the format of the game created a community feeling, in which the players felt safe to share their looks and thoughts. Even when the players felt uncomfortable with wearing a look at a first instance, the effect of “we’re in this together” (as one player reported) turned out to be an important tool for empowerment and motivation. The sharing amongst friends created a feeling of competitive “I can top that”, as revealed by one player, but also of care and support. When sharing a picture of their look, one player said in the chat group “I cannot believe I am going out dressed like this” (Figure 10), but still did. This is an example of how the play amongst the group in fact creates a safe space for experimentation, possibly empowered by the rise of the magic circle.
One player in the group, however, revealed that during the game she felt like she didn’t have enough clothes, and that she needed to buy more pieces in order to be more diverse. This type of feedback can suggest a way in which this game could back-fire: instead of supporting waste reduction, it stimulates more shopping. It can be argued, however, that the shopping factor combined with wardrobe appreciation could still retain waste. The same player, after all, reported herself that she had rediscovered a couple of items she had forgotten about.

Overall, the players reported a fun experience, and most of them were sad about the game coming to an end. When filling out the survey, they all had many other ideas of other rules that could be integrated in the game. These points show how the game has a great replayability potential. Furthermore, when asked if they would wear any of the dressing rules again, all of them named at least one rule they would want to keep on trying out, suggesting that the effects of the game can bleed into real life.

Table 3 shows the insights from the first game prototype, and their potential action points.
When done right, fashion rules have the power to revive old clothes and reveal outfit combinations that can bleed into real life.

Create thoughtful fashion rules, that are calibrated to empower the wardrobe-metabolism concept.

Create fashion rules that emphasizes the wardrobe-metabolism even further, by including ideas of swapping, fixing and customizing for example.

Competition mixed with community support can empower players to feel safe and push their boundaries of fashion.

Capitalize on the feeling on “we’re in this together” through game mechanics.

Private sharing creates a low-threshold for participation and creates a “secret society” feeling to the game.

Avoid public sharing as game mechanics.

Following fashion rules triggers ideas for new fashion rules from the players themselves.

Create mechanics in which the dressing rules can be created by the players themselves.

Playing Wear What? is an entertaining event on a rather uninteresting routine of getting dressed.

Explore how Wear What? can become a self-driven by any group of players at any time.

Table 3. List of insights and actionable points for Wear What?

### 6.2 Pattern War

*Pattern War* is an experiment that draws inspiration from the author’s previous study (Barbosa, 2016), where participants would paint their own textiles through self-reflection activities that dictate painting rules. These previous activities had the aim of bringing the wearer into the design process of their own products through life-reflection activities, creating therefore an emotional bound between them and their product.

As a progression of the painting experiments, *Pattern War* was designed to explore how games can be used as means to the textile painting step of the product design process. It is a card game that invites the players to take the role of pattern designers by painting on t-shirts.
*Pattern War* ultimately works with the question of *how can play and games assign greater meaning to garments?* by exploring the fashion sustainability topics for design-led interventions of “co-design” and “empathy” (Fletcher & Grose, 2012).

### 6.2.1 Player experience goals and mechanics

*Pattern War* was envisioned as a game of bluff and deceive, such as games like *Coup* and *Werewolf* (BoardGameGeek, n.d.). This has much to do with the author’s own taste for games, but also to how the competition, as seen on the *Wear What?* game, sparks engagement.

The defined player experience goals for *Pattern War* were: players should feel like they trust no one, but will still have to cooperate in order to reach a pleasant design output.

As the player experience goals suggest, the painting of the t-shirt and pleasant design output should be the driving reason for cooperation, and, as a matter of fact, should be the driving reason for the game’s existence. The painting on textile should not happen as a collateral effect of playing the game – for example, as if a game of chess is played with pieces that are dipped in paint, and a textile is painted as a consequence of serving as the chess board. In this example, the players are not engaged in painting the textile, but in playing chess.

*Figure 11.* The work of Edda Gimnes served as great inspiration for the design of *Pattern War.*
Creating the mechanics of this game was somewhat complex, because at the same time that the player experience goals should be met, the t-shirt painting results should be aesthetically pleasing. The results of the t-shirts are a crucial aspect of the game, because it could be either result in love (keep garment) or hate (dispose garment). The works from the fashion designer Edda Gimnes (2016) served as great inspiration for the aspired aesthetics of the textile painting (Figure 11 shows some of her work that inspired Pattern War).

The game setup starts with each player receiving 2 mission cards, which contains secret missions that they should accomplish throughout the game. The missions are related to how the patterns are painted (view the orange cards on Figure 12). The players are also dealt 5 painting cards (green cards on Figure 12), which dictates what the player can paint on the different t-shirts (among other actions), and 2 reveal cards (blue cards on Figure 12), which they can use to call another player on their mission. The goal of the game is to accomplish the missions without being caught by the other players. The rules and mechanics of the game are displayed in Table 4.

**Figure 12.** Cards from the Pattern War game. The green ones are the paint cards; the blue are the reveal cards and the orange are the mission cards.
Pattern War: Rules / Mechanics

| In their turn, a player can either choose 2 paint cards to use, or they can choose to swap one of their cards with the deck. |
| The paint cards can be used to paint on any of the t-shirts. |
| At any time, a player can call on the other player’s mission. If correct, the called upon player loses that mission. If not correct, the calling player loses a reveal card. |
| The game ends when a player completes their missions. |

Table 4. Rules and mechanics of Pattern War.

6.2.2 The prototype and the play-testing

Pattern War went through an iterative process where its core mechanics were first prototyped and play-tested on a paper prototype (Figure 13). After tweaking some of the mechanics and designs of the game, Pattern War was finally played by four people on four different t-shirts. Each of the t-shirts were named after each future owner. The gameplay lasted for about forty minutes, through which all of the players were seemingly engaged in the game, with a competitive attitude. Mixed with the competitiveness, the players were also engaged in discussing the direction of the t-shirt pattern designs, especially when it concerned their own t-shirt. Figure 14 shows how the gameplay looked like, and Figure 15 shows the players posing in front of their creations after the game was over.

Figure 13. Playtest session of Pattern War on paper.
6.2.3 Results

When the game first started, the players were excited about playing, but they felt insecure about permanently painting on t-shirts that would be owned by themselves in the future (the name tags on the t-shirts created extra pressure). It was noticeable that the first brush strokes were very cautious. A player mentioned when painting for the first time that “this is a lot of pressure. I’m not sure I feel good about this”. As the game progressed, however, the players started immersing in the gameplay more and more, and consequently they loosened up about the painting. They started using the “free painting” cards very often (the free painting card allows them to paint whatever they like, in no connection to the missions, in order to make the designs more appealing) which shows how engaging with the pattern design was as attractive as the competitiveness of the game (even though the free painting cards can also be used as a strategy). At the end of the gameplay, all of the t-shirts were painted and given to their owners.

Figure 14. Gameplay session of Pattern War on the actual t-shirts. The red laps are the name markers.

The paper prototyping testing proved to be a valuable step of the process, for it not only surfaced problems with the design of the missions, but it showed how the painting cards could be developed further with the addition of the “free-painting” option. This card in special was a big resource for self-expression and players’ interaction, as they would allow players to intentionally paint things each other’s t-shirts (with either good or rather questionable intentions) – e.g., the necklace that one player drew on the other player’s t-shirt is an ironic symbol that says “you should accessorize more often” (view the top-left t-shirt in Figure 15).
When the magic circle was dissolved and the game was over, the players were unsure about the aesthetics of the result. The fact that the t-shirts didn’t have much of a fit or a flattering shape was a big problem for most of the players. Nevertheless, they were still asked to use the t-shirts in the future, if they found opportunity to do so, and share their pictures to the group (through a Whatsapp chat). The responses and shared images (Figure 16) showed that all of the players developed a taste to their designs, and felt comfortable wearing them. A player even mentioned, while wearing the t-shirt, that she “will never throw this t-shirt
away”, referring to the memories it carried. Furthermore, after a couple of weeks after the game, the players reported that they still used the t-shirt, as either a training top or as a “going to the supermarket” outfit.

The engagement with the game and consequently with the pattern design of the t-shirts indicate that a game can be a great channel to activate consumers into a co-design fashion process. Table 5 lists insights and potential action points of Pattern War.

<table>
<thead>
<tr>
<th>Game insight</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A game of painting rules have a great potential to engage people in the co-design of their garments.</td>
<td>Explore games like Pattern War as further means for co-design; games through which players actively and consciously engage with the designing of their products.</td>
</tr>
<tr>
<td>The rules of painting plus the choice of material (paint and brushes) ensure a consistent aesthetic look to the final result.</td>
<td>Further explore other materials and other rules for different results and greater re-play value.</td>
</tr>
<tr>
<td>The free-painting cards played in-between painting rules empower the players to express their selves and style. It also allows for symbolic communication between the players through the painting.</td>
<td>Always include mechanics that allow self-expression. Make sure there is a good balance between free-painting and painting rules throughout the game.</td>
</tr>
<tr>
<td>The name-tags on the t-shirts creates an extra layer of either competition or cooperation in the game (depending on the player’s attitude).</td>
<td>Consider whether the extra layer of competition adds to the player experience goals.</td>
</tr>
<tr>
<td>The desirability of the final result depends not only on the aesthetics of the painting, but on the shape and model of the garment.</td>
<td>Do not play game of co-creation on pieces of clothes that the players do not desire to wear at the first place.</td>
</tr>
</tbody>
</table>
After the game was over, a community feeling was created through the sharing of similar garments, each carrying the strokes from all of the players – a secret shared language.

Explore the “sharing of a private co-designed collection” as a community and shared memories platform.

Table 5. Insights and actionable points from Pattern War.

### 6.3 Pattern War Collections

The next experiment is an iteration of the previous Pattern War game. Even though the participants felt comfortable wearing the t-shirts, and some of them mentioned how they would never dispose of it, there was not enough desire to the product noticed from the players. Being not enough, in this context, means that there are chances that the product will be discarded in the future, or gathering dust.

As the insights showed, in order for a game like Pattern War to work, the participation needs to be complemented by a garment with a tasteful shape and cut. Furthermore, Pattern War disregarded one of the main findings of the author’s previous research project (Barbosa, 2016), which is the effect of the textile transformation from the state that the participant leaves the painted textile, to the form it gets when made into an actual product. The reshaping and cutting through the textile changes and adds values to the aesthetics of the product, creating a surprise factor that sparks a sense of delight in the player. According to Fullerton, “the aspect of uncertainty in outcome is an important one for our play-centric process because it is a key motivator for the players”.

Pattern War Collections, therefore, builds on previous findings from Pattern War, capitalizing on the textile transformation and community feeling. The experiment uses the same Pattern War game, but instead of painting on t-shirts, the game happened over five meters of raw fabric. The goal of Pattern War Collections is for the players to design their own textile through the game, and for the textile to be later transformed into garments (chosen by the players through a list of model options). These transformed garments then belong to a limited private collection owned solely by the players – thus strengthening the community feeling.

#### 6.3.1 The prototyping and the play-testing

The Pattern War game was again prototyped and play-tested on paper prior the painting on textile. The goal with the paper prototyping was to tweak some of the missions that were still confusing and some of the mechanics around the dealing of cards. Through the paper prototyping other means of self-expression were also tried out, like the writing of words. The new set of Pattern War cards can be seen on Figure 17.
In the “real” play-testing session, a game night date was set between a group of friends, involving dinner, music and candy. Because this experiment attempts to create memories that are transferred onto the garments through the playing of the game, the evening’s set-up was purposeful. Even though a game (like chess, for example) can be as immersive when playing with paper pieces or gold pieces (Stenros, 2014), this research decided to invest on the aesthetic and sensorial experience of play nonetheless.

*Pattern War* was played by four participants. In order to fill the five meters of fabric, the game was played twice. The whole session lasted for about two hours, through which the players kept steady engagement levels. Figure 18 shows how the play-testing session looked like, and Figure 20 shows the resulting textile after the two gameplays.

![Image of cards for Pattern War](image)

**Figure 17.** New set of cards for *Pattern War*. The mission cards were made more clear. The free-painting cards were made into drawings, suggesting the players ways in which they could use the
card (such as writing). The reveal cards became trust cards, according to a change of game plot (players are part of a company, and if they lose their trust cards, they are fired).

Four unique pieces of garment were created after the game was over. A group chat was created with the participants after the game, so that they could follow the progress of the making of the collection – pictures were sent throughout the process of cutting, sewing and finishing of the garments (Figure 19). Through the chat group, the players could also choose a name for their collection, which turned out to be “The Appendix Bluff”. The online sharing is an attempt to both strengthen the community feeling and to connect the players with the artisan, adding value to the final product (Joy et al., 2012) (Clark, 2008) while demystifying the fashion design process. This is an attempt to follow the philosophy of the slow fashion movement. View Figure 21 for the results of The Appendix Bluff collection.

After the game was played and the collection sewed together, a questionnaire was distributed to survey the players on their experience (Appendix D shows the players’ full answers).

Figure 18. Gameplay session of Pattern War over five meters of textile.
Figure 19. Chat group were the players could follow the progress of their clothing collection.

Figure 20. Part of the resulting textile after the Pattern War game was over. The words painted on the fabric were due to the “free painting” cards. The words chosen by the players were related to their evening, such as “fortune” (in reference to the fortune cookies they ate before the game).
6.3.2 Results

The change from t-shirts to wide textile canvas was significant for the player experience. Because they didn’t know where each brush stroke would appear in the future collection (differently from the previous Pattern War experiment), the wide canvas gave them more freedom, less choice restrictions and less pressure. As one player said “I did not think so much about that this was textile that I would wear at some point. I was more focused on achieving the mission or seeing a part of the fabric as a holistic piece which should look nice”.

Figure 21. This research presents: The Appendix Bluff Collection (name chosen by the players). A private collection designed by four friends through a game of Pattern War.

The introduction of writing on the textile added a layer to the experience that was unprecedented – it not only allowed for greater self-expression together with the free-painting, but it also created a “secret” language shared amongst the players. The words written through the game were related to the happenings of that game-night, such as rice paper rolls (which was the evening’s dinner). The chosen name of the collection itself is a shared secret of the game night experience.

After the game was over, the collection was created and distributed among the players (Figure 23 shows the distributed packages with a care description that can be kept as a post card). Their responses to the garments were very positive, and they all felt positively surprised with the results. One player mentioned “I honestly didn’t think this was going to
look this good!” which shows how the transformation of the textile plays an important role on the surprise and delight factor. Another player said “This is really nice because I know exactly who did what here [pointing to the details of the shirt]. It brings me back to our game night!” The last quote is an example of what the research aims to reach with the experiments: an added value to the garment that speaks to memories and emotional values. Figure 22 shows some of the players wearing an Appendix Bluff garment.

Figure 22. Players wearing outfits from the Appendix Bluff collection.

The results from the questionnaire, however, even though confirm the positive surprise and delight from the game, raise questions about the sustainability of the approach. One player, for example, mentioned that she would have preferred that the color of the fabric was different. Another player said that, even though she really liked the result of her top, she wouldn’t pay to have a garment made this way since it’s too much of a risk (as it might as well
turn out really bad). This very risk, which was also raised in the first version of Pattern War, threatens the experience with foreseeable chances of fashion waste.

Table 6 lists the summary of the insights gathered from Pattern War Collections and their potential actions.

**Figure 23.** Packages with the garments delivered to the players. The care card has a thank you note and care instructions. The signature is handwritten from the artisan (the author), in order to create a connection between the wearer the the producer.

<table>
<thead>
<tr>
<th>Game insight</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not knowing where the painting will appear in the garment releases painting and creative pressure.</td>
<td>Further explore approaches where the players don’t locate their drawings in the garment.</td>
</tr>
<tr>
<td>The transformation of the textile creates anticipation, surprise and delight.</td>
<td>Don’t disregard the transformation factor in similar approaches.</td>
</tr>
</tbody>
</table>
Writing, accompanied by free writing, enriches the “secret shared language” introduced in the previous game. It strengthens self-expression, community feeling, and shared memories.

Further explore how other ways of expression like writing can enrich the secret shared language.

The risk of fashion waste through a fashion co-design model like Pattern War Collections can be high.

Tweak mechanics of the co-designing games, or overall setup, to lower risks and reaffirm sustainability.

| Table 6. Insights and actionable points from Pattern War Collections. |

### 6.4 We Said You Said It

*We Said You Said It* is a game created as an attempt to explore two game impact goals through the questions of: *How can play and games assign greater meaning to garments? and how can garments spawn a long-lasting sense of delight through games?*

The design experiment is a word game that investigates embroidery as a game mechanic, while at the same time introducing it as a different fashion media to the research process. Introducing embroidery as part of the experiment is also an attempted to explore a DIY activity that embraces the slow and the mindful, as opposed to the fast-paced fashion of today. Furthermore, the addition of embroidery explores a more “sensorial” aspect to fashion products, connecting to reflections of the slow-fashion movement.

*We Said You Said It* is a game created to be played among roommates, and it uses the house’s fridge and word magnets (over 200 of them) as main elements. The design of the game draws from insights of the previous activities, such as the community feeling and the “secret shared language”. This research believes that words as a game design material can be harnessed and permeated with shared meaning, giving the game experience an easy pathway for memory recall – much the same way that the words on the Appendix Bluff Collection can be used to easily access the memories of that night. Slogan t-shirts and embroidered words were the main inspiration for the fashion output of the game (Figure 24).
6.4.1 Player experience goals and mechanics

For this game, the envisioned player experience goals involve some of the observed experiences from the first iteration of the Pattern War game, specifically when one player would free-paint on another player’s t-shirt. The player experience goals for We Said You Said It, therefore, are: The player should feel the temptation to tease the other players, but at the same feel a sense of collaboration and support. The mechanics of the game should ensure that the player’s result is a surprise to him/herself.

The mechanics and rules of the game are listed on Table 7.
We Said You Said It: Rules / Mechanics

- Each player will be written a sentence collectively by the other players with the words on the fridge.
- Each player can start, restart and swap words for any other player’s sentence.
- A player cannot touch their own sentence.
- Every Sunday, the players will embroider their selected sentence on one designated piece of clothing.
- The game goes on until there’s no more space on the garment.

Table 7. Rules and mechanics of We said you said it.

6.4.2 The prototyping and the play-testing

To design this experiment, a couple of word games were tried out before hand, all with the idea of later transforming the played words into embroidery. Games like the Exquisite Corpse and other surrealist games (Brotchie & Gooding, 1995) were tested out, yet none of them felt like a good fit to an embroidery session. They were rather quick games, and the words created felt “disposable”. That’s when the idea for the use of Magnetic Poetry (Magnetic Poetry, 2017) came along for the creation of a lasting play of words that culminates, every week, with embroidery.

We Said You Said It was played by 5 roommates, for a course of 10 days before the first embroidery session. The “game board” (a fridge) can be seen on Figure 25. No one really knows who started who’s sentences, neither who changed what words – but all of the players experienced their sentences being changed every day. The embroidery happened on a Sunday night, where 3 out of 5 roommates were present. They arranged fika and music for a relaxing Sunday evening (Figure 26).
Figure 25. *We said you said it* setup on the fridge. These were the final sentences: Decorate yes but sing too; Tickle my body in a closet; I celebrate this hug; The dream of a fabulous homo brother; and Intimate show flame included.

### 6.4.3 Results

The *We Said You Said It* game proved to be an amusing activity for the roommates to share during the course of the play-testing days. The game was a source of conversation in various encounters around the house. Upon debrief, the players reported that they were often feeling very curious to know how and if their sentences were changed. The final sentences were thought to be funny amongst the players (Figure 25 shows the final sentences on the fridge), especially because they followed the change progress of them, which created a shared memory or a shared “secret” behind the words (just like in *Patter War Collections*).

The embroidery, however, offered a much higher threshold for the participants’ engagement. Some of them felt intimidated by the craft, and didn’t show up at the Sunday session. For the ones who did, it took them a couple of days to finish the work (and not just the evening, as it was expected). The difficulty and unfamiliarity with embroidery were the main pain points. Nonetheless, when the embroidery was finished the players appreciated the finished look of the pieces, and have reported to have worn them “a couple of times” (see some of the finished pieces can be seen on Figure 27).
The engagement curve of the *We Said You Said It* game started high and rapidly lowered when the players realized the embroidery would take much longer than they thought. If the player doesn’t have a developed taste for the craft, the *We said you said it* can turn “fun” into boredom. As a result, the game was discontinued after the first embroidery Sunday.

For the ones who managed to complete the game, the question of “How can play and games assign greater meaning to garments?” was explored and yielded desirable and wearable results. On the other hand, because the game no longer continued, the question of “How can garments spawn a long-lasting sense of delight through games?” could not be experimented with, as the garments could not be continually filled with new sentences. *We Said You Said It*, however, continues to be played on the fridge to date – without embroidery involved.

Table 8 shows the list of insights and action points of this design experiment.
Figure 27. Results from the *We said you said it* game after the embroidery session.
Game insight | Potential actions
---|---
Words continue to show potential for shared memories and shared secrets. | Further explore how words can be integrated in playful fashion.
Unfamiliar materials and skillful crafts create high threshold engagement. | In the exploration of other types of media, take familiarity and effort into consideration.
Embroidered words can create desirable looks, even though the craft is intimidating. | Explore perhaps how word games can make use of automatic embroidery machines for a similar look and easier engagement.

Table 8. Insights and potential actionable points of the We Said You Said It game.

6.5 Velcro Play Parade

The concept of modular clothes, as introduced by Fletcher and Grose (2012), has the potential to engage the wearer for long with their modular garments, as they “allow for the playful and creative engagement of the wearer and have the potential to bring a long-lasting sense of delight by being adaptable to personal preference and needs” (p.80). This concept has such a straightforward connection to play and games that it has inspired the creation of the Velcro Play Parade game. How could a game allow for the wearers to shuffle elements in their garments, creating a long-lasting sense of delight?

For the design of this game, a lot of fashion design inspiration was needed, because it essentially meant that experimentation with fashion materials and construction would have to be taken as a primary challenge. Figure 28 shows a moodboard of the fashion designs that served as inspirational resources in the process.

After dueling and sketching with different ideas, the Velcro approach came to light – what if players could stick things to their backs, that are made of Velcro, and change it whenever they want? The idea seemed interesting and went straight into prototyping. Finally, a jacket, a pencil skirt and a backpack were created and layered with Velcro panels.
Figure 28. Moodboard for the Velcro Play Parade game.
6.5.1 Player experience goals and mechanics

The aim for the Velcro Play Parade game was to explore words as means for expression, building up from previous insights. The game was first envisioned as almost literally a bodily version of the fridge word game, where friends could create sentences for each other. The player experience goals, therefore, are similar to the previous experiment’s: The player should feel the temptation to tease the other players, but at the same feel a sense of collaboration and support. There should be a level of challenge in creating the sentences, so that the players feel engaged in a competitive way.

![Image of Velcro triangles]

*Figure 29. The bag with the Velcro triangles given to the players.*

At the beginning of the game, each player received a piece from the Velcro Play Parade, plus a bag with 50 triangles that were made to stick onto the Velcro panels (Figure 29). The triangles contain either letters, patterns or a solid color. The mechanics and rules of the game can be seen on Table 7.

### Velcro Play Parade: Rules / Mechanics

<table>
<thead>
<tr>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every time a player chooses the Velcro piece to wear, they should randomly select 15 letter-triangles, take a picture of them and share it on a Whatsapp chat group with the other players.</td>
</tr>
<tr>
<td>After picking the 15 letters, the player should create a word or a sentence with them.</td>
</tr>
<tr>
<td>Throughout the day, the other players should, in turns, create other words or sentences with the same letters, and share it over Whatsapp.</td>
</tr>
</tbody>
</table>
Every time a new word or sentenced is shared, the wearer should write it on their Velcro piece.

The players can use the solid and patterned triangles in any way they want.

**Table 9.** Rules and mechanics for the Velcro Play Parade game.

### 6.5.2 The prototyping and the play-testing

Before prototyping the core game mechanics, there was a prior process of prototyping the actual Velcro pieces to be worn with the game. Different options were tried out before the final models came to life. Figure 30 shows an early prototyping of the Velcro triangles. Figure 31, Figure 32 and Figure 33 shows the final *Velcro Play Parade* garments.

Before the game was play-tested, the pieces were experimented with as the author wore them a couple of times at different occasions.

The *Velcro Play Parade* game itself was played by three players over the course of one week, when they shared the game updates via Whatsapp (Figure 34). The engagement with the game, however, declined fast by the end of the week, as the players went quiet towards the end.

After the pieces were collected back, a quick debrief conversation clarified the player’s experience and thoughts of the game.

![Figure 30. Early prototyping of the Velcro pieces. On the left, the idea was to play with full words to create sentences. Because the squared look of the panels wasn’t pleasing to the author’s eyes, a triangular approach was tried, yet it didn’t work with full words. That’s how the triangles with letters came to life, as seen on the right image.](image-url)
Figure 31. The Velcro Play Parade skirt.

Figure 32. The Velcro Play Parade jacket.
Figure 33. The Velcro Play Parade backpack.

Figure 34. Game play of Velcro Play Parade on Whatsapp.
6.5.3 Results

In a nutshell, Velcro Play Parade showed to be a waste of a product idea that was full of potential. This first insight was developed from the author’s own experience of playing the game, and from the debrief with the players. The mechanics and main set-up of the game didn’t explore the garments to their full extent, and the main problem for it was the existence of a “structured game” around them, and a digital platform as the game hub. As one player said “The game was kind of fun, but it felt a little too constructed. Not natural.” She then added “I saw no real purpose for a bag or jacket when the word game was played on Whatsapp”. Why playing with the words on both real and digital worlds? Why not only playing with the words in the real world, where the playful artifact is actually placed? And why structuring a game around an already playful artifact? These are rhetoric questions that summarize the impressions of the game.

![Figure 35. Player's friend interacting with her jacket.](image)

On a positive note, however, the players reported being wowed by the products and the novelty of the idea. They enjoyed the playfulness of decorating the pieces however they wanted, and they thought it was “fun” to walk around with “weird” messages around. Furthermore, the players were asked whether they thought of how else the Velcro pieces could be used, and they turned out to have many ideas of applications. Examples were: playing tag with friends, creating one-time events where people stick things on each other, integrating blinking lights and buzzing sounds to the Velcro modules, collecting Velcro collectables.
In reality, the pre-testing and wearing of the pieces prior to the play-test yielded more interesting results. At times, when wearing the Velcro jacket, the author’s friends asked permission to rearrange the triangles on her back. This playful interaction intermediated by the jacket was an unusual approach to fashion, as clothes don’t often invite interaction from others. Figure 35 shows a player’s friend engaging with her jacket on the same day that she received the piece, before the game had started.

When wearing the skirt, however, the Velcro didn’t invite interaction quite in the same way. The author’s strategy then was to play with the triangles herself in public and observe other people’s reactions. Some people look intrigued. A passerby came up to to ask what I was doing, and this same person thought the skirt was “cool” and “fun”. Again, the unusual and novel way of interacting with the garment is probably the intriguing factor.

Table 10 shows the summary of insights and potential actions from the play-testing of the Velcro Play Parade.

<table>
<thead>
<tr>
<th>Game insight</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>In an attempt to create another game that explores words as material, the actual novel Velcro-wear was deprioritized and not explored to a full extent.</td>
<td>When first setting up the player experience goals, make sure to take in consideration the game materials at hand, their properties and potentials.</td>
</tr>
<tr>
<td>Modular Velcro-wear as a game design material shows a lot of potential.</td>
<td>Explore types of play where the Velcro and Velcro modules are at the core of the experience.</td>
</tr>
<tr>
<td>Modular Velcro-wear affords social interaction.</td>
<td>Explore Velcro games that experiments with social interaction via garments.</td>
</tr>
<tr>
<td>Modular Velcro-wear clothes pushes the boundaries of how clothes are expected to be interacted with.</td>
<td>Intervene in social fashion conventions by disseminating ideas like Velcro Play Parade.</td>
</tr>
</tbody>
</table>

Table 10. Insights and potential action points of the Velcro Play Parade game.
6.6 We are Malmö

As a final experiment, this research aimed to explore some of the actionable insights from the previous games, while focusing on the creation of meaning on clothes through games. The decision was to iterate around the idea of a textile co-design experience, by tweaking the game set-up according to the insights from the Appendix Bluff Collection and its game origin, Pattern War Collections. Because the outcome of the game was so positive, and yet displayed opportunities of improvement, it was hard to resist and not iterate on the idea.

Pattern War Collections displayed one important risk that couldn’t be neglected: the players that buy into the game might not like the result of their pieces of the final collection. This risk could mean fashion waste. Furthermore, the players have different tastes, and they might disagree on choices of colors, for example. Pattern War Collections as a game is more successful than as a fashion consumption model. We are Malmö is, therefore, an attempt to twist things and create a model where players do not have to take any risks.

The final experiment is divided in two parts: We are Malmö – Collective Drawing, where textile was collaboratively designed, and We are Malmö Exhibits, where the resulting collection was exhibited in a gallery fashion.

6.6.1 We are Malmö – Collective Drawing

We are Malmö – Collective Drawing was set up as an installation at the Malmö City Library, where people could draw their own avatars on textiles with markers. For the reader to understand the concept, here’s the publicly shared event description:

“Sometimes we throw away our clothes a little too soon, a little too easy. But what if they meant more to us than just a price and brand tag? What if they carried a little piece of each of us?

We are Malmö is an attempt to give new life to old ideas of fashion. It invites everyone to collectively have fun and paint faces on textile. This textile will later become a clothing collection, giving us a new perspective on fashion, waste and the city of Malmö itself.”

The twist on the Pattern War Collections model is that the people invited to co-design the textile are not necessarily the same people that will consume it. The consumers will be the people that actually appreciate the aesthetics of the resulting collection.

We are Malmö is an initiative that iterates on the co-design ideas introduced by Fletcher and Grose (2012). By transforming textile into a collaborative media, the hands of many will help design sensorial products, connecting back to reflections of the slow-fashion movement (Clark, 2008) – bring thus meaning to garments.
To arrive at the We are Malmö concept, much inspiration for the aesthetics of the resulting outcome was taken from playful fashion examples. Figure 36 shows a moodboard created to inspire the creative process.

![Figure 36. Moodboard for the We are Malmö experiment.](image)

**Player experience goals and mechanics**

The players of We are Malmö are the people invited to the collaborative drawing. The player experience goals are: the players will feel free to draw their own avatar without fear of judgment. They will feel inclined to explore their avatars creatively. The players are driven by the motivation of playing with and drawing representations of their own selves.
In the game set-up, the players have access to textile markers and an extended piece of fabric, where they should draw their avatars. The piece of fabric is covered by smaller pieces of paper with the instructions “Take this paper off and draw your avatar here” (view Figure 37). Additionally, a digital booth with an online terminal is placed next to the textile, for the players to register the avatars they draw. The simple mechanics of the game are listed on Table 11.

![Figure 37. "Draw your avatar here" paper covers placed on top of empty faces contours of the We are Malmö textiles.](image)

<table>
<thead>
<tr>
<th>We are Malmö – Collective Drawing: Rules / Mechanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each player can choose any spot on the fabric that contains the paper cover, remove the paper and draw their avatar.</td>
</tr>
<tr>
<td>After drawing their avatar, the player can use the code on the paper cover to register their drawing at the booth.</td>
</tr>
<tr>
<td>Each player can draw as many avatars as they want.</td>
</tr>
</tbody>
</table>

**Table 11.** Rules and Mechanics of *We are Malmö - Collective Drawing.*
The prototype and the play-testing

As a first step, *We are Malmö* was prototyped and play-tested on a white board with paper and markers, inside a student studio at the Malmö University building (Figure 38). Empty contours of faces were drawn on the board and covered by the papers with the “Remove and draw here” instruction. The results from this early prototyping led to the the idea of adding “fun” prompts to the cover papers to help the players draw their avatars. Apart from helping the players in their creative drawing process, the prompts also created a bigger diversity of drawing elements in the final result. Some examples of prompts are: Draw your avatar as if you were hanging by Ribersborgs beach on a sunny summer day; as if you are eating a delicious falafel; as if you decided to be a magician. View Appendix E for a list of all of the prompts.

![Drawing of various avatars on a whiteboard](image)

**Figure 38.** Whiteboard first prototype of the *We are Malmö – Collective Drawing* game.

The final play-testing of *We are Malmö – Collective Drawing* happened on the KRUT (Malmö Stad, n.d.) area of the City Library of Malmö. Posters were distributed through the Malmö University and a public Facebook event was created (Figure 39 and Figure 40) in order to create awareness of the event. Furthermore, the staff from the KRUT group helped spread the word about the collective drawing by sharing it on their social media channels, as seen on Figure 41.

At the library, three colored pieces of fabric of 1.5 meters each were attached to a wall. The empty contours of faces were drawn on the fabric and covered by the cover papers with the prompts. The digital booth with the online terminal was placed next to the textiles, inviting
the players to register their avatars by giving it a name and leaving a message to the people of Malmö, as seen in Figure 42.

The aim of the booth was to create a connection between the individual drawings and the final pieces of clothes. By registering their avatars with a nickname and a message, it would be possible to create a special online page for each piece of clothing from the collection, where the consumers could see who their respective contributors were, their nicknames and messages. The idea was that this page would create an extra layer of value attached to the garments.

Figure 39. We are Malmö poster distributed throughout the Malmö University building.
Figure 40. Public Facebook event to create awareness of We are Malmö.

Figure 41. Social media sharing from the City Library KRUT group. From left to right, the posts shared the event poster, the avatars created at the event day, and a video from the author talking about the initiative.
Results

The *We are Malmö* game was at the library for the course of a day (from 10AM to 8PM). Around thirty-five people drew their avatars on the textile, and around ten people drew them more than one time. The average drawing time for each avatar was five minutes, with some people spending up to 10 minutes drawing representations of themselves on the textile. The engaging time was a surprising result, as most of the players seemed to really have put and effort in their drawings.

When participating in the game, some players weren’t really aware of the fact that the textile would be used to create real clothes. Some players just simply approached the textile wall and followed the “draw your avatar here” prompts, engaging solely because of the drawing possibility. Drawing avatars as a simple task and as a familiar approach for its pervasiveness in the game world, combined with approachable tools – markers, as opposed to embroidery – outshined the final purpose of the game. In fact, this was a positive result, since the point of the collective drawing is to invite people to draw freely, with no pressure or intimidation.

On the other hand, the other part of the game – the booth – didn’t afford as much engagement. Because the booth experience was a disconnect from the main game, not all of the player’s
registered their avatars. One player, for example, asked: “Do I really have to do that?”, which shows how the booth felt more like an obligation, rather than a part of the “fun”.

Furthermore, many spots on the textile were unfortunately left in blank. That risk, however, was acknowledged from the beginning. As Löwgren and Reimer (2013) suggest, in relation to collaborative media:

“Creating lightweight prototypes and testing them with intended users in an iterative process before committing to implementation is a pointless activity in situations where use is fundamentally constituted by a critical mass of actual users”.

Although this research does not believe that the play-testing of this early prototype was pointless (rather the opposite), it acknowledges that it would be interesting to see how this a collaborative platform could ramify and how social practices could emerge from the use of a larger mass.

A sequence of images, starting from Figure 43 until the end of the chapter, shows the set-up of *We are Malmö – Collective Drawing*. The images attempt to transmit the qualities of the experience at the City Library.

Table 12 shows a list of the insights and potential actions from the *We are Malmö – Collective Drawing* experience.

<table>
<thead>
<tr>
<th>Game insight</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiar tools and approachable tasks produce genuine engagement.</td>
<td>When co-creation depends on engagement, always explore the use of approachable tools and tasks.</td>
</tr>
<tr>
<td>People can engage for long and for multiple times when drawing avatars.</td>
<td>Explore avatar creation as an engaging activity in the process of co-creation.</td>
</tr>
<tr>
<td>Using textile as a collaborative media results in a design that is full of diversity and meaning.</td>
<td>Explore how the collaborative textile evolves as a collaborative media over time.</td>
</tr>
<tr>
<td>People engage because of the “fun” of the engagement, and not because of the overarching purpose.</td>
<td>Explore how other engaging activities could be designed for the creation of a collaborative textile design.</td>
</tr>
</tbody>
</table>
If the existence of a secondary task (the online booth registration) aside from the gameplay doesn’t offer the same level of engagement, the players will probably not fulfill it.

When the game has a secondary task that helps the fulfillment of the game’s overarching purpose, make sure to include the game in the same engagement flow.

**Table 12.** Insights and potential actions from *We are Malmö – Collective Drawing.*

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**Figure 43.** Welcome entrance of the We are Malmö – Collective Drawing.

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**Figure 44.** Wider shot of the event setup. The booth stands on the left side of the textiles, and the tools are placed in front of them.
Figure 45. Participants drawing their avatar on the textile. Their concentration and engagement with the drawing is visible through the image.

Figure 46. At times the participants would share tighter spaces, for they would choose their drawing spots according to the paper cover prompts, rather than the position.
Figure 47. Participants drawing at the bottom of the textile. The back participant brought a chair closer to the textile so she could draw more comfortably, while the front participant chose to squat instead.

Figure 48. Participant drawing at the very top of the textile.
Figure 49. Close shot at the available tools. Apart from markers, sequins were also available for gluing onto the textile.

6.6.2 We are Malmö Exhibits

Because the We are Malmö clothing collection wouldn’t be tailored for anyone in particular, the collection was created in order to be exhibited back to the public, in a gallery fashion. The aim of the exhibition was gather the public’s opinions and thoughts around the experiment.

A collection of five different pieces of clothing was created out of the collaboratively painted textile. The sewing patterns utilized for the making of the collection came from the Peppermint Magazine (n.d.) – a source that is very fitting to this research, for it is a magazine that talks about style and sustainability.

The doing and the showing

The first step of the process involved the assembling and cutting of the garments’ pattern pieces. Later, when the patterns were cut and the garments sewed together, pictures of the author wearing the garments were taken in order to display them at the exhibition. The aim of the pictures was to show the collection being worn in a natural context, in the city of Malmö; to somehow prove the “wearability” of the garments. Figure 50 shows the resulting pieces.
Figure 50. The five pieces created for the We are Malmö clothing collection.
The ambition of the *We are Malmö* concept was to have an online platform where the viewers of the exhibition could access each piece of clothing and see the nicknames and messages from each of the avatars present in the garments. However, because the engagement with the online booth during the play-test wasn’t great, the platform idea was dropped and swapped by posters with the photos from the author’s photoshoot. These posters were displayed physically at the exhibition. Figure 51 shows an example of how the few nicknames and messages collected from the booth were integrated into the them, and Figure 52 shows how posters were displayed at the exhibition. View Appendix F for all of the posters from the collection.

The exhibition happened at the same space at the City Library of Malmö, as Figure 53 shows, and lasted for a full day. In order to gather the desired feedback from the visitors, a lottery was created to lure people in: the visitors were invited to write down their thoughts in a piece of paper, and put them in a “box of thoughts” for a chance to win one of two clutch bags from the *We are Malmö* collection (view Figure 54).

![Garment poster example](image)

**Figure 51.** Example of a garment poster created for the *We are Malmö* exhibition. The nicknames displayed around the red frame are the nicknames of the avatars that are visible on the garment. The name chosen for the garments were all chosen from the participant's messages – e.g. "Stick Together".
Figure 52. Posters with the participants' nicknames and messages displayed at the exhibition.

Figure 53. We are Malmö exhibition setup at KRUT space in the City Library of Malmö.
Figure 54. The "box of thoughts" collecting opinions from the visitors in exchange for a chance to win a clutch bag from the We are Malmö collection.

**Results**

As a sustainable practice, a rule of thumb is to aim for the least amount of fabric leftovers when cutting sewing patterns on textile. This rule, however, meant that the assembly of the patterns couldn’t take into consideration the positioning of the avatars, or even consider which avatars would be left out. As a result, even if many avatars made it to the collection, lots of them didn’t (or just a small visible piece of them) – which felt like a great loss for the collection.

During the exhibition, at least 10 visitors that walked up to the clothing rack had participated in the actual collaborative drawing of the collection. They were all curious about where their avatars had “ended up” and searched for them in the garments. Luckily none of the participants at the exhibition had their avatars on fabric left overs. Their excitement when seeing their avatars, however, only confirmed how important it is for the participants of a collaborative activity to see their contribution in the final result. Figure 55 shows two friends who had found themselves in the garments, taking pictures with it, displaying a sense of pride.
Figure 55. Two friends walked up to the clothing rack to find their avatars. After they did, they took pictures holding the garment.

Figure 56. Collected papers from the "box of thoughts" placed next to the clothing rack at the exhibition.

The overall feedback from the visitors was very positive. One participant said that “If I knew how nice these pieces would turn out, I would have maybe made a much nicer drawing”, confirming the no-pressure player experience when drawing on the textile. Another participant said “This is such an interesting project. I would totally use this skirt. I just
really love it”, which shows how the aesthetics of the collection has the potential to appeal to some.

From the lottery box, ten papers were filled with opinions (Figure 56), and they overall match the feedback received at the exhibition, while diving deeper into conceptual details (view Appendix G for all of the received feedback). One of the participants and member of the library staff mentioned “I love the idea of letting people co-create this fabric, the element of collective stories, surprise. I’m intrigued to watch the result and want to see more works from Ana [reference to the author]”. The mention of “collective stories” fits really well with the author’s impression when cutting, sewing and feeling the garments. Another participant, a regular visitor of the library, said: “Great way to engage the community and express our thoughts visually. Cool outfits, it was awesome to be a part of your creations.” These examples of feedback demonstrate the potential that We are Malmö has as a model that engages people into the creation of fun and meaningful fashion. Furthermore, the implementation of the box of thoughts was key to gathering more detailed feedback from the public— even if not that many. Without the box, it is unclear how feedback could be gathered from the gallery exhibition.

Table 13 shows a summary of the insights gathered from We are Malmö Exhibits.

<table>
<thead>
<tr>
<th>Exhibition insight</th>
<th>Potential actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of textile as collaborative media adds meaning and sensorial qualities to garments through memories and collective stories.</td>
<td>Further explore activities in which textile is used a collaborative media platform.</td>
</tr>
<tr>
<td>It is important that participants of a collaborative task can see their contribution in the final result.</td>
<td>Explore ways in which every participants’ contribution appear in the final result, such as pre-drawing the clothing patterns on the textile (without ruining the surprise experience).</td>
</tr>
<tr>
<td>The excitement and engagement with the We are Malmö project shows how the game has the potential to work as a fashion model.</td>
<td>Explore other play formats that this concept can take form, for a better replicability and replayability.</td>
</tr>
<tr>
<td>The lottery box of thoughts was a good strategy to gathering people’s opinions about the project.</td>
<td>Elaborate on other ways in which outcomes from games, exhibited in a gallery, can gather meaningful feedback.</td>
</tr>
</tbody>
</table>

Table 13. Insights and potential actions from We are Malmö Exhibits.
7. Discussion

The present study is built on the premise that play and games can be applied to fashion practices in order to address problems of fashion sustainability. The design process undertaken from the research begun from the question of: How can play and games help reduce fashion waste? Guided by a Research through Design methodology, through a play-centric approach, the design and testing of seven experiments (six games prototypes and one exhibition) explored different angles of the design space, referred to as the game impact goals: behavior change, creation of meaning and lasting engagement.

The main findings of this study show that when playing games in the context of fashion, people feel safer to experiment and push the boundaries of their own concepts of fashion – complying with the theoretical concepts of magic circle (Stenros, 2014). The signs of behavior change demonstrated through the pushing of boundaries also concur with the studies of serious games (Whitton, 2014), and how the transformative aspects of games can be exploited in order to provoke changes in the players for the better. Furthermore, the behavior changes seen through the Wear What? game are in line with the wardrobe metabolism thinking introduced by Fletcher and Grose (2012), since, as shown by this research, wardrobe appreciation can result in less fashion waste. Additionally, the results show potential for other approaches of wardrobe metabolism to be explored, such as clothing swap and customization.

This study has also shown that games have an incredible potential to transfer meaning to clothes through co-creation practices. According to Fletcher and Grose, bringing the consumers to the design process of their own products can result in a greater bond between the product and the owner. This research has shown that combining co-design with games can bring even more meaning to the garments – through memories of play, stories, meaningful words or shared secrets. The results strongly agree with Sicart’s (2014) notion that “memories are composed of these instances of play, the victories and defeats, but also the shared moments” (p.23) – suggesting that the results of this research can be interpreted as embodiments play memories. On top of that, results demonstrate that the sharing of the experiences with friends further strengthens the power of the suggested game impact goals.

As a further outcome, this research has demonstrated that games that require high efforts and unfamiliar tools can lower the player’s engagement significantly – diminishing, therefore, the sustainable cause. Especially when it comes to a co-design effort, considering the players’ skills and familiarity with the materials and tasks is of great importance.

Finally, the results from this research suggest that when games are embedded in garments, they have the potential to playfully engage their owners, spark social interaction and inspire new and playful ways to engage with fashion. These results demonstrate how the modularity approach to clothing suggested by Fletcher and Grose can be further explored through the integration with games.
The results from the seven design experiments generated a number of actionable insights that constitute the knowledge contribution presented by the current research. Following Zimmerman et al. suggested list of the beneficial contributions of interaction design work to the research community, this is how this work presents its own:

- **Identification of opportunities for new technology and theoretical gaps:** By probing a rather new field through the design and testing of game prototypes, this research identified new ways in which theoretical aspects of fashion sustainability and play studies can be bridged. Furthermore, the exploration of opportunities opens up a space for new technologies and uses of technology to emerge;

- **Design artefacts as embodiment of theoretical opportunities and discoveries:**
  The main goal of the seven design experiments conducted by this research was to explore the theories of the design space, embodying opportunities and insights. Thus, through the exposure of the ideas through the design of games:

  "the practice community can more easily observe the value of different theories, models, and technology, and this can motivate them to follow the threads back to the original research that might most impact their work" (Zimmerman et al., 2007, p.498)

- **Importance of the research framing:** The efforts of this research is to contribute to the field of fashion sustainability by suggesting its intersection with play and game studies. This study believes that its main contribution lies in the exposure of the relevance of this research framing, hoping to inspire future work to undertake the same or similar perspectives in the context. By looking at co-design, empathy, modularity and wardrobe metabolism through the lenses of play and games, this research has opened up a box full of possibilities and promises of real change.

As with any other research, the present study faces a number of limitations. The impact of the experiments on fashion waste cannot be fully supported by the results, for it would require a longer observation period and interaction with the players. It is hard to tell, for instance, if and when the garments generated throughout the design process will be disposed of. Additionally, it is equally hard to measure the transformative aspect of games through one and only gameplay session, as games need longer time and engagement to be able to change the structure itself. The findings, however, still suggest that there could be impact, and that there could be transformation.

The current study also highlights practical implications of prototyping games that are intertwined with fashion. The considerations of visual aesthetics for the games that involve the making and the wearing of clothes, as both mechanics or outcomes, is paramount. If the player doesn’t feel comfortable with the garments, or doesn’t appreciate how it looks or how it was made, the results will be compromised with. **Pattern War** is a great example of it – in an attempt to design an early prototype of the game core mechanics, the shape of the underlying garment was neglected. Prototyping with fashion, therefore, requires a high attention to the look-and-feel aspect of the prototypes, where it concerns the wearing of clothes.
Finally, this research strongly recommends the introduction of game studies in the fashion design sector, and vice-versa, suggesting the actionable insights from the experiments as starting points. It is believed that the merge can contribute considerably to the current approaches to fashion sustainability, or at least introduce a new attitude and point-of-view to the design of fashion; a point-of-view that has the power to challenge the status-quo and opens people’s eyes to other ways of dressing that is not just consuming fast-fashion.

8. Conclusion

Driven by an envisioned potential of merging play with studies of fashion sustainability, this research went through a play-centric design process to explore the question of “How can play and games help reduce fashion waste?” The process was guided by an expansive Research through Design approach, where design experiments probed different angles of the design space.

Seven design experiments – six game prototypes and one exhibition of a game outcome – engaged players in lab, field and gallery settings. The design experiments investigated three game impact goals that could potentially have a positive effect on the pursuit of fashion sustainability: behavior change, creation of meaning and lasting engagement.

The main research findings show that in the context of fashion, the concept of magic circle is invaluable for the creation of a space where players feel safe to challenge their own conceptions of fashion – implying a behavior change. Additionally, the results show that, when applied to the co-design of fashion products, games have a great potential to assign meaning to garments through shared memories and secrets, stories, meaningful words and self-expression. Furthermore, the study showed that clothes that are designed as games have a great potential to playfully engage their wearers, sparking social interaction and inspiring new and playful ways to engage with fashion. Finally, the research results demonstrate the importance that social circles have to games, and consequently, to fashion – the feeling of “we’re in this together” strengthens the potential of any other results, from behavior change and meaning making to lasting engagement.

In order to activate further exploration of the design space, each design experiment conducted by this research generated actionable insights that can be received by the research community as knowledge contribution. Furthermore, and most importantly, this research believes that the relevance of this research framing shall not be dismissed – fashion sustainability is a pressuring topic that needs people to be “engaged in what they do and know best” (Fletcher & Grose, 2012, p.4) in order for transformation to happen. Can games save fashion? The answer is probably no, but this research has proven that play and games offer a fruitful path to starting trying.
9. References


Appendix A

Interview with Suzanne Smulders, co-founder of the LENA project.
1/May/2017

- How did the LENA project first start?

After working in the fashion industry our focus tended to go straight to the sustainable aspect of fashion. With Doortje-Vintage.com we specialized in the reuse of clothing with a focus on quality and craftsmanship. It is great to see more and more people value secondhand clothing, but still the problem of overconsumption was bothering us a lot. That when we developed the idea of one big shared walk in closet, functioning as a library.

We started working on the idea late 2013, when we spend about a year on research, development, writing our businessplan and testing the concept with a pilot. In december 2014 we officially launched our library in Amsterdam at the Westerstraat. In january 2016 we hit a number of 280 members.

- What are your main learnings (failures & successes) from working with LENA?

We have overcome quite some challenges so far, like figuring out from scratch what the borrowing system should look like. Now, early 2016, we look back at a successful start, but as with every start-up there still are some challenges to come. There are two big challenges we’ve had.

1. First we have to change people's mindset on consumption and introduce them to a new way of using fashion. The concept is new and innovative, and it takes people out of their comfort zone. We as pioneers hope to make a way for all the libraries following us soon. And I think we now hit the point where all sustainable minded people know how to find us, be the next step is ‘the big masses’. They won’t easily be motivated to do some more effort for doing good.

2. Lastly we felt we got slightly limited by our location, because if you live too far (even in Amsterdam, but the other side of the city) it is hard to make frequent use of the system. Therefore we have just launched our online library system, which makes it possible to borrow clothing throughout the whole country.

- Did you engage with / think about any other fashion sustainability initiatives before LENA?

Yes the vintage (web)-shop we have for 10 years already (Doortje Vintage). The idea of LENA came from there, to lift things to the next level.

- What is LENA’s consumer profile?
LENA is a library for ladies only. We are so happy to see that our client base varies from 17 year old students to 55+ ladies. The thing they all have in common is that they love the LENA style, which is a combination of unique eyecatchers and clean cut timeless pieces. Having a subscription at LENA is not so much based on certain set demographics of a certain group, but it encounters different motivations to come and borrow clothing with us:

· a more sustainable lifestyle
· an endless wardrobe for only €20,- a month
· experimenting with different styles
· no more misbuyings with the try-before-you-buy system
· choose from a high quality and unique selection

All together quite a big group with different takes on what we are doing, which on one hand makes it difficult to please them all, but on the other hand shows a great potential!

• How do you believe LENA impacts the fashion sector, and how do you think you differ from other initiatives?

By introducing a borrowing system as a new business model we see different opportunities for the future. Focus shifts from 'ownership' to 'shared access'. Consumers have access to many items, save money, experiment with style and don't pile up excessive amounts of textile which end up being waste.

High quality items are important for the borrowing system, which is why we partner up with brands lifting up the supply chain by setting restrictions. This results in a satisfied customer, less pressure in the chain, less waste and use of toxics, higher quality garments and the preservation of craftsmanship. A win-win situation.

We started our first physical library in Amsterdam, but goal is to go globally. The model is easy to scale up and can be applied in every segment of fashion, f.e. children's or men's wear.

• What other initiatives do you believe could be relevant for a more sustainable fashion future?

I believe in ideas that fight the massive production & consumption habits we have developed. The main problem is the quantity, i mean, even if everything produced today would be from sustainable materials etc., we still kill our planet by taking all its raw materials.
Appendix B

List of rules created for the Wear What? game.

<table>
<thead>
<tr>
<th>Wear What? dressing rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix at least two patterns in your look.</td>
</tr>
<tr>
<td>Use an unexpected pop of color in your look.</td>
</tr>
<tr>
<td>Wear a scarf on your head.</td>
</tr>
<tr>
<td>Wear a top over a long-sleeve shirt.</td>
</tr>
<tr>
<td>Wear double-denim.</td>
</tr>
<tr>
<td>Wear two pieces of clothing that you have never worn together before.</td>
</tr>
<tr>
<td>Wear an athletic look.</td>
</tr>
<tr>
<td>Wear a belt over a shirt or a dress.</td>
</tr>
<tr>
<td>Wear an un-matching pair of something visible.</td>
</tr>
<tr>
<td>Combine at least two colors you’d be hesitant to otherwise.</td>
</tr>
<tr>
<td>Layer as many visible pieces as you can for a cool look.</td>
</tr>
</tbody>
</table>
### Appendix C

**Answers to the Wear What? player experience survey.**

#### How did it feel exploring different combinations of your wardrobe? (6 responses)

<table>
<thead>
<tr>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciting and fun, yet a little uncomfortable. I don't usually experiment with my clothing that much!</td>
</tr>
<tr>
<td>It really gave me an &quot;excuse&quot; to wear different clothes, and also to borrow clothes to other people because I didn't have a lot of clothes with me. I feel like I should try to go out of my comfort zone more often.</td>
</tr>
<tr>
<td>FUUUUN! I never knew my wardrobe incorporated so many different styles and combinations!</td>
</tr>
<tr>
<td>It was really fun and also interesting. I looked at my wardrobe with different eyes, since I had to look for something specific every day. Normally I choose being comfortable as my highest priority when picking clothes, this week it was different.</td>
</tr>
<tr>
<td>I opened my eyes for garments I haven't worn in a while. I started thinking more about what I was wearing.</td>
</tr>
<tr>
<td>It felt exciting to go out of my comfort zone</td>
</tr>
</tbody>
</table>

#### How comfortable were you while playing the game? Could you talk about it?(6 responses)

<table>
<thead>
<tr>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>As mentioned, I was a bit uncomfortable with some looks. When I was wearing something unusual for myself, I felt like people are gonna stare at me and comment - but actually they never did. It was all in my head I guess. I always felt more confident about the outfit towards the end of the day.</td>
</tr>
<tr>
<td>I sometimes wasn't always comfortable with what I was wearing because I usually always dress the same way, so it was weird to meet friends while having a scarf on my head for example! But most of the time it was ok, also because I didn't take a lot of risks (Eg. using socks to complete the challenge... which is cheating a bit!).</td>
</tr>
</tbody>
</table>
Super comfortable, but that might be because we were sharing it within our private friend group and not publicly.

It really depends on the rule. Some days I actually felt more like myself than usually because the challenges related to a part of myself that I didn't connect with so much any more. A part which likes to draw attention to myself by picking clothes/accessories that stick out. On other days I wasn't comfortable because I felt like it was too much, even though it was always my own clothes.

It was fun! Not too challenging, that would have been hard for me and my quite dull wardrobe.

Most of the days I was super comfortable with it, but when the challenge took me way out of a business outfit, I shared with my colleagues that I was participating in a research for a friend in order to feel comfortable in my work space.

**How did it feel sharing your looks with the other girls? (6 responses)**

Fun! I loved seeing what others were doing. Felt like we're in this together. It was a mix of competitiveness and support.

The social aspect was super nice, and the discussion was so funny to follow! I wasn't comfortable taking pictures of myself at the beginning, then it got better because we were all doing the same thing. Seeing their pictures also was an inspiration if I wasn't dressed yet.

I felt I was making a statement every time, as if I was having a conversation with them through my clothes, letting them know about another layer of me. "Hey, this is a new layer of Sena I would like you to get to know"

It felt a little weird. I don't take selfies a lot, so I didn't like that part. Also, if somebody just looked amazing, maybe the feeling of "oh dammit, I can't keep up with this" came about. But sometimes it is also a reason to say: I can top that. So ambiguous ;) Since most of the girls are close friends, it also got okay at some point...

That was the most fun part. Get the game going and wait for people's posts and comments. Engaging!

It was cool to share my looks with them, but since I was the outsider one, I was a bit concerned because I didn't know how they would react to play with someone they didn't know, so I kept a low profile. After meeting most of them I felt more confident in sharing the pictures.
What was the day you enjoyed the most? (6 responses)

- Day 1: Two different patterns
- Day 2: Pop of color
- Day 3: Head scarf
- Day 4: Short-sleeve over long-sleeve
- Day 5: Double-denim
- Day 6: Two pieces never worn together before
- Day 7: Athletic look

Why? (6 responses)

- It was something I wouldn't otherwise do, but I felt it looked nice and was a different look.
- It was the easier for me, since I love patterns, and I was able to wear a top I really like.
- I like serendipity and I am obsessed over the little details, that combined both :)
- It felt the most like myself when wearing it. the rule was open for interpretation and i could wear one of my favourite clothing pieces.
- Because i digged out this lovely pink bra that i almost forgot i had!
- Because it was really challenging, but the results were amazing. It is something I will keep trying to do in the future
### What was the day you enjoyed the least? (6 responses)

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>Day 1: Two different patterns</td>
</tr>
<tr>
<td>16.7%</td>
<td>Day 2: Pop of color</td>
</tr>
<tr>
<td>16.7%</td>
<td>Day 3: Head scarf</td>
</tr>
<tr>
<td>16.7%</td>
<td>Day 4: Short-sleeve over long-sleeve</td>
</tr>
<tr>
<td></td>
<td>Day 5: Double-denim</td>
</tr>
<tr>
<td></td>
<td>Day 6: Two pieces never worn together before</td>
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<td>Day 7: Athletic look</td>
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</tbody>
</table>

### Would you wear any of those rules again? If so – which ones? If not – why? (6 responses)

- I could wear double denim, head scarf, two patterns definitely. Athletic look maybe for a lazy day. Short sleeve over long sleeve was actually nicer than I expected, but I doubt I would wear it again.

- I want to try "pop of color" again, with more imagination and "risks" this time, because I loved the ideas of the other participants.

- Athletic look, pop of color. They suit my style and I already do them. The others, not that much.

- yeah, i surprisingly loved my double-denim outfit. also the pop of colour, headscarf and maybe the two patterns would be nice to wear again. the short over longsleeve wasnt my thing, really. it was too much of what is "trendy" right now and i couldnt identify with it.

- I wear different patterns sometimes as well as double denim. The top i wore on the long/short sleeve day i hope to wear again. Comfortable! Oh, the color pop as well. That is why i bought that bra!

- The 4 first days
Do you have any other rules in mind that could have been "fun" to wear? (6 responses)

More colour experiments maybe? I was thinking, if I get to make a rule, I'd make them wear the three main colours (red, blue, yellow) in the same outfit, or as many pieces of the same colour in an outfit as possible (obv black would be very boring here and prob not a winner). It would hard for me though!

Wear something the "wrong way".

Playing with colors: Ton sur ton, monochrome, transparent/opaque; playing with textures: lace, velvet, leather etc; unusual uses: wearing belt on outerwear, wearing a skirt over trousers, using sth for other purposes, modifying something; challenging yourself: wearing sth you would NEVER EVER wear, wearing sth you don't like; fashion periods: 60s, 70s, 80s, 90s, rock, grunge, gothic etc; combining and refining 2 different styles: 70s gothic, 80s androgyny; or a 2-step combination: making a combination you really like based on any concept or none, then replacing an item with a significantly different one (like flat boots with platform sandals, or a classy white shirt with a white loose tshirt etc). The last one would be EXTREMELY FUN!

mmh maybe some more personal challenges. like, wear something which makes you feel powerful. or wear something that conveys a message. or wear something that gets you in a good mood. dress like a person that inspires you...

Bold color matches?

Mix 70s and modern, wear something that represents a movie or song title, rainbow outfit

Did you tell anyone outside of the game that you were playing Wear What? Why? (6 responses)

Yes! Because I thought it was funny. And I little bit to explain why i'm wearing something.

My mother because I borrowed some jewelry and she saw me wearing unusual things. We discussed the challenge sometimes and we tried to find a solution together for the double denim challenge. I also told my brother because he saw me taking pictures of myself, which I usually never do.

To Derya, my best fashion friend! We both love fashion, always shop together, send each other fashion photos, links etc, make combinations, snap a photo and ask for feedback, ask for help when indecisive. The whole week, I sent the photos also to her, though I didn't change anything
according to her comments. Her comments were NOT on how I should combine, but rather how SHE would combine. We have different styles and we both like our own style, yet still comment on each other's to expand our perspectives. We have an indirect effect on each other's style :)

I told just my classmates, so people that i see in real life...

Yes! I told a friend and we went through the whole whatsapp thread. She looked at all the photos. She enjoys these kinds of things so i showed her and she thought it was great!

Yes, because I wanted them to not judge my clothes and also so they could take pictures of me

**Would you play this game again?**

- I could, yes.
- I think so! Because with time, I could take more risks and find nicer ideas on what to wear.
- DEFINITELY YES
- definately!
- Sure!
- Yes, it was fun!

**Would you change anything in the game? Suggestions/ideas on how to improve it?**

Point system wasn't transparent, we didn't know what was going on even though we were curious. But I am really not sure if it's better to know... I'd like to keep it casual and not so competitive that you form voting strategies.
I don't own a lot of clothes, so it was sometimes difficult. I rediscovered one or two clothes I wasn't wearing anymore, but it also made me want to buy more clothes to be less limited. Maybe something can be made to avoid a non-sustainable outcome to the "I don't have enough different clothes" realization. A link to second hand clothes shops? To a DIY blog? A way to trade clothes between the players? Or more rules on appropriation (asymmetrical, color, sporty...) without specific clothes named (denim, scarf...)?

I guess all was good.

maybe it would be fun to come up with rules in the game. reverse it. i look into my closet and see what would be inspiring to wear and make a rule for you, too. (risk: too much effort) i got a little tired of explaining why i voted for specific people, maybe voting is enough.

Post photos at same time maybe.

Never share the best look before the end, give feedback to the participants at the end (like people love this look of yours because of this!), have the entire day to wear the clothes and voting could be in the following morning. always send the recap photo with all the looks, allow one vote and one like to each look (the person with more likes at the end will get extra points)

Care to share any more thoughts? (6 responses)

It was nice that we formed a little community in the whatsapp group, where we complimented each other, threw around ideas and even some cultural education happened <3

I had "fun" :D

It was fun. At first, I was aiming at winning, but then I realized, it is actually not a challenge against the others, but to myself and my wardrobe. It helped me reevaluate my wardrobe, my style, otherwise, I tend to be lazy and just wear the very first tshirt I grab with the same pair of jeans. I enjoyed how a simple intrusion can help me "revive" the long-forgotten items in my closet, rather than "hunting" for new items. Tack :*

I really enjoyed this week! it was a fun game and made me really think about how (boring) i dress when i am in my everyday life auto-pilot... it also showed me that it is nice when people look at me when i feel confident about what i am wearing. and when i didnt feel so comfortable about it, i knew it was a game and i didnt have to wear it again.
<table>
<thead>
<tr>
<th>Well arranged, fun and engaging. On a reasonable level. Required engagement but not so it was disturbing at all. It added some spice to your day! The nice feeling of secrecy. I am doing something that noone knows about.</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was fun to challenge myself in a area I normally don't care, It made me more self-aware of what I was going to wear and being part of the game made me confident enough to go outside with unexpected clothes</td>
</tr>
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## Appendix D

*Answers to the Pattern War Collections player experience survey.*

### How did you feel playing the game that created The Appendix Bluff? (3 responses)

<table>
<thead>
<tr>
<th>Response</th>
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<tbody>
<tr>
<td>Excited</td>
</tr>
<tr>
<td>It felt competitive, fun, creative and challenging.</td>
</tr>
<tr>
<td>The game was very fun and I really enjoyed the time with the group.</td>
</tr>
</tbody>
</table>

### When playing the game, were you aware that you were painting on the textile our future garments? If so, how did it feel? If not, why did you think that was? (3 responses)

<table>
<thead>
<tr>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes I was aware. It was fun to know we were going to see the textile in a new form later.</td>
</tr>
<tr>
<td>Yes. It puts a level of pressure on the painting.</td>
</tr>
<tr>
<td>While playing, I did not think so much about that this was textile that I would wear at some point. I was more focused on achieving the mission or seeing a part of the fabric as a holistic piece which should look nice (but I did not imagine wearing it in that moment).</td>
</tr>
</tbody>
</table>

### Would you change anything from the game experience? If so, what would that be? (3 responses)

<table>
<thead>
<tr>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>perhaps some of the missions were harder than others</td>
</tr>
<tr>
<td>There are some rules that might need tweaking or clarifying.</td>
</tr>
<tr>
<td>no</td>
</tr>
</tbody>
</table>
### After the game ended, what did you think of the pattern we created together? (3 responses)

- It was interesting. very geometric!
- It was funny. I was a bit worried how it'll actually look in clothes.
- I really liked the pattern but I could not really imagine it as clothing on myself. The style of the pattern was not really mine. However, when I saw my piece, I loved it! So the actual transformation to a piece of clothing was very important!

### While the collection was being produced, what did you think of the sharing of pictures on the messenger group? (3 responses)

- Great to see the process!
- It was nice!
- It was nice seeing that you made it =)  

### How does it feel to own your new piece of clothing from the Appendix Bluff? (3 responses)

- It's unique and has a backstory. So great!
- The shirt looks way better than I expected - the pattern looked too funny when it was laid out. I look at the shirt and remember that evening and Ana's sewing sweatshop! It's also nice to think about the fact that it's totally unique.
- It feels great! I love the piece and the way we created it together.
Would you change anything of the garment, or of how it was made? If so, what would that be? (3 responses)

- Maybe I would've preferred a different background color for the textile.
- Maybe it could be a bit more minimalistic in the cut. Also, the fabric seems to wrinkle a bit, and I'm not a big fan of ironing.
- No, it is great as it is. A little revealing that's why I haven't worn it yet, but I am looking forward to summer.

Would you own a similarly made garment? Why? (3 responses)

- Well yes, if I start making bolder fashion decisions.
- Not sure what you mean by similarly made? Like, with the game? Not sure I would pay for it, it's really hard to tell how it'll actually look in the end. In this case it turned out way better than I hoped, but I guess it could also look like crap!
- Yes, it was fun and the outcome is really nice. So of course I would like to create and own another piece. But I think it is also crucial it was created with friends and not with strangers.
## Appendix E

*Prompts created for the “Draw your avatar here” paper covers as part of the We are Malmö – Collective Drawing mechanics.*

<table>
<thead>
<tr>
<th>Draw your avatar here…</th>
</tr>
</thead>
<tbody>
<tr>
<td>As if you were hanging by Ribersborgs beach on a sunny summer day.</td>
</tr>
<tr>
<td>As if you were eating a delicious falafel.</td>
</tr>
<tr>
<td>As if you were out on a romantic date at Lilla Target.</td>
</tr>
<tr>
<td>As if you were backpacking somewhere tropical.</td>
</tr>
<tr>
<td>As if you just found out a band you love is playing in Malmö.</td>
</tr>
<tr>
<td>As if you just got the best vegetable deals at Möllans market.</td>
</tr>
<tr>
<td>As if you have become a unicorn.</td>
</tr>
<tr>
<td>As if you were dancing hip hop at Grand.</td>
</tr>
<tr>
<td>As if you were demonstrating at Gustavstorg for gnome’s rights.</td>
</tr>
<tr>
<td>As if you just heard Danish people talking Danish very loud.</td>
</tr>
<tr>
<td>As if you joined a tango dance club.</td>
</tr>
<tr>
<td>As if you were the captain of the boat sailing through the canals of Malmö.</td>
</tr>
<tr>
<td>As if you decided to be a magician.</td>
</tr>
<tr>
<td>As if you were skateboarding by the Konsthall.</td>
</tr>
<tr>
<td>As if you had pollen allergies but didn’t care!</td>
</tr>
</tbody>
</table>
As if you were going to a Halloween party.

As if you were at the Kallbadhus sauna.

As if you were solving a very hard mathematical problem (splitting a bill).

As if you just found the answer to the ultimate question of life, the universe, and everything.

As if you were birdwatching.

As if you just spent 5 hours at IKEA.

As if you were riding your bike on one of those windy days.

As if you painted your face with all of the makeup in the world.

As if you were having a nice fika with a friend.

As if you were having glögg at the Christmas market.

As if it was raining and you are enjoying getting all wet.

As if you were your favourite animal.

As if you were dressed as your favourite dessert.

As if you were an emoji.

As if your hair was made out of flowers.

As if it was finally Summer.

As if you only had clown suits in your wardrobe.

As if you were born with wings.
Appendix F

Posters created for We are Malmö Exhibits.
Appendix G

Written feedback from visitors at the We are Malmö exhibition.

• Feedback 1:
  I love the idea of letting people co-create this fabric, the element of collective stories, surprise. I’m intrigued to watch the result and want to see more works of Ana.

• Feedback 2:
  Very cool project. Great way to engage the community and express our thoughts visually. Cool outfits it was awesome to be a part of your creations.

• Feedback 3:
  I enjoyed drawing my avatar and then seeing it on a piece of clothing. I was also a great way to interact in the room.

• Feedback 4:
  Seeing the people’s names on the paper, the “designed with” names, makes the garments seem more valuable. They feel important and more precious than other clothes.

• Feedback 5:
  Love the concept. Fun project. I see so much developing possibilities with this project. And it’s always fun to see things that triggers you. Great patterns/models for the clothing. Good luck in the future.

• Feedback 6:
  It’s cool. Very empowering.

• Feedback 7:
  You are such a good dressmaker! These clothes are so great! Congrats! =D

• Feedback 8:
  Super cool project! Fun to draw an avatar and even funnier to see them (avatar) on the clothes! Nice! More of those projects I would say!

• Feedback 9:
  It was much fun to draw on the textile! I’m so impressed with the garments! Is it possible to buy the clothes afterwards? I want the one with my face on it :)

• Feedback 10:
  Creative and inspiring. Interesting process and great execution!