Transient impressions
designing breaking and changing textile expressions
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Title
Transient impressions
Designing breaking and changing textile expressions

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Abstract

Sustainability can sometimes be seen as being about choosing more environmentally friendly materials, or developing production processes. Yet materials in many products outlast the objects’ useful life-span.

This work explores breaking and changing qualities in textiles. Sustainability and people’s relationship to textiles are discussed through decomposing and changing processes in woven textile material and different life-spans of materials. By taking a critical view on the current consumption practises the work tries to raise questions about them.

Expressions are created by combining potentially dynamic materials with woven structures. The textiles respond to everyday stimuli by breaking or changing.

Result is an interactive installation exploring processes of breaking and changing in textiles. The installation changes under the duration of an exhibition in cooperation with visitors. It offers public the possibility to participate in discussion around sustainability in a concrete way.

The work proposes a way of working with textile material, where expressions are designed to change over different periods of time. Designing for different life-spans could open up for discussing approaches to sustainability which extend beyond material or production efficiency considerations. The most durable option is perhaps not always the most sustainable. Perhaps it could rather be a question of appropriate life-spans.
Introduction

What is an appropriate life-span for a textile?
Is a textile’s life-span static? Does a textile need to be durable to be sustainable? Sustainability can sometimes be seen as being about choosing more durable, recyclable or environmentally friendly materials, such as organic cotton or lyocell, or developing more efficient production processes. Yet materials in many products outlast their actual useful life span and exceed the time in which they become aesthetically outdated. When the object is discarded, it still lingers around as waste. Sometimes an object with a short life span could be more sustainable.

Textiles can be expected to be designed to be durable, flame retardant, easily cleaned and to retain their expression over longer periods of time regardless of external wear such as washing and sunlight. Designing textiles that are meant to be breaking down and changing takes an opposing position to this by deliberately designing dynamic expressions that change over different periods of time. Sustainability and people’s relationship to textiles are discussed through decomposing and changing processes in textile material. Perspectives on sustainable development are discussed through different life-spans of materials.

This approach has been chosen in order to be able to ask questions rather than give answers, as in the practise of critical design. Dunne and Raby (2013, p.35) define critical design as “... critical thought translated into materiality. It is about thinking through design rather than through words and using the language and structure of design to engage people.” They further argue that critical designs can present alternative scenarios that help highlighting weaknesses in the existing reality. Design becomes critique when it discusses not only future-scenarios, but current situations, and by highlighting their limitations opens up space for possibility of alternative scenarios. Rather than suggesting how things should be, future-scenarios act as a tool for speculating how things could be (ibid., p.3). Breaking and changing textiles work in a similar manner by not telling how things should be, but by rather speculating on how things are, and how they could be.
Design programme

This work presents and discusses design programme that explores different breaking and changing qualities in textiles. The aim is to try to make current consumption patterns of textiles more visible by highlighting them through exaggeration and to ask could values concerning textiles be different from what they are at the moment. By giving textiles different dynamic changing qualities they are made even more fragile or of lesser quality. Textiles react to everyday stimuli by breaking down and changing, thus purposefully behaving unpredictably where they are supposed to work. The work proposes a way of working with textile material, where expressions are designed to change over different periods of time.

In my earlier projects I have explored breaking and changing qualities in textiles from different viewpoints. The projects have discussed issues relating to sustainability and to people’s relationships to textiles. Textiles that break or change have been explored in contexts of home textiles and their users and in fashion as tools for designers. In this work breaking and changing qualities are explored in exhibition context in the form of an interactive installation. Earlier projects can be divided into two categories, building context and developing methods, and they form the foundation on to which this work builds on.
Building context

The process started as an exploration into the meaning of being sustainable and durable. Sustainability and durability were approached through trying to express their opposite qualities, short-lived and fragile, in textiles through manipulating fabrics and yarns with different techniques to wear out and break them down. A contradiction, the dual nature of a textile looking fragile yet being durable and vice versa was explored.

In my project ‘Unpredictable home textiles’ this contradiction was developed with focus on interior textiles behaving unpredictably. Small woven home textiles such as place mats, coasters and kitchen towels would react to everyday use by breaking down or changing. Some objects turned from one useful thing to another; for example a place mat could after washing be turned into a bag (picture 1). Other objects were simply destroyed in use, and eventually possibly turned into another object. A kitchen towel would for example shrink and melt when hands were dried on it. Visually the woven textiles aimed at expressing qualities of durable everyday home textiles. Fragility became a function and expression visible in the textiles through users’ interaction with them, when the textiles reacted to use unexpectedly by breaking or changing.

By breaking down and changing the textiles became inconsistent with the user’s expectations of how they should behave. Misbehaving home textiles could serve as a way to create awareness of the preconceptions that exist of using such objects. A similar situation could be when something that is believed to be a quality product breaks down only after a short time of use. When for example a shirt, purchased from a brand whose products are considered to be of good quality, loses its shape after first wash. Disappointment rises, because the product did not meet the expectations. At the same time it forces reflection on where those expectations came from in the first place.
Developing methods

Textiles with dynamic breaking and changing qualities were explored further in my project ‘Formable knits’ by developing and producing for fashion knitted textiles with breaking down and changing properties. Aim of the project was to develop a collection of knits with different dynamic qualities to be used in a workshop by fashion students (picture 2). A collection of three different types of knits with different qualities were developed. The fabrics were developed with the aim of leaving their dynamic qualities open for other designers’ interpretation.

The project was funded by the Smart Textiles Prototype Factory, who sponsored the materials used in the workshop. The materials were also included in the Smart Textiles material library.

The materials were used by second year bachelor students in fashion at the workshop ‘Crafting Wearables’ held at the Swedish School of Textiles on 28.10.-1.11.2013 by Oscar Tomico and Linda Worbin. The students developed their own methods of working with the materials’ changing properties. They used a variety of methods to form the fabrics to achieve different expressions, thus using the materials’ qualities as tools for their design processes. Working with breakage and change as parts of the design process could open up for new methods of designing. How these qualities could be used for discussing sustainability, consumption and people’s relationships to textiles is explored in this work.

Some examples of the student’s work from the workshop also opened up for potentially new possibilities for designing multifunctional garments. Designing garments that can further be moulded by their users could help extending the garment’s use-time. This opens up for further exploration on how to design for different life-spans. This theme is also discussed in this project.

Both the woven and the knitted design examples presented a range of properties ranging from subtle to more radically explicit in expression. The woven home textiles include transforming to completely breaking objects. The knitted fabrics range from fabric that stretches out and increases in size to a variety that is completely melted and destroyed. Here this idea of a range of properties are further expanded to include several time-spans and reactions. Presenting a range of properties that support and complement each other could better help illustrate the complexity of the relationship to current material consumption.
Aim of this work

This work explores breaking and changing processes in textiles. The aim is to try to make current consumption patterns of textiles more visible by highlighting them through exaggeration. Textiles that do not last but break and change have been used as a method for commenting on current consumption habits. By taking a critical view on the current consumption practises the project tries to raise questions about them. Could our values and attitudes towards textiles be different than what they are at the moment?
Planned obsolescence

Today’s consumption has become detached from the context of production (Borgmann, 2000, p.420) Products can readily be purchased from stores and the manufacturing processes behind their existence remain largely invisible to the consumer. This is partly due to the current model of industrial production where different processes are spread over the world. Production has become segmented and specialised so that people become experts in a specialised field, but the overall picture becomes harder to perceive (Albers, 1947, p.36). This is connected to the increased amount of information and complexity of the world, which in itself is not necessarily negative, as it contributes to the knowledge of whole mankind.

Devices have also become so complicated that the processes behind their functions become abstract to the user (Borgmann, 2000, p.420). At the same time they have made performing different things easier and effortless. Borgmann calls this phenomenon the device paradigm. Compared to writing with a pen or a typewriter in earlier times writing and text processing has become more effortless and easily available. A laptop can be used for writing documents, but how it functions, or could be repaired, is not evident from the object itself. With industrialisation people have lost connection and firsthand experience of the material world (Albers, 1947, p.38).

According to Borgmann (2000, p.419), result of the device paradigm is paradigmatic consumption, which lessens people’s engagement with material reality. Paradigmatic consumption can be defined as enjoyment without effort. It could be watching a television show or buying a new garment to shape your identity without the strain of actually reflecting on your identity, opinions and values. With the need for investing effort into achieving things removed, it has become easy to consume commodities in search of good life.

Goods are readily available in plenty, and in the Western world standard of living is high enough so that people have money over after necessities to spend on other things. At the same time more and more textiles and other commodities are being consumed. Product life spans are becoming shorter and increased consumption leads to increased discarding of products. Yet products that are only used for a short period of time are still mostly produced from virgin materials.

Electronics are perhaps one of the more obvious examples of these types of products. For example for a smart phone four years is a long lifetime, after which it will become waste. A similar phenomenon occurs in fashion, although the cycle is even faster. A high fashion value party top might only be used a few times before the user grows tired of it or it goes out of fashion and becomes replaced by the next new thing.

Updated versions of different electronic appliances are published continuously, while for example battery lives of older models decrease dramatically after only a few years of use. Batteries and other worn out parts can rarely be replaced. Electronics and software manufacturers also often stop supporting their older models or softwares, or they become incompatible with newer models, making consumers constantly update their appliances. In fashion garments may be of such poor quality that they break or start looking dishevelled only after a few washes. This phenomenon, where products are designed to be replaced in order to sell more products, could be called ‘planned obsolescence’, a phrase coined by Vance Packard in his book The Waste Makers at the end of 1950’s (Cooper, 1997 cited in Chapman, 2005 p.8).

In 1965 Anni Albers (p.66) reflects on ‘calculated obsolescence’ and the role of designer in writing that as the day’s economy is built upon change, a designer trying to create timeless forms best suited for the object instead of following the latest trends “…finds himself in conflict with the economic pattern of our time.” Albers argues that people are urged to continuously want more and newer things, and a designer taking a longer life-span approach might not be the most successful one. Discussion about the long term sustainability of increased industrial mass-production is by no means new. Still from 1950’s and 1960’s the speed and amount of production has increased.

This behaviour is supported by the low quality of many products, which makes them not worth repairing. In some cases repairing is not even possible, as is the case with plastic laminated chipboard, from which plenty of furniture today is made of. Low quality could in part be seen as a consequence of the current throw-away society.

Hard competition for market-share and profit make companies press prices even lower. This is especially the case in the fashion industry where big multinational companies strive to offer consumers garments at low prices. To keep prices low the quality of the garments and their materials is low and production is placed in low-cost countries. This also directly affects environmental standards of production and the working conditions of factory workers and producers of raw-materials, who often work overtime under hazardous conditions on a salary below living expenses (Fletcher, 2008, p.162).

As a counter reaction to growing consumption concerns about the long
term sustainability of the current system have been raised. Ecological and ethical issues have been discussed from various different viewpoints. Generally sustainable development has often been seen as an issue relating to development of more efficient and less environmentally burdening production processes and improving the working conditions in the industry. Also material choice has been seen as a key factor for developing more sustainable options with organic cotton, lyocell, recycling and reusing materials in different ways being the most commonly preferred solutions. More environmentally friendly materials have been offered as a response to consumer demand. These approaches have been well compatible with the industry’s aims as more efficient production also means more items produced faster from same input of raw material.

Yet the issue is more complex than simply improving processes and switching to better materials. Simply ceasing to consume is not an option since consumption is already built in the current Western society and way of life. The relationship to consuming material goods is complicated and extends beyond the physical proportions of the products. Yet its impact can be seen in the physical world.

Perhaps other approaches to addressing the system could be useful. Using products for longer time and hence consuming less could be one alternative to the current practises. Longer life spans of products could be encouraged by using materials that last a long time and age well. Maintenance and repairing instead of discarding old and buying new could be favoured.

**Longer-term alternatives**

There could be many ways to try to bring forward these kinds of values in design. An ultimate example of such a durable object could be the so called super normal objects collected by Jasper Morrison and Naoto Fukasawa. Morrison and Fukasawa (2007) have collected different everyday objects that work so well, they claim, that people stop noticing them. Anni Albers (1947, p.39) lifts up lightbulbs as examples of these types of objects. Unpretentious in their form and made by unknown designers they function well and perform their duty without a fuss.

Same types of older nameless industrial objects have also been collected in Sweden. These everyday objects often did not have a named designer and they have existed only to fulfil the function they were designed for. They disappeared when society changed and they were no longer needed. (Swanberg, 2002.) What connects these objects is that they work so well that they can be used without the need to think about them and in that way they become invisible to the users. (Fukasawa and Morrison, 2007.) Morrison and Fukasawa (2007) even suggest that the act of using a product that performs its function well could in itself be a meaningful and pleasurable experience for the user. Maybe these kinds of objects could exceed consumers’ need for change and new experiences? This way they could also invite people to maintain and repair them well, so that they will keep their functionality.

Stripping objects of all meaning except their function is not still problem-free, for objects carry multiple meanings that extend beyond their function. This is especially the case with fashion and textiles, which are experienced more as a part of a consumer’s identity than protection from outside conditions. Continuous identity building through consuming is built into today’s fashion industry. In home textiles the cycle of discarding and consuming is still somewhat slower.

Albert Borgmann (2000, p.421) defines things that bring longer term fulfilment beyond material objects as focal things. Focal things are defined as things that have value in themselves and they are often abstract, such as mountains, works of art or food. The action of attending to these things, such as preparing food, is focal practise. As opposed to current technological development that aims at minimising effort needed to achieve things, attending to focal things requires a degree of strain. Preparing a good meal needs time and effort invested in it and enjoying the meal with family or friends requires time and presence from the participants. At the same time these efforts can connect people to the present moment and the reality of food and eating compared to warming up ready-made meal, which with its unknown ingredients and production processes leaves the origin of the food invisible.

Physical objects can be mediators even in focal practises. For example when running, good shoes and other equipment are needed. Their purpose however is not to remove all effort from training, but rather make it ergonomically safe. Opposite to paradigmatic consumption distracting people from reality, the objects enable focusing on focal things, like running. This encourages forming a close relationship personal with an object, like playing an instrument and going through the effort and pleasure of practising with it repeatedly makes the player become intimate with the object (ibid., p.419).

One way to encourage longer life spans of textiles could be by building person-product relationship over time. Home textiles made of durable
materials such as thick cotton or linen can last a long time. Through continuous use and washing they develop qualities that they do not possess as new. These qualities could include for example the softness of old cotton bed sheets, or roughness of linen terry towels. In clothing certain leather products such as jackets or bags are considered to age well and gain value by use. Jeans and shoes improve and become more personal to their user when they mould themselves after the user’s body.

These qualities appear over time through the user’s interaction with the textile and cannot be added to the product artificially at production stage. The user has to commit to using the product continuously to achieve the qualities. Thus the user moulds the product as his/her own over time and development of person-product relationship could be encouraged. Extensive use over time also helps create personal memories connected to the textile, which contributes to creating a meaningful relationship with the object (Niinimäki, 2011).

Jonathan Chapman (2013) argues that textiles and garments could in fact be designed to improve with age. In this scenario the newly sold textile would not be the finished product, but only the beginning of a continuous process where the user moulds the final garment to his or her own. Chapman further suggests that this would also encourage people to keep and look after their textiles or garments longer. Eunjeong Jeon (2013) has researched the relationship between garment form and comfortability experienced by the user when wearing the garment. She argues that how things are touched conveys emotions in people and that garments by their form and tactile properties can empower the body to feel and move to encourage feelings of being comfortable in one’s body. This way the garment encourages the building of a personal relationship with it.

In a qualitative inquiry carried out among sustainably oriented consumers by Anne Marchand (2004, p.128) a quite opposite view in thinking sustainably was revealed. The results of the study showed that the participants were more disposed to accept an object’s physical ageing when they had no emotional attachment to it. The participants expressed a wish to keep themselves free from attachment to objects. Instead objects were seen to have an instrumental value (Marchand 2004, pp.112, 114). Yet the participants were quite conscious in what they experienced as important values in objects. In describing objects the participants stressed qualities such as functionality, high-quality in form of durability and longevity and usefulness. With usefulness they were referring both to the object being used by the user and to the intention behind designing the object. These were seen as essential parts of the overall ‘product quality’ experienced by the participants, alongside with ethical, social and environmental aspects of the production of the object, and the values of the company producing it. If the object was seen to possess these qualities, it was seen as valuable. (Marchand 2004, pp.114, 116)

In a way the useful and functional value attached to objects links back to the super normal objects collected by Jasper Morrison and Naoto Fukasawa. Though sentimental attachment to objects is avoided, in being useful and used the objects become valuable to their users. In being used the object in a way acquires personal value for its user. Though this value is not perceived as sentimental, it could perhaps still be emotional, in the sense that through using the object an action can be performed well and satisfaction acquired from the object enabling this action to happen smoothly. Even though these approaches of encouraging person-product relationships and emphasising usefulness of the object seem quite opposed there could still be seen similarities in that they both build on the object having some kind of personal value to its user. Participants in Marchand’s (2004, p.128) study perceived timelessness in objects to be something subjective and beyond formal qualities. This view would support the notion of personal value to the user or owner being a factor that could positively affect to an object’s life span. Both these ways of relating to objects could have potential to contributing to prolonging life spans of objects and preventing their untimely obsolescence.

Designing for different life-spans

The most durable or longest lasting solution is still not in all cases the most sustainable option. Another way to approach sustainability could be by designing for different life-spans. For example technology is continuously changing and becoming smaller. Yet plenty of accessories for example smart phones or iPads are made of durable materials. IPad cases are made from thick leather that would last decades. Yet when the iPad-mini is released these cases become too large, and a new case has to be purchased. The useful life-time of such a case roughly corresponds to the life-time of the appliance. This would suggest that a material with a shorter life-span could be more appropriate for such objects. One example could be a smart phone case made out of durable, moisture resistant paper designed by Naoto Fukasawa for Siwa. This type of an object could simply be put into paper recycling at the end of its useful life-time.

Kate Fletcher (2008, pp.163-164) compares designing garments for
different speeds to the different rhythms found in nature. In ecosystem fast and slow rhythms co-exist and support each other. In same way fast and slow rhythms could exist in garments, with fast changing high fashion combining with more long-lasting garments made of quality materials (ibid.).

Defining these rhythms relates to recognising for which purposes garments are acquired (Fletcher, 2008, p.169). ‘The Lifetimes project’ led by Kate Fletcher (2008, p.175) explored different speeds and user motivations in garments. For example a high fashion piece is often purchased on impulse for its experience of newness and the good feeling buying it. A scenario developed in the project proposes that this type of garment could be designed for a short life-time. The garment could have low-impact production using recycled raw-materials and at the end of its useful life-time the garment could easily be either returned to the store for recycling or composted. An alternative scenario of renting a vintage piece for a night out or a special occasion was presented as a way to respond to consumers wish for constant renewal and identity-building (ibid.).
Other designers’ work

Material and technique as tools for expression

Japanese textile designer Reiko Sudo creates innovative fabrics for her company Nuno. Technique and material are key design variables in Sudo’s work. Her fabrics often combine weaving techniques with different finishes to create unexpected surface textures. Sudo’s fabrics are designed without named front and reverse sides to leave the user the freedom to interpret them. Tactility, the desire to touch and feel the material is at the core of Nuno’s fabrics. Reiko Sudo has said that “The first image that comes to (my) mind is the feel and touch of the material, its texture” (Millar, 2005, p.11). She works towards these expressions through finding ways to combine elements from techniques and materials in a new way. For example for the honeycomb weaves overspun wool yarns were combined with traditional Japanese waffle weaving to create three-dimensional fabrics with spongeline resilience (Millar, 2005, p.53).

Textiles’ tactile qualities are important also in my work as they together with textile’s visual expression create the overall impression of the textile. Textiles come close to people’s skin and are often simultaneously experienced with more than one sense. Thus textiles’ tactile qualities are not indifferent or subordinate to their visual qualities. Tactile qualities can appeal, but also repel as was reported by the students who had been working with PVA fabrics on their own body. They found the feeling of the fabric melting and shrinking on them unpleasant and even claustrophobic. PVA (polyvinyl alchol) is a synthetic yarn that shrinks and melts when it comes into contact with water over \(+20\) °C.

Tactile and visual qualities in textiles are also connected. When I have been presenting the PVA textiles on different occasions, same types of reactions of discomfort have risen even without people touching the textiles. The same can be seen in Reiko Sudo’s textiles, which have such a strong material presence that they manage by their visual expression to convey the feeling of how it would feel to touch them.

Traditional Japanese craft techniques such as weaving and dyeing are frequent design variables in Reiko Sudo’s work. She often works in co-operation with local craftsmen from regions all over Japan. She then combines her knowledge of industrial processes with the skill of local craftsmen to push the limits of what can be manufactured industrially. Possibilities and limitations of industrial production forms an important design variable as Nuno’s fabrics are designed to be produced industrially. Sudo’s skill lies in finding new ways to bring together craft and industry, for the benefit of both.

Reiko Sudo’s method of working by pushing what can be done with techniques and what materials can be used in textiles remains a constant inspiration to me. In the project ‘Unpredictable home textiles’ my focus laid strongly on developing new weave structures and combining those with PVA yarn to create textiles that broke down or changed in use. In the ‘Formable knits’ project, in which knitted fabrics for fashion with breaking and changing qualities were developed, focus was, instead of pushing the technique, more on combining knitting technique with PVA yarn to explore how their fusion could add to creating breaking and changing expressions in textiles, thus merging technique with material.

Material wise Nuno’s fabrics employ a variety of materials ranging from traditional Japanese materials such as silk, wool and washi-paper string to modern technological achievements such as biodegradable plastic and a coating technique used for applying stainless steel coating to car parts. Sudo’s open minded approach to material and her background in studying textile design at the department of industrial design enable her to co-operate with industries other than textiles to develop materials and finishes to achieve new tactile expressions. This way she works with material choices in an innovative way, trying to find new solutions regardless of whether her material inspiration comes from traditional or modern technologies.

Water soluble PVA yarn that I have been working with is used in the industry for example in the process of knitting socks. The socks are knitted in a long tube with a row of PVA between each sock. After knitting the socks are washed to shrink. In washing the socks are also separated from each other as PVA melts away, eliminating the need for additional work step of separating the socks manually. Ludvig Svensson in Sweden has used PVA in woven fabrics to create structures such as holes in the final fabrics, when the in-woven PVA is washed away after weaving. Thus PVA has usually been used as a part of the manufacturing process and not as a part of the end result as well. In my work PVA has become a part of the final result of the process, whether it is as a function to be changed by the user or as a tool for the designer.
Working with dynamic breaking and changing qualities in textiles

Working with dynamic expressions of breaking down and changing has been chosen as the method to explore current attitudes towards textiles and garments. There are many examples of working with textiles that possess dynamic qualities that cause irreversible change in them. Hanna Landin’s, Anna Persson’s and Linda Worbin’s (2010) ‘Burning Tablecloth’-project uses a non-chemical burnout (ausbrenner) technique to create structural and colour changes in textiles. By supplying heat to the fabric through conductive heating wires embedded in the knitted structure, the fabric’s expression can be affected after its production. Depending on the amount of heat and the material of the textile marks left on the textile can vary between colour change and breaking or melting of the fabric. As the fabric burns from the impact of the heat, the change process is irreversible (ibid).

The technique was used in creating a tablecloth that responded to incoming mobile phone signals by burning parts of the fabric. A micro-controller sensed incoming calls and text messages and turned on heat in some places in of the tablecloth. Thus the tablecloth became a way of presenting information in an alternative way (Persson, 2013).

Delia Dumitrescu and Anna Persson (2013) worked with shrinking, stiffening and breaking knits in their project ‘Knitted Heat’. Collection ‘Touching Loops’ included three knitted structures (ibid.). One structure became warm and shrank changing the surface texture of the knit, one turned from soft to hard when heat stiffened parts of the structure and one shrunk and broke when it was heated. Heating was achieved by leading electric current through conductive yarns integrated in the knitted structures.

The materials were developed within the concept of interactive tactility with the aim of extending the aesthetics of textiles by working with changing tactile properties in textiles. They reacted to touch by heating up and changing their structure. Due to the conductive yarn integrated in the structures, the materials were able to sense the location of touch and changes were directed to those areas (ibid).

Both these projects use irreversible changes in textiles as methods for creating expressions. The PVA fabrics developed in my ‘Formable knits’ project also use this method. As a difference to ‘Burning Tablecloth’ and ‘Touching Loops’, instead of heat, water is used to initiate changes in textiles. PVA shares some similar features with the materials, since it shrinks and breaks when it comes into contact with water and it also turns hard when it dries half-dissolved.

The changes in the heat mouldable textiles stop when the heat is turned off. The dissolving process of PVA is also stopped when the fabric dries, but it will immediately continue if the fabric comes into contact with water again. Fabrics changed by heat could thus be still used in a range of applications without inadvertently changing them. In contrast reactivity to water sets more limitations to the possible uses of PVA fabrics. This makes the change process less controllable and gives the materials a more temporal nature.

‘Burning Tablecloth’ and ‘Knitted Heat’ discuss textiles more as presenting new possibilities for interaction. My starting point for exploring textiles with dynamic breaking and changing qualities was to explore the meaning of sustainability and durability by working with their opposite, things that are fragile and break down. Still Anna Persson (2013) proposes that these kinds of dynamic breaking properties in textiles could be used to encourage person-product relationships. Causing irreversible changes in textiles could work as way of personalising a textile or saving the memory of an occasion in it, as in the case of the ‘Burning Tablecloth’ (Persson, 2013).

The critical method

Greetje van Helmond’s degree work (Fairs 2009, p.110) from 2007 at the Royal College of Art in London approaches long-lasting, highly valued objects from its opposite. As a comment on the current consumption patterns and how durable and valuable raw materials are used for producing items that are only used for a short time and then discarded van Helmond produced jewellery by growing sugar crystals on thread. These crystals appeared valuable and beautiful, but were in fact made of everyday ingredients, in contrary to the valuable materials often used to produce things that are used for a short time. The jewellery was produced by sinking threads into saturated sugar solution and letting them stay there for weeks, in which time sugar crystals form on the thread (ibid.)

The final jewellery appear precious but they are actually extremely fragile so that they can only been worn once before crumbling. The smallest crystals crumble at touch (Fairs 2009, p.110). For the collection, which is called ‘Unsustainable’, van Helmond also created a wall made of bread. According to van Helmond (2013) the objects she creates will not last long, but they will last long enough to stay ‘new’.
My method of working with unpredictable textiles that will be destroyed or changed when they should last as a means to explore what is sustainable and durable has similarities to van Helmond’s approach. She explores sustainability and durability through working with their opposite, jewellery and other objects that in fact are not durable, but fragile and made from very basic, cheap materials. By taking a phenomenon and approaching it from its opposite is for van Helmond a way to make visible and raise questions about people’s current consumption habits. Exaggeration by contrasting jewellery that is usually experienced as something very long lived and precious and the cheap, fragile everyday ingredients her sugar jewellery consists of help making her message even clearer and stronger.

In the same manner my aim is to try to raise questions about current textile consumption habits by attempting to make visible some features by highlighting them through exaggeration. By making textiles last for even shorter time than they are expected to, I try to draw attention to aesthetic obsolescence, the phenomenon of fashion or textiles becoming aesthetically out-dated before their actual physical lifespan is even near its end. Current production patterns encourage this replacement of textiles and especially garments. To guarantee a low price quality (and the working conditions of textile workers and farmers etc.) are kept low, which encourages the rapid disposal of textiles.

Change as a function to prolong objects’ lifespan

Exploring breaking and changing qualities in textiles could also lead to more practical solutions for prolonging objects’ life spans. Place mats that could be turned into coasters developed in the project ‘Unpredictable home textiles’ presented one such possible application for textiles’ dynamic qualities. The possibility of embedding multiple functions or objects into three layered woven textiles was discussed in my ‘Formable knits’ for fashion project through a garment fashion student John-Daniel Isacsson’s created in the workshop ‘Crafting Wearables’. He used PVA as sewing thread to create a multifunctional top that could be changed into a dress and how this could open up for possibilities for making garments more sustainable by prolonging their life by adding in them a feature of change that the user could initiate at will.

In these examples change and plans for future use would be embedded in the textiles with the help of the textile structure and a dynamic material, giving the textile the ability to move from one state of being to another, possibly giving it a new purpose in the process.

Similar projects have been done in the field of design. Japanese designers Takuya Niimi and Yuki Niimi have tried to address the problem of products being discarded early when they start showing signs of wear in their project ‘Towel with Further Options’. By using a very simple means of adding a grid-like pattern to the terry surface of a bath towel they have created an object that has a range of future uses embedded to it. When towel becomes worn out smaller pieces can be cut out of it to serve as bathroom mats and eventually cleaning cloths. The pattern on the towel instructs the user where to cut it and gives the new smaller pieces edges that will not fray, making them look intentional. (Fairs 2009, p.54)

Tom Dixon employs the idea of change and breaking down in-built in the material in Eco Ware-series that includes cups, plates and bowls that are designed to wear out in use. The dishes are made of a biodegradable bamboo-fibre plastic that can be made as a by product of bamboo industry. As the dishes are used and washed the material slowly biodegrades losing its shiny surface. Dixon argues that this character in fact makes them more interesting and unique to the user who moulds them over time. The material’s lifespan is about five years, after which it can be composted (ibid., p.61). This way of building change or break down into objects could present possibilities for designing for different life-spans.
Experiments

Breaking and changing expressions are created by combining a potentially dynamic material with a textile technique. Dynamic properties the textile possesses are embedded in the textile material itself. The textiles respond to everyday stimuli such as water, heat, UV-light, rubbing, washing or simply the passing of time. These conditions can be applied to the textiles both consciously, with the aim of changing them or unconsciously, through use.

The expressions are built up from how technique (weaving) meets material (breaking/changing). Visual and tactile expression of the material is the focus. The method of working is a fusion of the methods developed in earlier projects. In ‘Unpredictable home textiles’ woven jacquard patterns were used in combination with different bindings to create patterned fabrics with different breaking and changing properties. With the knitted fabrics in ‘Formable fabrics’ a step towards a more abstract approach was taken and focus laid more on how material meets knitted structure to create breaking and changing expressions. This more abstract approach will be transferred to weaving in this work. If a pattern is used, it will be used to create structure on the textile on a bigger scale instead of creating patterning on the fabric.

Water soluble PVA (polyvinyl alcohol) yarn is used to create more instant changes in textiles. It reacts to water by shrinking and melting. Though its reaction time and speed can be manipulated by the amount and temperature of water, it produces almost instant breakage or change, after which the object is irreversibly transformed. By its instant reactivity PVA offers a tangible and understandable way of visualising the speed with which garments and textiles are consumed and discarded today.

In my previous projects PVA has been the main method for creating changes in textiles. Using materials that react to different stimuli than water and materials that break or change over different periods of time could help further illustrate the complex relationship between consuming and physical material goods. Therefore also other materials are explored in this work. These materials could include for example paper yarn, milk protein (casein) yarn, biodegradable PLA (polylactic acid) yarn, heat shrinking PET yarn, heat shrinking, stiffening Rhovyl yarn, cassette tape, uncoated copper and stainless steel.

The experiments produced during the process can roughly be divided into two groups. The first phase includes experiments focusing on change on the level of fabric, or its structure. Samples include textiles which’s structure changes in reaction to different stimuli. The textiles could in their first state be flat and could be moulded with water or steam to give them volume and more three dimensional form. They would then keep this shape until formed further. In their third state some of the textiles would change form once again by for example layers separating from each other dividing one textile into two.

Second phase of experimenting shifted focus from shaping fabric to shaping material in itself. Different life-spans of materials and reactivity to various stimuli emerged. Different reactivities, such as softening by rubbing, gradual biodegrading or colour changes could not be expressed in changes based on creating visible volume and breakage in fabric. For this reason focus was shifted to exploring ways to apply different materials into woven constructions to explore and connect the different life-spans in form of multilayered weaves.
**Formable fabrics**

The series of experiments focuses on creating breaking and change in textiles on fabric level. Experiments explore how woven structure meets material to create breaking and changing expressions. Focus is laid on combining woven constructions with different materials way to create breaking and changing expressions.

The starting point was that the textile in its first state would be flat. It could be moulded without destroying it by shrinking the PVA with steam. Eventually, when the fabric comes into contact with water two layers would be separated from each other, or the reverse side of the fabric would melt away revealing another expression, possibly also becoming more transparent.
Contrast in materials

Hand-woven experiments

Experiments woven on 24-shafted computer steered hand-looms (picture 3). Samples include two-layered woven structures exploring transparency and combining contrasting materials such as paper-like linen, monofilament and plastic strips to create contrast between the first and the second state of the textiles. PVA is used as the active yarn initiating change in textiles.

Floats enhancing sense of material

Creating areas of weft floats in the fabric was explored to achieve a stronger, yet subtle sense of material (picture 4). Thin and thicker paper yarns and stainless steel were used as weft materials. The samples were further treated by machine washing in 40 °C. After washing the materials’ expression was much changed as the floats had shrunk, shrinking and deforming the whole fabric. Paper yarns became curly and twisted around themselves while stainless steel tangled in itself. Also the materials’ tactile expression changed from sleek, airy and organised to messy, rougher and thicker. These created a contrast between the fabrics first and second state.
Exploring volume and change on fabric level

The series explores creating volume and change in fabrics on different scales ranging from subtle small scale change on the surface structure of the fabric to creating larger more three dimensional changes in fabrics. The experiments were woven on industrial jacquard.
Merging approaches

Weaving experiments were carried out in collaboration with Nilla Berko, a fellow master student in textile design. The project aimed at combining participants’ different areas of knowledge to create textiles with sound-absorbing qualities for public spaces. Water reactive melting and shrinking PVA yarn and heat reactive shrinking Pemotex yarn were used to create woven textiles that could be moulded on spot depending on the needs of the place (picture 5).

Shrinkage was used as a method to create volume and structure in the textiles. PVA was used for creating stiffness in the textiles by adding a PVA weft between the woollen wefts. PVA could afterwards be melted by painting the fabric with water thus adding stiffness that helped supporting the volume created by shrinkage. A new way to shrink PVA with steaming without melting and breaking it was discovered. Volume and structure were created by combining in industrial jacquard a large simple pattern with two-layered bindings containing floats and binding areas. This enabled the construction of textiles with alternating areas of shrinking floats and points binding the floats together with the main body of the fabric.

A dense double-face weave in wool was used for the body of the textile. The material and binding were chosen with the aim of improving the materials’ sound absorbing qualities by making it denser. This was further enhanced by shrinking properties of the material, which allowed for gathering more material in a smaller area.

Also the uneven surface structure of the material could help dividing the direction of sound waves. Precise sound-absorbing qualities of the materials are not systematically tested, though. The material could rather be seen as a way of creating or forming space.

The materials produced in the workshop could be seen as raw-materials to be formed further on by others. The materials possess certain qualities that could be seen as tools for interior architects or designers. These qualities can be easily utilised with the help of a steam iron. The materials could then be formed on spot after specific needs to create space specific customised solutions. This approach is similar to that of my project ‘Formable knits’ where knitted fabrics were designed to be used by fashion students. The workshop with Nilla Berko transferred these qualities from knitting into weaving.
Subtle change on structure

The experiment explores creating subtle changes in the surface structure of a fabric (picture 6). The flat surface of a fabric changes into a more structured one when the fabric is steamed. If the fabric is washed, it divides into two fabrics as layers become separated from each other. Alternatively, one layer is washed out changing surface appearance on one side of the fabric.

Crepe bindings were chosen as the base for developing the multilayered bindings because of their lack of visible pattern, which allows focus on surface structure. Two different crepe bindings were experimented with to compare their effect on the surface structure. The textiles were meant to be without a named front and reverse side.

Using the quality of PVA shrinking but not melting in steaming, the aim was to prolong time-span from the instant towards the slower. Multilayered bindings consisting of two layers and an invisible binding weft connecting the layers were used to create change in materials. PVA was used as the functional binding weft and by manipulating it the fabrics’ structure could be moulded and the layers separated.
The experiment explored combining three layered binding with a simple small scale pattern to create surface structure to the textile (picture 7). Bindings combining floating and binding parts were applied to a pattern. The textile could be moulded by manipulating the floats situated between two layers of fabric.

Brass was used as weft material to give the fabric stiffness to better hold the form. PVA was used as the functional binding weft and by manipulating it the fabrics’ structure could be moulded and the layers separated. In some cases the samples show a more distinct front and reverse side, while others show changes on both sides.

Rather small square and diamond patterns were used in the experiment resulting in quite small scale structure. The combination of a square patterned binding and the wavy structure of the shrunken fabric in its second state make the overall impression quite complicated.
Blowing up volume

A larger, yet simple pattern was experimented with. This also enabled creation of larger volumes in the fabrics. Crepe bindings were continued to use as base for the structures as they better directed the focus on to the larger structure of the fabric instead on the surface patterning.

Simple stripe and square patterns in sizes varying between 40 x 50 cm and 40 x 40 cm were used together with three layered bindings combining crepe binding on front and reverse side and a PVA weft alternately floating and binding inside the two layers (picture 8). The fabrics could then be manipulated by shrinking or dissolving the PVA floats inside the fabric. By steaming the fabric volume could be created and dissolving the floats would further cause the layers to separate.

The three layered fabrics have two layers, a front and a reverse side. The third layer consists of PVA weft that alternately floats between and binds with the two other layers. The third layers acts as an invisible functional layer between these two, causing the changes in the textile and thus forming the overall structure and expression of the whole textile.

Stainless steel was used as weft to give the structure support. Metal could also be deformed afterwards. Materials’ expression varied from light permeable to highly reflective depending on direction of light. After washing the material transformed. It shrunk and the stainless steel that did not shrink formed a wavy surface to the material.
Comparing materials’ qualities

To be able to compare reactions in different materials same binding was combined with them. For the construction of the experiment two crepe bindings were combined with a weft yarn running between the layers and binding them together. The fabric in construction had three layers but due to the almost invisible binding weft in practise consisted of one layer. The double layer construction also decreased the amount of cotton warp threads of each side, thus giving weft material a larger role.

Different materials were then applied to the construction. These materials included PVA, milk protein (casein) yarn and paper yarn. 0.10 mm thick stainless steel yarn was used as the invisible binding weft inside all the samples as a common nominator. Additionally also c-cassette tape was tried as the middle weft with the paper yarn.
**Rhovyl/PVA**

Heat shrinking Rhovyl-yarn was combined with PVA in a squared pattern to explore creating different transformations in one fabric (picture 9). With this experiment it became apparent that structures creating change through volume in the fabric would not be applicable to different materials reacting to various stimuli at different time spans.

Rhovyl was expected to react to pressing with heat by stiffening, but no substantial results were achieved even when the iron was held pressed against the material for several minutes. The material also did not respond to steaming or washing. The sample was subjected to outside conditions, where PVA was gradually washed away by rain, while Rhovyl remained intact. It was thus excluded from further experimenting due to its poor reactivity.
In samples containing PVA and milk protein linen was used in the lowest layer to create bottom for the possible changes. The samples were treated in different ways to cause changes or breakage in them (picture 10). Pieces of all samples were washed in machine at 40 °C. In washing PVA disappeared from the fabric (up right). Milk protein did not react to washing in any way. Samples were also steamed and ironed. PVA reacted to steaming by shrinking forcefully. It did not react much to ironing without steam. The samples with PVA and milk protein yarn were very similar in their visual expression, causing a contrast between the materials when one reacted forcefully while the other did not.

The samples were also subjected to outside weather conditions for four weeks. Over this time PVA had melted, in some areas revealing the stainless steel floats between the layers, in others becoming a hard, glue like surface on the fabric (left). The side with milk protein showed no perceivable change.
Paper yarns

Paper yarn was combined with the same three layered crepe binding. Stainless steel was used as middle weft to be able compare samples. Also cassette-tape was tried as middle weft. Paper yarn was used on both sides to enhance the feeling of the material. In another experiment to further enhance the feeling of material the middle layer was left out and thin paper yarn was woven in to separate layers. For this experiment satin, an even sleeker binding was chosen.

Samples were machine washed at 40 °C. Paper yarn became limper and especially at the edges of the fabric the twist of the yarn opened. The yarn still kept its slightly rough texture. Cassette tape did not react to the treatment.

The paper samples were rubbed with sandpaper to break them. This made the surface of the fabric first softer and then broke the yarns revealing the stainless steel. The paper yarns seemed to break more easily than the cotton warp threads. By rubbing the fabric in weft and warp directions different expressions were created (pictures 11, 12).
Layers of life-spans

The idea of repetition, a type of form repeated in different materials to visualise the different reactions and time spans of the materials was explored. This idea was developed into four layered weaves incorporating a range of different qualities of materials. The materials were primarily arranged from more explicit in expression to subtle starting from instantly reacting PVA and ending with stainless steel and copper, materials that might change in expression, but keep their functionality.

Two constructions were explored. A four layer weave where the layers are tied together by warp threads changing place at regular intervals and a four layer weave with separate layers connected to each other by floating warp threads. Different combinations of materials were applied to the constructions. Striped, circular and squared patterns requiring different constructions were tested. To keep the focus on material and to keep the four layer structures clear, bindings with little surface structure were chosen as the base binding for the layers. The bindings included plain weave, satin and rips.
Four layers – flat structure

Four layer bindings with warp threads changing places between the layers binding them together were constructed from the base binding of tabby (picture 14). Different material combinations were tested with the binding. These materials included PVA, a transparent shrinking PET yarn, thin and thicker paper yarn, milk protein yarn, PLA and stainless steel.

The woven samples were treated to explore how the materials reacted (picture 13). One piece was machine washed in 40 °C and another sample was steamed and ironed. As a result some materials reacted while others did not show much change. In washing PVA disappeared, while stainless steel became wavy thus shrinking in width. PLA, milk protein or the cotton warp did not react to washing other than by shrinking slightly. Paper yarn became limper and perhaps slightly rougher when it lost some of its sleek surface. At the edges of the samples the paper yarn also lost its twist. Shrinking PET yarn did not react to washing.

PVA reacted to steaming by shrinking forcefully. This combined with the cotton warp resulted in an almost paper like surface. PET shrink yarn did not react much to steaming. Instead it shrunk when it was ironed on. If the material was pressed with iron long enough, the material would melt leaving holes. PVA on the other hand did not shrink much from ironing without steam.

These observations might suggest that the materials could be manipulated separately even when they are part of the same fabric. They could maybe for example be used on different layers in a four layer weave, causing reactions to different stimuli with PVA changing more radically with the help of water and shrinkyarn reacting to higher temperatures.

All materials explored were quite neutral in their appearance. They were thin and most of them were white or close to white. Combining them with plain weave further enhanced the neutral expression, making the fabrics light and slightly transparent. With the materials being quite similar in expression in their first state, changing of the material was what created differences between their expressions.
A four layer weave with separate layers connected to each other by floating warp threads (picture 15, 16) was experimented with. To enhance the role of varied weft materials in relation to the cotton warp, I experimented with weft-dominant satin and rips bindings. Also plain weave was used. Striped, circular and squared patterns requiring different constructions were further tested.

A variety of materials were combined with the bindings. These materials included PVA, a transparent shrinking PET yarn, thin and thicker paper yarn, milk protein (casein) yarn, PLA, cassette tape, stainless steel and copper. Apart from the cassette-tape, which was brown and thicker, all the materials were light and neutral in colour and composition.

The samples were steamed and ironed with same results as the previous four layered samples. Samples were also subjected outside conditions to explore weather’s impact on the expressions.
Plain weave

The experiment consisted of a multilayered weave of four layers connected to each other by floating warp threads traveling between the layers (picture 17). Plain weave was chosen as the binding because of its density creates stiffness in the material. Different materials were experimented with in the layers. Materials combined with cotton warp included PVA, PET shrink yarn, thin paper yarn, PLA, milk protein yarn, cassette tape and stainless steel.

PLA and milk protein yarn did not show any changes at such short time-span. Stainless steel could be formed by crushing, but otherwise showed no changes. Affecting the material for example trying to get it rust by soaking it in saltwater or with other steel objects could perhaps have been further experimented with. Due to the speculative nature of their long-term behaviour the three materials were excluded from further experimenting.

Main characteristics of the materials included:

\textbf{PVA + cotton warp (up left):}
\begin{itemize}
  \item warp threads drawn together by shrunken PVA form a dense surface
  \item tactile feeling paper like, stiff
  \item a coating of PVA can be seen and felt on the material, slimy when wet and hard when dried
  \item all weft material has dissolved and the textile can be ripped open in warp direction
  \item subtle effect due to white warp and weft combined in dense, even binding
\end{itemize}

\textbf{thin paper + cotton warp:}
\begin{itemize}
  \item a rougher, stiffer feeling compared to original state
  \item still a quite loose structure
  \item no other perceivable changes
\end{itemize}

\textbf{stainless steel + cassette tape + cotton warp (up right):}
\begin{itemize}
  \item when crushed, steel deforms and does not regain its original shape
  \item a dense, even surface due to plain weave
  \item no other perceivable changes
\end{itemize}

\textbf{PET shrink yarn + cotton warp (below)}
\begin{itemize}
  \item three dimensional forms created by altering shrunken and non-shrunken areas
  \item soft triangular shapes caused by the tip of the iron
  \item material is quite stiff and has a plastic feeling, stiffness helps the shapes pop out
\end{itemize}

\textbf{PLA + cotton warp}
\begin{itemize}
  \item quite soft, thin feel due to thin PLA yarn as weft
  \item no perceivable changes
\end{itemize}

\textbf{milk protein + cotton warp}
\begin{itemize}
  \item quite soft, thin feel due to thin weft
  \item no perceivable changes
\end{itemize}
Satin binding

In this experiment I worked with a multilayered weave consisting of four layers connected to each other by floating warp threads travelling between the layers (picture 18). Different materials were used as weft materials to create a series of layers reacting to different stimuli. Materials combined with cotton warp include PVA, PET shrink yarn, thin paper yarn and copper. An 8-shaft satin binding was used to create weft dominance to the fabric. Due to the binding the material became quite loose and soft. Warp threads move in wiggles due to the loose construction.

In their first state all layers are quite neutral, light and flat in their expression. As they change they develop more distinct characteristics. Some materials show no change over shorter observation periods, but would require time-span of months or even years to transform.

Main characteristics of the transformed materials include:

- **PVA + cotton warp (up):**
  - warp threads drawn together by shrunken PVA form a dense surface
  - tactile feeling paper like, stiff
  - warp has unevenly divided into groups of different sizes
  - a slight coating of PVA can be seen and felt on the front side
  - all weft material has dissolved and the textile can be ripped open in warp direction
  - the material has lost most of its width

- **thin paper + cotton warp:**
  - a rougher, stiffer feeling compared to original state
  - still a very loose structure
  - no other perceivable changes

- **uncoated copper + cotton warp (below):**
  - white warp more visible, wiggling warp threads create an irregular, moving vertical pattern
  - warp threads moving mostly in pairs, some undulating, others going straighter
  - the copper either reflects light or hides from view depending on direction of light and the movement of the material
  - perceivable change in colour in the material from shiny reddish to dull dark brown after one week outside
  - different areas reacted unevenly
Rips binding

This experiment was based on a multilayered weave consisting of four layers connected to each other by floating warp threads travelling between the layers. Different materials were used as weft materials to create a series of layers reacting to different stimuli. Materials combined with cotton warp include PVA, cotton, PET shrink yarn, paper yarn and uncoated copper. A rips over two threads binding was used to create slightly more weft dominance to fabric while still preserving certain degree of stiffness in the weave (picture 19). Due to the binding warp threads group in sets of two, also hiding the stripyness caused by the travelling warp threads.

In their first state all layers are quite neutral, light, flat and organised in their expression. As they change they develop more distinct characteristics. Some materials show no change over shorter observation periods, but would require time-span of months or even years to transform.

Main characteristics of the transformed materials include:

- **PVA + cotton + cotton warp (up left):**
  - the sample held its with because it was supported by stick holding the construction
  - a more subtle effect due to white weft / white warp combination – no contrast
  - denser and looser areas build due to warp threads grouping
  - a random netting, alteration between netlike areas and more solid areas

- **PVA + uncoated copper + cotton warp (middle):**
  - a paper like surface to touch
  - copper holds the width better, though material shrunk slightly
  - copper threads hold place, warp threads moved in groups leaving copper floats
  - chance a part of creation of the pattern, some parts group in bigger areas when they shrink, others in smaller
  - copper loops caused by shrinking PVA create a hairy surface to the textile
  - copper weft left in the material, so it can not be ripped open after PVA dissolving
  - colour changes in copper from reddish to dark after one week outside

- **PET shrink yarn + uncoated copper + cotton warp (below):**
  - three dimensional forms created by altering shrunken and non-shrunken areas
  - soft triangular shapes caused by the tip of the iron
  - material is quite stiff and has a plastic feeling, stiffness helps the shapes pop out
  - copper creates additional support enhancing shape
  - copper forms loops where the PET yarn has shrunken most, but the copper has not
  - paper + copper + cotton warp
  - a slightly rough, stiff surface feeling compared to original state
  - colour changes in copper from reddish to dark after one week outside

- **uncoated copper + cotton warp (up right):**
  - more regular expression due to a more organised structure
  - warp threads move in pairs
  - colour changes in copper from reddish to dark after one week outside
Focus on Material

Material’s potentially dynamic qualities were explored in different ways. Material samples were made in hand and industrial knitting (picture 20). By producing the samples in knitting instead of weaving allowed for the elimination of other materials, in this case the cotton warp from the samples, so that the materials’ qualities for breaking and changing could be explored by themselves. The samples were then tested further in different ways.

A piece of each material was buried shallowly in ground and covered with earth and dry leaves. The materials were left in the ground for at least 2 months after which they are dug up and observed. The materials buried included PVA, heat shrinking Pemotex, Rhovyl, milk protein, biodegradable PLA, thin paper yarn, thicker paper yarn, uncoated copper, thin stainless steel knit and thicker stainless steel knit.

Sample pieces of the woven materials were also subjected to outside conditions to test how different materials will react to weather conditions over a longer period of time. Pieces of the woven materials were attached to a fence and left there for several weeks (picture 22). Expectedly PVA dissolved. On the sample where it was combined with a background weave of linen PVA melted and dried several times in rain forming a hard, transparent, glue like surface thus changing the fabrics expression from grey and even to black and structured by revealing black warp threads and stainless steel woven between the layers. As a comparison the milk protein yarn on other end of the sample did not react to water. All the samples were at least slightly stretched out and deformed by wind.

The four layered sample containing different materials changed most visibly during exposure to weather (picture 22, left). The first layer combining both PVA weft to cotton warp or PVA and copper weft to cotton warp, changed most radically. After a rain the parts containing only PVA had shrank together forming a dense twisting material. The parts combining PVA and copper had shrank and turned slim, but the copper held the fabric flatter than the parts without it. The copper threads had moved with the force of shrinking PVA, forming a hairy surface of loops to the fabric’s surface. After one week outside, the uncoated copper had changed colour from shiny reddish to dull dark brown. The colour change was uneven, creating a variation in surface of the fabric.

The metals, copper and stainless steel were also subjected to some treatments to see if change could be inflicted upon them. The copper used in the experiments is uncoated, so it should react to certain chemicals and outside conditions by changing colour. Pieces of the materials and a control piece of paper yarn were put into vinegar and acid citron juice (picture 21) in closed jars. The copper showed visible changes in vinegar after one day, when turquoise coating started to build on it on the places that were not directly in contact with vinegar. The places of copper soaking in vinegar showed no change. This could indicate that the vinegar has to evaporate and dry before the reaction happens. After two days all the dry parts of the copper were densely coated by a dull, dark turquoise surface. Stainless steel did not react to vinegar. The piece of paper knit was coloured light turquoise from the part that was in contact with water coloured by the copper. None of the materials reacted to citron juice. The results propose that vinegar could be used to spray on copper if its expression wishes to be changed.

![Picture 20](image)

![Picture 21](image)
Defining the final expressions

All the samples were analysed and classified. The materials were divided into three general groups (table 1) and then the woven samples were further classified by their more specific qualities (table 2).

Based on the analysis materials representing different types of changes and various time-spans were chosen for the final piece. Aim was to create a comprehensive range of qualities ranging from radical to subtle and from instant to long-term. Expressions of all chosen varieties are quite similar; neutral, light and loose in their first state. When the materials start changing differences between them emerge and they develop their own distinct characters according to their qualities.

Multilayered woven construction with four separate layers connected by travelling warp threads was found to be best suited for expressing a broader range of qualities. Due to separate layers each material or life-span could be presented independently. At the same time all layers were a part of the same weave, inherently connected at the construction level by the warp threads moving between the layers connecting them.

Experiments dealing more with creating volume and change to the textile on level of fabric construction were suitable for expressing certain types of changes that could be initiated by parts of the material shrinking or dissolving thus moulding the fabric. They were however not so well suited for expressing other slower types of changes, such as colour changes, deforming or wearing out.

The clear shape of the layered structure and the monotonous expression of the materials create a contrast and leave room and for the materials’ reactions. The different qualities ranging from more radical to subtle are interconnected by single threads. Stripy patterns caused by the warp threads travelling between the layers work as a visual cue to viewer of that the different layers, or time spans, are connected on elementary level in the construction of the material.

In an exhibition context the work could be presented as a hanging installation. Thin rods sewn at the top and bottom of the layers would keep the fabrics straight. Rods attached parallel to the ones holding the fabrics would ensure the layers hang separately.

To more tangibly communicate changes in the layers additional water, rubbing or heating could perhaps be used. Possibly these would even be available for the audience to try themselves. To speed up the reactions a piece could also be positioned outside exposing it to weather. A similar piece could then be placed inside and a connection, either a direct visual connection or one via screen, could be established between the pieces.

Materials reacting over longer periods of time would not show any perceivable change over the duration of the exhibition. To visualise the changes happening in more long term treated and non-treated samples of different materials, and possibly films of their changes could be presented in smaller scale as a small material library. The installation could then visualise different time spans.
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<td>x</td>
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<tr>
<td>PLA/cotton</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**Table 1**

**Table 2**

*materials that break/change visibly/instantly*

- PVA, PET shrink yarn, Pemotex, Rhovyl

*characteristics of fabrics:*

- react visibly to (different) stimuli by breaking or changing (melting and shrinking)
- irreversible

*materials that break/change over longer period of time*

- paper yarns, milk protein (casein), PLA, cassette-tape

*characteristics of fabrics:*

- react to stimuli by gradually changing over a longer period of time by breaking, becoming more fragile, changing, becoming softer, limper
- irreversible

*materials that change over long period of time*

- copper, stainless steel

*characteristics of fabrics:*

- react to stimuli over a long period of time but maintain their functionality, change in visual (maybe also tactile) appearance
- possibly reversible where colour changes are concerned, irreversible where bending and shaping of the material has occurred
Result

Intensity and time

Different time- and reactivity-spans of textile materials were found in the process.

Two factors relating to the type of change were found: intensity and time (picture 23).

Intensity in this case refers to the radicality of change happening in the textiles or objects. Different scenarios ranging from more radical to subtle had been explored in the earlier projects. Most radical scenarios included completely melting single jersey fabric in PVA, breaking place mats and towel in PVA and breaking PVA and stainless steel knit. More subtle reactions ranged from changing objects such as place mats and the grey woollen roll-pattern fabric to woven PLA fabric of uncertain biodegrading time. Set on a timeline it showed that radical and mid-range scenarios were most well represented. This lead to the thought that perhaps more longer term scenarios could be developed further to complement the more instant changes.

PVA and other possible materials were also set on a timeline to compare potential times of breaking or changing. The lengths of times are an estimation, but can hopefully be used to give an indication of what types of scenarios could be built around different materials. As the timeline shows, most experiments in the earlier projects with the exception of PLA textiles are situated in the more short term end of the scale. Therefore the more instant scenarios could be complemented by expanding this timeframe.

The fact that emphasis has laid on more radical instant reactions is partly due to the nature of PVA used, as it reacts to warm water over 20 °C by instantly shrinking and melting. Yet the ability of an instant, tangible reaction to visualise the speed of consumption and quality of textiles today should not be neglected. More radical scenarios certainly have a place in the work. More subtle and long-term scenarios could be used alongside the more radical ones to deepen and further illustrate the complexity of consumption of physical objects.

Out of the experiments four examples with different time-spans reacting to different stimuli were chosen for the final piece. These examples represent a range of dynamic breaking and changing qualities ranging from explicit in expression to subtle. In their first state the examples share a quite similar expression. They are white or almost white, light and sheer. Their expression is quite neutral and subdued to leave room for changes in the materials. When the materials transform differences between them emerge and they develop their own distinct characters.
Intensity/time

PLA, uncertain biodegrading time

changing objects, place mats & towels

subtle

changing fabric, the grey fabric becomes more

clear examples in high & mid range

more examples in long-term? radicality in thinking in long time spans?

stainless steel

uncoated copper

uncoated
copper

paper

PLA

PET shrinking yarn

PVA steamed

PVA - cold water

PVA - hot water

breaking PVA objects, place mats & towel

breaking PVA + steel knit

INTEGRITY

radical

instant

PVA

single jersey in PVA

breaking PVA in PVA

unpredictable home textiles

VVA

unpredictable home textiles

Formable knits

PVA

PVA

cassette tape

milk protein (casein)

years

paper

PLA

stainless steel

‘Unpredictable home textiles’

‘Formable knits’

‘Transient impressions’

picture 23
The chosen materials include:

1. A fabric combining cotton warp with PVA weft (picture 24, up left). The material reacts instantly, shrinking when it comes to contact with water or steam. When steamed the soft surface is transformed to paperlike, slightly rough surface changing also the fabric’s tactile qualities. If water is applied to the fabric it will first shrink and turn slimy. When dried the material turns hard and its colour becomes yellowish. Once melted the material can be ripped open in warp direction even when it has dried and hardened. Thus its structure is dissolved and destroyed. As PVA is completely dissolvable and cotton is a cellulose based material, the material will eventually completely degrade and disappear. The transformation is irreversible.

2. A fabric combining cotton warp with PET shrink yarn and copper weft (up right). The material does not react as instantly as PVA. It does not react to water or washing, and not much to steam. Instead it can be formed with heat from for example an iron. If heat is applied for a long enough time, the material will break. The fabric can be formed from flat to more three dimensional, and it will retain its shape until heat is applied to it again. When PET yarn shrinks, copper wefts will form loops on the surface of the fabrics adding another tactile and visual expression to the material. Unlike PVA, the material can not easily be completely destroyed, instead more localised breakage appears in form of holes. As the material is a plastic it will not biodegrade, but will instead linger around even after it has been moulded unrecognisable. The transformation is irreversible.

3. A fabric combining paper yarn with cotton warp (below left). Paper gives the fabric in its first state a sleeker, stiffer expression. Over time through continuous handling and washing the material will turn softer and limper. When washed the paper yarn loses its twist especially at the edges of the fabric. If subjected to mechanical abrasion the material will either soften or break depending on whether it is abraded in weft or warp direction. Changes in the material happen gradually over a longer period of time and are therefore difficult to observe and compare. Paper and cotton are cellulose based materials and the material will eventually completely degrade and disappear. The transformation is irreversible.

4. A fabric combining uncoated copper wire with cotton warp (below right). The material is shiny, sleek and reddish in its first state. Over time the copper will change colour to dark brown. The change can be speeded up by exposing the material to outside conditions. The change is however only visual and the material retains its functionality and durability. The colour changing process can be reversible. The material can be formed and deformed manually, after which it will not return to its original shape. The material will not degrade or disappear even after it has been broken beyond usability by deforming. This transformation is irreversible.
Result became an interactive installation exploring processes of breaking and changing in textiles (picture 25). The installation will change during an exhibition by interaction with visitors. By the end of the exhibition the installation is irreversibly transformed.

The installation consists of four layers, or four life-spans of textile material, connected to each other by floating warp threads travelling between the layers. The installation is woven out as one piece. The layers represent the four qualities chosen out of the experiments. The layers react to different stimuli over different periods of time. Some of the changes are visible for the visitors to the exhibition; others will happen more gradually over longer periods of time.

Outermost layer of the installation consists of water reactive PVA. This layer can be manipulated with water provided in spray bottles at the exhibition. Next layer consists of heat shrinking PET yarn combined with occasional copper wefts. This layer is formed in advance to give viewers an indication of materials qualities. Third layer consists of paper, and will not show any perceivable changes during the exhibition. Fourth layer combines copper wire with cotton warp. With the installation being situated inside, the copper will most likely not show any visible change in colour during the duration of the exhibition. If some colour change will have time to occur during the exhibition, it will be too gradual for the visitors to perceive. Alternatively colour of the copper could perhaps be changed already before hand. Reshaping of the layer by the visitors may occur.
The installation is irreversibly transformed by the end of an exhibition and therefore new piece must be made for every occasion. The installation planned for the opening of the Textile Fashion Centre on 22nd May and The Swedish School of Textiles Exit14-exhibition on 28th May consists of an 7.5 meter high fabric (picture 26). Installation is accessible for public for interaction on two levels. A smaller, three metre high version is shown at Galleri Ålgarden 8th-11th May 2014.
Discussion

The process

Main aim for the project was for the whole time to explore different breaking and changing qualities in textiles, but the forms these explorations took varied during the process. At first structural and volume change on fabric level was explored. By using three layered weaves combining floating and binding parts structure or volume could be created to first flat fabrics. These could then further be formed by separating the layers. Simple patterns such as stripes and squares were combined with the bindings.

With these experiments I found that this type of change would not suit for expressing other types of reactions. Therefore focus was laid on developing weave structures that would allow for expression and comparison of different types of change. Three layered structures with a hidden middle layer were developed. After the materials changed in different ways, such as melting or rubbing with sandpaper a new expression emerged when middle layer was revealed. The experiments resulted in a small collection of material samples.

Yet it felt that in these comparable forms of materials were tied to a certain format of change instead of expressing the diversity of potentially dynamic qualities they possessed. To explore their different qualities the materials were tested by exposing them to different conditions and treatments, such as weather, washing, heating, or vinegar.

In thinking how the materials different characteristics could be expressed without the result being a mixed collection of varied material samples, four layered weaves combining different materials in same fabric were developed. The decision to use four layered weaves brought with it some limitations. Due to the multilayered structure of the weave the fabrics were quite loose even though the amount of weft threads per centimetre was high because this amount was in practice divided between four fabrics. The loose structure commanded a simple binding. Double-faced bindings and satins were experimented with, but the loose weave, where all wefts were visible simultaneously did not allow for building of different front and reverse sides in the fabric. The loose weave also encouraged usage of single weft material per layer, as surface structure could not be much elaborated by combining different materials.

The multilayered structure also enabled the amount of warp threads to be divided to several layers, thus resulting in a less dense warp leaving more room for the weft materials, which in this project were the main focus of exploration together with the woven constructions. At the same time this combined with the fact that many of the weft yarns were thin added to creating a loose structure. With some thin yarns such as PVA, milk protein and PLA this resulted in a fairly non-distinct, sheer expression. Thin paper yarn also gave sheer result, but due to the material’s stiffness the paper layer was stiffer. After washing it became limper and thus came closer to the other materials.

The warp and most of the weft materials were slightly off-white or otherwise neutral. Together with the simple bindings and many of the weft materials being very thin this resulted in different layers being very similar in their visual expression. Expression of the layers became subdued. This similarity of the materials was discovered in the process of developing comparable woven structures and it was then perceived as a strength enabling comparison of the materials.

With the four layer weaves I needed to assess these uniform expressions again. The experiments were woven on a white warp. While lying flat the experiments looked all quite the same, white, light, neutral. The samples appeared non-expressive. At the same time many different materials with different reactivity and life spans had been mixed together in the layers. I felt perhaps the fabrics had become only a collection of different materials without further implications.

It was only when I built a small model and hung up the experiments so that the layers could hang separately that they seemed to find their form. After this I analysed all the different experiments and picked out the final four qualities, or expressions. The final expressions are quite minimal, with neutral colours and no pattern. This was due to focus laying more on exploring the fundamental qualities of the materials. The dynamic expressions are quite basic, partly due to the chosen woven construction. I feel I would have wanted to go deeper into developing the expressions. But perhaps this could be something to explored further later.

Most of the practical work was done in industrial jacquard loom. Developing a good working relationship with fellow master student Nilla Berko during our mutual sketch project for the work allowed us to work independently on the jacquard machine, even though we were working with
our own separate projects. This enabled more independent and extensive exploration and development of woven structures.

The resulting life-spans of breaking and changing textiles were woven as one piece consisting of several independent layers connected by warp threads travelling between the layers. Weaving is a technique well suited for creating multilayered structures and this quality was utilised in the experiments. The system of two yarns interlacing that builds the base of woven structures enables different parts of the weave to exist independently and differ from other parts of the fabric, while still holding the overall structure, the fabric, together. These qualities enable building of fabrics with functional middle layers and different materials on different layers. At the same time all the layers are part of one woven structure and thus inherently connected on constructional level. They can be constructed and defined in bindings and their combination to pattern.

In her work Reiko Sudo often tries to find ways to push what can be done in industrial techniques. In my project pattern was after experimentation discarded from the process to not be limited by maximum repeat size of the pattern. A binding was repeated as many times as was required for the desired height. This half-manual steering of the weaving process allowed for full control over the sizes of the different woven areas that was needed for the size of the installation.

Choosing industrial jacquard weaving as opposed to hand-weaving or knitting brought some possibilities and limitations. The machine had a cotton warp, and this element was present in all the samples. Compared to constructing your own warp in hand weaving or the one yarn system of knitting where only single material can be used allowing full control of material choices, this was a limitation. On the other hand working in industrial weaving enabled wider developing and testing of different woven structures, when bindings could be changed at will instead of deciding on a binding before setting up a hand-loom. Industrial weaving was also well suited for production in larger scale. Producing multiple installations on larger scale would not have been possible in hand weaving.

### Inherent material qualities

A variety of materials were explored in the process. The materials ranged from natural, such as paper, synthetic, such as PVA and PET shrink yarn. Some less traditional materials required treatment before they could be used in an industrial weaving machine. Old cassette-tapes needed to be spun to yarn before they could be used. Employing a variety of materials ranging from traditional and natural to modern synthetic materials is characteristic also of Reiko Sudo’s work. For example by applying coatings for car parts to textiles she has pushed the limits of materials that can be used in industrial production. Sudo has also worked with wool, paper and biodegradable plastic, which could be seen as materials with potential dynamic qualities, but usually expressions of her fabrics are not specifically designed for changing. In my work material’s, such as paper’s, qualities are explored for their potential in creating expressions that change over time.

In materials that react faster, perceivable changes in the experiments were produced. PVA and PET shrink yarn could be instantly visibly melted and formed. Copper changed colour outside in a week and in a day when exposed to vinegar. When crushed, it deforms instantly. These changes could be perceived and documented. Regardless of its visible changes copper was chosen as the representative of the slowest life-span because though the material undergoes visual changes it retains its functionality. Metals do not biodegrade in nature, so even if copper weave becomes deformed beyond usability, the material does not disappear. Instead copper can be reprocessed and used again.

Other materials react slower and gradually so that changes in them are more difficult to perceive. Paper yarns became limper and rougher when washed, or stiffer and rougher when left outside in rain. They could artificially be worn out by rubbing with sandpaper. Apart from the slight alterations in the qualities of the material, no changes occurred during the relatively short period of time of the project. Over longer periods of they could turn even softer, but such changes would require longer time of manual wearing out, such as wearing and washing a garment.

The materials that react the slowest did not show any perceivable changes during the project. PLA and milk protein (casein) are biodegradable. Under favourable conditions, such as UV-light, high temperature and humidity breaking down process could perhaps be speeded up, but nevertheless it could take years before the materials disintegrate. Also cassette tape could react to longer periods of exposure to heat or repeated playing. Some of the tapes used in the process were weak and other durable, perhaps suggesting something of what kinds of conditions they had been subjected to. Also reliable technical information about the materials was not available. Therefore they remain speculations which make it difficult to evaluate them. This was the reason these time-spans were left out of the final chosen expressions, and varieties with more distinct qualities were
chosen instead.

It could though be argued that also paper and perhaps copper represent rather difficultly observable changes. The reason for choosing them however was specifically to expand the time-span from changes that can instantly be seen to more subtle, gradual changes occurring over longer time. Through their fundamental qualities, paper’s eventual softening and biodegradability and metal’s indestructibility, they represent different types of changes occurring over different periods of time.

If observations could be made over the duration of several years perhaps different material life-spans could explored more effectively. This could open up for possibilities for designing objects with defined life-spans, which gradually transform over years. Tom Dixon’s biodegradable Eco-Ware dishes present an existing example of this type of design thinking. Same thinking could be applied in textiles, where the material and actual life-span often do not meet.

As an example cotton is widely used as material in textiles because its qualities make it suitable for many types of uses and it is commonly available. Cultivating cotton is a water and chemical intense process. Cotton is a durable material that tolerates use and maintenance without losing its qualities. If cotton however is processed into a poor quality garment, with twisting seams and single jersey so thin that the garment loses its shape after a short period of use, the materials durability loses its meaning. So do all the resources that have gone into growing it. For a garment only intended for a short time use, another, less durable, recyclable or biodegradable material could be more convenient.

Designing for breaking and changing expressions

How is it to design for expressions that change over time? In addition to creating expressions, also a time-span is considered. This time-span then becomes part of the textile’s expression. Changes that happen over short time can more accurately be defined. It is possible to take the textile through the change process to see how the expressions build up. Different variations can be tested and evaluated, similarly to designing more static expressions.

When designing expressions for longer time-spans the results are harder to predict. Changes will be seen after a longer time and they might happen so gradually, that they become harder to observe. Proper documenting of the textile over a longer period of time could be of help here. At the time of development changes in the textile can perhaps be simulated to create some understanding of how the process will end. To speed up the changing process the material could arbitrarily be subjected to the type of stimuli it can be expected to react to. These methods could include washing, rubbing, soaking, exposure to UV-light, use of weather chamber or other ways that simulate the processes the material could go through at considerably slower rates.

Yet dynamic breaking and changing expressions can only be designed up to a certain point. General outlines of how the material changes and what it reacts to can be decided upon by the designer. Changing of the expression however takes place according to the qualities of the material and the outcome depends on how the material is subjected to the stimuli. This phase can not at least fully be controlled, though it can be directed. The directing however can happen beyond control of the designer, by the user, as could be the case with an interactive installation.

In my project ‘Unpredictable home textiles’ it was the user who initiated change in textiles by using them. In another project of mine, ‘Formable knits’ the fabrics used in the fashion designers’ workshop presented different dynamic qualities that a designer could use as a tool for creating certain expressions. The breaking down and changing qualities were designed to be open, so that they would present the fashion students’ opportunities for expression, instead of offering a ready, defined way of use.

In ‘Unpredictable home textiles’ interaction with the user helped making the experience of breakage and change more understandable. Experiencing personally the home textile changing in use made more tangible the connection between the object and the values and behaviour associated with it. User interaction and providing a personal tangible experience of breakage and change as a way of communication was explored further in this work through an interactive installation breaking and changing from the actions of the exhibition visitors. Some parts of the installation are changed before hand to give public an indication of the nature of the materials. In other parts control is assigned to the public. This is done by providing them with means to manipulate the piece, and an encouragement to do so.

In Hanna Landin’s, Anna Persson’s and Linda Worbin’s (2010) project ‘Burning Tablecloth’ the tablecloth reacted to incoming phone calls by burning in random places. Parameters to how the material would react and to what, was set up by the researchers, but the outcome would be defined by the users of the textile. If after initial burn marks the users would decide not to take mobile phones to dining table anymore, the tablecloth
would stop changing. Perhaps of course affecting people’s behaviour could have been one aim in this case. If people spray water on my PVA textile in the exhibition, or crush the copper, the textile will change accordingly. If they do not dare to interact with an exhibition piece, or stop when they realise the textile is reacting, the piece will remain in its original state.

Same situation could be with an object designed to change gradually over time. The designer sets the parameters for change, but it is the user or circumstances that actuate it and mould the object. This uncontrollability leads to a certain degree of chance in the outcome. Each textile starts from the same situation but the outcome is always slightly different. This could be seen as desirable, especially in cases where longer term personal relationships to objects are wished to be encouraged. Then the user would mould the object unique to themselves.

Changing over time happens naturally to all objects as they are worn out by use and time. The difference with specifically designing for expressions that break or change is that the aging process is taken to be a part of the design and its effects on the textile are tried to be anticipated and assessed. It could be seen as designing for different life-spans instead of static objects.

Critical design

Critical design can sometimes be seen as negative commenting on already recognised shortcomings in the current reality. Dunne and Raby (2013, pp.34-35) argue that critical design does not have to be negative. It can also be a gentle refusal of existing reality offering an alternative approach to how things could be. This is also what differentiates critical design from commentary. Instead of merely pointing out existing problems critical design examples suggest an alternative to existing situation, thus opening up space for discussion (ibid.).

Breaking and changing textiles could be seen as a softer way of approaching critical design. By behaving unpredictably and quickly deforming the textiles comment on the current throw away culture. At the same time something having a short life-span is not necessarily a negative thing.

Greetje van Helmond’s graduation collection was called ‘Unsustainable’ (Fairs 2009, p.110) partly as a comment on current consumption patterns, but also because of the short lifespan of the objects. It could be argued that despite their extreme fragility the sugar jewellery is in fact not unsustainable. It is made of renewable materials, and once the crystals are broken, they can be composted or new ones could be grown to replace them, as opposed to many products that become discarded as worn out or aesthetically out-dated. Deliberately designing the objects a short life-span is not necessarily an unsustainable solution. A short lived renewable object could be a more sustainable solution than an object made of durable materials discarded because it has become aesthetically out-dated or worn out.

What differentiates critical design from art is its connection to everyday. Art can naturally exist in an abstract, different reality, but design usually occupies a space in the existing reality, thus becoming recognisable (Dunne & Raby, 2013, p.43). Though abstract in itself, the installation contains elements that are familiar and thus can be related to. Textiles are something people encounter in their everyday life. They come close to skin and are slept between, and identity can be built through what kind of textiles one chooses to wear. Through the intimate relationship people have with textiles they become recognisable. The way they are related to, used and consumed becomes perhaps even self-evident.

Plain white fabric is like an archetypal textile, neutral and so quotidian it becomes almost invisible. Public’s possibility to directly interact with the installation creates possibility for a tangible, personal experience of breakage and change. On the installation remain marks of other people’s interaction with it and how this has affected the material. By behaving unpredictably the materials make themselves visible and subtly question the existing reality. By proposing an alternative way of relating to textiles they open up space for discussing alternative approaches to how material goods are valued, produced, consumed, used and discarded.

Concluding remarks

The installation is an abstract design example of discussing material life-spans, created for exhibition context. The same approach to material life-spans could however be applied to other types of designs and contexts. Objects designed for different life-spans such as super normal objects collected by Jasper Morrison and Naoto Fukasawa, the towel with further options by Takuya and Yuki Niimi, biodegradable Eco-Ware dishes by Tom Dixon and papery smart phone case by Naoto Fukasawa present a more holistic approach to addressing the overall life-span of objects. By designing for different life-spans different rhythms ranging from fast to slow could be created (Fletcher, 2008, p.164). Some objects could be designed
for short term use and subsequent discarding and others for long-term use and maintenance. Objects of a short life-time could satisfy people’s need for change and newness. Slower objects could encourage maintenance and building of person-product relationships. This would also relate to better recognising why certain types of products are purchased.

Textiles and especially garments are often purchased for other reasons than the practical warmth and shelter they provide. In Western countries where standard of living is high consuming goods has become a way of expressing one’s identity. The combination of having money over to spend after paying necessary expenses and decreasing textile prices has led to increased consumption.

At the same relationship to material has changed. Being able to buy plenty of goods is no longer a luxury and with that also appreciation for material has perhaps diminished. Material has become quotidian and through that abstract or even invisible. Production processes behind the goods consumed remain largely invisible to the public and once the objects leave the consumers sphere of consciousness they become invisible again. At the same time the actual object does not disappear, but lingers around as waste.

Textiles and other products are produced from tangible physical raw-materials, but as Albert Borgmann (2000, p.420) suggests, perhaps the industrial manufacturing processes scattered around the world make their origin vaguer compared to the earlier times when people due to necessity had to build, repair and maintain objects more. By having to work hands on with the material they perhaps acquired a better understanding of it. For today’s consumer objects present themselves perhaps more as abstract representations of different values used to build up an identity.

As an example I am thinking of my grandmother’s threadbare terry hand-towels, used until the loops had worn out. For her the hand-towels represented utility objects. Perhaps she also chose ones that she found attractive, but because there was not money to spend continuously on such things they nevertheless were chosen to be used for a long time. In this example material presents itself as something tangible. It has a life-span over which it gradually changes. It comes from a limited supply of material and therefore time is invested in it instead. In comparison purchasing an inexpensive t-shirt with no information about who made it and how, and with little means to repair it if it loses its shape after a few washes makes investing time in it less meaningful. Purchasing a new shirt is more convenient.

Designing for different life-spans could open up for discussing new approaches to sustainability which extend beyond mere material or production efficiency considerations. The most durable option is not necessarily always the most sustainable. Rather it could be a question of appropriate life-spans. Designing for destruction can be seen as critical, but it also presents alternatives to how material goods could be perceived. Instead of solely considering physical sustainability of materials their role and value in the society and individual’s life could be considered. Could there be other values that could take the place of material goods? For example time is becoming valuable in today’s busy society. Perhaps instead of investing money into something, investing time could be valuable. Perhaps by changing how material goods are valued, also the system of how they are consumed could be affected.
References


