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REPORT

Consumer behaviour
on washing

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Summary

Consumer behaviour concerning garments and fashion is an understudied area today. Studies are often performed as self-reporting questionnaires, where respondents are asked to estimate for example how frequently they wash a particular garment, from recollecting their memory of the past year.

For the life cycle assessment (LCA) studies in Mistra Future Fashion (performed in project 2 (P2)), quantitative information about consumer behaviour regarding use and washing of fashion garments was needed. The available statistics on how textiles in general are washed and dried in Sweden do not distinguish between on the one hand home textiles, such as towels and bed sheets, and on the other hand garments. The difference between how consumers treat home textiles and garments was in practice totally unknown, which is especially critical concerning drying habits, since drying is the major energy consuming process for laundry. The consumer behaviour study in project 4 (P4), reported in this document, therefore focused on providing information specifically for fashion garments to the LCA, and to find a survey method without the need of estimation by respondents.

An initial test was made to see whether tagging technology, such as Near Field Communication (NFC), in combination with smart phone apps, could enable immediate feedback, be less time-consuming and less boring to the test person than traditional self-reports and can be a means to also change the consumer's behaviour. A demonstrator was created and displayed at the Mistra Future Fashion Symposium in May 2013. The technology was however too immature to give the requested information about consumer behaviour regarding use and washing of fashion garments within Mistra Future Fashion. Traditional methods were instead turned to in order to deliver the requested results.

In autumn 2014, a survey set-up was created together with the consumer behaviour experts in project 7 (P7) in order to align the background data collection with the larger survey performed in P7 to make the results compatible. One part of the survey consisted of a questionnaire distributed at the Swerea IVF website, via Mistra Future Fashion links, twitter and other channels. The questionnaire contained traditional questions about purchase, use, wash and disposal of garments. 225 respondents participated in the questionnaire. The other part of the set-up was a probe survey where a probe package, containing a scale, a basket, a self-report and instructions, was delivered home to pilot consumers. 19 respondents participated, chosen as friends, neighbours or relatives to people working at Swerea IVF AB. The respondents were asked to fill in the report for each washing machine that was loaded during the period. The weight of the laundry was measured in the households for a period of three weeks. The textiles were divided into **four parts: home textiles dried using "some kind of heat"** (tumble dryers, drying cabinets, heated rooms for hang drying etc.), home textiles dried without heat, garments dried using "some kind of heat", and garments dried without heat.

The results from the web questionnaire were in most cases in line with results from previous studies. The division into home textiles and garments showed that 34% of the laundry was home textiles (bed linen, towels etc.) and 66% was garments. The product



categories **home textiles, underwear and socks were said to be dried using “some kind of heat” in around 50 % of the cases, whereas the rest of the garments were less frequently dried using “some kind of heat”, this occurred in around 25 % of the cases.** The use of detergents and frequency of ironing showed also to be a little different from figures on European average behaviour giving specific input on Swedish consumer behaviour.

The results from the probe study showed that the different households ran between 7 and 39 washing machines during the three week test period. Most respondents used 40°C and **only about 20% of the garments were dried using “some kind of heat”.** Of all washed items that were dried without heat, 75% were garments. The study also showed that many respondents did not have a choice of drying method.

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Foreword

This report is a result of the Mistra Future Fashion programme (funded by Mistra), covering behaviour regarding buying, use and discharge of clothes. In order to find out **about people's behaviour, many** people have been involved, answering questions, weighing garments and describing their behaviour in different ways.

We would like to thank them who have participated in our studies in different ways, without your support these studies were not possible!

Introduction

Objectives

For the life cycle assessment (LCA) studies in Mistra Future Fashion (performed in project 2 (P2)), quantitative information about consumer behaviour regarding purchasing, use, including washing of fashion garments and discharge of clothing and home textiles was needed. The available statistics on how textiles in general are washed and dried in Sweden do not distinguish between on the one hand home textiles, such as towels and bed sheets, and on the other hand garments. The difference between how consumers treat home textiles and garments was in practice totally unknown, which is especially critical concerning drying habits, since drying is the major energy consuming process for laundry. The consumer behaviour study on washing in project 4 (P4), reported in this document, therefore focused on providing information specifically for fashion garments to the LCA, and to find a survey method without the need of estimation by respondents.

The two parts of the study

The first part of this report describes a study performed by Innventia testing a new survey method. An initial test was made to see whether tagging technology, such as Near Field Communication (NFC), in combination with smart phone apps, could enable immediate feedback, be less time-consuming and less boring to the test person than traditional self-reports and can be a means to also change the consumer's behaviour. A demonstrator was created and displayed at the Mistra Future Fashion Symposium in May 2013. The technology was however too immature to give the requested information about consumer behaviour regarding use and washing of fashion garments within the Mistra Future Fashion programme. Traditional methods were instead turned to in order to deliver the requested results.

In autumn 2014, a survey set-up was created together with the consumer behaviour experts in project 7 (P7) in order to align the background data collection with the larger survey performed in P7 to make the results compatible. The second part of this report describes a study performed by Swerea IVF of consumer behaviour with traditional survey methods. The aim was to answer the questions in the LCA in P2 and also other parts of part 4 of this project. Main questions are: Which part of the lifetime of a garments, is for the environment most important to be changed? Impact per day of use could be an interesting measurement, but some data lack from the statistics so far. Some studies have been made considering the use of so called key garments in P2: jeans, T-shirt, dress and jacket. This study has especially considered the questions not already answered in the P7 study mentioned above, and will also give answer to some more questions. The survey was conducted through a questionnaire spread via internet, and a weight registration project. In the second, test persons/families weighed all their laundry during three weeks and also answered some questions.

Tagging for sustainability - Feasibility study

Authors: Therese Johansson, Hjalmar Granberg

Background

The consumer's behaviour during the use phase of textiles (e.g. washing and wearing) is an understudied area. It is also the phase that has the largest environmental impact during the lifecycle of the textile. Consumer studies in the use phase are mainly based on self-reports, i.e. letting the consumers fill in a form with predetermined questions. The filling in and readout of self-report data are usually experienced as boring and time-consuming, and does not allow for any behavioural feedback to the consumers until the data have been analysed, which is usually done at the end of a project.

Why tagging

One may wonder – is there any automatic method to get access to information from the washing & wearing of textiles, and based on the information give direct feedback to the consumer to improve behaviour? Yes – we think that mobile phone readable tags in combination with tailored mobile phone apps can do this. The latest tagging technology is a low cost version of radio frequency identification called near field communication (NFC). This can be read from a distance of couple of centimetre, automatically opening a **mobile phone app and record data. In addition to monitoring the consumer's use phase**, the state of the art report [1] has shown that tagging based technology can be used to add values to fashion such as entertainment, provenance, and new business models. In essence one could say that by adding small tags with limited footprint to the physical goods, one adds an intangible design element having a large but yet unexplored potential.

By performing a textile use phase, consumer based tagging study one can explore:

- Which are the technical challenges faced in an NFC based textile tagging system?
- How do the consumers respond to gamification and instant gratification?
- Did the persons in the study learn to become more sustainable users?
- What are the consumer insights from the use phase of textiles?
- How can the user experience of the tagging readout be improved?
- What are the differences between a self-report and a tagging based readout?

Objectives

The objectives of the feasibility project reported here is to:

- Identify and reduce the risks for a consumer based textile use phase tagging study
- Propose an outline of a following pilot study and a consumer based textile use phase study
- Attract and estimate the interest from companies in such a study

These tasks were undertaken by several cross-disciplinary brainstorming sessions, studying the profile of student consumers through a web based questionnaire, and



presenting the technology as a tagging demonstrator at a Mistra Future Fashion Symposium in Malmö May 2013.

Methods

Cross-disciplinary brainstorming

Much of the work performed has been in the shape of meetings and brainstorm sessions. Participants have been Wencke Gwozdz, Sarah Netter, and Sarah Bly from CBS, experts in consumer studies, Susanne Sweet from SSE, expert in consumer studies and member of the MiFuFa management team, Erik Ottosson and Dominique Sjögren from SignTrace, NFC pioneers, Nandi Nobell, independent designer, and Hjalmar Granberg and Therese Johansson from Innventia, material scientists and activity leaders.

The brainstorm sessions have, among others, addressed the following topics:

- Consumer profile and availability
- Scenarios and risks
- Tags and sensors
- Apps and gamification
- Internet of things
- How to give feedback to the consumers
- Project outlines

Questionnaire for students

Consumers, or project participants wanted in the proposed follow up tagging projects are students, e.g. bachelor students at their first or second year of study, who may not have firmly set use phase behaviour yet and could thereby be easier to influence. Is it possible to use bachelor students in a textile use phase consumer based tagging study?

NFC technology only exists on newer versions of Android smartphones. In Nordic countries the market leader is Apple with their iPhones. SignTrace estimated that approx. 10% of the smartphones in Nordic countries today is a smartphone with NFC technology. If this is true for the students at CBS and SSE, there should be enough possible consumers for the proposed use phase tagging study.

In order to estimate student attitudes to engaging in a use phase study involving tagging technology and to estimate the percentage of students having NFC enabled phones, a quick web based pre-survey for bachelor students at CBS and SSE was compiled. See appendix 1 for data from the web survey.

Demonstrator – first technology study

To visualise the technology, and at the same time look at the interest in using the technology in a consumer based use phase tagging study, a demonstrator with NFC tags was created and showed at the Mistra Future Fashion Symposium in Malmö May 2013. The demonstrator contained both a table cloth, see appendix 2, with print and tags addressing important issues, and tagged clothes. The garments could be tried on and people could try reading the tags on themselves via a smartphone.

Results and discussion

Risks identified and addressed

To be able to perform the study, there should be minimum input from the students with maximum output data. Different scenarios were discussed, including which tags and sensors to use, where to place them, how many garments to tag, how to get good information for the washing behaviour from the students etc. Some risks were identified, see the list below.

Risks and problems

Participant behaviour

- washing by mother or partner --> no info

- lazy participants

- quitting participants

- not enough NFC telephones in participant group

- difficult to read tags (non-intuitive or awkward)

- Changing seasons during the study – garments for all months of the study

Gamification - feedback

- privacy issues

- game elements not interesting

Technology

- is the tag washable?

- does the iButton/sensor work?

- no internet when reading tags

How to reduce the risks above was also discussed. See the list below.

Reducing the risks

- student profile questionnaires

- researcher brainstorm sessions

- simple demonstrator

- buy and test technology

- tag workshop

tag design

relevant gamification elements

input to design of tag in clothes

In the present feasibility study some of the risks were addressed, please see the following sections. Some of the risks are proposed to be targeted in the projects following the present feasibility project, see more in section *Project proposals*.

Students and their smartphones

As mentioned above, the desired consumers to use in a following textile use phase tagging study are bachelor students. It was suggested that 50 students at SSE in Stockholm and 50 students at CBS in Copenhagen would be manageable and enough to make an interesting consumer use phase study. A suitable duration of the study would be four to six months.

The questions, and answers, of the pre-study compiled can be found in appendix 1. The students were asked what smartphone they use and if they would be willing to participate in a study such as the tagging study. Due to different reasons the survey was only performed at CBS with some 50 replies received. With the limited amount of participants this pre-survey should be considered indicative.

58 students answered the question about phone model. 60% of the respondents have an iPhone, whereas 10% have a smartphone with NFC technology. 44 students answered the question on willingness to participate in a 4-6 month study, 14% said yes and 32% said maybe. Those who said no (55%) and gave a reason, often mentioned that it sounded time consuming, and some thought it would be too personal for sharing. Arguments for participating were because of better consumer awareness and for interest in seeing how one would act when having the possibility to behave in a more sustainable way. One interesting economical argument was also given; someone who did not want to spend too much money on clothes was interested in learning how to keep the garments better. Out of 43 students, about 50% thought it would be interesting to receive tips on how to use the clothes in a more sustainable way.

With the bachelor students available at CBS and SSE, a large enough group to find participants to the study should be available within the 10% of the students with a smartphone with NFC technology. To be able to get students to participate, different incentives for participating in the study were discussed. One option could be to give away smartphones, however that is a quite expensive alternative. Other suggestions were designer clothes, a chance to win/earn a smartphone, gift certificates etc.

Tags and Sensors

The NFC tags themselves are not smart; they require an app to tell the smartphone what to do or what data to gather. There are washable NFC tags, and even though they are relatively small, thin and flexible, they are not designed to visually disappear when applied on fashion garments. Another option for NFC tags could be QR codes; they

however require a QR reader on your phone which adds an extra step when reading the tags. On the other side, they work on iPhones as well.

RFID tags have different uses, Mistra Future Fashion have come in contact with a version used by Textilia. Textilia can keep track of all their items and it seems easy to use the **tags. However for the tags to work this “easily”, they are used in closed systems with** different reading stations to keep track of the items.

Interesting data to gather in the tagging study is wear frequency, washing frequency, washing temperature, drying temperature, detergent use etc. There are humidity and temperature sensors that can give some of this information; however a consumer study like the proposed tagging study quickly complicates things. With 50 students in Copenhagen and 50 students in Stockholm there is no closed system. The sensors should be loggers so they can log data, and the data should be readable without much effort. They should also be washable.

iButton logger sensors are small and lightweight, and can be sewn into garments. There are also both temperature and humidity loggers available from Maxim Integrated producing the iButtons.

To read the iButtons, a kit of an adapter, reader/probe and a computer is needed. There is no wireless reading possibility today; at least the adapter is still necessary. If looking at wear only the iButtons could be possible to use. There are iButtons that could log data for a six month study. One objective of the consumer study, however, is to try to change the behaviour of the consumer and that requires data gathering and feedback. If the sensors are sewn in discreetly, they might be difficult to take out and read. Collecting the iButtons half-time to read the data might be one option for dealing with sensor data.

However, the iButtons require protection in order to withstand water so to use them in washing machines might prove complicated. Maxim Integrated recommends their iButton capsule, it weighs 18 g and has a diameter of 25,4 mm and a height of approx. 25 mm [2]. Another water proofing option is a low weight silicone based capsule, it weighs 5 g, is 25 mm long and has a diameter of 22,5 mm [3]. Both of these are difficult to discretely sew into/onto garments.

A second option discussed was a washable temperature sensor that could be thrown in with the garments being washed. This option would require registration of garments being put in the washing machine. A sensor that was looked into was the Mini Spy RF Green [4], which is a washable wireless temperature data logger. The advantage of this product would be the wireless solution; the disadvantage would be that it needs a closed system with internet access points where it can be read. This is still possible but at quite a high cost. This could however be looked into if desired in a future step of the study.

The third option was most discussed and involves the development of an app to register temperature, detergent etc. This would require app development costs, and more input **from the students. However it could probably be made quite “smooth” for the students.** This is the option recommended at this stage. However, this issue should preferably be evaluated in a pilot study before the consumer study with the students. See more in section *Project proposals*.

Tagging demonstrator

The tagging demonstrator was created so that the tag reading situation could be experienced, and it was also a tool for raising awareness and interest for the proposed use phase tagging study. The demonstrator consisted of a table cloth, see appendix 2, with illustrations of important aspects to feed the discussion, e.g. NFC tags, Internet of things, sustainability, the use phase of fashion and selected issues for the proposed consumer study. NFC tags were hidden under some illustrations and more info could be obtained through the smartphone. Another part of the demonstrator was clothes with tags for people to try on, and test and experiment with the tags and smartphones. The garments illustrated where the tags could be hidden, and how it was possible to read the tags when wearing the clothes.



Figure 1 Discussions during the tagging demonstration May 28th, 2013. Demonstrator cloth with tags on table.

Depending on the smartphone, download preparation, and the internet connection, the response time for reading the tags varied between 1 to 30 seconds. During the demonstration when everything was new and exciting, longer response times did not matter, but this may become an issue for the consumers in the proposed use phase study. The consumer attitudes towards reading response times should be investigated, preferably in a pilot study.

Outcome of demonstration in Malmö May 28-29th 2013

The table cloth and tagged garments were much appreciated in Malmö. It was possible for both researchers and industry representatives to try the NFC technology and to better understand the idea of the consumer study. Some questions were raised:

- Are the tags washable, will they fall off?
- Does washing really have such a big environmental impact?
- What is the extra fun/info that would make the tags worth while, instead of information on a website?
- What are the tags made of? --> Environmental impact, relative to the impact the tags give?
- Tags in stores – privacy issues, is it ok at all?

Generally speaking there was much interest from researchers, and there were many ideas on collaborations and comparisons with other ways of performing a consumer study of the use phase. From the industry there was less interest, at least regarding willingness to pay for this kind of study. However they are interested in data on the use phase of fashion. It is possible that the technology is perceived as still in an early stage, and that there are questions also related to privacy and sustainability regarding the tags that are not clear for the industry. Privacy and sustainability issues should possibly be addressed in following projects.

Project proposals

The discussions and activities performed within the present feasibility study emanated in a multi-step project proposal with toll gates. Figure 2 shows an overview of the steps and some more information regarding activities for each project can be found in the lists below. This report represents the tollgate after the feasibility study.

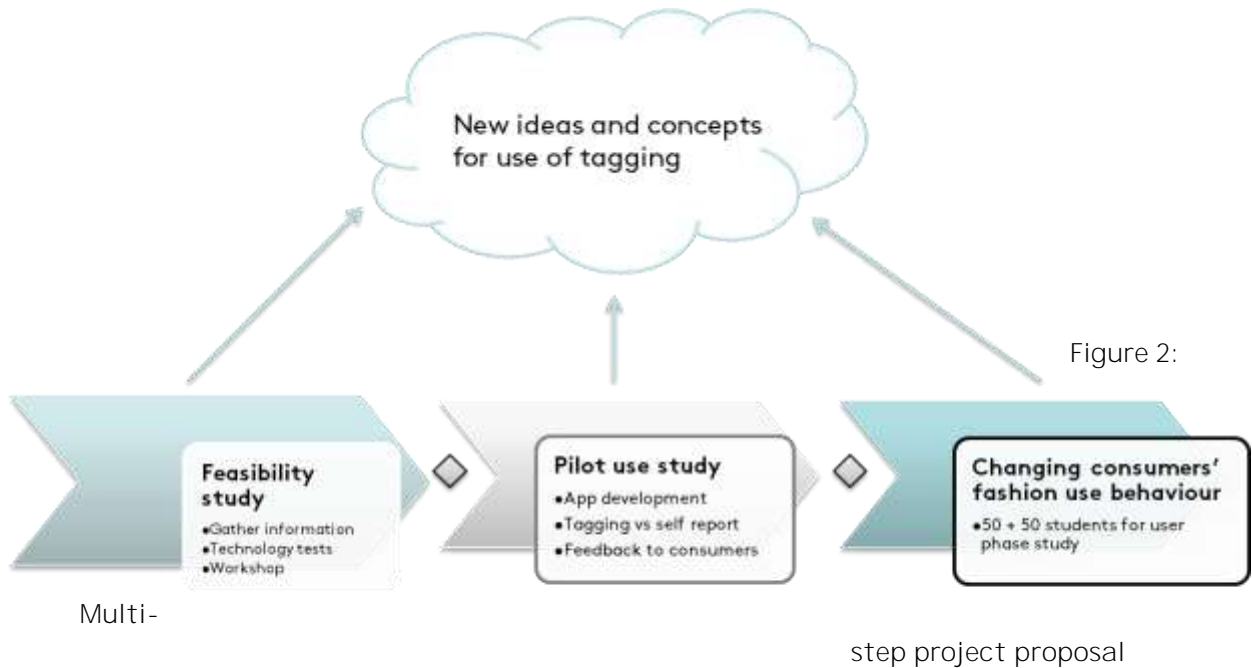


Figure 2 Multi-step project proposal

Feasibility study (ending with the present report)

Activities:

- Gather information

Options for tags (NFC, other RFID tags, QR codes)

Can we use temperature sensors, what equipment is needed?

- Technology

How do the sensors work?

What data can we get out?

- Workshop (Demonstrators with tags, May 2013)

How do the phones and apps work?

Where can the tags be placed?

- Report

The proposed follow-up projects are a pilot use study and the textile use phase consumer based tagging study.

Pilot use study

Activities:

- Development of app for use and washing study
- Preparation for 2 week pilot study

Questionnaire. Definition of sustainable user.

- Self-report vs. tagging

5 + 5 persons (within MiFuFa) are recruited for a 2 week study. 5 persons (self) report use and washing of 5 garments, 5 persons have 5 garments tagged.

Implementation of temperature sensor

- Gamification

Workshops – how to give feedback? Social networking? Fun and gaming? Material library?

- Report

Time frame:

- 4-5 months

Changing consumers' fashion use behaviour

Activities:

- (Further) development of app for use and washing study
- Preparation for 4-6 months field study

Recruitment. Questionnaire. Tags, database etc.

- Field study

50 + 50 bachelor students (at CBS and SSE) with 30 garments each tagged

- Gamification

Development and implementation of gamification.

- Report + publications

Time frame:

- 18 months

Conclusions and suggestions for further work

- It is possible to perform a consumer based use phase tagging study.
 - There are enough bachelor students at CBS and SSE with a smartphone using NFC technology
- The recommendation in this step is to develop an app to record washing data instead of using sensors.
- A pilot use study is recommended before the consumer based use phase tagging study to:
 - Test the technology
 - Define a sustainable user
 - Evaluate tagging vs. self-reports
 - Address privacy and sustainability issues, both for consumers and interested companies.
- The interest from the industry was not as high as anticipated, the interest from researchers was higher.
- The application of tags to clothes really inspires and awakes much interest, but is still to a large extent technology driven.

References tagging feasibility study

1. Joint state of the art report – Mistra Future Fashion proj. 2 and 4, Swerea IVF, Innventia and Chalmers University of Technology, March 2013.

2 <http://www.maximintegrated.com/datasheet/index.mvp/id/5190>, accessed 2013-10-25

3 http://www.signatrol.com/product/132_pack-of-5-enclosures.html, accessed 2013-10-25

4 <http://www.jri-maxant.com/mini-spy-rf-green-prd6-15-143.html>, accessed 2013-10-28

Consumer behaviour study, using web-survey and practical tests in homes

Authors: Simonetta Granello, Sandra Roos, Anna Karin Jönbrink

Background and objectives

The tagging technology described in the previous chapter proved to be too immature to give the requested information about consumer behaviour regarding use and washing of fashion garments within Mistra Future Fashion. Traditional methods were instead turned to in order to deliver the requested results according to the objectives described in the introduction.

Methods

In order to find out the necessary information, it was decided to go for a combination of a web survey and a probe study.

Web survey

Questionnaire development

The choice of questions to this questionnaire was made in several steps. The primary and main focus was to answer the questions of the project outlines as described in the objectives. Second, other similar projects that were in the same field, were glanced at, for possible benefit by having more or less the same structure.

The survey was intended to include only the least possible questions (for example questions around washing by hand was excluded) in order to increase response rates. The exact choice of words in the text was thoroughly discussed to make the intended meaning as clear as possible and maximize the ease of participating. Meetings were held with project participants from the Mistra Future Fashion P2, P4 and P7, and also with the P4 advisory board to gather experience and advice. It was for example discussed whether the questionnaire should render facts about a person or facts about a household. It resulted in a mix: one person is responding for many persons in some cases, at least if this person is washing and buying clothes for others. We consider the resulting questionnaire to be clear for the respondent on where information is requested for one person and where it is requested for the unit as a household, washing together.

The questionnaire and the probe study instructions were only distributed in Sweden in the Swedish language¹. All the answers were set to multiple choice questions for practical reasons, even in cases when it was not necessary to have multiple choices (sex, income, access to car etc.). The questionnaire was further tried out sharp by test persons on the Internet before the release of the final version.

A translated version of the questionnaire can be found in Appendix 3.

¹ In case there is confusion about the English translations used in this report, the accurate wording can be found in the original questionnaire or the survey text.

Questionnaire distribution

The questionnaire was distributed via the available channels within the limits of the project budget and time. We tried to reach as many participants or respondents as possible in a short leap of time. From November 2014 to January 2015, the questionnaire was available on the Internet and the spreading was performed via: social media, Swerea IVF's twitter account, private Facebook spreading from colleagues, via Intranet, private channels via Mistra Future Fashion participants, a textile newsletter (e-mail to 1500 recipients), links at project website and Swerea IVF website. This method is sometimes referred to as "snowball **sampling**"². From the beginning it is possible to have control over which persons that spread the message, but from a certain point it will spread without control in all the directions.

225 respondents answered the questionnaire. It was seen clearly that the main part of **them answered directly when they got the link. Each "push" resulted in respondents** immediately, and then they faded out.

Probe study

Probe study planning

The choice of background questions to this part of the study was made in a similar way to the questionnaire. As this study was small sized, there was no intention of covering a special population segment by the participants. The primary and main focus was to answer the questions of the project outlines as described in objectives. Other similar projects that were in the same field were glanced at, however no probe weighing studies concerning domestic laundry could be found, why this was seen as a screening survey to outline what is important.

The aim of the probe study was to reach 20 participants, since the effort per participant is higher for this type of study compared to the questionnaire. For each participant was obtained a 5-kg-scale, an adjacent laundry basket and a compensation reward to the participant. A "**weighing-kit**" with **detailed** instructions for the three-week test period was prepared, as well as a questionnaire for each laundry cycle during the test period. The probe study protocol was tested out sharp by a colleague who was not involved in the project.

The participants were not supposed to work at Swerea IVF or be participants in the Mistra Future Fashion project. Therefore colleagues and friends were asked to encourage their neighbours, friends, relatives or other reliable persons to take part in this project. 19 participants finally volunteered, all living in western Sweden. Many of the persons who did not want to participate replied that it was too much effort to weigh their laundry for three weeks. Several of the participants on the contrary were eager to do this in order to contribute for the sake of the environment.

² http://en.wikipedia.org/wiki/Snowball_sampling

Questions in the probe study

In the probe study, each laundry cycle during the test period was followed by information about wash temperature, if any of the “key garments” were represented in the laundry, the colour of the laundry (estimation based on a scale from light to dark) etc.

For each laundry cycle during the period, the dry weight (before washing) was weighed, divided in four piles:

1. Home textiles that will be dried by tumbling or other method using extra energy
2. Garments that will be dried by tumbling or other method using extra energy
3. Home textiles that will be dried by hanging in the air (no extra energy use)
4. Garments that will be dried by hanging in the air (no extra energy use)

The test period was chosen to three weeks. It was presumed that in this period, most people change their bed linen at least once.

A translated version of the instructions and questionnaire can be found in Appendix 4.

Results

Results from the web survey

Background information about the respondents

The background information questions were chosen to be identical with some of the background questions in the previous study from P7 (Gwozdz et al., 2013). This gave the opportunity to extract more respondents from certain groups and have more information on the same topic.

Mostly women answered our questions; 75% were women and 25% were men. None of the respondents were below 19 years old, and only 2% were more than 65 years old. 84% of the respondents had access to a car. The numbers of persons in each household were as follows: 45% of the respondents lived in households of one or two persons and slightly more were three or four in the household. 18% of the respondents had children below 6 years old and 32% had one or two children between 6 and 18 years old. The education level of the respondents was high. 70% had a university degree, 14% had attended university but had no degree (yet), and 16% had attended senior high school as their highest education level. About 50% of the respondents had 10 000-30 000 Swedish crowns net profit monthly, 10% had below 10 000 SEK monthly. 27% of the respondents washed in a shared washhouse or laundry room, and 73% had their own facilities. Almost 45% hang dried their laundry, 35% used tumble dryer to dry their laundry and 20% used heated cabinet or heated drying rooms.

Questions about purchase of garments

In the questionnaire, the first six questions were about where and how the respondents buy their clothes. **The questions about "where" considered mode of transportation and distance to this place. The questions about "how" considered how often, how many garments and if something else is bought at the same time.**

77% of the respondents answered that they usually buy their clothes in shops, 15% on internet and 7 % buy second hand. Someone commented that they respond as if textile fabric is clothes as they produce their own clothes by sewing at home. Others specified which items they buy second hand. Many comments showed that underwear and socks are not bought second hand.

The distance to the place of purchase is between 2 and 15 km in 65% of the cases and the most common way to get there is by car or by public transport. 16% go to the place of purchase by foot. Some comments consider that they go shopping where they work or when they have the opportunity to be in other locations.

How do You get to the place of purchase of garments?

(more than one answer possible)

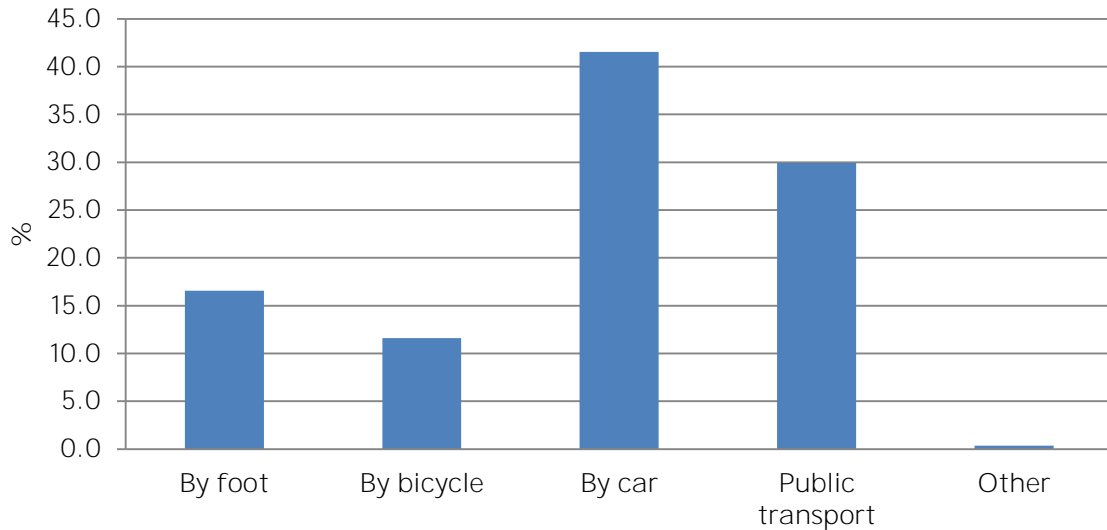


Figure 3. How to get to the place for purchase of garments

When buying clothes, 52% of the respondents did this as an activity with this single purpose, while 37% of them did this together with other planned shopping. Only 11% bought clothes when they happened to see them, for example when they bought food etc.

How do You normally go about buying clothes?

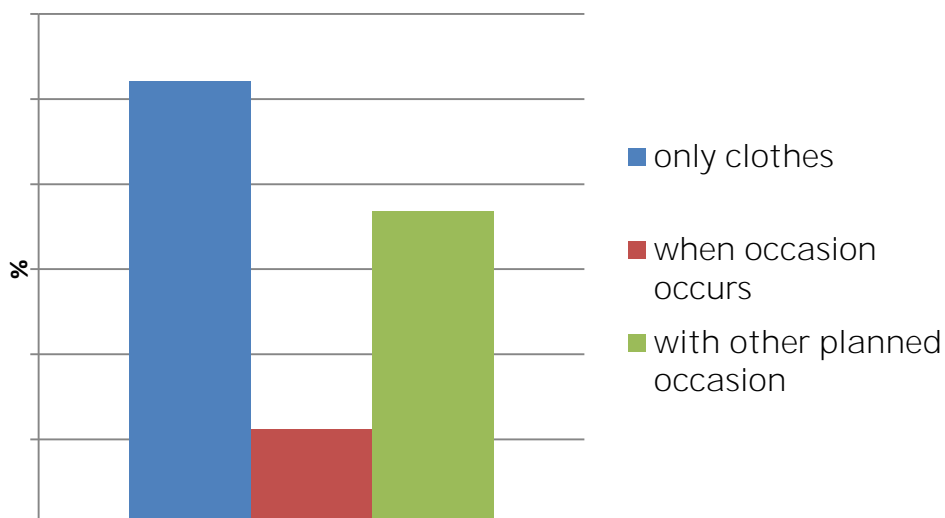


Figure 4 How to buy clothes.

Many respondents commented that there is big difference in the buying habits depending on if they buy garments to themselves or to their children. As children need new clothes for different reasons (they grow between seasons) the shopping habits will also look different.

Questions about use of garments

In the second section of the questionnaire, questions were all about the “key garments” in this project. The garments were called jeans, T-shirt, dress and jacket. A definition of each garment was provided by giving an example and also a short description in the question. Several respondents did nevertheless comment that they did not know how to classify their garment in a right way. The definition “**dress or other fancy garments**” could for example be interpreted as a nice shirt for a male or a fancier garment. Some respondents used dresses often but understood **the question as more “party dress”**.

The respondents were also asked to estimate how many of the garments they possessed and how often they used them. Many commented that this was a “tricky” estimation as some changed clothes several times a day and did not know **how to count “one wear”**. Most however also commented that they presumed we meant one time = one day in the question.

Jeans

Jeans in the questions were defined as full length trousers made of cotton, denim or stretch material and with closing. 64% of the respondents had 3-7 pair of jeans and 34% of the respondents used jeans more than 251 times in a year. 17% of the respondents had less than 3 pair of jeans and 17% had 8-15 pair of jeans. 13% of the respondents used jeans less than once a week in a typical year.

How many times in a year do You wear jeans?

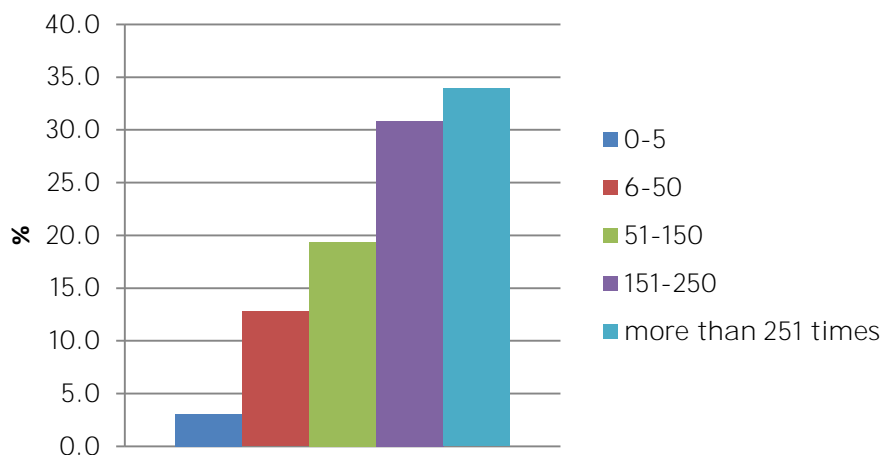


Figure 5 Jeans wearing frequency.

How many times do You use a pair of jeans before You wash them?

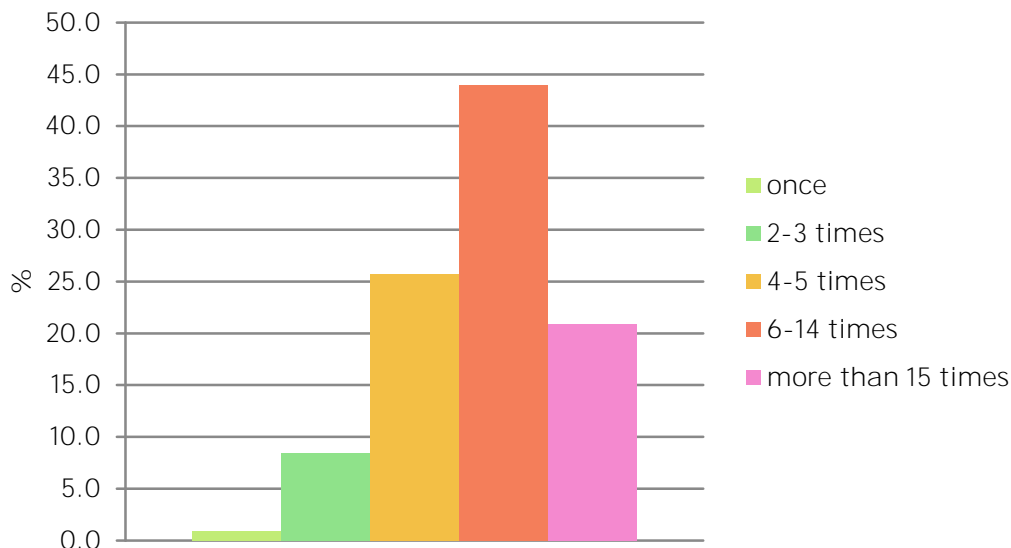


Figure 6 Jeans washing frequency.

T-shirt

The definition of T-shirt in the questions was a short sleeved top made of cotton jersey or similar material. 44% of the respondents had 3-7 T-shirts and 32% of them had 8-15 T-shirts. 35% of the respondents used T-shirt more than 251 times in a year. 16% of the respondents used T-shirt less than once a week in a typical year.

Dress

The definition of dress in the questions was a fancy garment or other party wear. 38% of the respondents had 3-7 dresses and 15% of them had more than 16 dresses. 53% of the respondents used dress 6-50 times in a year, and 28% of the respondents used dress less than once a week in a typical year.

Jacket

The definition of jacket in the questions was a light outer wear, not a suit jacket, coat, heavy winter wear, rainwear or workwear. 60% of the respondents had 3-7 jackets and 25% of them had 0-2 jackets. 32% of the respondents used jacket more than 251 times in a year, and 12% of the respondents used jacket less than once a week in a typical year.

Questions about washing of garments

In the third section of the questionnaire, the questions treated the washing procedure, e.g. how often people wash their key garments and which items they wash at home, and their use of different washing temperatures. There were also questions about the drying method, ironing and dosage of detergent and softener, if used. Several of the most common user behavior differed between the garments:

- 34% of the respondents used a dress 2-3 times before they wash it
- 44% of the respondents used a pair of jeans 6-14 times before they wash them
- 46% of the respondents used a T-shirt 2-3 times before they wash it
- 96% of the respondents used a jacket more than 15 times before they wash it

When several different items were listed (home textiles, sportswear, nightwear, underwear, socks, heavy sweaters, skirts, trousers, blouses, shirts, jeans, T-shirts, dresses and jackets) some of these products showed to be treated in special ways:

- Least washed at home were: jackets, dresses and blouses
- Most dried with energy were: socks, underwear and home textiles
- Most frequent for use of ironing were: skirts, shirts and blouses
- Most frequently washed with use of softener were: home textiles, underwear and T-shirts

Which items do You iron?

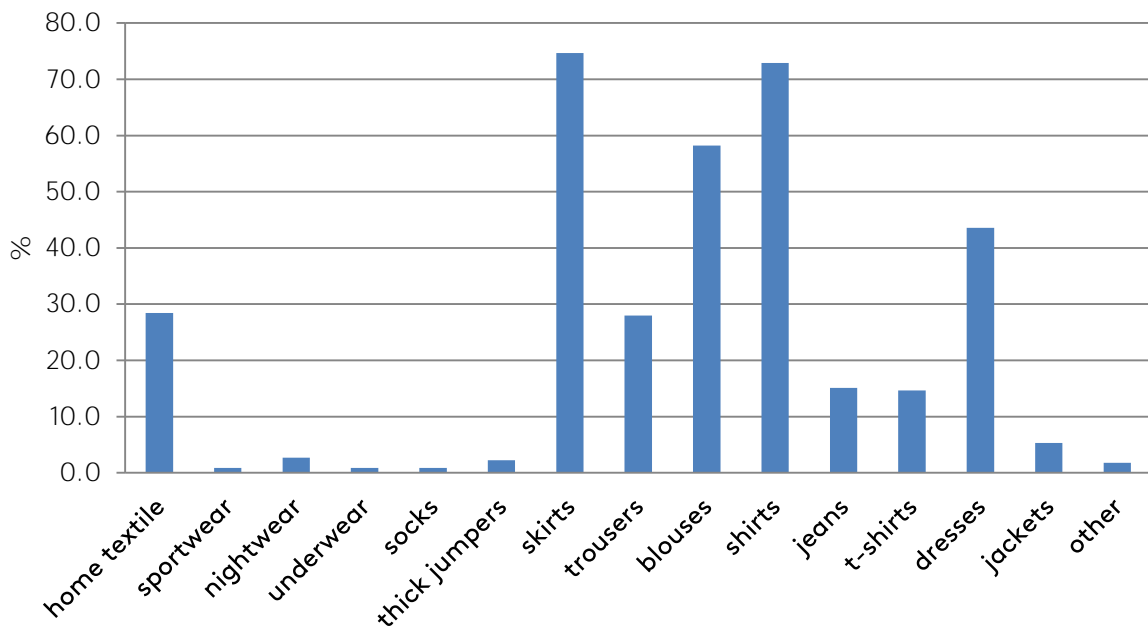


Figure 7 Ironing frequency.

When it comes to washing, 50% of the respondents claimed that they used the recommended amount of detergent.

If they used softener (54% did not) they did not use the recommended amount, but they used very little.

Questions about discharge of garments

In the fourth section of the questionnaire, the questions treated discharging of garments: how many times the respondents used their “key garments”, **which items they** threw away at home, and their choice of different disposal methods.

- 30% of the respondents used a dress 21-50 times before they discharged it.
- 52% of the respondents used a T-shirt more than 100 times before they discharged it.
- 82% of the respondents used a jacket more than 100 times before they discharged it.
- 93% of the respondents used a pair of jeans more than 100 times before they discharged them.

What do You do with garments that have been discarded?

(more than one answer possible)

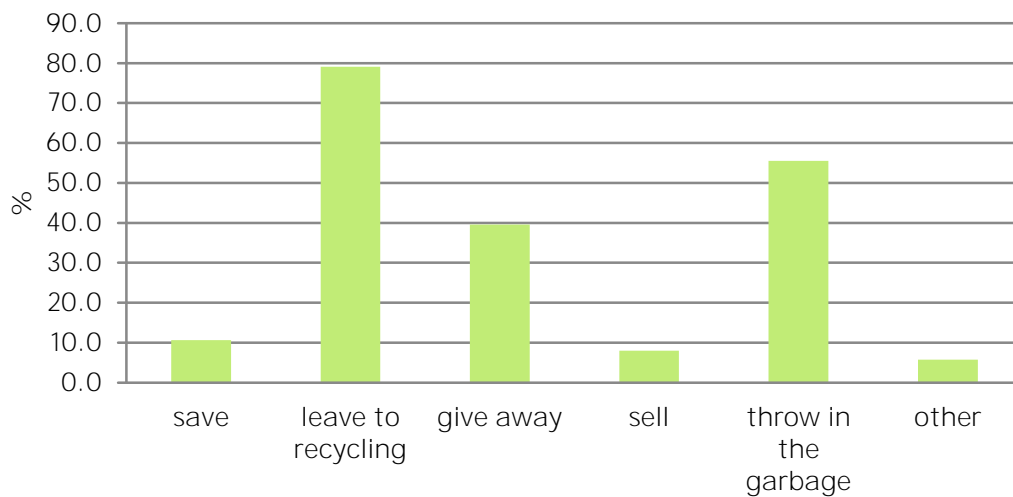


Figure 8 Discharge of garments.

One interesting question was why they discarded a garment.

Why do You discard a garment?

(more than one answer possible)

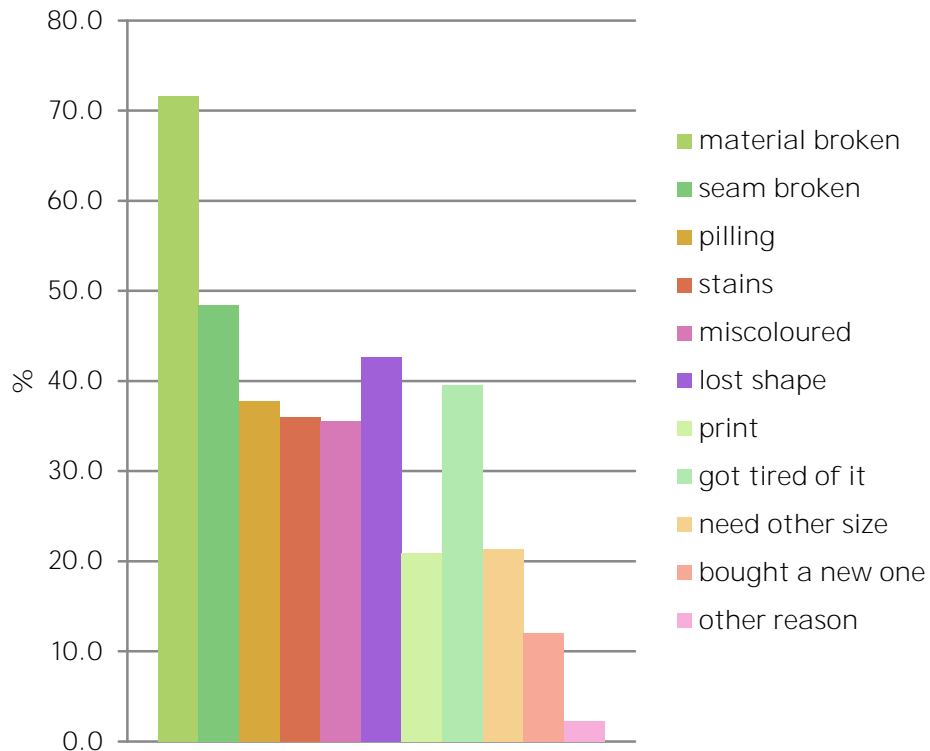


Figure 9 Reason for discharging a garment.

The most common reasons for discharging a garment were: broken material, broken **seam, loss of shape or simply "got tired of it"**. The **least common reasons for discharging** a garment were: that the respondent bought a new one, bad print quality or the need of another size.

When the respondents decided to get rid of the garment almost 80% left some clothes to recycling in some form. More than 50% threw some away in the household garbage. The most common way of transportation to the place for discharge was by car.

Results from the probe study

Background information about the respondents

The participating households contained from one to more than five persons. During the test period 19 households and the laundry of 53 persons were subject to this analyse of washings. Almost half of them were children. In the majority of the cases a woman filled in the information as the person normally performing the washings in these households.

95% of the test persons (the 19 that filled in the test protocols) had a university degree, which is far more than the average in Sweden. In many of the families not all the persons lived in the household all the time. The number of persons may be misinterpreted due to this. Also the laundry from one person was done in several different households sometimes. Especially separated parents with children wrote comments about this.

Results from the probe study on buying behaviour

Several aspects in the questionnaire did not differ when respondents with children were separated from respondents without children (about 50% with/ without). The respondents estimated that they had more or less the same number of key garments at home, and they used them more or less the same amount of times before they washed or discarded them.

When the respondents with children went shopping they still shopped in shops (not more often on the internet) and estimated that they shopped closer to the home than respondents in average. When they went shopping they bought more garments every time. This is logic as they have bigger families and less time.

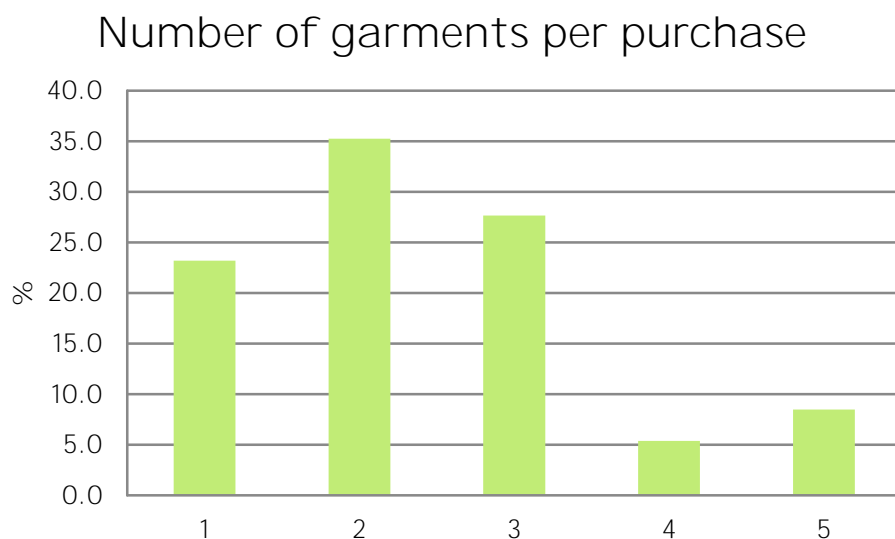


Figure 10 Number of garments per purchase, all respondents.

Number of garments per purchase for respondents with children

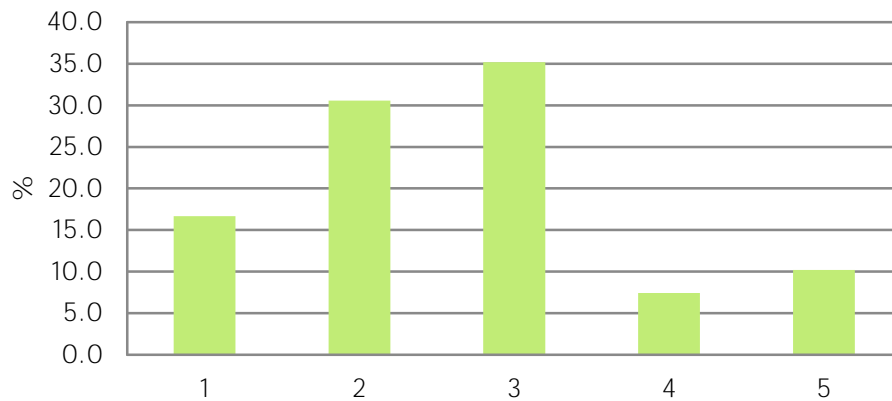


Figure 11 Number of garments per purchase, respondents with children.

Results from the probe study on use phase behaviour

Several aspects of wear before wash did not differ when respondents with income below and over 30 000 SEK monthly (about 50% above/ below) were separated. Both respondents with high income and low income estimated that they had more or less the same number of key garments at home, and they used them more or less the same amount of times before they discarded them.

One exception was the number of uses before wash for the dresses, where respondents with high income washed dresses more seldom. There was no question included about the price range when they buy their clothes in the questionnaire. Perhaps this could be the reason for people with high income to wash their dresses more seldom than respondents in average.

In the earlier Mistra Future Fashion study performed by Gwozdz et al. (2013) 38.6% of the respondents estimated that they used a T-shirt twice before they wash it and 15.8% used it once.

How many times do all respondents use a T-shirt before they wash it?

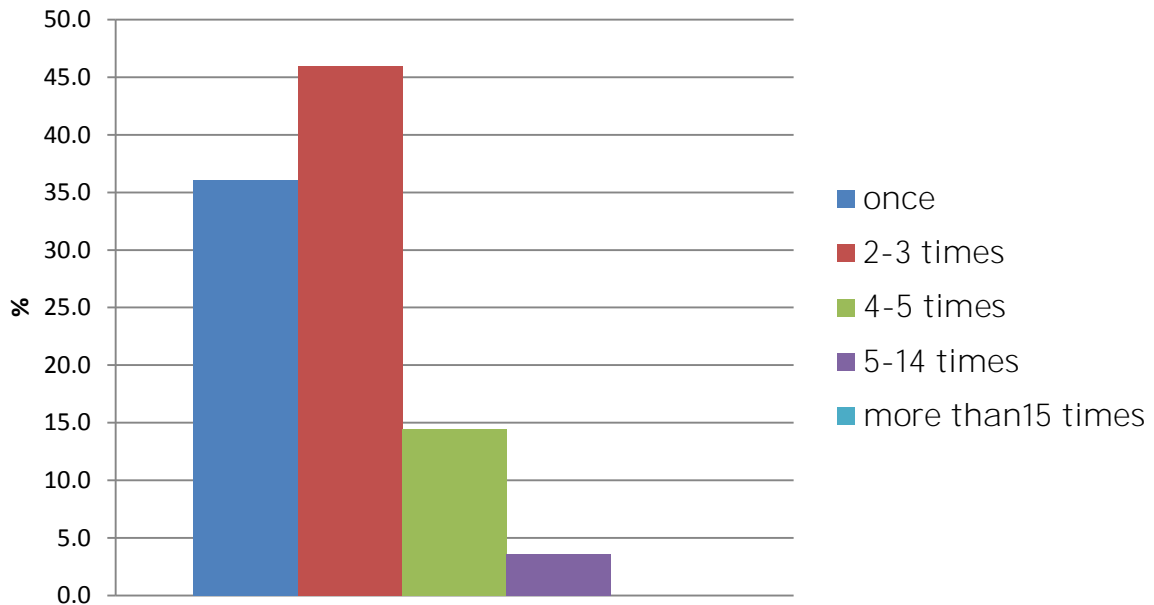


Figure 12 Number of uses of T-shirt before wash, all respondents.

How many times do respondents with high income use a T-shirt before they wash it?

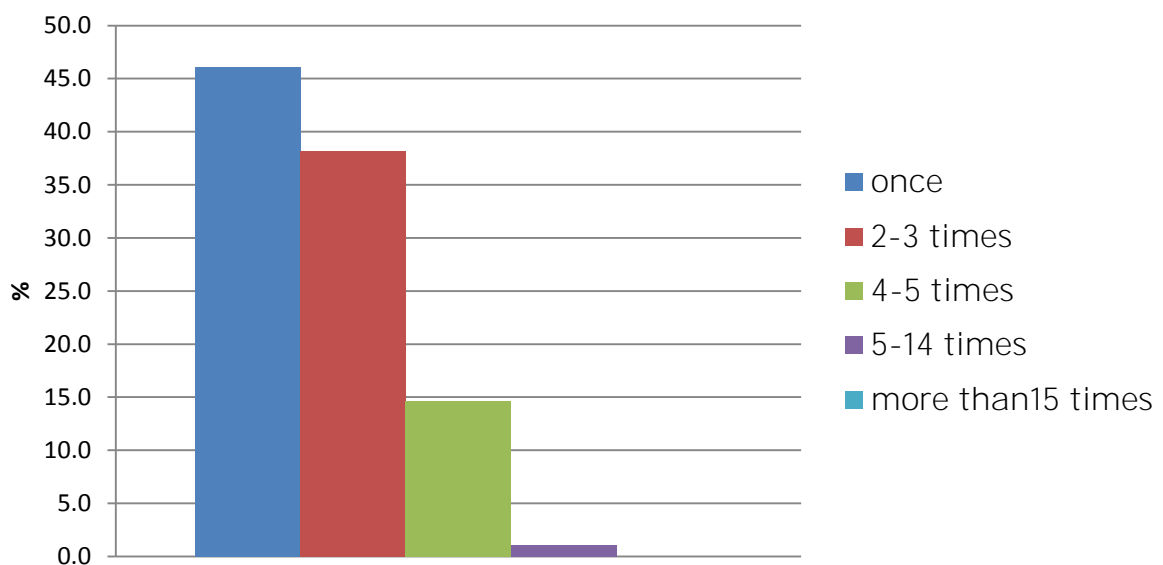


Figure 13 Number of uses of T-shirt before wash, high income respondents.

How many times do all respondents use a dress before they wash it?

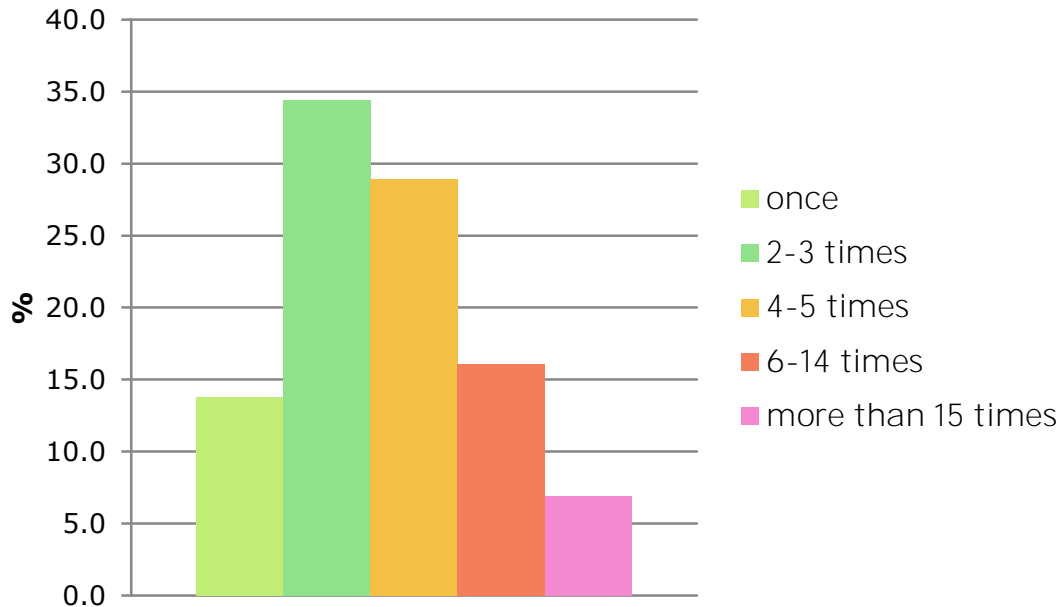


Figure 14 Number of uses of dress before wash, all respondents.

How many times do respondents with high income use a dress before they wash it?

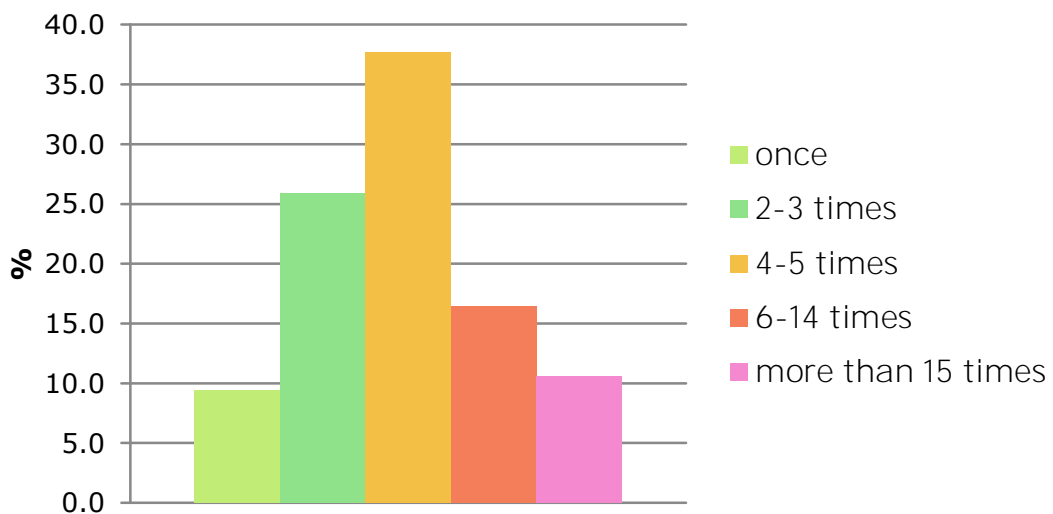


Figure 15 Number of uses of dress before wash, high income respondents.

Results from the probe study on washing behaviour

In total 236 laundry cycles with the average load of 2.7 kg were performed during the test period. The average washing temperature was 44.4°C and the average colour of the **washed items were almost equally light and dark on a scale where the choices “mostly white”, “bright colours”, “dark colours”, and “mostly black” were used.**

In total 628 kg of laundry was weighed and 66% of this was garments (**defined as “all items you can wear”**). The rest was considered as home textiles.

A wide variety of detergents were used. Many households used different detergents for different purposes and or different days during the test period. In 18.2 % of the laundry cycles softener was used. Many households did not use softener at all. In 8.1 % of the laundry cycles stain remover was used. Many households did not use stain remover at all. 24% of the garments were tumble dried or dried with other method using energy. 51% of the home textiles were tumble dried or dried with other method using energy.

Results from the probe study on washing temperature and softener

In the probe study, the washing temperature was registered as a measurement, and when the average temperature was calculated for all laundry cycles during the test period, the resulting figure was 44.4 °C. This is an average including washings also with home textiles.

The questionnaire included questions about which temperature the respondents most often used for garments, and 73% of them answered that 40°C was the most common temperature and in average they used 43.7°C as washing temperature. In the earlier Mistra Future Fashion study performed by Gwozdz et al. (2013) respondents estimated that their average washing temperature for clothes was 42.9 °C (77.8% used most commonly 40°C). In the probe study, the **respondent’s answers showed** that in 18.2 % of the washings softener was used. Many households did not use softener at all. In the questionnaire respondents listed for which items they used softener, see figure below.

Which items do You wash with softener?

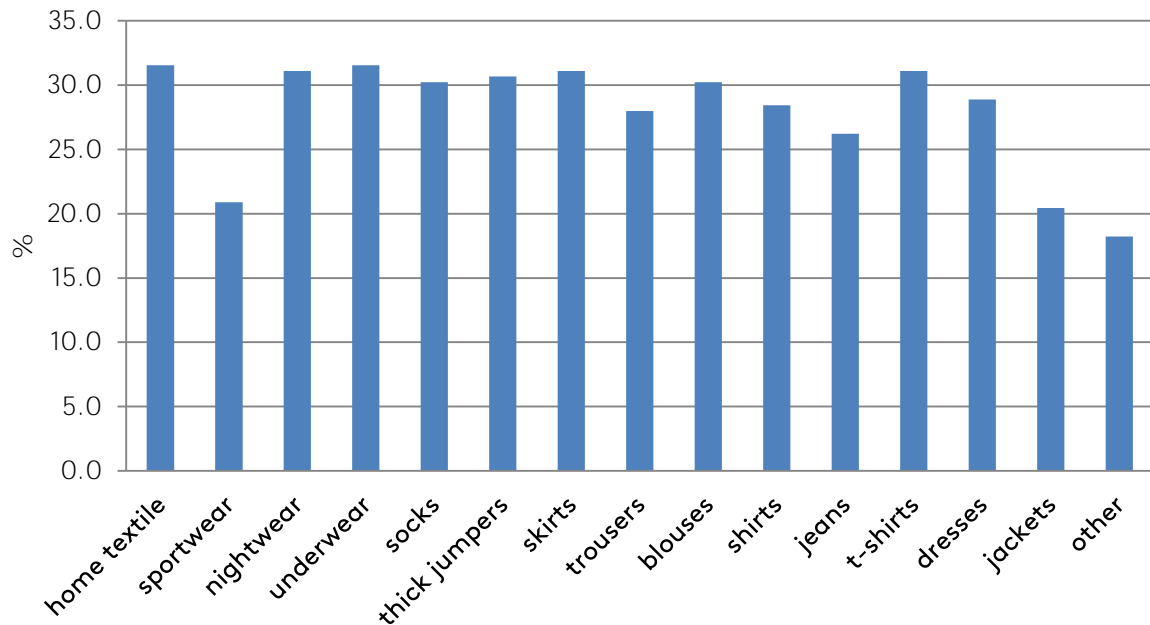


Figure 16 Use of softeners

Results from the probe study on drying

In the probe study respondents' answers showed that 50 % of the home textiles were dried with extra energy use (e.g. drying cabinet or tumble dryer). The same estimation was made by the respondents in the web questionnaire. These also listed for which items they use energy to dry, see figure below

Which items do You dry "with extra energy"?

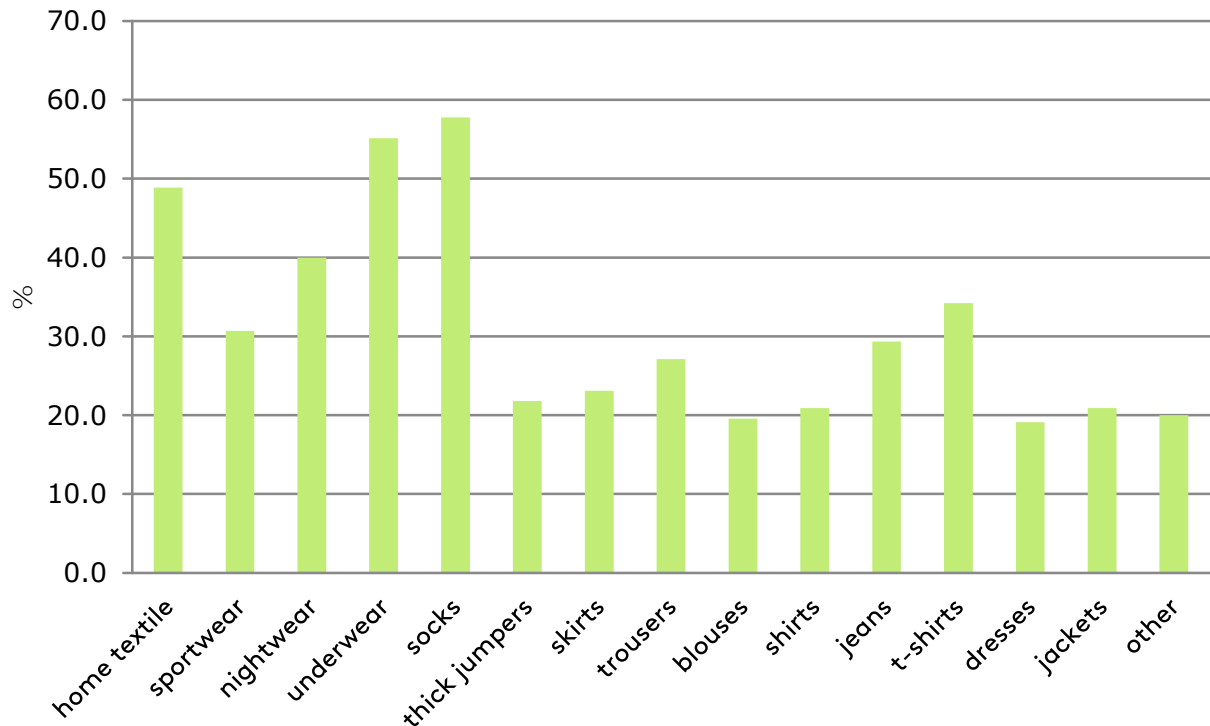


Figure 17, Use of "extra energy" for drying washed items.

Suggestions for further work

- To perform a longer study. One year would be a suitable period to catch variations over the seasons.
- To clearly define the test object. When further web surveys or probe studies are made, we recommend having a more strict definition regarding if it is one person or a household with several people that is measured in the study.
- To ask people keep a clothing diary for what clothes they wear during the test period.
- To include inspection of the garments, regarding pilling, holes etc. of discarded garments.
- To use a more sophisticated analysis equipment with tagging or other methods, when the technology is mature.

References consumer behavior study

Gwozdz, W., Netter, S., Bjartmarz, T. and Reisch, L. A., Report - Survey Results on Fashion Consumption and Sustainability among Young Swedes, Mistra Future Fashion Report, 2013, available at

<http://www.mistra.org/download/18.235dce8d1429b736de3406/1386697330067/Report+Mistra+Future+Fashion+Consumer+behaviour+2013.pdf>

Common discussion and conclusion: Tagging feasibility study and Consumer behaviour study

Consumer behaviour concerning garments and fashion is an understudied area today. Studies are often performed as self-reporting questionnaires, where respondents are asked to estimate for example how frequently they wash a particular garment, from recollecting their memory of the past year.

For the LCA studies in Mistra Future Fashion, quantitative information about consumer behaviour regarding purchasing, use including washing and discharge of fashion garments was needed. The available statistics on how textiles in general are washed and dried in Sweden were not sufficient.

An initial test was made to see whether tagging technology, such as Near Field Communication (NFC), in combination with smart phone apps, could enable immediate feedback, be less time-consuming and less boring to the test person than traditional self-reports and can be a means to also change the consumer's behaviour. A demonstrator was created and displayed at the Mistra Future Fashion Symposium in May 2013. The technology was however too immature to give the requested information about consumer behaviour regarding use and washing of fashion garments within Mistra Future Fashion. Traditional methods were instead turned to in order to deliver the requested results.

A traditional survey set-up was created together with the consumer behaviour experts in P7 in order to align the background data collection with the larger survey performed in P7 to make the results compatible. One part of the survey consisted of a questionnaire distributed at the Swerea IVF website, via Mistra Future Fashion links, twitter and other channels. The questionnaire contained traditional questions about purchase, use, wash and disposal of garments. 225 respondents participated in the questionnaire. The other part of the set-up was a probe survey where a probe package, containing a scale, a basket, a self-report and instructions, was delivered home to pilot consumers. 19 respondents participated, chosen as friends, neighbours or relatives to people working at Swerea IVF AB. The respondents were asked to fill in the report for each washing machine that was loaded during the period. The weight of the laundry was measured in the households for a period of three weeks. The textiles were divided into four parts: home textiles **dried using "some kind of heat"** (tumble dryers, drying cabinets, heated rooms for hang drying etc.), **home textiles dried without heat**, **garments dried using "some kind of heat"**, and **garments dried without heat**.

The results from the web questionnaire were in most cases in line with results from previous studies. The division into home textiles and garments showed that the **categories home textiles, underwear and socks were said to be dried using "some kind of heat" in around 50 % of the cases, whereas the rest of the garments were less frequently dried using "some kind of heat", this occurred in around 25 % of the cases. The use of**

detergents and frequency of ironing showed also to be a little different from figures on European average behaviour giving specific input on Swedish consumer behaviour.

The results from the probe study showed that the different households ran between 7 and 39 washing machines during the three week test period. Regarding the amount of detergent, 50% of the respondents claimed that they used the recommended amount. Very few of the respondents used softener (54% did not) and most claim that they did not use the recommended amount, only very little. Most respondents used washing temperature 40°C and only about 20% of the garments were dried using **“some kind of extra energy”**. **Of all washed items that were dried without heat, 75% were garments**. The probe study also showed that many respondents did not have a choice of drying method.



Appendices

Appendix 1 Tagging study web survey



Appendix 2 Tagging study demonstrator

Appendix 3 Consumer behavior web questionnaire

Contribute to a better environment by showing how you do your laundry!

In order to develop the fashion of the future, we need to know more about purchasing habits, how and when you wash your garments, and what you do with them when they are no longer needed.

Data that emerge as a result of this questionnaire will contribute to the development of new materials, methods and garments that are better from an environmental point of view.

The questionnaire has been created by the Swedish research programme Mistra Future Fashion (see www.mistrafuturefashion.com).

The questionnaire is aimed at everyone in Sweden.

Please fill in a form for every family member.

Every filled in form can participate in a raffle for flower cheques if contact details are provided. You have until the end of January 2015 to answer but more cheques are available in a raffle for answers we have received before Christmas!

Please feel free to spread the questionnaire to other clothes consumers you know!

If you have any questions please contact: simonetta.granello@swerea.se

Please circle one or several alternatives per question:

(please consider the whole year if your habits vary between the seasons)

A. Questions about your garment purchases ³ (not home textiles):		
1. Where do you normally shop?	A shop Second hand Internet other	
2. How do you get to the place of purchase (or collection) most of the times?	On foot By bike By car Public transport Other.....	
3. How long would you estimate such a journey to be?	<2 km 2-5 km 5-15 km >15 km	
4. How do you normally go about buying clothes (for yourself or someone else?)	You only buy clothes You buy clothes when you "stumble upon them" e.g. when you are out shopping food You buy clothes in connection to other planned purchases Other ways:	
5. How many items of clothing do you normally buy at each occasion?	One Two Three Four Five or more	
Any comments related to your answers about your purchases?		

³ Textile products you can wear. E.g.. jeans, bathrobe ,socks

<u>B. Questions about the use of your garments (not home textile):</u>		
1. How many pairs of jeans do you have (approximately)?	0-2 3-7 8-15 more than 16	
2. Can you estimate how many days in a year you wear jeans?	0-5 times 6-50 times 51-150 times 151-250 times More than 251 times	
3. How many T-shirts do you own (approximately)?	0-2 3-7 8-15 more than 16	
4. Can you estimate how many days in a year you wear a T-shirt?	0-5 times 6-50 times 51-150 times 151-250 times More than 251 times	
5. How many dresses or other evening wear garments do you own (approximately)?	0-2 3-7 8-15 more than 16	
6. Can you estimate of how many times a year you wear a dress or other evening wear outfits?	0-5 times 6-50 times 51-150 times 151-250 times More than 251 times	
7. How many jackets do you own (approximately)?	0-2 3-7 8-15 more than 16	
8. Can you estimate how many times in year that you use a jacket?	0-5 times 6-50 times 51-150 times 151-250 times More than 251 times	
Any comments about your answers related to these questions?		

<u>C. Questions about the care of your garments (not home textiles):</u>		
1. Can you estimate how many times you wear a pair of jeans before you wash them?	1 time 2-3 times 4-5 times 6-14 times More than 15 times	
2. Can you estimate how many times you wear a T-shirt before you wash it?	1 time 2-3 times 4-5 times 6-14 times More than 15 times	
3. Can you estimate how many times you wear a dress or other "Sunday best" before you wash them?	1 time 2-3 times 4-5 times 6-14 times More than 15 times	
4. Can you estimate how many times you wear a jacket before you wash it?	1 time 2-3 times 4-5 times 6-14 times More than 15 times	
5. Which of the following do you normally wash at home?	None Home textiles Sportswear Nightwear Underwear Socks Thick jumpers Skirts Trousers Blouses Shirts Jeans T-shirts Dresses Jackets Other:	

<p>6. Which of the following do you normally dry using heat (tumble dry/drying cupboard that require energy)?</p>	<p>None</p> <p>Home textiles</p> <p>Sportswear</p> <p>Nightwear</p> <p>Underwear</p> <p>Socks</p> <p>Thick jumpers</p> <p>Skirts</p> <p>Trousers</p> <p>Blouses</p> <p>Shirts</p> <p>Jeans</p> <p>T-shirts</p> <p>Dresses</p> <p>Jackets</p> <p>Other:</p>	
<p>7. Which of the following do you normally iron?</p>	<p>None</p> <p>Home textiles</p> <p>Sportswear</p> <p>Nightwear</p> <p>Underwear</p> <p>Socks</p> <p>Thick jumpers</p> <p>Skirts</p> <p>Trousers</p> <p>Blouses</p> <p>Shirts</p> <p>Jeans</p> <p>T-shirts</p> <p>Dresses</p> <p>Jackets</p> <p>Other:</p>	
<p>8. Which of the following do you use fabric softener on?</p>	<p>None</p> <p>Home textiles</p> <p>Sportswear</p> <p>Nightwear</p> <p>Underwear</p>	

	<p>Socks Thick jumpers Skirts Trousers Blouses Shirts Jeans T-shirts Dresses Jackets</p> <p>Other:</p>	
9. Which washing temperature do you normally use when washing garments?	<p>30 40 60 90 Other:</p>	
10. How do you dose detergent?	<p>I use very little I use a lot I measure up the recommended amount Other ways:.....</p>	
11. How do you dose fabric softener?	<p>I do not use it I use very little I use a lot I measure up the recommended amount Other ways:.....</p>	
Any comments about your answers to these care questions?		

<u>D. Questions about discharge of garments (not home textiles):</u>		
1. Can you estimate how many times you use a pair of jeans before you discard them?	<p>I do not own a pair of jeans</p> <p>No time</p> <p>1-5 times</p> <p>6-20 times</p> <p>21-50 times</p> <p>51-100 times</p> <p>More than 100 times</p>	
2. Can you estimate how many times you wear a T-shirt before you discard it?	<p>I do not own a T-shirt</p> <p>No time</p> <p>1-5 times</p> <p>6-20 times</p> <p>21-50 times</p> <p>51-100 times</p> <p>More than 100 times</p>	
3. Can you estimate how many times you wear a dress or other Sunday best before you discard them?	<p>I do not own a dress or Sunday best</p> <p>No time</p> <p>1-5 times</p> <p>6-20 times</p> <p>21-50 times</p> <p>51-100 times</p> <p>More than 100 times</p>	
4. Can you estimate how many times you wear a jacket before you discard it?	<p>I do not own a jacket</p> <p>No time</p> <p>1-5 times</p> <p>6-20 times</p> <p>21-50 times</p> <p>51-100 times</p> <p>More than 100 times</p>	
5. When you discard a garment- what is the main reason for doing so?	<ul style="list-style-type: none"> • The fabric is ripped • The seam, zipper or similar thing is broken • The fabric is burlled • Stains • Discolouration • The garment has lost its shape • The print has aged and does not look good 	

	<ul style="list-style-type: none"> • I am tired of the garment • I need another size • I have bought a new one • Other. 	
6. What do you do with garments that have been discarded?	<p>I save them I leave them at a collection point I give them away I sell them I throw them away Other</p>	
7. When the garments are discarded - how do you transport yourself to the recycling / waste collection / disposal site?	<p>On foot By bike By car Public transport Other.....</p>	
Comments about your answers on these garment life questions?		

Background questions. Please circle one (or in some cases several) alternatives per question		
Gender	Woman Man	
Age	Under 19 19-26 27-45 46-65 Over 65	
The number of people in your household (people whose washing is washed together)	No one One Two Three Four Five or more	
How many people in your household are children under the age of 6?	No one One Two Three Four Five or more	
How many people in your household are between 6-18 years old?	No one One Two Three Four Five or more	
Which is your highest completed level of education?	Pre upper secondary / high school Upper secondary / High school University-/ college course (NOT a degree) University-/ college degree	
You do your washing in.....?	A shared laundry room Your own laundry room Other:.....	
You dry your	Hanging In a tumble dryer	

clothes.....?	In a drying cupboard In a drying room Other.....	
How large is your personal disposable income per month? (i.e. the income you have left after tax has been deducted)	<SEK10 000 SEK 10 000-30 000 SEK 30 000-60 000 >SEK 60 000 I do not want to answer this question	
Do you have access to a car?	Yes No	
Any comments about your answers on these background questions?		

If you can consider being contacted by us again (within the frame of the same project) please provide your contact details here:

.....

Is there anything you wish to add?

.....

Appendix 4 Probe study test protocols

Survey of laundry practice in your home. Contribute to a better environment by informing us about how you wash your clothes!

In order to develop future fashion with less environmental impact we need to know more about how people wash and dry their different garments and home textiles. The questionnaire is aimed at people in private households in Sweden.

Swerea IVF, who carries out the survey, is part of the Swedish research programme Mistra Future Fashion, who are behind (responsible for?) this survey, www.swereaivf.se. The results from the survey will be ready in the summer of 2015.

www.mistrafuturefashion.com

Scope and remuneration:

The questionnaire about laundry habits in your home will go on for three weeks at each **test person's house**. Please answer the background questions once and the questions on laundry and weight of your laundry for each occasion. When you have participated you **get to keep the scales and basket if you wish and you will also receive a "Triss" lottery ticket!**

This is how the weighing works:

Turn on the scales by activating the battery.



Place the little scales at an appropriate place in your laundry room.

Place the piece of foam on the scales.

Place the basket right on top of the piece of foam.



It will now sit steadily and evenly distribute the pressure in a good way. Set the scales to zero.

Weigh home textiles and garments separately before you put them in the machine.

It is fine to write several separate numbers in each square – they do not need to be summarized! (if you fill up the basket several times)

Use one questionnaire page per wash and washing machine during the whole test period.

Please feel free to write comments on the back of the page if needed!



If you have any questions please contact

Simonetta Granello at Swerea IVF

phone: 031 – 706 63 43

or email: simonetta.granello@swerea.se

This table is filled in once per test person

Test person ID:.....

Background questions	Please mark one or more alternatives
1. Sex	Female <input type="checkbox"/> Male <input type="checkbox"/>
2. Age	under 19 years old <input type="checkbox"/> 19-26 <input type="checkbox"/> 27-45 <input type="checkbox"/> 46-65 <input type="checkbox"/> over 65 <input type="checkbox"/>
3. The number of people in your household	One <input type="checkbox"/> Two <input type="checkbox"/> Three <input type="checkbox"/> Four <input type="checkbox"/> Five or more <input type="checkbox"/>
4. How many people in your household are children under the age of 6?	None <input type="checkbox"/> One <input type="checkbox"/> Two <input type="checkbox"/> Three <input type="checkbox"/> Four or more <input type="checkbox"/>
5. How many people in your household are between 7 and 18 years old?	None <input type="checkbox"/> One <input type="checkbox"/> Two <input type="checkbox"/> Three <input type="checkbox"/> Four or more <input type="checkbox"/>
6. What is your highest completed level of education?	Compulsory school <input type="checkbox"/> High school <input type="checkbox"/>

	University <input type="checkbox"/>
7. You wash your clothes in?	A shared laundry room <input type="checkbox"/> Your own laundry room <input type="checkbox"/>
8. You mostly dry your laundry using.....?	A clothes horse <input type="checkbox"/> A tumbler <input type="checkbox"/> A drying cupboard <input type="checkbox"/> A drying room <input type="checkbox"/> Other..... <input type="checkbox"/>
9. How large is your personal disposable income per month?	<SEK 10 000 <input type="checkbox"/> SEK 10 000-30 000 <input type="checkbox"/> SEK 30 000-60 000 <input type="checkbox"/> >SEK 60 000 <input type="checkbox"/> I do not wish to answer this <input type="checkbox"/>
10. Do you have access to a car?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Any comments ?	

This table is filled in once per washing machine and wash during the test period.

Testperson ID/Laundry date:

A. Questions about the laundry:	Please mark with a cross one or several alternatives per question
1. Which temperature will you be using for this wash?	30°C <input type="checkbox"/> 40°C <input type="checkbox"/> 60°C <input type="checkbox"/> 90°C <input type="checkbox"/> Other: <input type="checkbox"/>
2. Which of the following items are included in the laundry? :	Jeans <input type="checkbox"/> T-shirt <input type="checkbox"/> Dress or other Sunday best <input type="checkbox"/> Jacket <input type="checkbox"/> Towel <input type="checkbox"/> Sheets <input type="checkbox"/>
3. Which colours do the items in the laundry have?	Mostly white <input type="checkbox"/> Mostly light <input type="checkbox"/> Mostly dark <input type="checkbox"/> Mostly black <input type="checkbox"/> Mixed <input type="checkbox"/> Other <input type="checkbox"/>
4. Which detergent do you use?	
5. Do you use fabric conditioner?	yes <input type="checkbox"/> no <input type="checkbox"/>
6. Do you use stain remover?	yes <input type="checkbox"/> no <input type="checkbox"/>

B1. Weighing of laundry that will be tumble dried or be dried in a drying cupboard or other ways that require extra energy use [gram]		
	Total weight home textiles	Total weight garments
Before washing = DRY WEIGHT		
B2. Weighing of laundry that will be hung up to dry on a clothes horse, or be dried in other ways that do NOT require extra energy use[gram]		
	Total weight home textiles	Total weight garments
Before washing = DRY WEIGHT		