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Global Differences in Consumer Practices Affect Clothing Lifespans

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Abstract: Most studies of clothing and related habits are carried out within a country. However, apparel production and sales are a highly globalized industry, with many of the same large chains operating worldwide. It is thus quite possible that the use of the same mass-produced clothing differs between various geographical areas. Based on a practice theoretical approach, we have studied differences in consumption, use and disposal of clothes in different countries that may affect the lifespan of apparel. The paper is based on an international survey in five countries with large apparel markets: China, Germany, Japan, UK and the USA. 200 respondents from each country answered to a comprehensive web-based survey on their wardrobe content. We found differences in practices that could affect the lifespans of clothing in these five countries. At the same time, we find many similarities. For clothing acquisition, buying new items dominates in all the five markets, and washing machines contribute to the main chore of keeping clothes clean. Home production and second-hand clothes constitute a very small part of clothing consumption in all five countries. Many respondents showed low sewing skills, and repair activities were done irregularly. Thus, many of the challenges to increasing the lifespans of clothing are similar for all the five countries. At the same time, there are significant differences. These differences open up for the possibility to learn "best practice" by studying the countries and transferring knowledge between regions. When defining use phase in LCA and other sustainability tools, it must be taken into account that despite the fact that clothing is a global industry, consumption is part of local practice.

Introduction

Longer lasting products will generally lead to less material extraction, less pollution and less energy-use in all the phases of a product's life, including transport (Cooper, 2010), with the only exception being when there is a significantly more efficient new product available (Montalvo et al., 2016). At the same time, a tendency towards a short 'service life' and low intrinsic material value has been the effect of the current market-based system of mass consumption and low-cost production, exemplified by so called 'fast fashion' (Fletcher, 2008). Economic growth, whilst raising incomes, has led to an increase in the use of materials and energy, and related pollution and waste. Montalvo et al. (2016) estimated that longer lasting products could increase economic activities related to extended use through activities such as maintenance, repair, and rental services by 7.9 billion Euros per year to Europe's economy. An example within clothing shows potential reduction of circa 100,000 tonnes of CO^2eq and 2000 tonnes of waste per annum in the UK, if just 10% of t-shirts were used longer (Downes et al., 2011).

To include length of lifespans and other parts of the use phase of textiles into various forms of LCA analyses and comparison tools, knowledge about how clothes are used is needed (Laitala et al., 2018). There is also a need for knowledge about environmental impacts in the use phase (Wiedemann et al., Forthcoming) and how longevity contributes positively to environmental accounting.

Studies of clothing habits are usually done locally or within one country, but to integrate consumer based data on lifespans and use into LCA, we need knowledge about global variation. The knowledge we have about these conditions is usually based on comparisons of the results of different national studies (Laitala et al., 2017). Few have compared countries within the same study and with the same methods, although some examples can be found (e.g. Gwozdz et al., 2017; Pakula &

Stamminger, 2009, 2010; Presutto et al., 2007; Spencer et al., 2015; The Nielsen Company, 2012).

This lack of global comparisons applies to clothing research in general and not only related to lifespans. In particular, there is little knowledge about the southern hemisphere, developing countries, and the growing markets for clothing (Laitala, 2014b). Clothing lifespans have mainly been researched in a few European countries (Goworek et al., 2013; Gracey & Moon, 2012; Klepp & Laitala, 2016; Laitala, 2014a; Langley et al., 2013; Maldini et al., 2017; Maldini et al., 2019). This paper seeks to fill the knowledge-gap by examining some major countries in different parts of the world; China, Germany, Japan, UK, and the USA.

We will use a practice theoretical approach. Based on Reckwitz (2002), Shove et al. (2012), define practices as composed of three elements: 1) meanings, referring to what Reckwitz called mental activities and emotions, 2) competences; the elements of motivational knowledge, meaning multiple forms of understandings and practical knowledgeability; and 3) materials, encompassing objects, infrastructures, tools, hardware, and the body.

Due to limited space we can only draw some examples of aspects that can affect clothing longevity. Many of the survey questions are related to what consumers do, and therefore include all the three aspects of the theory. For example, repair of clothing presupposes access to equipment, know-how and an intention to repair. Similarly, laundering is related to cleanliness and hygiene ideas, access to water and equipment, and skills (Shove, 2003).

The research question we ask is; are there major differences between consumers' clothing practises in distinct parts of the world that can affect the lifespan of clothing? Consumption, as we understand it, consists of acquisition, use, and disposal of goods. All three stages are relevant to longevity.

Method

The paper is based on a wardrobe audit (Fletcher & Klepp, 2017) conducted online by AC Nielsen at the end of 2018. Over two hundred respondents from each country answered a comprehensive survey on their wardrobe content. For selected clothing items, details such as lifespan, active use time, wear occasions, materials, and laundering practices were registered.

The survey focused on adult respondents between 18 to 64 years old. The sample was pre-stratified to represent the gender distribution and other demographics of the country in question. The respondent demographics for each country are given in Table 1. The data is weighted to the population. For enabling the analysis, one database was prepared per respondent (N=1111), and another per garment (N=53 461). In China, the oldest age group is underrepresented. In addition, the sample is only from the ten largest cities and is not representative for the whole country. This enables comparison of a bit more similar consumer groups in terms of living standard.

	CN	DE	JP	GB	US
Respondents	230	224	224	213	220
Garments	10595	11705	12022	9384	9755
Men	54%	51%	51%	47%	49%
Women	46%	49%	49%	53%	51%
Age 18-29	41%	19%	19%	22%	21%
Age 30-49	49%	45%	50%	52%	44%
Age 50-64	10%	36%	31%	26%	35%

Table 1. Respondents' background variables.

To prevent respondent wear-out, the number of clothing categories assessed in detail was limited to categories of common clothing items such as suits, t-shirts, trousers, skirts and socks. Item-specific questions were limited to a maximum of 10 items per category.

Results and discussion

Acquisition

We asked respondents how they had acquired each of the registered clothing items. Seventy-four percent of garments were newly bought items by the respondents themselves (Fig. 1). The second most common acquisition method is gifting. The percentage of preowned clothing is low (9%), both when we look at items bought second-hand (5%) and those received as hand-me-downs (4%). Respondents from the USA and the UK are more likely to receive and buy items second-hand.

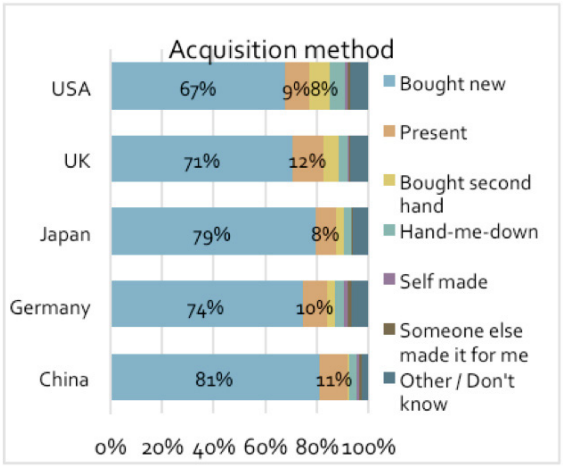

Figure 1. Which of the following best describes how this item was acquired? (Garment data)

Home production and repair

Even though only a few of the garments registered in the survey were homemade, questions on consumers' craft activities showed that some do acquire clothing by making it themselves. This is most common in Germany and the USA, where 15 % of respondents had knitted or crocheted during the past year (Table 2). These figures are still lower than in Norway, where 25 % of the population had knitted or crocheted during the past year (Laitala & Klepp, 2018). It was not that common to make something new out of old clothing or sew new clothing, but also this was most common in Germany and USA. The Japanese and the Brits are least active in making clothing.

	CN	DE	JP	GB	US
Sewn a button	57%	53%	52%	49%	48%
Fixed an unravelled seam	37%	17%	25%	18%	26%
Patched clothing	9%	32%	10%	17%	23%
Darned clothing	16%	22%	34%	14%	11%
Changed a zipper	29%	8%	2%	6%	14%
Fixed a trouser length	24%	17%	24%	20%	13%
Adjusted the size of clothing	18%	8%	6%	6%	10%
Made something new out of old clothing	4 %	8 %	5 %	2 %	10 %
Sewn new clothing	6 %	8 %	4 %	5 %	8 %
Knitted or crocheted	10 %	15 %	6 %	6 %	15 %
None of these	15 %	27 %	26 %	37 %	31 %

Table 2. Which of the following have you done in the last 12 months? (Person based data)

Of repair activities sewing on a button (51%) was most frequent, while changing a zipper was the least frequent activity (14%) (Table 2). Consumers in the UK are the least likely to have performed any clothing maintenance or production in the past year (37%), closely followed by the USA, while the Chinese are definitely most active as only 15% had *not* done any of these activities last year. The Chinese respondents were most likely to have fixed an unraveled seam (37%), while only 17 % of Germans replied that they had done the same. This is counter to patching, as 17 % of Germans had patched a garment compared to 9 % of the Chinese. Adjusting trouser lengths and darning clothing are most common in Japan and China (24%). This shows that there are national differences in which repair techniques are frequently used.

To repair and make clothes is also dependent on handicraft skills, and therefore we asked whether respondents knew how to sew by hand or use a sewing machine (Table 3). It is interesting that the Chinese report to have done most repairs in many categories, but are the most modest in reporting their sewing skills. This may be a cultural variation, grounded in the expectation of skills when asked if you can use a sewing machine or sew by hand.

	CN	DE	JP	GB	US
I can use a sewing machine	20 %	29 %	42 %	18 %	35 %
I can sew by hand	35 %	50 %	56 %	50 %	55 %
I can knit	15 %	22 %	15 %	14 %	15 %
I can crochet	9 %	25 %	15 %	6 %	17 %
None of these	50 %	37 %	27 %	39 %	30 %

Table 3. Here are some statements people have made about their skills in making / repairing / altering clothes. Which of the following best applies to you? (person based data).

Laundering

Laundering leads to high environmental impacts (Bain et al., 2009), and frequent laundering, use of old top-loading washing machines (agitator type), and use of tumble dryer can contribute to increased wear and tear of clothing (Hartline et al., 2016).

Table 4 shows which laundry appliances and methods are used in the respondents' households for washing and drying clothing. It

shows that China has largest variations in washing machine types, and highest occurrence of hand washing. Top loading washing machines are most common in Japan and the US, while Europeans use mainly front-loaders. Tumble-drying is most common in the US. Line drying indoors is more common than outdoors in all countries besides Japan. Using shared appliances such as laundromats or machines in an apartment complex is most common in Japan and the US.

	CN	DE	JP	GB	US
Top loading wm	25 %	16 %	63 %	6 %	60 %
Front loading wm	29 %	62 %	11 %	64 %	17 %
Combination washer dryer	27 %	6 %	20 %	16 %	3 %
Twin tub wm	11 %	2 %	3 %	1 %	3 %
At home dry cleaning	8 %	1 %	2 %	2 %	2 %
Shared wm (laundromat)	6 %	8 %	10 %	8 %	13 %
Hand wash some laundry	96 %	55 %	65 %	52 %	54 %
Tumble dryer	8 %	24 %	5 %	21 %	54 %
Shared dryer (laundromat)	7 %	5 %	10 %	4 %	10 %
Line drying outdoors	51 %	20 %	38 %	27 %	10 %
Line drying indoors	53 %	37 %	34 %	38 %	19 %

Table 4. Please indicate which of these items you currently use. Do you hand wash any of your laundry? (WM=Washing machine) (Person based data)

Washing laundry by hand is a common practice in China, where 96% of respondents replied that they wash some of their laundry by hand. This is second most common in Japan (65%), while only a bit over half of Germans, Brits and Americans replied the same.

Disposal

The last stage of use is to dispose of the garment, and there are several reasons for disposal, as well as alternatives for where to dispose of the garments.

Clothing disposal reasons show that there are variations between countries, as the Chinese respondents were more likely to dispose clothing due to fashion or personal dislike (Table 5). Unsuitable fit was quite common in all countries except Japan, where only 7% of clothing were likely to be disposed based on this. Japan is one of the wealthier countries that is less affected by the obesity epidemic (Yeom et al., 2009), and it seems that fewer experience problems with changing body size than in the other countries.

	CN	DE	JP	GB	US
Not in fashion any more	21 %	10 %	6 %	9 %	9 %
Poor fit	12 %	17 %	7 %	14 %	16 %
Dislike the colour or style	20 %	10 %	4 %	6 %	7 %
Lack of space	6 %	3 %	2 %	3 %	5 %
Don't need it any more	11 %	5 %	13 %	8 %	8 %
The colour has faded	3 %	5 %	5 %	7 %	8 %
A hole in the fabric	9 %	18 %	15 %	18 %	18 %
Pilling	3 %	2 %	13 %	6 %	3 %
Loses its shape	12 %	16 %	21 %	13 %	11 %
Other wear and tear	2 %	5 %	6 %	4 %	4 %
Unknown	3 %	9 %	9 %	11 %	11 %

Table 5. What do you think is likely to be the main reason you would dispose of this particular item? (Garment based data)

Japanese are far less likely to donate their clothing and instead choose to trash it or sell it (Table 6). Donating clothing to reuse or recycling stands out as something typically Western, with the US and the European countries on top. If these habits were to spread to the East, it would have major consequences for the already oversupplied global second-hand clothing market.

	CN	DE	JP	GB	US
Donate to charity or recycling collection	39 %	42 %	8 %	44 %	44 %
Donate / give to family / friends	16 %	10 %	5 %	11 %	15 %
Put in the Rubbish Bin at home	26 %	22 %	56 %	22 %	17 %
Recycle at home (e.g. use as cleaning cloth)	11 %	8 %	7 %	7 %	8 %
Sell (e.g. garage sale, eBay)	2 %	7 %	10 %	3 %	2 %
Other / Don't know	6 %	12 %	15 %	14 %	14 %

Table 6. What would you expect to do in order to dispose of this clothes item or accessory when you no longer want it? (Garment based data).

Results from this survey show, similarly to many previous studies, that it is more common to give to reuse than to acquire and use second-hand clothing in developed countries, but there are big differences between east and west.

Conclusions

With respect to our research question, this study has demonstrated that there are differences in practices that can affect the lifespans of clothing in the five surveyed countries. However, we also find many similarities. In clothing acquisition, buying new items dominates in all the five markets, and washing machines do most of the work in keeping clothes clean. Handcrafted and second-hand clothes constitute a very small share of clothing consumption. There is absence of some sewing skills, and not all repair activities are done regularly. Thus, several challenges to increasing clothing lifespans apply in all the surveyed countries.

The differences between Japan and China are as big as between the three western countries. This means that research in different regions, not just per continent, is needed to increase our knowledge of clothing lifespans. This enables us to learn "best practice" by studying specific countries and transferring knowledge between regions. In working with LCA and other sustainability tools, consumption as part of local practice must be accounted for, even though clothing is a global industry. The same mass-produced clothes can be included in different clothing habits and used, repaired, washed and disposed differently. When the goal is to increase clothing lifespans, the efficiency of various measures differs between countries.

To steer these practices towards a more sustainable direction, we see that changes are needed in all the elements that constitute practices. These include materials such as the clothing, cleaning technologies, infrastructure, and meanings related to the importance of sustainability and fashion, and competences, for example in how to maintain clothing. In Japan and China, increased use of second-hand clothing could extend clothing lifespans locally. In the UK, a boost in practical knowledge of repair and handicrafts could contribute positively to keeping clothes longer in use. Poor fit is an important disposal reason, especially in Germany and the USA, and could be combated with strategies to avoid mistake purchases as well as improved size and fit labelling, and flexible design of clothing. The USA has a lot to gain in improving laundering practices such as reducing tumble drying, laundering frequency, and replacing top-loading with front loading washing machines. China differs in placing a higher importance to fashion, which has a potential to shorten clothing lifespans.

This paper provides an analysis of data collected with similar methods in five large consumer markets. Further analyses should relate these findings to local investigations, and to differences in economics, markets and regulations. In the work on environmental improvements, it is crucial to take the use phase seriously and increase the knowledge of geographical differences in today's clothing practices. China stands out and will therefore be an important country to investigate more closely, not least through cooperation with researchers with greater knowledge of the local conditions. Due to the large population of China, changes in the use phase of clothing there will have major global consequences.

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