Clothing longevity: the relationship between the number of users, how long and how many times garments are used

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4th PLATE 2021 Virtual Conference
Limerick, Ireland - 26-28 May 2021

Clothing Longevity: The Relationship Between The Number of Users, How Long and How Many Times Garments are Used

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Keywords: Reuse; Clothing Lifespan; Active Service Life; Second-Hand; Preowned.

Abstract: Reuse of clothing is a central strategy in circular economy for keeping the resources and materials in the loop longer. This paper studies the correlation between clothing service lifespans measured in years, number of wears and number of users, and whether there is a difference in length of lifespans between new and preowned garments. The analysis is based on an international quantitative wardrobe survey conducted in China, Germany, Japan, the UK and the USA with 53 461 registered garments. Results show that newer garments are used more actively than the older garments. Garments that are less than two years old are used about 30 times per year, while garments that are over 15 years old are only used about 3 times a year. Second-hand garments are worn on average 30% times less by the current user than garments that were acquired as new. Garments that the user anticipates donating or selling are worn 22% times less than garments that are planned to be discarded. The results show that reuse is beneficial for increasing the clothing lifespans, but it does not increase the active wear as much as expected. These findings have theoretical, managerial and political implications on which measures contribute to the longest garment lifespans with the least environmental impact and which kind of measures could help to implement these changes. This should be considered in life cycle assessments where various disposal methods are compared, as well as in policy development where in increasing the lifespan with first user should be focused more on.

Introduction

Climate change and pollution have been recognised as the most pressing issues to date, and many nations are aiming at circular economy to combat these challenges. One of the goals of circular economy is to keep resources and materials in the loop longer through longer product lifespans, where a lot of policy focus has been put on reuse and recycling. To guide these policies, studies are made to compare the environmental impacts of reuse and recycling. This is especially the case of clothing, where majority of large-scale recycling is still downcycling, and longer lifespans through reuse is by large environmentally more profitable option compared to material recycling or energy recovery through incineration (Fisher et al., 2011; Schmidt et al., 2016).

It is important that the Life Cycle Assessments (LCAs) and other comparisons are based on actual data on consumers' use of preowned garments, because such studies are used to guide the development of policies. There is some information related to the replacement rate of second-hand clothing (Farrant et al., 2010; Nørup et al., 2019), which shows that the second-hand garments do not replace new garments in 1:1 basis. However, in addition to replacement in acquisition, there is lack of knowledge on how the second-hand garments are used. Clothing lifespans can be described and measured in years, the number of wears, cleaning cycles, and the number of users (Klepp et al., 2020). To our knowledge, nobody has studied the length of the second or third use phase in detail. This paper aims to contribute to this discussion by studying the *correlation between clothing service lifespans measured in years, number of wears and number of users, and whether there is a difference in length of lifespans between new and preowned garments.*

This paper is a continuation of our work in exploring clothing lifespans where we have previously studied which factors contribute to the length of these lifespans (Laitala & Klepp, 2020), how the size of wardrobes impacts lifespans (Klepp et al., 2019), as well as differences in clothing practices between users from different countries (Laitala & Klepp, 2019).

Method

The paper is based on an international quantitative wardrobe survey conducted in China, Germany, Japan, the UK and the USA. The total number of respondents was 1111, with over 200 respondents from each of the five countries. Questions about wardrobe content and usage practices were related to respondents' specific clothing items and the total number of registered garments was 53 461. The survey included detailed questions about the possession lifespan, number of wears, occasions the garments are worn, cleaning frequency as well as acquisition, and disposal methods. More details of the method are given in previous publications (Klepp et al., 2020; Laitala & Klepp, 2020).

Results

To answer the first part of our research question, we study the connection between lifespans measured in years and number of times the garment has been worn. In order to get comparable results for the two measures, we use the data for the current lifetime of the garment and exclude the estimated future use. The responses are based on questions "How many times have you worn this item?" and "When did you buy or acquire this clothes item?". This is not the same as the total lifespan of a garment, which is approximately twice as long for the average of garments.

There is a connection between how many times garments are worn and how old they are, but the increase in number of wears is not as large as one would expect (Fig. 1). Doubling the lifespan in years does not double the number of wears. There is a clear indication that the new garments are used more actively than the older garments in the wardrobe. Garments that are less than two years old are used about 30 times per year, while garments that are over 15 years old are only used about 3 times a year. The average age of garments that are worn less than once every six months is 6.9 years.

The connection varies depending on the type of garment. Clothing for formal social occasions and religious wear is worn fewer times than their age would indicate, while workwear, sports clothing and nightwear are worn more times than average for garments of the same age. Underwear was not included n the study, but the use is likely similar to the latter category.

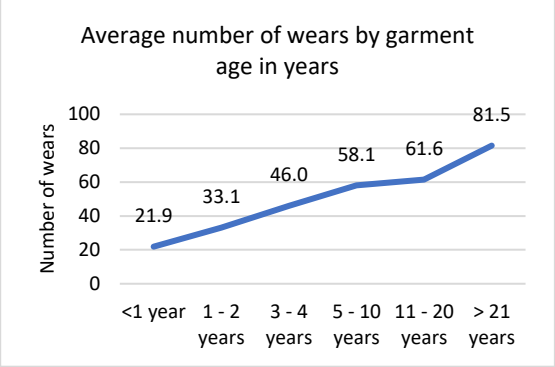

Figure 1. Average number of times garments are worn to date based on their current age in years

Lifespans of preowned clothing

When comparing the length of lifespans of garments that were acquired as new to those that were preowned, we found that second-hand garments are worn on average 30% times less by the current user than garments that were acquired as new. The difference is less for skirts and dresses (17%), and larger for formal wear such as suits (52%). On average, new garments were worn 82 times and second-hand garments 57.5 times (Figure 2).

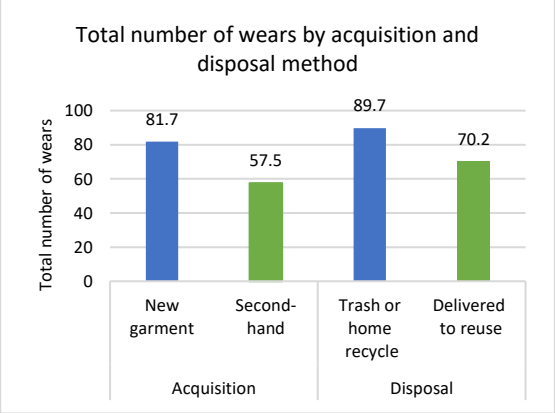

Figure 2. Total number of wears of garments acquired either as new or preowned, and garments expected to be disposed of or donated/sold

Garments that are used most times are either bough new or tailored/custom made (Figure 3). Second-hand garments that were either bought or received as hand-me-downs were used equally many times. Surprisingly, self-made clothing was worn the least number of times. The difference between garments that were self-made and those that were made by some else (tailored, made -to-measure etc) is striking. Further analysis indicates that respondents with many self-made garments had large

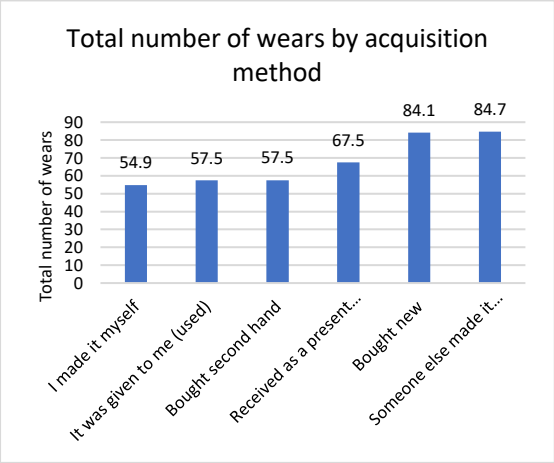

Figure 3. Total number of wears of clothing acquired through different channels.

wardrobes, which partly explains the reduced need for wearing the items many times. At the same time, a higher share of these items were likely to be disposed of due to poor fit, dislike of colour/style and lack of space/need, indicating that the makers may have lacked skills to create items that would fit their own needs.

Similar pattern is seen in clothing disposal. Garments that the user anticipates donating or sell are worn 22% times less than garments that are planned to be disposed of (Figure 2). Garments that the user anticipates giving to friends or family are used the least times, followed by those to be donated to charities (Figure 4). Garments that are recycled at home or disposed to a rubbish bin are used most times, and therefore most likely rather worn out before disposal and therefore less suitable for reuse.

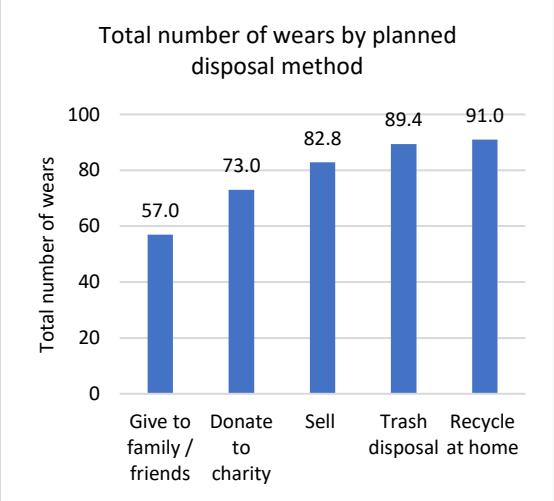

Figure 4. Total number of wears of clothing anticipated to be disposed of through different channels.

When measured in years, the difference is surprisingly the opposite. Garments are kept 31% longer if they are pre-owned, while the age difference in garments that are planned to be given to reuse is minor, only 3% longer.

Number of users

Garments with more than one consequential user get several use phases and thus increased service life. The garment lifespans measured in years more than doubles by having a new user, but the second user increases the number of wears only by 46% and having three users by about 103% (Figure 5). This is estimate has uncertainties as we have only information from one user and do not know how many users the preowned garments have had, or whether the donated garments actually will get a new user.

Our results indicate that reuse is beneficial, but when calculating the benefits, it should be taken into account that the preowned garments are not used as much as new garments.

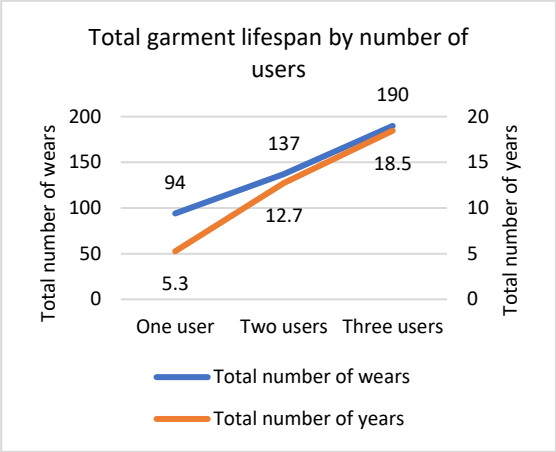

Figure 5. Total garment lifespan measured in number of wears and years by number of users.

Conclusions

The active life of clothing in our wardrobes varies based on how long we have had the garment, as well as whether they are acquired as new or preowned, and whether they are anticipated to be delivered to reuse or not. Newer garments are used more actively than the older garments. Second-hand garments are worn on average 30% times less by the current user than garments that were acquired as new, and similarly, garments that the user plans to donate or sell are worn 22% times less than garments that are planned to be discarded. This shows that clothing reuse does not increase the

number of wears as much as could be expected, as having one new user does not double the active wear of garments, even though it doubles the lifespan measured in years.

There are variations between garment groups on how beneficial reuse is. The difference in new and preowned skirts and dresses is minor, while some other clothing such as suits and other formal wear are used much less when preowned. Further research is needed on the relationship between occasions and lifespans. Our findings indicate that occasions that occur less frequently but require specific clothing makes measuring garment service lifespan in years more suitable, while the number of wears is a more indicative measure for the clothing worn regularly. It remains to systematize this so that it can be operationalized in lifetime research.

These findings have theoretical, managerial and political implications. The theoretical contribution is in better understanding of the consequences of measuring lifespans in different ways, and the relationship between them and different types of clothing. Working further with these concepts is important in order to develop more precise terms and theories within product lifespan research.

The findings have also political implications. They can contribute in understanding which measures promote the longest garment lifespans with the least environmental impact and which kind of measures could help to implement these changes. This should be considered in life cycle assessments where various disposal methods are compared, as well as in policy development where also focusing in increasing the lifespan with first user should be focused more on. Circular economy initiatives should therefore prioritise the use rather than reuse to start with, as this is where the greatest potential lies for keeping products in active use for a long time.

Acknowledgments

This work was supported by the Research Council of Norway, project nr. 303080 “LASTING-Sustainable prosperity through product durability”, and Australian wool growers and the Australian government through Australian Wool Innovation Limited (AWI), contract number 4500012208. We would like to thank Nielsen AG for conducting the survey.

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