

## Unveiling the Power of Repair Services in Enhancing Consumer Repair Behaviour in the Fashion Industry: A Crucial Step Towards a Circular Economy

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**Abstract:** Advocates for reducing the fashion industry's ecological impact emphasize the importance of Circular Economy (CE) principles, with repair being a vital strategy for extending product lifetimes. The current research aims to go beyond merely identifying the factors that influence consumers' perceptions of repair services and their repair behaviour. It explores the types of repair services people prefer and presents actionable and practical design strategies that companies can adopt to facilitate their transition to CE. A quantitative survey (n=265) was set up to identify preferred repair services and factors influencing willingness to repair. Moreover, a focus group with experts (n=10), used the input generated by the survey to further discuss possible design strategies. The survey findings reveal that although consumers strongly support repair, few actually participate in it. While high costs are identified as a barrier, trust and respect for repair professionals serve as motivators for repair behaviour. Additionally, there is a clear preference for local repair services over those offered by fashion brands. The developed design strategies aim at increasing the visibility of repair services, enhancing consumers' repair skills, and leveraging trust in craftsmanship to improve perceptions of quality. The study concludes that improving repair service quality through these design strategies will extend the lifespan of clothing and footwear, crucial for the CE transition. Future research should explore the practical implementation of the proposed strategies and look for possible cultural differences.

### Introduction

The fashion industry gained significant attention in recent decades due to its substantial consumption and ecological footprint (Kucińska-Król et al., 2024). Consequently, efforts to reduce this impact have strongly emphasized adopting the principles of the circular economy (CE). According to the Ellen MacArthur Foundation (2020), the core vision of the CE in the fashion industry is to be restorative and regenerative, benefiting businesses, society, and the environment. This approach keeps fashion products and materials at their highest value and reintroducing them into the economy after use to prevent waste (Ellen MacArthur Foundation, 2020). Literature on CE emphasizes repair as a key 'extending-the-loop' strategy because it extends product lifetimes, shapes social interactions, behaviour, and cultural norms, reduces waste, and conserves resources while fostering collaboration, knowledge sharing, and a deeper appreciation of craftsmanship (Henke, 2019; Jackson, 2019; McLaren et al., 2020).

Additionally, engaging in repair can enhance quality perception which is vital for a CE as high-quality clothes last longer (Connor-Crabb & Rigby, 2019), and the perception of it influences the efforts to extend their lifespan (Ninimäki & Durrani, 2020). Moreover, understanding what defines quality leads to better purchasing and care decisions, ultimately reducing the environmental impact. Here, repair plays a key role in maintaining quality perception. However, introducing repair in the current linear economy is associated with complexities (Parajuly et al., 2024) and so far, it is a relatively recent area of research (Niskanen et al., 2021). A substantial body of research (Frik et al., 2021; Laitala & Klepp, 2018; McNeill et al., 2020; McQueen et al., 2023a; Terzioğlu, 2021) identifies various motivators and barriers consumers face when repairing clothes. The Repair Motivations and Barriers (RMB) model by Terzioğlu (2021) consolidates existing research on repair motivations and barriers into a well-structured format as it outlines repair behaviour, highlighting technical, emotional,

and value-based motivations and barriers. In this model, technical aspects cover the required tools, materials, and knowledge for repair while emotional aspects involve users' emotional responses that influence motivation and value aspects related to the product's aesthetic, symbolic, and functional worth (Terzioğlu, 2021). Due to fast fashion, traditional clothing care skills have decreased, making it harder for people to value and maintain their clothes for long-term use (Hernandez et al., 2024). Additionally, findings show that women and elders are more inclined to self-repair, while younger consumers rely more on unpaid services (McQueen et al., 2023; and McNeill et al., 2020). Furthermore, Niinimäki and Durrani (2020) highlighted that repair professionals significantly influence consumer repair behaviour, encouraging sustainable practices. Lastly, consumers tend to trust retailers, manufacturers, or independent repairers more than repair cafés for electronic device repair (VLAIO Living Lab, 2023). Despite this, little research exists on consumer perceptions regarding clothing and shoe repair professions, their impact on repair behaviour, and preferred services. Therefore, this study combines consumer-focused research with industry-academic collaboration to propose strategies for advancing the transition to a CE through repair (Colley et al., 2024). We formulate following research questions:

RQ1 – What factors influence the consumers' repair behaviour and their perception of repair services for clothing and shoes?

RQ2 - What type of clothing/shoe repair services are preferred by consumers?

RQ3 - What design interventions can fashion brands, and local services adopt to enhance consumer engagement and promote CE?

## Method

### Case

This research, part of a Flemish Government-funded project, explores consumer behaviour to guide design strategies for longevity and reuse. It brings together academic institutions and fashion companies to advance the transition to CE, focusing on repair services and secondhand goods. Decathlon, a sporting goods retailer, part of this project, aims to support this transition by offering repair, rental, and secondhand options while planning to introduce shoe repair in Belgian stores (Decathlon, 2023). To understand consumer preferences for repair services, Decathlon collaborated with the University of Antwerp,

which supports such initiative of slow fashion, ensuring objective and unbiased research on consumer perception.

### Research Design

The research design is twofold: first, a quantitative study was conducted to address RQ1 and 2 using a Qualtrics-based questionnaire. The survey comprised of several parts, starting with demographics followed by questions on repair attitudes (5 point-Likert scales), frequency of repair (self- or (un)paid), types of repair one uses and barriers and motivators towards repair) (Terzioğlu, 2021) (RQ1). The last section addressed perception of repair services (RQ2), using a within-subject design to compare perceived quality between brand and local repair (Likert scale). After analysis, a focus group (n=10) was held to brainstorm strategies based on the findings (RQ3). The focus group participants were professional tailors and shoemakers (n=2), an employee at Decathlon (n=1), researchers (n=3), designer (n=1) and employees of the city and province of Antwerp (n=3). The three-hour session included a results presentation, idea generation linked to repair barriers/motivations, and categorization of ideas by implementation complexity. The ideas were noted down on post its and similar ideas were categorized in cohesive categories, which were later summarized in a single slide (see discussion). The survey was sent to 51,500 Decathlon Belgian customers via email (purposive sampling) and shared on social media (convenience sampling) to reach a broader and diverse audience. Ethical approval was granted by the University of Antwerp's Ethics Committee. Participants were informed about the study's purpose and their consent for the use of their anonymous data was taken before beginning the survey. In total, 265 respondents fully completed the survey and passed the attention check. 40% identify as male, 59% as female, and 1% as non-binary. Respondents' ages were categorized and later recoded into two groups: under 50 (49%) and 50+ (51%). Furthermore, 27% of respondents had a low education level (primary or high school), while 73% were highly educated (bachelor's degree or higher). Results of the survey were analyzed using IBM SPSS version 29. The reliability of each variable consisting of multiple item measurement scales (five-point Likert scale, (1) strongly disagree to (5) strongly agree) was assessed through Cronbach's alpha ( $\alpha$ ) and data reduction took place by using a factor

analysis when a  $> 0.7$ . Figure 1 provides an overview of the variables with descriptive information of the items and the final constructs. For the data analyses, we used a paired sample t-test to calculate the preferred repair service and a regression analysis to calculate the influences of different variables concerning repair profession acknowledgement (skill, respect, difficulty, location, easy to find, information, not boring, innovativeness, trendiness) on quality perception of repair services.

Final constructs / Items	Mean	SD	Factor loading	$\alpha$	KMO
<b>A. Repair attitude</b>	4.51	.71		.937	.857
I am positive about repairing clothes and footwear.	4.47	.82	.897		
I like the repair of clothes and footwear.	4.54	.73	.936		
I am comfortable with the idea that clothes and footwear can be repaired	4.52	.75	.947		
Repairing footwear and clothing is sustainable.	4.52	.76	.893		
<b>B. Functional barriers (Terzioğlu, 2021)</b>	2.70	.91		.803	.803
Repair service is not easily accessible.	2.67	1.2	.847		
I know too little about what repair services do.	2.83	1.2	.750		
It takes too much time to get something fixed by a repair service.	2.65	1.1	.625		
<b>C. Emotional barriers (Terzioğlu, 2021)</b>	1.87	.65		.803	.803
In my opinion, repair is not yet socially accepted.	2.16	1.1	.821		
I have a lack of confidence in repair services.	2.01	.94	.560		
I am embarrassed to have my footwear and clothes repaired.	1.45	.68	.683		
<b>D. Value barriers (Terzioğlu, 2021)</b>	2.90	.91		.803	.803
It takes too much effort to get something fixed by a repair service.	2.64	1.2	.602		
I find repair too expensive.	3.05	1.1	.571		
I prefer to replace my broken footwear and clothes with a new one that is in fashion.	3.05	1.2	.801		
<b>E. Quality perception branded repair (Erdoğan &amp; Bidevri-Turan, 2012)</b>	3.7	.66		.854	.801
Decathlon repairs no longer have functional defects.	3.59	.79	.811		
Decathlon repairs no longer contain aesthetic flaws	3.42	.80	.813		
Footwear repaired by Decathlon can last for a long time again	3.72	.78	.868		
I think my footwear will be of high quality after the repair at Decathlon.	3.52	.80	.846		
<b>F. Quality perception local repair (Erdoğan &amp; Bidevri-Turan, 2012)</b>	3.71	.66		.788	.726
Cobbler repairs no longer have functional defects.	3.75	.85	.776		
Cobbler repairs no longer contain aesthetic flaws	3.41	.90	.727		
Footwear repaired by a standard shoemaker can last for a long time again	3.95	.79	.812		
I think my footwear will be of high quality after the repair at a standard shoemaker.	3.72	.82	.819		

Figure 1. Descriptives and Factor analysis of variables

## Results

### Repair behaviour and perceptions (RQ1)

Respondents showed a strong positive **attitude toward repair (A-Fig 1)** (mean = 4.51, SD = 0.71), but this rarely translated into action, thus revealing an intention-behaviour gap. Only 15% had items repaired by a third party more than six times in 2023, while 85% were repaired less than five times. Over half rarely or never repair clothing themselves. Pants were the most repaired item (49% self-repair, 60% paid repair), while footwear and jackets were primarily fixed through paid repair. T-shirts and sweaters were repaired the least. Expensive or newer items are repaired more often, as repair costs for cheaper or older items may not be worthwhile. Therefore, the complexity and condition seem to play a role in repair behaviour. Only 31% of respondents felt confident in their repair skills. This gap between repair attitude and behaviour, also common in pro-environmental research (Čapienė, 2019;

McNeill et al., 2020), is further explored in the next part of the study.

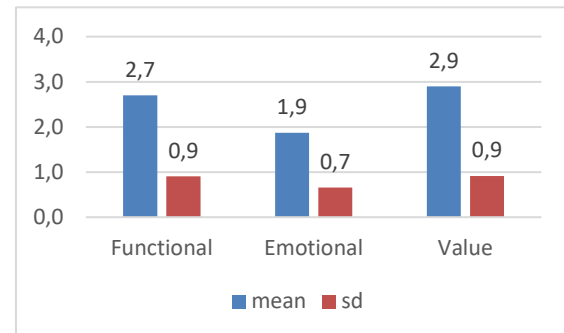
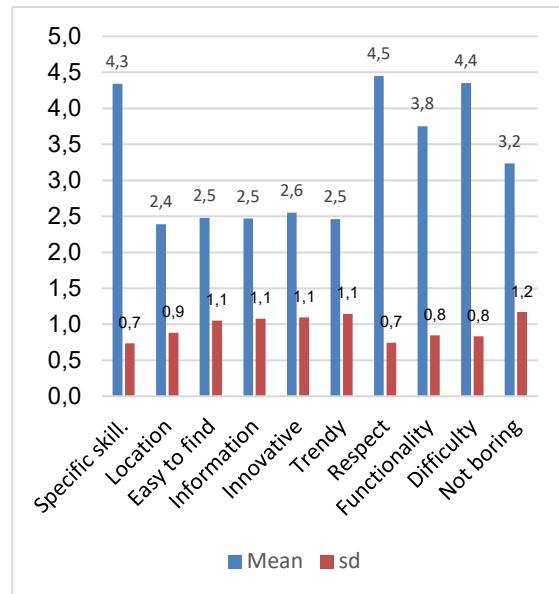


Figure 2. Mean scores and standard deviation of repair barriers

Regarding repair barriers, **(B) functional**, **(C) emotional** and **(D) value barriers** scored neutrally (Fig 1 (B, C, D) & 2), with the perceived high cost of repair scoring above 3 on the Likert scale, while perceived embarrassment scored below 2 (Figure 1). The neutral scores suggest that respondents may be unaware of what hinders their repair activities or that relevant reasons were not listed in the survey. The results of the barriers are reflected in the motivations, where the highest motivators for repair are the trust in knowledge and skills of the repair service (54%), which also acts as a reason to have an item repaired (63%). Eco-consciousness also has an impact on the motivations towards repair, where 47% of the respondents highlight that repairing footwear and clothes is the right thing to do, and 44% view the reduction of carbon as one of their motivators. Regarding price, 44% see repair as cheaper than buying new, yet only 18% view repair costs as low. This aligns with the earlier findings, which indicate that value barriers are seen as the most significant.

While barriers to repair remain unclear, results show (Figure 3) that repair is socially accepted, and respondents hold a positive view of repair services. They acknowledge repair skills as specialized and challenging, expressing respect for those with these. However, factors such as information about repair services and their accessibility/location scored neutrally. Additionally, while repair shops aren't seen as boring, respondents are neutral about their innovativeness and trendiness, as well as the nice location in the city. The internal correlation was insufficient ( $\alpha = 0.387$ ) for factor analysis, so each item was analyzed independently

instead of reducing it to a smaller set of factors. Therefore, we can conclude that while respondents highly value and trust the expertise of repair professionals, they do not frequently utilize these services, with cost being the main barrier.



**Figure 3. Mean scores of items measuring the acknowledgement of repair**

### *Preferred repair service (RQ2)*

As fashion brands expand their repair services, understanding consumer perceptions of both **brand-provided (E- fig 1)** and **local options (F- fig 1)** is essential, as both contribute to the CE. In this study, respondents viewed both services positively, but a paired sample t-test revealed that local repair is preferred over branded repair for three aspects: (1) no functional defects after repair ( $t=3.342$ ;  $p<0.001$ ), (2) durability post-repair ( $t=4.945$ ;  $p<0.001$ ), and (3) high quality after repair ( $t=3.914$ ;  $p<0.001$ ). For "no aesthetic flaws," there was no significant difference, as both services scored equally.

Lastly, we examined what influenced the quality perception of the local repair service using a regression analysis. Only two of the nine items measuring the acknowledgement towards repair services have a significant influence on the quality perception of repair: respect towards repair services ( $b = 0,192$ ;  $p=0,006$ ) and nice location in the city ( $b = 0,130$ ;  $p=0,047$ ). We conclude that there are other factors next to respect towards repair services and their nice location that influence the quality perception of the local repair service.

### *Design interventions (RQ3)*

These survey results were presented to a focus group of experts (see research design). Later the ideas were discussed in a brainstorming session where all ideas were summarized on a single slide. Subsequently, these insights were categorized as strategies based on shared objectives (see discussion). These strategies aim to increase the visibility of repair services, improve consumer repair skills, and highlight the value of repair, aligning with CE principles by maximizing product reuse and minimizing waste. The strategies were later grouped into four design interventions: (i) enhancing repair service visibility, (ii) improving repair skills, (iii) ensuring quality control of repairs, and (iv) increasing the perceived value of repair.

## **Discussion**

Though respondents express a strongly positive attitude towards repair as a sustainable practice, it rarely translates into action, with clothes and footwear seldom repaired. This discussion will explore the four design interventions that were identified in the focus group workshop of experts based on survey results (See methods), to pinpoint key innovations and needs for expanding repair services. To effectively implement these strategies, we suggest that fashion brands adopt a Product-Service System (PSS) approach as it integrates products and services to fulfil customer needs while promoting the CE principle. By offering repair services alongside their products, fashion brands can create a cohesive system that enhances the visibility, accessibility, and quality of repair services.

### *Design interventions for visibility of repair services*

Clothes are seldom being repaired through self-repair or a third party. To promote actual repair behaviour, it's important to enhance the visibility of repair services, highlight craftsmanship, present available options, and leverage the respect and trust consumers have for repair professionals (Lee & Wakefield-Rann, 2021). Building on the survey results and the focus group discussions, we can conclude that visibility can be achieved in different ways:

**-Physical visibility:** Locating repair services more prominent and strategic within the store (for branded repair) or city (for local repair), or redesigning their visibility ensures they are easily identifiable and inviting to customers. Fashion brands can collaborate with local repair to increase the quality perception and establish familiarity with the local repair shops



**-Visibility of the process:** Enhancing trust and quality perceptions of repair services by (Güsser-Fachbach et al., 2023; Singh et al., 2022) improving interactions between repair professionals and customers and provide valuable insights and tips to boost confidence in self-repair skills.

**-Online visibility of repair:** Leveraging social media platforms (Instagram and TikTok) to effectively engage younger generations by showcasing the benefits and possibilities of repair, thus fostering a culture of sustainability and normalization of repair.

**-Collaboration:** Fashion brands can collaborate with local repair to increase the quality perception and establish familiarity with the local repair shops (Singh et al., 2022).

**-Early repairability insights:** Providing customers with information on repair possibilities during purchase to encourage informed decisions and a more sustainable approach to product ownership.

### *Design for repair skill improvement*

We found that repairs are more often conducted by professionals than individuals, likely due to consumers' low confidence in their skills and high trust in repair professionals. We reason that empowering individual to improve their repair skills is essential for increasing self-repair activities and overall repair rates. This could be achieved by:

**-Basic skills:** Organizing workshops for various repair tasks, from simple (e.g., fixing a button) to complex (e.g., darning), can boost confidence and foster a community of participants with different skill levels (Durrani, 2018).

**-Education:** Introducing repair workshops in schools can instill care and maintenance habits early, promoting self-sufficiency and sparking interest in repair professions like cobbling and tailoring (Özkan & Wever, 2019). More insight is needed on how this can be integrated into not only basic education but also design education.

**-Community skills:** Repair cafés can provide repair resources (e.g. sewing machines, fabrics, patches) to further practice repair skills without needing to make (expensive) material costs. Moreover, skilled repairers at repair cafés can assist with troubleshooting (Milstein et al., 2017; Moalem & Mosgaard, 2021; Niinimäki & Durrani, 2020).

### *Design for repair quality control*

Trust in the repair service's knowledge and skills emerged as the primary motivator for

repair. Local repair services are favored over branded ones, likely due to unfamiliarity with brand repair offerings and the perception that fashion brands prioritize selling new products. This situation contrasts with other sectors, such as automobile repair, where trust in the brand to repair exists (Hong & Kim, 2020). In contrast, local services build trust through personal relationships and visible repair equipment. Unlike sectors like automobile repair, branded repair often lacks direct interaction with repair professionals, which can diminish trust. Brand sales assistants have different skills than those needed for repair. Therefore, the perception might be that they are going to miscommunicate with the repair service (Ben Amor, 2019). Strategies to increase the quality control of repair can decrease the fear that repaired products cannot last as long as their new counterparts. However, further research is needed to understand how quality is perceived in repair services and products. We suggest:

**-Durability claim:** Offer warranty for repaired items to assure durability and reliability.

**-Quality of repairers:** Leverage trust in skilled repair professionals as this elevates the perceived quality of repaired items, reinforcing the value of repair services.

**-Quality through transparency:** Maintaining transparency in the repair process by clearly communicating methods and standards used to achieve high-quality repairs can build trust and encourage more widespread acceptance of repaired products.

**-Quality partnership:** Dao et al., (2021), emphasize the need for collaboration between business stakeholders and customers to achieve successful business innovation in repairability. To simplify repairs, fashion brands can partner with repair professionals to analyze their products and identify design improvements that enhance repairability. Incorporating insights from experienced repairers can result in more accessible and durable designs.

### *Design for repair value*

In the study, the perceived high cost of repair remains the most important barrier towards repair. Therefore, it is interesting to highlight the added value of repair.

**-Upgrade cost:** Customization can increase the added value of repair and emotional value attached towards the product ('The Rise of Personalised Sneakers', 2024) which enhances better care and influences clothing longevity

and more sustainable future clothing selection (Maguire & Fahy, 2023).

**-Transparent costs:** Transparency in repair costs offers pricing insight and could reduce frugality. It also allows personalized pricing by letting customers perform simple tasks (e.g., removing a zipper), decreasing repair service hours and overall costs (Bunodiére & Duflou, 2023; Mohan et al., 2014).

### Limitations of the research

A key limitation of this study is the use of quantitative data to capture consumers' repair behaviour and perceptions as it may not capture the depth of respondents' perceptions and behaviors. Moreover, the nature of data collection through Decathlon's mailing list of their Belgian customers may provide limitations in the diversity of perspectives and may reflect the views of more motivated respondents rather than the entire target population.

### Conclusion

This research explores consumer repair behaviour and perception of clothing and footwear, highlighting the vital role of skilled repair professionals who are highly regarded for their craftsmanship and expertise. Despite this recognition, consumers rarely use repair services due to high costs (RQ1). Both brand-provided and local repair options are effective, with a preference for local services, and both support the CE (RQ2). To improve repair practices, four design interventions are proposed: (i) increasing repair service visibility, (ii) enhancing repair skills, (iii) ensuring quality control, and (iv) boosting the perceived value of repair (RQ3). In conclusion, repair services are key to advancing the CE by maximizing the reuse of products, materials and, reducing the need for new purchases. Though focused on Belgian consumers, this study offers valuable insights for future research on cultural differences and the practical application of repair strategies. Further research is needed to explore how consumers assess repair quality and whether a hierarchy exists to further develop quality assurance, as well as how to integrate reparability into design education to educate designers to design for reparability.

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