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Unpicking the Gender Gap: Examining Socio-Demographic Factors and Repair Resources in Clothing Repair Practice

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Abstract: Increased fashion consumption spurred by fast fashion has led to excessive textile waste, giving rise to a global crisis as textile waste pollutes land and waterways, while landfill and incineration contribute to global greenhouse gas emissions. Extending a product's life for as long as possible is a core principle of the circular economy (CE) to ensure that the maximum value of the original product is realized over its lifetime. As such, repair is an essential component of a CE because it supports the preferred waste hierarchy elements of reduce and reuse, with recycling being the last resort in a CE necessary to close resource loops. Consumers are an essential enabler of a CE; therefore, it is critical to understand consumers' characteristics in the context of behaviors such as repair. The purpose of this study was to examine the role of gender on engagement in clothing repair practices; women have often only been the focus of clothing repair studies. An online survey was conducted to collect responses from Canadian and U.S. consumers (n = 512). Findings showed that self-repair was the most common form of clothing repair, with women being more highly engaged in self-repair practices, increasing with age. Paid repair is the type of repair that has the lowest level of engagement, and there are only negligible differences between the genders. Men utilize unpaid forms of repair more than women. However, among the youngest age group (18–24), both genders are equally likely to have clothing repaired for free. Gender gaps exist, but opportunities for increased utilization in repair can be created to encourage full participation within a CE. In particular, the findings point to the importance of increasing repair activities amongst men and younger consumers.

Keywords: clothing; repair; repair resources; gender; waste hierarchy; circular economy

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1. Introduction

The fashion industry plays a major role in worldwide pollution and contributes significantly to climate change. Excessive consumerism, spurred by the fast fashion industry, has led to excessive textile waste, particularly in the traditional Global North. Wardrobes in the West are overfilled, and seasonal or random decluttering [1,2] leads not only to the disposal of clothing in residential waste streams, but also in bags of unwanted clothing making their way to thrift and charity stores. Donation to charity is the most common method for the disposal of unwanted clothing [3,4]. However, this proliferation of donation often results in large volumes of unusable textiles, which are either destined for landfill or incineration locally, or contribute to a growing problem in the traditional Global South, in the form of low-quality exported second-hand clothing: "It is a system of insistent colonialism from the Global North, masking their treatment of the Global South as 'donations', using them as if they were some kind of landfill" [5] (para. 1). Thus, the global second-hand economy has been challenged in its apparent sustainability because it effectively offshores textile waste to countries that are little equipped to deal with the ecological disaster it creates [6].

Taking a circular approach to clothing production and consumption is vital in addressing the frequent problems found within the current fast fashion model, as well as with

other textile products, where the traditional linear model of take–make–consume–waste approach, is failing the global environment. Within a circular economy (CE), products and the materials from which they are made are highly valued. Extending a product's life for as long as possible is a core principle of the CE approach, ensuring that maximum value of the original product is realized over its lifetime. Furthermore, at the end of a product's useable life, materials should be recycled to form a new product, in order to maintain the value of those materials. The goal of the CE system is to keep waste to a minimum while reducing the overall use of new resources, hence turning "waste into a valuable resource" [7] (para. 1).

Bocken et al. describe the CE in terms of the slowing, closing, and narrowing of resource loops [8]. Recycling closes the loop between post-consumer use and production because it occurs at the end of a textile's useable life where the product is broken down back to the basic materials (e.g., fibers and polymers) for use in the manufacture of a new product [9]. Slowing resource loops includes designing for longevity and including services that extend the life of products for as long as possible. Examples of CE models toward slowing clothing consumption include sharing, leasing, reusing, repairing, and refurbishing [10]. Research points to problems associated with some of these approaches to clothing consumption, such as the global warming impacts of the increased transportation of garments [11], or the geographic and context specific limitations of shared consumption [12]. Shared economies for clothing also face problems when natural deterioration that occurs during a garment's lifespan (e.g., fading, pilling, and holes) become unacceptable earlier within a business model of multiple users per item [13]. Consumer expectations surrounding clothing quality of shared items are often higher than what they apply to their own possessions. For instance, the perception of the potential transfer of bodily fluids or odors acts as a barrier to the general acceptance of shared models of consumption [14]. This issue may prove even more challenging for shared models of consumption in the wake of the global COVID-19 pandemic and increased demands for hygiene [15]. In addition to consumer barriers to uptake of the shared clothing consumption model, the overall sustainability of these models has been called into question, where sharing may in fact reduce garment life [14]. Keeping clothing in active use by the original user, therefore, has the greatest potential for reducing the overall carbon footprint associated with the production, transportation, use, and disposal of garments [11,13], and was the focus of the current study.

2. Circular Economy Frameworks and Clothing Repair

2.1. Repair within a Circular Economy

The consumer is one of the two enablers of a successful CE system, the other being the business model itself [14,16]. Understanding the role of the consumer within a CE system is crucial, because consumers make decisions as to where and what to purchase, how to care for, and when and how to dispose of products. This is particularly pertinent for clothing and textiles, where garments can be so inexpensive and accessible [17]. However, consumers can be motivated to engage in product-life-extension strategies where they perceive a high personal value of clothing attachment [18], thus supporting the underlying philosophy of a CE approach to garment use.

In a recent review of CE scholarship, Kirchherr et al. [16] identified 114 CE definitions and coded them on multiple dimensions. They recommended that a CE framework should be positioned within the waste hierarchy, at a minimum within the 4Rs framework of reduce, reuse, recycle, and recover, where there are levels of preference for the various elements. The authors note that most of the CE literature focuses heavily on recycling and less on the higher-order, more desirable elements of reduce and reuse. In the CE, repair is integral to supporting the preferred waste hierarchy elements of reduce and reuse. Reuse occurs through repair, where the term can encompass all modifications made to a garment, including dealing with damage as well as re-making or upcycling. Refurbishment involves repair, but is where returned products are repaired then sold to a new customer [19], as

seen in some collections from outdoor brands (e.g., The North Face Renewed collection). Repair for refurbishment is differentiated from repair for reuse, where the reuse is often understood to be by the original owner, although not exclusively. Through repair, the life of ones' clothing can be significantly extended, potentially leading to a reduction in overall consumption. Furthermore, through repair, clothing that may have otherwise been discarded can continue to remain in use at their highest form, as the garment was originally made and intended to be used.

2.2. Repair Behavior

Clothing repair can take the form of self-repair, where consumers repair their own clothing and textile items; repair by others, in the form of paid repair, where a professional carries out a repair service; and unpaid repair, where others repair clothing or textiles for free. Physical, psychological, and financial barriers may prevent a person taking up these various forms of repair practice [17,20], where these repair barriers can be conceptualized as a measure of repair resources [21]. For example, not having the skills to repair, or access to the tools to repair, are barriers to carrying out self-repair [22], while having skills and access is more likely to cumulate in self-repair [21]. However, having insufficient time to carry out repairs, even when skilled people also have access to the required tools, can become another barrier to people completing their own repairs [23]. This means that a level of prioritizing repair is required to ensure repairs are completed. Prioritizing repair can also be relevant to both paid and unpaid repairs [21], because this involves time and organization to take clothing to someone to repair. Paying professionals to repair clothing may pose a financial barrier [24]. Paying for repairs is particularly relevant when the cost of replacing clothing is perceived to be low [20]. Therefore, being able to afford professional repair services can be viewed as a repair resource for paid repair, whereas viewing paid services as too costly may be associated with increased engagement in self-repair [21].

Women are the typical demographic represented in existing clothing repair studies. Sewing and mending are often viewed as female-oriented domestic tasks [25], and women are said to be more likely to have the skills to sew, and therefore, perform repairs on clothing, than their male counterparts [24]. Often, studies that examine repair do so in the context of female fashion garments, hence the natural affinity of a female sample [26]. Despite this, a successful CE clothing system requires engagement in repair activities from all genders. Considerations of the repair practices of other genders (usually only men) have occurred in a limited fashion, generally outside of North America. Repair within CEs has been investigated amongst Norwegian men and women [24,27], and from a sample of residents of the city of Hull in the United Kingdom [28]. Within the United States, Diddi and Yan [22], surveyed 254 individuals attending various sustainability-related events in a mid-sized city in the state of Colorado. Of their sample, 27% were men, and gender differences were not examined [22]. In a more recent Canadian study, 640 responses were collected from students at one Canadian university [29]. In this study, 53% of the sample were women, 44% were men, and 3% were non-binary/third gender. Men were found to engage in clothing repair, although to a lesser extent than women; however, the construct combined self-repair and other forms of repair [29]. Furthermore, the student population was limited by age and, to some extent, diversity, because all respondents had at a minimum completed their high school education and were on their way to completing a higher degree.

In the context of sustainable clothing consumption, which includes these practices that occur during the use phase of clothing, North American consumers are an important population to examine. In North America, the volume of textile consumption and waste is among the highest in the world, with the United States generating 17 million tons (15.4 million tonnes) of textile waste in 2018 [30]. A recent report on Canadian textile waste estimated that Canadians discarded 1.3 million tonnes of textiles in 2021 [31]. The United States is among the highest in exports of clothing to the Global South [32], and Canadians are similar to US consumers per capita. Canadians are estimated to generate 31.2 kg of textile waste per year, a little less than the Americans at 34.8 kg/year [31]. Based on various

U.S. and Canadian audits of textiles in municipal waste, textiles comprise 4–6% [2,33]. In a recent audit of residential waste from Ontario (Canada's largest province), 64% of textiles that were thrown out were considered to be "good enough" quality to be reused, with most of these benefiting from repair in order to be reused [33] (p. 4).

Examining the characteristics and propensity of consumers toward clothing repair is essential in furthering the role of communities, government, and businesses in increasing repair activities. Therefore, through a quantitative survey, we collected responses from Canadian and U.S. consumers, measuring the role of selected socio-demographic variables (gender, age, education, and employment status) and repair resources on different forms of repair practice. This study extends previous research by McQueen et al. [21], who examined repair resources and practices of younger Canadian consumers (18–34 years). In this research, we examined more closely the self-reported behavior of men and women regarding their clothing repair practices, skills, tools, repair prioritization, and perceived expense of repair. Clothing repair by the individual is important in extending the useable life of garments, keeping garments in reuse and reducing the consumption of new clothing items; therefore, examining multiple forms of clothing repair practices is pertinent. Furthermore, consumers who particularly value their clothing may engage in more than one type of repair when skills, access to tools, and time differ [27]. There is a general understanding that men and women vary in sustainable consumption practices, and these can also be influenced by age [34,35]. Therefore, delving into the nuances of age and gender within various forms of clothing repair practice is essential in determining the availability of repair facilities for learning skills toward repair, encouraging engagement with professional clothing repair services, and highlighting the demographics of who to target to increase motivation toward repair.

This study was guided by the following research questions:

1. RQ 1: How do men and women differ in their repair behavior for self-, paid, and unpaid repair?
2. RQ 2: Do other socio-demographic factors influence repair practices of men and women differently?
3. RQ 3: Do repair resources impact the level of engagement in repair practices for men and women differently?

3. Methods

3.1. Data Collection

A survey was developed to measure repair practices among Canadian and U.S. consumers. The survey was performed through Amazon's Mechanical Turk (MTurk), where the survey was posted and eligible participants within discrete gender and age ranges could respond. A total of 512 valid survey responses were received. The demographic profiles of the respondents are shown in Table 1. Women made up 51.8% of the sample, and 50.4% of the respondents resided in Canada. Of the sample, 14.1% were aged from 18 to 24 years, 30.5% were 25–34 years; 20.3% were 35–44 years; 15.2% were 45–54 years; and 19.9% of the sample were aged 55 years or older. Age groups aligned with the age-range categories offered by the MTurk platform. Canadian respondents were typically younger than the U.S. respondents, with median age ranges of 25–34 years and 45–54 years, respectively. Therefore, the Canadian and U.S. data were pooled for analysis, consistent with other studies related to clothing consumption trends of North American consumers [36].

3.2. Survey Instrument

3.2.1. Dependent Variables

The survey tool included three repair practice scales (self-, paid, and unpaid) used in previous research [21] and shown in the Appendix A. These scales were utilized because they represent one of the only recent measures of repair that separates repair practice into self-, paid, and unpaid; as such, the internal validity measures were improved. As noted in the literature review, this distinction is important to understanding the repair

practice of individuals across differing socio-demographic variables, as was the aim of this research. Each repair practice scale was a three-item five-point Likert scale consisting of (1) strongly disagree to (5) strongly agree. For self-repair, the scale was identical to that used by McQueen et al. [21]. However, an additional item was added to each of the paid and unpaid repair scales, creating three-item scales. The additional items were: "I never pay someone else to repair my clothing" for the paid repair scale and "I never have my clothing repaired by someone else, for free" for the unpaid repair scale. The internal reliability of each repair practice scale was good, with a Cronbach's alpha score for self-repair of 0.881, 0.838 for paid repair, and 0.863 for unpaid repair.

Table 1. Summary of respondents by selected socio-demographic and coding variables used for multi-variant analysis.

Demographics (Coding Variable)	Frequency	%
Gender		
Men	247	48.2
Women	265	51.8
Age		
18–24 (1)	72	14.1
25–34 (2)	156	30.5
35–44 (3)	104	20.3
45–54 (4)	78	15.2
55+ (5)	102	19.9
Education		
Less than high school (1)	4	0.8
High school diploma (1)	58	11.3
Some college or university study (2)	85	16.6
Apprenticeship or Trades Certificate (2)	15	2.9
College diploma (2)	38	7.4
Bachelor's degree (3)	217	42.4
Graduate degree or diploma (4)	86	16.8
Doctorate (4)	9	1.8
Employment status		
Not employed, not looking for work (1)	24	4.7
Not employed, looking for work (1)	37	7.2
Student (1)	29	5.7
Retired (1)	34	6.6
Employed part-time (2)	72	14.1
Employed full-time (3)	316	61.7
Country		
Canada	258	50.4
USA	254	49.6

3.2.2. Independent Variables

The four repair resource scales used by McQueen et al. [21] were used in the current study (see Appendix A). These scales were developed in relation to the repair practice scales used as dependent variables in this study; therefore, the four repair resource scales were selected to maintain consistency in measurement and interpretation. Repair resources comprised skills, tools, priority toward repair, and perceived expense of repair. As with repair resources, each item was measured using a five-point Likert scale of (1) strongly disagree to (5) strongly agree.

The Cronbach's alpha score for the four-item repair skills scale was 0.872, 0.816 for the three-item repair tools scale, 0.754 for the four-item repair priority scale, and 0.713 for the two-item perceived expense scale. Therefore, all four scales indicated a good level of internal reliability, being greater than 0.70 [37]. In line with the underpinning research questions of this study, key socio-demographic data, including age, education, and employment status, were also collected.

3.3. Data Analysis

Means (*M*) and standard deviation (*SD*) of individual scale items and final constructs were calculated. Analyses of the differences between subjects for each type of repair practice were carried out using Kruskal–Wallis tests. Each individual responded to each question related to repair practice dependent variables; therefore, the Friedman's test was conducted to determine whether there were significant differences amongst the three types of repairs within groups.

Two multivariate hierarchical regression models were used to examine the contribution to variation in each of the three repair practice measures of the socio-demographic variables and the repair resources. The hierarchical regression models were completed separately for men and women. The first step in the model was the socio-demographic variables of age, education, and employment status. The coding variables used are shown in brackets in Table 1. The second step in the model included the four repair resource measures, which were means from the multi-item scales. All statistical analysis was carried out using IBM SPSS Version 28 (IBM Corp., Armonk, NY, USA).

4. Results

4.1. Respondents

The socio-demographic profiles of the survey respondents are provided in Table 1.

4.2. Descriptive Statistics

Figure 1 shows the mean scores for self-, paid, and unpaid repair, differentiated by gender and age. In general, respondents had higher mean scores for self-repair than other forms of repair. This was particularly notable in the responses from women, where the mean values for self-repair were all above three, indicating a high level of agreement with the statements related to the self-repair of clothing. As age increased, the propensity toward self-repair also increased, with older women more inclined toward self-repair than younger women ($H(4) = 9.591$, $p < 0.001$). Women aged 55 years or older differed significantly in self-repair behavior from women younger than 35 years.

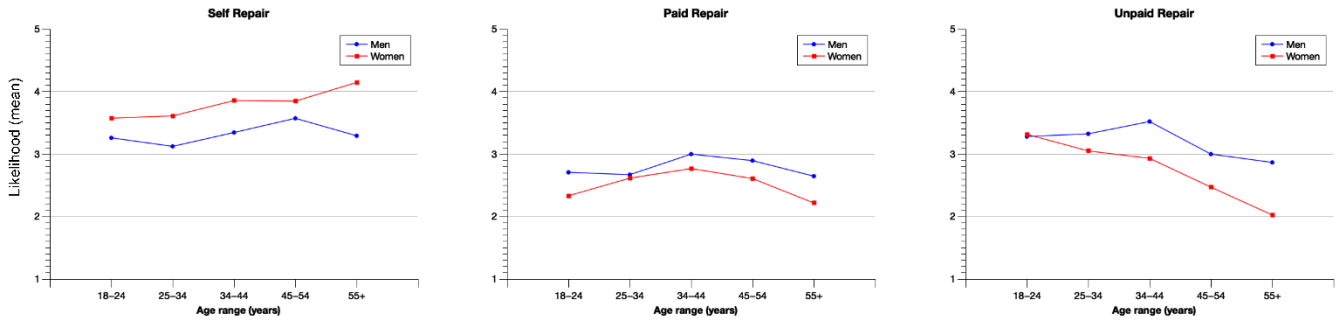

Figure 1. Mean scores for self-, paid, and unpaid repair by gender and age.

Between the other two forms of repair, there was generally much lower engagement in paid repair services than unpaid repair, because mean values for all age groups and genders were below three. Unlike the results for self-repair, men were more likely to engage the services of a professional than women, because they had consistently higher mean scores over all age ranges. Similarly, in unpaid repair, men were more likely to utilize the services of another to repair clothing for them, with the exception of the 18–24 age group, where mean values did not differ between the two genders. As age increased, engagement in unpaid repair generally decreased, with an exception for men in the 35–44 age group who had a higher mean value than men younger than 35 years.

Table 2 shows the means and standard deviations for self-, paid, and unpaid repair by gender. Responses to the three types of repair practices differed significantly, with the self-repair mean score of the sample being 3.55 (*SD* = 1.10), differing significantly from

paid repair (M = 2.64, SD = 1.10) and unpaid repair (M = 2.99, SD = 1.19) (see Table 2). Similar relationships among the three types of repair practice were found when results from women only were compared; however, for men, self-repair and unpaid repair did not differ significantly, with mean scores of 3.28 (SD = 1.10) and 3.23 (SD = 1.12), respectively.

Table 2. Comparisons among repair practices by gender—mean (SD).

	n	Self-Repair	Paid Repair	Unpaid Repair	χ^2	df	*p* Value *
Total responses	512	3.55 (1.10) [a]	2.64 (1.10) [b]	2.99 (1.19) [c]	143.87	2	<0.001
Gender							
Men	247	3.28 (1.10) [a]	2.77 (1.05) [b]	3.23 (1.12) [c]	42.85	2	<0.001
Women	265	3.80 (1.03) [a]	2.52 (1.14) [b]	2.77 (1.21) [b]	136.59	2	<0.001

* p value based on Friedman's chi-squared test; [a,b,c] mean values followed by a different superscript letter are significantly different at $p < 0.05$ by post hoc tests.

It is clear that utilization of the various forms of clothing repair practice differs among men and women. Repair practices were significantly different between genders in this study (except for men in self- and unpaid repair), which indicates that most respondents engage in only one form of repair activity. However, some respondents still engage in more than one type. To examine the data more closely on this aspect, we conducted cross-tabulations of two forms of repair for men and women (see Figure 2). Initially, four groups of mean scores for each repair type were compiled by creating four categories. Mean scores of 1–2 were labelled "none", mean scores of 2.01–3 were labelled "rarely", scores of 3.01–4 were labelled as "sometimes", and scores of 4.01–5 were labelled as "often". When two repair types were cross-tabulated, 16 groupings were created. These 16 groups were further collapsed into four quadrants, A to D. Quadrant A corresponded with low engagement in both forms of repair practice. Quadrants B and C corresponded with low engagement in one type of repair practice and high engagement in another. Quadrant D corresponded with high engagement in two forms of repair practice.

Among women, the preference for self-repair over the other forms was evident: 51.7% of women were in Quadrant C, showing high engagement in self-repair versus paid repair (Figure 2d); 45.3% were in Quadrant C, with, again, high engagement in self-repair but low in unpaid repair (Figure 2e). However, 40.5% of men were in Quadrant D, showing a high level of engagement in both self- and unpaid repair (Figure 2b), making up the largest proportion in the self-/unpaid repair cross-tabulation. Despite a clear preference for self-repair amongst women, just over one-third (i.e., 35.5%) indicated that they engage in both self-repair and unpaid repair, and 29.1% of women engaged in both self-repair and paid repair.

Further analysis of the data determined the frequency of responses for all types of repairs. We found that 7.9% of female respondents and 12.2% of men reported never engaging in any repair activities (data not shown). It was evident that women were more prone to repair overall, because 51.7% of female respondents were likely to engage in high levels of at least one type of repair activity, whereas only 35.6% of men were likely to be highly engaged in at least one type of clothing repair.

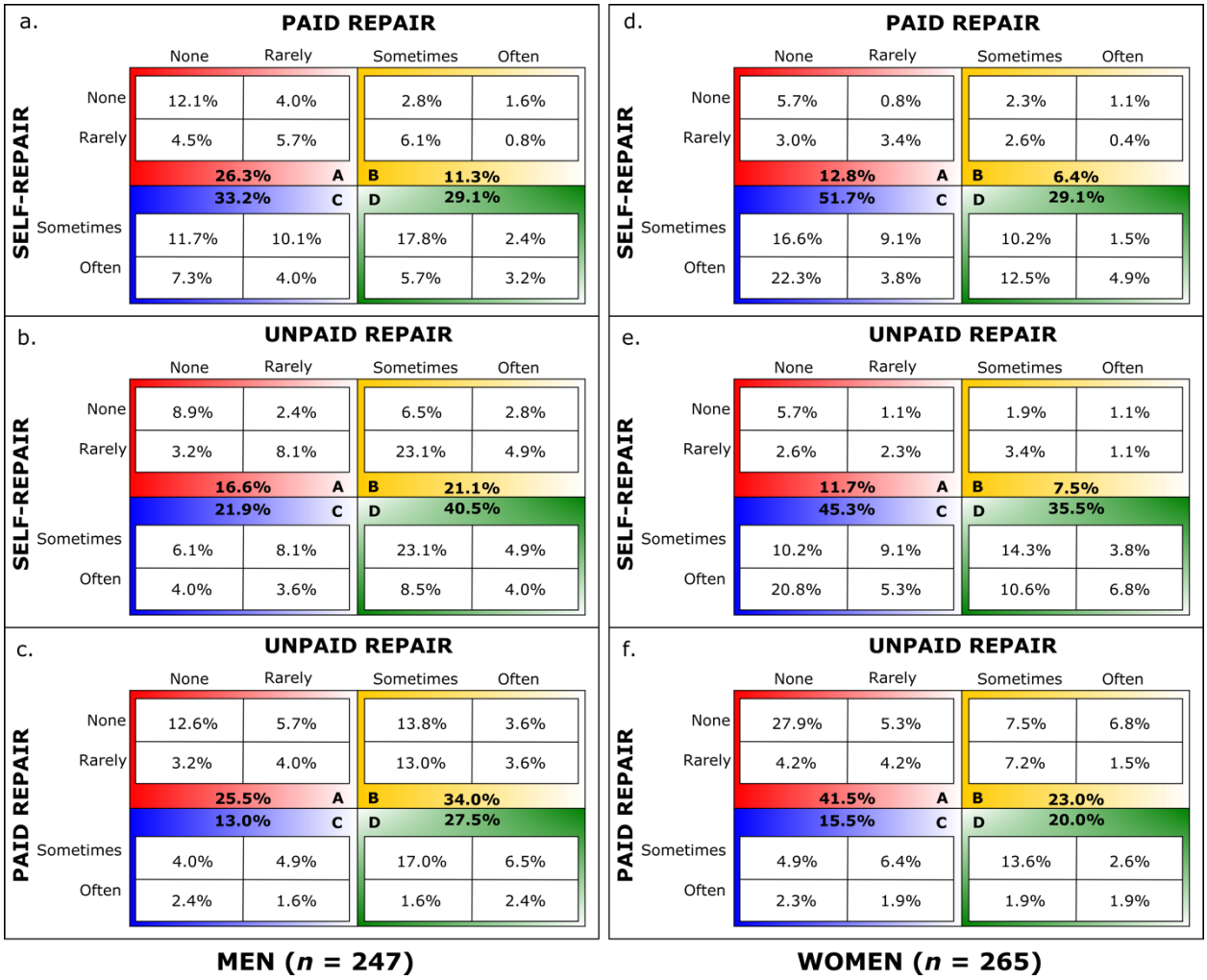

Figure 2. Repair matrices of self-, paid, and unpaid repair by gender indicating the proportions of high and low engagement in multiple repair practices. (**a**) Men self-/paid repair; (**b**) Men self-/unpaid repair; (**c**) Men paid/unpaid repair; (**d**) Women self-/paid repair; (**e**) Women self-/unpaid repair; (**f**) Women paid/unpaid repair.

4.3. Multivariant Statistics

Correlations among the variables for each gender are shown in Table 3. Hierarchical multivariant regression analyses examining associations between the three socio-demographic variables and four repair resources for repair practice are shown in Table 4. Again, the results for men and women are presented separately.

Table 3. Spearman's rho correlations [1] of repair variables.

Variable	Self-	Paid	Unpaid	Age	Education	Employment	Skills	Tools	Priority	Expense
Self-	–	0.187 **	0.113	0.068	0.097	−0.035	0.810 ***	0.637 ***	0.732 ***	0.153 *
Paid	−0.048	–	0.193 **	0.021	0.193 **	0.048	0.215 ***	0.174 **	0.242 ***	0.439 ***
Unpaid	−0.100	0.335 ***	–	−0.114	0.194 **	0.104	0.067	0.232 ***	0.143 *	0.115
Age	0.169 *	−0.041	−0.348 ***	–	0.156 *	−0.041	0.074	0.097	0.135 *	0.138 *
Education	−0.155 **	0.250 ***	0.062	−0.070	–	0.163 *	0.035	0.092	0.097	0.134 *
Employment	−0.194 ***	0.094	−0.007	0.007	0.243 ***	–	−0.065	−0.064	−0.120	0.001
Skills	0.772 ***	0.054	−0.082	0.141 *	−0.071	−0.131 *	–	0.684 ***	0.738 ***	0.112
Tools	0.642 ***	−0.110	−0.051	0.227 ***	−0.093	−0.128 *	0.701 ***	–	0.652 ***	0.134 *
Priority	0.678 ***	0.075	−0.051	0.201 ***	−0.130 *	−0.094	0.707 ***	0.529 ***	–	0.257 ***
Expense	0.150 *	0.517 ***	0.166 **	0.122 *	0.077	0.034	0.222 ***	0.132 *	0.284 ***	–

[1] Correlations for men are shown in the upper triangle, and women are shown in the lower triangle; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 4. Hierarchical regression analyses for clothing repair practices to socio-demographic variables (Model 1) and the addition of repair resources variables (Model 2).

	Self-Repair				Paid Repair				Unpaid Repair			
	Men		Women		Men		Women		Men		Women	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	β	β	β	β	β	β	β	β	β	β	β	β
Age	0.048	−0.026	0.185 **	0.026	−0.023	−0.072	−0.029	−0.056	−0.176 **	−0.203 ***	−0.356 ***	−0.395 ***
Education	0.087	0.031	−0.074	−0.038	0.204 **	0.139 *	0.24 5 ***	0.189 ***	0.216 ***	0.176 **	0.031	0.016
Employment	−0.060	0.040	−0.154 *	−0.051	0.002	0.034	0.032	0.018	0.078	0.099	−0.015	−0.016
Skills		0.565 ***		0.517 ***		0.156		0.142		−0.111		−0.178
Tools		0.124 **		0.223 ***		−0.025		−0.195 **		0.328 ***		0.186 *
Priority		0.241 ***		0.153 **		0.054		−0.044		0.006		0.001
Expense		0.007		−0.019		0.418 ***		0.539 ***		0.075		0.205 **
R^2	0.014	0.728	0.071	0.680	0.041	0.264	0.067	0.358	0.080	0.157	0.129	0.184
ΔR^2	0.014	0.714	0.071	0.609	0.041	0.223	0.067	0.292	0.080	0.077	0.129	0.054
ΔF	1.123	156.853 ***	6.661 ***	122.091 ***	3.432 *	18.120 ***	6.207 ***	29.217 ***	6.997 ***	5.471 ***	12.931 ***	4.268 **

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

4.3.1. Self-Repair

The first step of the regression analysis included the socio-demographic variables. In Model 1, the socio-demographic variables of age, education, and employment were non-significant for men and did not predict self-repair behavior ($F = 1.123$). For women, however, the socio-demographic variables accounted for 7.1% of the variance, which was significant ($F = 6.661$, $p < 0.001$). There was a positive relationship between the age of women and self-repair ($\beta = 0.185$, $p < 0.01$), and a negative relationship between employment and self-repair ($\beta = -0.154$, $p < 0.05$). In Model 2, when the repair resources were included, additional 71.4% and 60.9% of the variances were explained for men and women, respectively. Repair skills made the greatest contribution to predicting self-repair behaviors (men: $\beta = 0.565$, $p < 0.001$; women: $\beta = 0.517$, $p < 0.001$), followed by tools and priority for repair. Interestingly, priority for repair offered greater predictive power for men than tools for repair (i.e., tools: $\beta = 0.124$, $p < 0.01$; priority: $\beta = 0.241$, $p < 0.001$), whereas the reverse was true for women, with tools having more predictive power than giving priority to repair (i.e., tools: $\beta = 0.223$, $p < 0.001$; priority: $\beta = 0.153$, $p < 0.01$).

4.3.2. Paid Repair

In the first step (Model 1) of the regression analysis examining paid repair, only 4.1% of the variance was explained for men's participation in paid repair, and 6.7% for women. Education had a positive association with paid repair for both men ($\beta = 0.204$, $p < 0.01$) and women ($\beta = 0.245$, $p < 0.001$). In Model 2, when repair resources were included, an additional 22.3% of the variance was explained for men and 29.2% for women. The additional explanatory variable of perceived expense, related to having clothes repaired, was positively associated with paid repair (men: $\beta = 0.418$, $p < 0.001$; women: $\beta = 0.539$, $p < 0.001$). Thus, if participants did not perceive the cost of repair to be prohibitive, they were more likely to engage in paid repair. For women, there was a negative relationship between repair tools and paid repair ($\beta = -0.195$, $p < 0.01$) indicating that women who used paid repair were less likely to have access to repair tools.

4.3.3. Unpaid Repair

For unpaid repair, in Model 1, only 8.0% of the variance was explained for men and 12.9% for women. A negative relationship between age and unpaid repair was found for both genders (men: $\beta = -0.176$, $p < 0.001$; women: $\beta = -0.356$, $p < 0.001$). For men, education was also significantly associated with unpaid repair ($\beta = 0.216$, $p < 0.01$), because more highly educated men would be more likely to use unpaid repair. There was no relationship between education and unpaid repair for women. An additional 7.7% of the variance for men and 5.4% for women was explained in Model 2 when repair resources

were included. A positive association was found between tools and unpaid repair, which was stronger for men ($\beta = 0.328$, $p < 0.001$) than for women ($\beta = 0.186$, $p < 0.05$). For women, a positive association between perceived expense and unpaid repair was found ($\beta = 0.205$, $p < 0.001$), although one was not found for men.

5. Discussion

In this study, we examined men's and women's inclination toward repair activities. Previous research from Norway found that women were more likely to conduct their own clothing repairs, whereas men would request the help of someone else [24]. Our findings from a North American sample support this, indicating a likely global trend. Women are predominantly self-repairers, and men utilize others to conduct repairs for them. Our study contrasted men and women in respect to age, education, and employment status. Age did not factor into men's engagement with self-repair practice, but it did for unpaid repair. Older men were less likely to have their clothing repaired for free than younger men. A similar relationship between women and unpaid repair was found, where older women were much less likely to have a family member or friend repair for them. This particular trend was far stronger for women than men, which could likely be explained by the higher propensity for older women to repair their own clothing.

Our research was a cross-sectional study; therefore, we cannot assume that these trends will remain in the future. Respondents from the oldest cohort were born in 1966 or earlier, and since the early 21st century there has been a shift away from technical programs teaching sewing skills in the family and consumer sciences curriculum within public schools, with not all schools requiring sewing [26,38]. This curriculum shift, coupled with a general decrease in home sewing and crafting, could create a vacuum for opportunities to learn basic sewing skills among younger consumers. To some extent, this vacuum may be filled by online sewing and mending tutorials and information which are easily accessible to young consumers [39]. However, access to this information online may still not be sufficient in increasing repair activities if a lack in confidence in personal sewing/repair skills exists [40]. This may be where in-person instruction has advantages over online tutorials. Our data suggest that many young adults have access to people who can repair clothing for them, and both young men and women engage equally in unpaid repair. These findings agree with our previous studies on young university students (18–24 years), who were more likely to use unpaid repair than older students (25–34 years) [21]. The current study contributes to this insight into unpaid repair practices among a more diverse population, which included participants with different educational backgrounds, employment status, and a wider age range. Furthermore, this study supports the findings of previous work which suggested an overall downward trend in utilizing unpaid repair as age increases.

Higher education levels positively predicted paid repair for both genders, and unpaid repair in men, although not for women. There are several explanations that could be posited for this. More highly educated people may be more likely to have pro-environmental attitudes, which may lead to pro-environmental behaviors such as garment repair. For example, in a recent study, consumers with higher degrees were found to be more likely to purchase recycled clothing, with an association made between sustainable consumption and education level [41]. Other pro-environmental behaviors, such as general recycling and sustainable clothing disposal methods, have been associated with repair behaviors [22,42]. Furthermore, more highly educated individuals may perceive the environmental benefits of repairing to be worth paying for clothing repair, as well as being able to afford paid repair. Those with higher levels of education may be in professional roles which not only require a certain standard of dress, but also afford the financial resources to pay for repair. This seems likely because education has been found to correlate with income [43]; however, because respondents were not asked to report their income or their profession, this relationship could not be directly examined. It was interesting, however, that this association between education and repair was found only for paid and unpaid repair (men only), and not

self-repair for either gender. Multiple factors, such as limited financial resources or lack of time to carry out repairs, may be barriers that explain why there is no relationship between education and self-repair.

Repair resources include the skills and tools to carry out clothing repairs, the priority that individuals will give toward repairing clothing, and the perceived expense of conducting clothing repairs. As expected, the first three repair resources have the greatest influence on self-repair practice. Individuals who carry out their own clothing repairs had sufficient skills to conduct repairs. Furthermore, self-repairers have access to the tools for repair and give priority to doing those repairs. Through the separate multi-variant analyses, it was possible to observe different relationships between repair behavior and resources between the two genders. We found the priority toward repair to be more likely to predict self-repair than access to repair tools for men, whereas the reverse was true for women. For women, having access to repair tools was more dominant than the prioritization of repair. This may speak to the fact that many men who have access to repair tools do not engage in self-repair, but instead have their clothes repaired by another (evident in the strong positive association between men's unpaid repair practice and tools). That "other" uses the sewing machine and/or needle and thread that are accessible to the men, rather than men using them themselves. It may be that because there are fewer men who conduct self-repair, then those who do repair are more motivated, giving more time and priority to repair activities. Conversely, because women are greater self-repairers, if they have the repair tools within the home, they may be more predisposed toward using them, regardless of priority toward repair. These findings, particularly those of men who prioritize repair, point to the need to develop strategies that will deepen the sense of the importance of clothing repair among men who are not self-repairers. Such strategies which could be taken on by men's fashion brands may lead to men prioritizing repair and leading to increases in self-repair activities.

There are clear gender divides in the repair of clothing, and although this is not an entirely new finding, much of the previous work has focused on self-repair, repair as women's work, and women as menders for others [24]. Our study thus contributes to the literature in that it examines different forms of clothing repair practice, and therefore offers a more nuanced insight into the repair practices of both men and women. Furthermore, unlike the literature examining participants of community repair events [44], or attendees of pro-environmental events [22], our study examined a general population of consumers who may not have strong environmental or repair mentalities.

The implications of our findings shed light on the differences between men and women in clothing repair practices, as well as highlighting an age effect. Men do not carry out as many self-repairs, but they are equally as likely to have clothing repaired for them by others (presumably an older female relative) as young women. Men who have clothing repaired by others for free, most likely at home, have access to the tools for repair but choose not to use them themselves. Within a CE, where repair is an essential component, all forms of repair practice are valued and should be supported. However, determining how repair practices are sustained as the population ages is vital toward building a repair culture, where practices of informal and formal repair occur. The self-repair of apparel is still gender-bound, remaining in the women's domain. Exploring avenues that would help narrow this gender gap needs to be performed. The marketing of many sustainability-related messages, particularly those related to the domestic environment, is often directed at female audiences, which has likely contributed to the "eco gender gap" in sustainable behaviors [45]. These could be educational campaigns and advertisements that target young men to encourage them to learn to repair themselves, particularly by fashion brands that sell menswear to young men. As our survey showed, a number of Gen Zers have access to others who can repair for them, but this may not mean they will continue to repair as they age. There is, however, an indication that, in some regions, Gen Zers conduct more clothing repairs than other age groups [46,47]. This behavior was partly due to cost savings in reaction to increases in global commodity prices, but also driven by environmental concerns [47]. Programs and community events that engage younger people, both men and

women, toward upskilling and valuing repair, are even more vital today in the context of a move towards CEs. These can be carried out through repair cafés and other community repair events where skills are learned, tools are provided, and the motivation to repair may be maintained through the social connections developed during such events [44]. Fashion brands should also be playing their part in offering repair services. Although repair is more common within luxury and outdoor brands, repair services can be logistically challenging to carry out at scale. Fast fashion brands prefer takeback schemes and resale, because these CE methods continue to encourage the acquisition of new items [48]. Nonetheless, as part of their circularity initiatives, fashion brands need to encourage repair among their customer base as a major part of their sustainability goals. Furthermore, government subsidies for paid repair may take the form of lowering the cost the consumer pays for clothing repairs performed by tailors and dressmakers, or through tax incentives which consumers claim back on could incentivize engagement in paid repair practices. Ma et al. [49] drew attention to the importance of government subsidies for closed-loop supply chain approaches, which include repair services. Initiatives taken by different levels of government should also aim to increase the availability and accessibility of local community repair events.

6. Conclusions

Repair is an essential component of a CE, but has often been overlooked in the scholarly literature, in preference for recycling as an end-of-life practice [16]. Through acts of repair, clothing can continue to be used for its original intended purpose, thus fulfilling a central tenet of the CE framework. Through repair, clothing can be reused, and the consumption of new clothing can be reduced. Reduce and reuse are the highest priority areas within the waste hierarchy, which underpins a successful CE system. Environmental savings can be even greater when the repair is carried out by the first owner of a product, with the repaired item remaining in their possession for the long term. In this way, the environmental impacts that occur through various distribution networks of used clothing (e.g., transportation from business to consumer in various rental models) can be avoided. Therefore, it is critical to understand consumers' characteristics in the context of behaviors such as repair, as an essential enabler of a CE.

Our study of Canadian and U.S. consumers shows that there is a clear gender gap in repair practice among men and women. This finding is not entirely new; however, our research gives a more nuanced understanding of where the differences between genders are present, and where this gap narrows. The obvious trend which supports the literature is that women are self-repairers more so than men. Self-repair increases with age for women, but not for men. For unpaid repair, there are no differences in engagement; however, the gender gap widens with increasing age, most likely associated with women's increasing participation in self-repair. Paid repair is the type of repair that has the lowest level of engagement, and there are only negligible differences between the genders. A positive association between education level and paid repair was evident in both men and women, and unpaid repair for men only. This relationship indicates that highly educated consumers may be more environmentally aware to value the repair of clothing and/or could relate to professional employment. Through closer examination of the gender gaps in the different forms of repair practices, there are possible avenues toward encouraging increased repair engagement among both men and women.

7. Limitations and Future Research

There are limitations to the current study which are important to consider when interpreting the findings. Firstly, participants were recruited from the crowdsourcing platform Amazon's MTurk. Although MTurk samples have been found to be representative of the broader population and more diverse than many convenience samples (e.g., students), they have also been critiqued as being self-selected samples that are typically younger and more liberal than the general population [50,51]. Hence, the sample may not represent the general Canadian and U.S. populations. A second limitation was that the 55–64-year-old

age range was not a separate group from those aged 65+ years. Many individuals in the 55–64 age range may be employed; thus, only a small number of respondents identified as retired. Retirement compared with full-time employment may correspond to different factors that could influence repair behavior, such as time availability, economic status, and possibly skills. Therefore, for future research examining repair activities, a larger number of retired individuals should be included. Other demographic variables such as marital status could also predict various forms of paid and/or unpaid repair practice, but were not included in this study. In particular, marital status may be relevant for men who have unpaid repair carried out by their spouse. Therefore, future research in this area could examine an older age range and include additional socio-demographic variables. Men have often been under-represented in research on clothing repair activities; therefore, closer examination of interventions or programs that could increase men's engagement in self-repair activities should be investigated in future studies.

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Appendix A

Table A1. Repair practice and repair resources scale items.

Dimensions/Items	M	SD	Factor Loading	α
Dependent Variables—repair practices				
Self-repair				**0.881**
I never repair my clothing myself, even when the damage is minor. [a]	3.72	1.20	0.911	
I mend my own clothes	3.16	1.24	0.896	
I will make minor repairs to clothing (sew on a button or mend a small hole)	3.76	1.22	0.888	
Paid repair				**0.838**
I use a seamstress/tailor when I cannot repair myself.	2.65	1.31	0.884	
I never pay someone else to repair my clothing. [a]	2.40	1.16	0.878	
I take clothing that doesn't fit to a clothes repair/alteration service.	2.87	1.33	0.814	
Unpaid repair				**0.863**
I have a family member (or friend) who repairs my clothes for me.	2.92	1.36	0.918	
I ask my family and/or friends to help mend my clothes.	2.92	1.34	0.904	
I never have my clothing repaired by someone else, for free. [a]	3.13	1.33	0.805	
Independent Variables—repair resources				
Skills				**0.872**
I would know how to repair a damaged garment.	3.20	1.16	0.878	
I am confident in my ability to make moderate repairs to clothing (e.g., change a broken zipper).	3.00	1.29	0.858	

Table A1. *Cont.*

Dimensions/Items	M	SD	Factor Loading	α
I am confident in my ability to make minor repairs to clothing (e.g., sew on a button, mend a small hole).	3.63	1.25	0.852	
Mending clothing is a challenging task for me. [a]	2.90	1.19	0.815	
Tools				**0.816**
I have everything I need to repair my clothing.	3.13	1.26	0.910	
I have the necessary tools (e.g., needle, thread) for making minor repairs to clothing.	3.80	1.24	0.853	
I do not have access to a sewing machine to make clothing repairs. [a]	2.97	1.45	0.811	
Priority				**0.754**
I do not mend my clothes because it is too time consuming. [a]	3.48	1.16	0.811	
Repairing clothing is part of my routine.	2.49	1.16	0.772	
I find I do not have the time to make clothing repairs. [a]	3.38	1.14	0.753	
Of all the tasks in my life repairing clothing is not high on my list of priorities. [a]	2.37	1.04	0.694	
Expense				**0.713**
I do not get my clothes mended because alteration (repair) services are too expensive. [a]	3.19	1.19	0.882	
Clothing repair services cost too much. [a]	2.74	1.10	0.882	

[a] Items were reversed coded.

References

1. Ha-Brookshire, J.E.; Hodges, N.N. Socially Responsible Consumer Behavior? *Cloth. Text. Res. J.* **2009**, *27*, 179–196. [CrossRef]
2. Degenstein, L.M.; McQueen, R.H.; Krogman, N.T. 'What Goes Where'? Characterizing Edmonton 's Municipal Clothing Waste Stream and Consumer Clothing Disposal. *J. Clean. Prod.* **2021**, *296*, 126516. [CrossRef]
3. Degenstein, L.M.; McQueen, R.H.; McNeill, L.S.; Hamlin, R.; Wakes, S.J.; Dunn, L.A. Impact of Physical Condition on Disposal and End-of-Life Extension of Clothing. *Int. J. Consum. Stud.* **2020**, *44*, 586–596. [CrossRef]
4. Weber, S.; Lynes, J.; Young, S.B. Fashion Interest as a Driver for Consumer Textile Waste Management: Reuse, Recycle or Disposal. *Int. J. Consum. Stud.* **2017**, *41*, 207–215. [CrossRef]
5. Poerner, B. Where Does Clothing End Up? Modern Colonialism Disguised as Donation. Available online: https://www.fashionrevolution.org/where-does-clothing-end-up-modern-colonialism-disguised-as-donation/ (accessed on 16 June 2022).
6. Kozlowski, A.; Va Pesaran, D.M. Recontextualising and Appropriating Second-Hand Western Fashion Items in Non-Western Contexts. In *State-of-the-Art Upcycling Research and Practice*; Sung, K., Jagdeep, S., Bridgens, B., Eds.; Springer: Cham, Switzerland, 2021; pp. 61–64.
7. Bourguignon, D. *Turning Waste into a Resource Moving towards a "Circular Economy"*; European Parliament: Strasbourg, France, 2014.
8. Bocken, N.M.P.; de Pauw, I.; Bakker, C.; van der Grinten, B. Product Design and Business Model Strategies for a Circular Economy. *J. Ind. Prod. Eng.* **2016**, *33*, 308–320. [CrossRef]
9. Stahel, W.R. *The Circular Economy—A User's Guide*; Ellen MacArthur Foundation, Ed.; Routledge: London, UK, 2019.
10. Keßler, L.; Matlin, S.A.; Kümmerer, K. The Contribution of Material Circularity to Sustainability—Recycling and Reuse of Textiles. *Curr. Opin. Green Sustain. Chem.* **2021**, *32*, 100535. [CrossRef]
11. Levanen, J.; Uusitalo, V.; Harri, A.; Kareinen, E.; Linnanen, L. Innovative Recycling or Extended Use? Comparing the Global Warming Potential of Different Ownership and End-of-Life Scenarios for Textiles. *Environ. Res. Lett.* **2021**, *16*, 054069. [CrossRef]
12. Zamani, B.; Sandin, G.; Peters, G.M. Life Cycle Assessment of Clothing Libraries: Can Collaborative Consumption Reduce the Environmental Impact of Fast Fashion? *J. Clean. Prod.* **2017**, *162*, 1368–1375. [CrossRef]
13. Neto, A.; Ferreira, J. "I Still Love Them and Wear Them"—Conflict Occurrence and Management in Wearer-Clothing Relationships. *Sustainability* **2021**, *13*, 3054. [CrossRef]
14. Gyde, C.; McNeill, L.S. Fashion Rental: Smart Business or Ethical Folly? *Sustainability* **2021**, *13*, 8888. [CrossRef]
15. Brydges, T.; Heinze, L.; Retamal, M.; Henninger, C.E. Platforms and the Pandemic: A Case Study of Fashion Rental Platforms during COVID-19. *Geogr. J.* **2021**, *187*, 57–63. [CrossRef]
16. Kirchherr, J.; Reike, D.; Hekkert, M. Conceptualizing the Circular Economy: An Analysis of 114 Definitions. *Resour. Conserv. Recycl.* **2017**, *127*, 221–232. [CrossRef]
17. McLaren, A.; McLauchlan, S. Crafting Sustainable Repairs: Practice-Based Approaches to Extending the Life of Clothes. In *Product Lifetimes and the Environment (PLATE) Conference*; Nottingham Trent University: Nottingham, UK, 2015; pp. 221–228.
18. Niinimäki, K.; Armstrong, C. From Pleasure in Use to Preservation of Meaningful Memories: A Closer Look at the Sustainability of Clothing via Longevity and Attachment. *Int. J. Fash. Des. Technol. Educ.* **2013**, *6*, 190–199. [CrossRef]
19. Narayanan, S. *Optimizing Reverse Logistics with SAP ERP*; Galileo Press: Bonn, Germany, 2010.
20. Gwilt, A. What Prevents People Repairing Clothes? An Investigation into Community-Based Approaches to Sustainable Product Service Systems for Clothing Repair. *Mak. Futures J.* **2014**, *3*, 1–6.
21. McQueen, R.H.; Jain, A.; McNeill, L.S.; Kozlowski, A. The Role of Resources in Repair Practice: Engagement with Self, Paid and Unpaid Clothing Repair by Young Consumers. *Text. Res. J. under review*.

22. Diddi, S.; Yan, R.N. Consumer Perceptions Related to Clothing Repair and Community Mending Events: A Circular Economy Perspective. *Sustainability* **2019**, *11*, 5306. [CrossRef]
23. Nazli, T. Repair Motivation and Barriers Model: Investigating User Perspectives Related to Product Repair towards a Circular Economy. *J. Clean. Prod.* **2021**, *289*, 125644.
24. Laitala, K.; Klepp, I.G.; Haugrønning, V.; Throne-Holst, H.; Strandbakken, P. Increasing Repair of Household Appliances, Mobile Phones and Clothing: Experiences from Consumers and the Repair Industry. *J. Clean. Prod.* **2021**, *282*, 125349. [CrossRef]
25. König, A. A Stitch in Time: Changing Cultural Constructions of Craft and Mending. *Cult. Unbound* **2013**, *5*, 569–585. [CrossRef]
26. Norum, P.S. Examination of Apparel Maintenance Skills and Practices: Implications for Sustainable Clothing Consumption. *Fam. Consum. Sci. Res. J.* **2013**, *42*, 124–137. [CrossRef]
27. Laitala, K.; Klepp, I.G. Care and Production of Clothing in Norwegian Homes: Environmental Implications of Mending and Making Practices. *Sustainability* **2018**, *10*, 2899. [CrossRef]
28. Rogers, H.A.; Deutz, P.; Ramos, T.B. Repairing the Circular Economy: Public Perception and Participant Profile of the Repair Economy in Hull, UK. *Resour. Conserv. Recycl.* **2021**, *168*, 105447. [CrossRef]
29. McQueen, R.H.; McNeill, L.S.; Kozlowski, A.; Jain, A. Frugality, Style Longevity and Garment Repair—Environmental Attitudes and Consumption Behaviour amongst Young Canadian Fashion Consumers. *Int. J. Fash. Des. Technol. Educ.* **2022**, 1–14. [CrossRef]
30. US Environmental Protection Agency. Facts and Figures about Materials, Waste and Recycling. Available online: https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/textiles-material-specific-data (accessed on 21 June 2022).
31. Cheminfo Services Inc. *Characterizing Reuse, Recycling and Disposal of Textiles in Canada*; Cheminfo Services Inc.: Markham, ON, Canada, 2022.
32. Smith, P. Leading Exporters of Used Clothing Worldwide in 2020, by Country. Available online: https://www.statista.com/statistics/523673/used-clothing-leading-exporters-worldwide/ (accessed on 21 June 2022).
33. Drennan, K.; Weber, S.; Jacob-Vaillancourt, C.; Kozlowski, A.; Fiset-Sauvageau, L. *A Feasibility Study of Textile Recycling in Canada*; Fashion Takes Action: Toronto, ON, Canada, 2021.
34. Mandarić, D.; Hunjet, A.; Kozina, G. Perception of Consumers' Awareness about Sustainability of Fashion Brands. *J. Risk Financ. Manag.* **2021**, *14*, 594. [CrossRef]
35. Bloodhart, B.; Swim, J.K. Sustainability and Consumption: What's Gender Got to Do with It? *J. Soc. Issues* **2020**, *76*, 101–113. [CrossRef]
36. Baum, C.; Brown, P.; Gerstell, E.; Peng, A. *Perspectives for North America's Fashion Industry in a Time of Crisis*; McKinsey & Company: New York, NY, USA, 2020.
37. Nunnally, J.C.; Bernstein, I.H. *Psychometric Theory*, 3rd ed.; McGraw-Hill: New York, NY, USA, 1994.
38. Montgomery, B. Redefining Sewing as an Educationale Experience in Middle and High Schools. *J. Fam. Consum. Sci.* **2006**, *98*, 47–53.
39. Fixing Fashion. Available online: https://fixing.fashion/ (accessed on 25 July 2022).
40. Hustvedt, G.; Liang, Y. The Decision to Sew: Making Face Masks during the COVID-19 Pandemic. *Int. J. Fash. Des. Technol. Educ.* **2022**, 1–10. [CrossRef]
41. He, L.; Pan, Y. Recycled Clothes and Its Characters Impact on Consumers' Consumption. *J. Korea Converg. Soc.* **2021**, *12*, 159–167.
42. McNeill, L.S.; Hamlin, R.P.; McQueen, R.H.; Degenstein, L.; Garrett, T.C.; Dunn, L.; Wakes, S. Fashion Sensitive Young Consumers and Fashion Garment Repair: Emotional Connections to Garments as a Sustainability Strategy. *Int. J. Consum. Stud.* **2020**, *44*, 361–368. [CrossRef]
43. Hoehner, C.M.; Brennan Ramirez, L.K.; Elliott, M.B.; Handy, S.L.; Brownson, R.C. Perceived and Objective Environmental Measures and Physical Activity among Urban Adults. *Am. J. Prev. Med.* **2005**, *28* (Suppl. 2), 105–116. [CrossRef]
44. Durrani, M. "People Gather for Stranger Things, so Why Not This?" Learning Sustainable Sensibilities through Communal Garment-Mending Practices. *Sustainability* **2018**, *10*, 2218. [CrossRef]
45. Hunt, E. *The Eco Gender Gap: Why Is Saving the Planet Seen as Women's Work*; The Guardian: London, UK, 2020.
46. Granskog, A.; Lee, L.; Magnus, K.-H.; Sawers, C. *Survey: Consumer Sentiment on Sustainability in Fashion*; McKinsey & Company: New York, NY, USA, 2020.
47. Abdulla, H. Money-Saving and Greenliness Fuels Clothing Repair Trend. In *Just Style*; 2022; Available online: https://www.just-style.com/news/money-saving-and-greenliness-fuels-clothing-repair-trend/ (accessed on 29 July 2022).
48. Cernansky, R. Costly, Time-Consuming and a Sales Barrier: Why Fashion Hates Repairs. *Vogue Bus.* **2022**. Available online: https://www.voguebusiness.com/sustainability/costly-time-consuming-and-a-sales-barrier-why-fashion-hates-repairs (accessed on 29 July 2022).
49. Ma, W.M.; Zhao, Z.; Ke, H. Dual-Channel Closed-Loop Supply Chain with Government Consumption-Subsidy. *Eur. J. Oper. Res.* **2013**, *226*, 221–227. [CrossRef]
50. Huff, C.; Tingley, D. "Who Are These People?" Evaluating the Demographic Characteristics and Political Preferences of MTurk Survey Respondents. *Res. Polit.* **2015**, *2*, 1–12. [CrossRef]
51. Berinsky, A.J.; Huber, G.A.; Lenz, G.S. Evaluating Online Labor Markets for Experimental Research: Amazon.Com's Mechanical Turk. *Polit. Anal.* **2012**, *20*, 351–368. [CrossRef]