UPCYCLING AS A BUSINESS STRATEGY IN TEXTILE AND CLOTHING INDUSTRY CLUSTERS

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Abstract

Industrialization made consumerism an integral part of the economy, and the preoccupation with sustainable development has been debated within organizations, which seek ways to contribute to the future of the planet, aiming to minimize social and environmental impacts. In textile and clothing industry clusters, one way to minimize the environmental impact is the incorporation of Circular Economy, and upcycling can be highlighted among its practices. Under this assumption, this study aims to analyze the final customer's opinion on the incorporation of upcycling as a sustainable business strategy aimed at textile and clothing industry clusters, contributing with subsidies to the elaboration of strategies and actions for the incorporation of this practice in network companies. It is a quantitative study which utilizes a survey via online questionnaire and multivariate statistical analysis. Among the main results, it can be highlighted that the customer's frequency of practicing upcycling is correlated to their intention, to the conditions that prevent them to adhere and to the opinion of people who are considered important. It is inferred that there are many impeding conditions to the individual incorporation of the practice, and therefore there is opportunity for growth to companies, especially small businesses of the textile and clothing industry that operate in clusters, in which not only the economic and social values are involved, but also opportunities for inclusion of environmental value, considering the growth of the sustainability-focused market.

Keywords: Sustainability. Upcycling. Cluster.

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Introduction

The textile industry has expanded significantly in recent decades, causing a constant turnover of fashion products (FLETCHER, 2010), reducing clothing lifespan by 35% (KOROLKOW, 2015), and ranking second in the most polluting industries (BBC, 2017). In response to this development model, the Circular Economy (CE) positions itself as a catalyst for novel solutions (CNI, 2018), with upcycling emerging as one of its practical outcomes (STAHEL, 2016).

According to Ceglia (2020), upcycling is the modification or development of a new product from waste, components, and/or used materials, with the purpose of encouraging the return of materials with improved quality to the industrial system and increasing the lifecycle of clothing and its components (SUNG, 2018).

Palma et al. (2014) argue socio-environmental demands are becoming more common in businesses. This requires the implementation of business strategies aimed at ensuring that resources are managed in such a way that they are not depleted in the future, as well as minimizing the social and environmental impact of productive activities (PALMA et al., 2014). Thus, organizational responsibility includes not only the obligation to produce goods and services, achieve profitability, and generate employability, but also the consequences of its decisions and actions throughout the social system (CARROLL, 1999; SCHWARTZ; CARROLL, 2003). Therefore, in order to ensure competitiveness, businesses must develop a sustainable model that includes management practices that guarantee the expansion of innovation capacity (PALMA et al., 2014).

In this context, clusters are characterized by their significant role in regional economic development, as they not only benefit small and medium-sized associated companies financially and technologically, but also provide job and income opportunities, resulting in an improvement in the quality of life in the communities where they are located (ISBASOIU, 2006). Clusters provide a constructive and efficient forum for dialogue among businesses, suppliers, governments, and other institutions (PORTER, 2000).

Given the importance of the textile and clothing industry in the economy, as well as the companies that operate in a network, the objective of this research is to assess the final consumer's perception of upcycling as a business strategy aimed at textile sector clusters. Therefore, this analysis may generate subsidies for the development of strategies/actions aimed at textile and clothing clusters.

Literature Review

Upcycling

In recent decades, the textile industry has seen significant growth as a result of the consolidation of fast fashion[4], which emphasizes the business model of rapid acquisition and disposal of fashion products (FLETCHER, 2010). Consequently, the industry produces in increasing quantities, reducing the lifespan of clothing by 35%. (KOROLKOW, 2015). According to Todeschini et al. (2017), this behavior promotes the consumption of easily replaceable clothing, resulting in a slew of negative consequences for sustainability, the environment, and society. Today, the fashion industry is second only to the oil segment in terms of environmental pollution (BBC, 2017).

In Brazil, there is a vibrant textile industry. According to the Brazilian Textile Industry Association - ABIT (2021), the country currently has the West's largest complete Textile Chain, which includes spinning, weaving, processing, confection, retail, and fashion shows. With a production of 2.04 million tons, it ranks fifth among the world's largest textile producers, it also accounts for 11% of all jobs and 6% of manufacturing industry revenue (ABIT, 2021). However, waste generation from the production of clothing and textiles is underreported in the country. It is estimated that the country generates 160,000 tons of waste per year, 60% of which is discarded in landfills (LORENZETTI, 2018) due to a lack of waste sorting (ZONATTI et al., 2015).

In light of this, sustainability emerges as a means of supporting global development (SALCEDO, 2014), and it should be focused on strategies, actions, and product development. Hence, the circular economy positions itself as the best alternative to the dominant economic development model (linear model), the "take, make, and dispose" (NESS, 2008, p. 290), presenting innovative solutions for industry, governments, and society (CNI, 2018).

Upcycling is one of the practical and conceptual effects embedded in the circular economy (STAHEL, 2016). Reine Pilz, a German entrepreneur and environmentalist, coined the term "upcycling" in 1994, but it only became popular in 2002 by Willian McDonough and Michael Braungart in their book 'Cradle to Cradle: Remaking the Way We Make Things' (LUCIETTI et al., 2018). Upcycling has gained popularity since then because it is a promising sustainable behavior that has the potential to

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[4] Fast Fashion – in this context, it refers to the constant replacement of items sold in fashion retail stores. (SEBRAE, 2020).

significantly contribute to the reduction of waste, energy consumption, and greenhouse gas emissions (SUNG, 2017; WILSON, 2016).

However, since it is a new concept, upcycling has many different definitions and practices. It is commonly defined as a high-quality material retention process in a closed industrial cycle (MARTIN; EKLUND, 2011; EMGIN, 2012). The term is also described as the creation or modification of a product from used materials, waste, or components. That is, it encourages the incorporation of "creative" and often handmade forms of repair, reuse, renovation, update, remanufacture, and recycling into the industrial system (SUNG; COOPER; KETTLEY, 2018), as opposed to what would be considered degraded (CEGLIA, 2020). Therefore, the lifecycle of clothing, components, and materials is expanded (SUNG, 2017), increasing material efficiency while decreasing energy and water consumption, and solid waste generation (ALLWOOD, 2011; SUNG, 2017).

Upcycling is a consumer demand as well as an environmental emergency. According to Francis and Hoefel (2018), the demand for eco-friendly clothing, particularly among Generation Z, is growing. This generation, born between 1995 and 2010, is already immersed in a reality with a strong virtual presence (FRANCIS; HOEFEL, 2018). They are used to the fluid concept of information and are characterized by the pursuit of their own individuality, the respect for the individuality of others, and the search for new ways of performing in the world in which they live (OWEN; NAPOLI; SHIN, 2018). This is reflected in their approach to consumption and production, where they seek more sustainable alternatives to traditional models (FRANCIS; HOEFEL, 2018). This generation is so invested in this matter that it accounts for 90% of the 15 million people who have registered on "Depop," a global platform for reselling items that has made upcycling initiatives profitable for many of its users (MAGUIRE, 2020). Thus, product redefinition through upcycling can be used as a mechanism for designing personalized pieces, allowing the youngsters from generation Z to express their individuality (MARTINS; DA SILVEIRA SANCHES, 2020) while also contributing to the planet's sustainability (WILSON, 2016).

Moreover, the environmental and economic importance of upcycling is notable. According to the literature, it is an effective tool capable of leading the textile and clothing industry toward sustainability and the circular economy by reducing waste production and clothing disposal. Understanding the relationship between upcycling and consumers can soon lead to companies rethinking their business models, adapting and organizing themselves to keep up with such demand, and thus becoming more competitive.

Cluster

Clusters are composed of interconnected companies that share similarities and complementarities and are geographically close to one another, which encourages the formation and expansion of benefits related to the creation of value through networks of interaction between companies (PORTER, 2000). Organizations can be linked vertically through purchase and sale chains, horizontally through complementary products and services, or through the use of inputs, technologies, or similar specialized institutions (PORTER, 2000).

Furthermore, clusters differ in size, scope, and development trajectory (PORTER, 2000). Some groups are made up of small and medium-sized businesses, while others are composed of large corporations; some have partnerships with universities, and others are formed by traditional companies or high-tech organizations (MARTIN; SUNLEY, 2003).

According to the Brazilian Observatory APL (2020), there are currently 839 clusters distributed across 34 productive sectors in Brazil, with 104 clusters in the Midwest region, 122 in the North, 329 in the Northeast, 80 in the South, and 204 in the Southeast. In the textile and apparel production sector, there are 78 clusters distributed throughout the national territory.

The Southeast region has the most clusters in its territory (34), followed by the Northeast (21) and South (12). Table 1 displays information on the number of establishments and employees by region. The search was performed on the Data Sebrae panel on September 14, 2021. On the Panel, the establishment segmentation is updated daily using data from the Federal Revenue, whereas the most recent update on the number of employees is from 2018.

Table 1 - Establishments and employees by region

Region	Establishments (Headquarters + Branches) 2021	Employees 2018	No. of Clusters
North	10,048	6,336	3
Northeast	60,440	139,502	21
Midwest	30,860	33,302	11
Southeast	201,301	361,219	31
South	92,991	252,778	12
Total	395,640	793,137	78

Source: Data Sebrae (2021) and Federal Revenue (2018).

During the search, the data were also delimited according to economic activity in the IBGE's CNAE (National Classification of Economic Activities), considering Section C - Manufacturing Industry, through the Divisions: 13 - Manufacture of Textile Products and 14 - Production of Textile Products (IBGE, 2021).

Table 1 reveals that the number of establishments and employees is lower in the North region, which corresponds to a smaller number of clusters. Furthermore, despite having the second highest number of clusters, the Northeast does not hold the same position in terms of the number of establishments and employees.

Additionally, 75% of the 395,640 establishments are individual microentrepreneurs (MEI), 20% are microenterprises (ME), 3% are small businesses (EPP), and only 2% are medium and large companies. The majority of manufacturing and clothing establishments are micro and small businesses, which, according to Longenecker, Moore, and Petty (2004), end up contributing significantly in economic and social terms to the places where they are located through job creation, introduction of innovations, and competitive market stimulation.

Methodological Procedures

This study is descriptive-exploratory in nature and employs a quantitative research approach. In terms of procedures, data was collected via an online questionnaire adapted from the study "Factors Influencing Upcycling for UK Makers" by Sung, Cooper, and Kettley (2019). The authors' instrument consists of nine blocks of questions that address dimensions such as attitude, social factors, behavior, intention, impediments to facilitating conditions, habits, and the frequency with which they refer to upcycling.

The instrument used in this study was divided into two parts: the first included the nine dimensions for upcycling with a seven-point Likert scale mentioned in the previous paragraph, and the second contained seven questions to characterize the sample. The response description from 1 = Strongly Disagree to 7 = Strongly Agree was used for the variables of the social factor dimensions (dimensions of subjective norm, personal norm, and beliefs) and behavior and intention, while an option "Not Applicable" was added as a response to the social factor 3. The perceived habits dimension had the options from 1 = Never to 7 = Very often, the upcycling frequency had seven alternatives for answer from 1 = I never did it to and 7 = Every week and the attitude dimension

covered answers corresponding from 1 = Unpleasant to 7 = Pleasant when considering the practice of upcycling during the last 5 years.

From July 28, 2021 to September 14, 2021, the questionnaire was available via the Google Forms platform and was completed online throughout Brazil on social network groups with a focus on sustainability, recycling, reuse, conscious clothing, and the textile industry, yielding 153 respondents.

The data was organized in a Microsoft Excel electronic spreadsheet and analyzed with the SPSS software. Descriptive analysis was used to understand the respondent profile, and the Cronbach's Alpha test to assess the data's internal reliability. Furthermore, the KMO test (Kaiser - Meyer - Oklin) and Bartlett's sphericity were employed to validate the index of variability explained by the factors through the commonalities and suitability of the sample. Finally, a multiple regression was applied to assess the relationships between the dimensions and upcycling after verifying the suitability of the Factor Analysis (FA) and calculating the dimensions' scores. This technique was chosen due to its versatility and power in analyzing relationships between a dependent metric variable and one or more independent variables (HAIR; BUSH; ORTINAU, 2003).

Analysis and Discussion of Results

Cleaning and validation processes were initially performed to remove incomplete, duplicated, or incorrectly formatted data, allowing the analyses to begin. Following these procedures, the study had 152 valid responses.

According to the data, 69.7% of the sample is female, 29.6% is male, and 0.7% chose the "I prefer not to answer" option. In terms of age, 29.6% of respondents are 15 to 25, 42.8% are 26 to 40, 24.3% are 41 to 60, and 3.3% are 61 or older. The majority of respondents (65.8%) have two to six minimum wage salaries (1 minimum wage = BRL 1,100.00). In terms of education, 33.6% are studying or have completed postgraduate studies, 27.6% have not completed higher education, 25.7% have a university degree, and 13.2% have completed "up to high school studies". The sample includes respondents from across the country, with a concentration in the South (62.5%) and the Northeast (18.4%). The North, Northeast, and Midwest regions account for 19.1% of the total.

The dimensions Attitude and Frequency related to upcycling, which contained only one question, were also descriptively analyzed. When questioned about the attitude towards upcycling,

55.3% of the respondents considered the practice "pleasant", and there were no answers considering upcycling "unpleasant". Regarding the upcycling frequency, when asked about the last 5 years, 36.8% responded that they never practiced upcycling in the mentioned period and only 8.6% of respondents did it "every week".

As shown in Table 2, the other dimensions of the instrument were analyzed using the Cronbach's alpha test, KMO, Barlett's sphericity, and the variability explained by the factors through commonalities.

Table 2 – Instrument Dimensions

Dimension	Qty of items	KMO	Sphericity test	Commonalities	No. of factors	% Explanation	Alpha
Social Factor 1	4	0.798	<0.001	0.549 – 0.855	1	73.609	0.879
Social Factor 2	3	0.737	<0.001	0.805 – 0.866	1	82.733	0.895
Social Factor 3	4	0.818	<0.001	0.560 – 0.867	1	75.485	0.881
Behavior	4	0.831	<0.001	0.659 – 0.793	1	75.360	0.889
Intention	3	0.776	<0.001	0.916 – 0.937	1	92.636	0.960
Impediment to Facilitating Conditions	15	0.847	<0.001	0.466 – 0.910	4	74.467	0.913
Perceived Habits	11	0.835	<0.001	0.348 – 0.785	3	61.493	0.848

Source: Created by the authors (2021).

The social factor 3 dimension, which assesses items related to beliefs and upcycling inclusion in the respondent's daily life (such as workplace, family, communities, and social circle), had 123 valid cases, with the remaining 29 cases answering 'not applicable'. Table 1 shows that the KMO was greater than 0.737 in all dimensions, indicating that the factors found in the FA can adequately describe the variations in the original data. Hair et al. (2009) propose 0.500 as a suitable score. The p-value of < 0.05 in all dimensions considered by Bartlett's sphericity test indicated that the data are adequate for the application of the PA in the analyzed variables. When investigating the reliability of multidimensional constructs, it is necessary to verify the internal consistency using Cronbach's Alpha (MALHOTRA, 1999), which demonstrated that the dimensions of the current study achieved a coefficient greater than 0.848, indicating a high index of reliability.

Concerning the values found for commonalities, "the literature generally indicates a minimum value of 0.5 for a commonality to be considered satisfactory" (MATOS; RODRIGUES, 2019 p.26), satisfactory values were obtained for all dimension items, with the exception of 'impediment

to facilitating conditions' and 'perceived habits' - the variables free time referring to impediment, composting/fertilizer and drawing/painting among other artistic works referring to habits, presented lower values - resulted in an acceptable proportion of common variance. For the regression, it was decided to maintain the facilitating conditions dimension as it resulted in a score close to that indicated in the literature, and the perceived habits dimension was removed considering the Kaiser criterion (MATOS; RODRIGUES, 2019), since three of the eleven components presented eigenvalues greater than 1, explaining 23%, 18% and 14.2% of the variance, respectively. The perceived habits dimension is presented below, based on descriptive analyses of the most significant items.

The most striking figures can be found in item 5, simple reuse, for which 44.7% of respondents stated that they reuse materials on a regular basis. This was also the most important of the eleven questions organized in the perceived habits dimension. Item 8 contains another expressive value: recycling of domestic waste, which is made by 40.8% of the sample regularly. The outcomes from the two above mentioned items are the result of proposals for environmental education and awareness that have been addressed since primary school and in the face of a global concern that world leaders are constantly discussing. Mafaldo and Pinheiro (2011) have already emphasized the importance of a joint discussion between government and society: increased government investment is expected, as is a shift in society's habits in favor of natural resource preservation in an environmentally and ecologically manner.

Variable 9 Composting/fertilizer was also found to be significant in the results, with 36.2% of respondents never make use of composting techniques. Composting, according to the Ministry of Environment, is an alternative to recycling organic waste that has the potential to reduce up to 50% of what is sent to landfills. However, despite being a simple process that ranges from household to industrial scale, it is still underutilized in Brazil and needs to be popularized in order to be implemented in society (BRASIL, 2017).

After defining the variables to be included in the regression model, a descriptive analysis was performed to determine the mean and standard deviation. The values are listed in Table 3.

Table 3 - Descriptive statistics of the factors

	N	Mean	Standard deviation
subjective_norm	152	3.3980	1.62206
personal_norm	152	4.6864	1.86412
beliefs	152	4.2684	1.74266
behavior	152	5.1431	1.56736
intention	152	4.6140	1.94747
facilitating_cond	152	4.5680	1.37885

Source: Created by the authors (2021).

When the means are compared, the behavior factor has the highest (5.1431) among the six factors analyzed, and the subjective_norm factor the lowest (3.3980). This indicates that participants tend to consider the possibility of upcycling on their own (behavior), and that the opinion of people deemed important to them has no bearing on their decision (subjective_norm).

Multiple Linear Regression

Prior to developing the regression model, the correlation of the variables was broadly validated using Pearson's correlation coefficient. Table 4 displays the correlation values obtained for each of the factors.

Table 4 - Correlation Matrix

	subjective_norm	personal_norm	beliefs	behavior	intention	facilitating_cond	frequency
subjective_norm	1						
personal_norm	.489**	1					
beliefs	.534**	.523**	1				
behavior	.417**	.557**	.504**	1			
intention	.523**	.724**	.591**	.747**	1		
facilitating_cond	.043	.157	.250**	.202*	.163*	1	
frequency	.398**	.344**	.194*	.333**	.440**	-.196*	1

**. The correlation is significant at the 0.01 level (2-tailed).
*. The correlation is significant at the 0.05 level (2-tailed).

Source: Created by the authors (2021).

Social factors (subjective norm, personal norm, beliefs) have a moderate correlation. Furthermore, the factors that had the highest correlation with the intention to upcycle were personal norm and behavior, implying that the respondent's own upcycling principles and attitudes

(personal norm) influenced them more than the opinion of others (subjective norm). The highest correlation with intention (0.747) is seen with behavior, which demonstrates that an individual's way of acting is strongly related to the intention, practice, and opportunity to use upcycling, when this is possible (intention). Individuals with greater intention, on the other hand, tend to engage in more sustainable behavior, relying solely on themselves to adhere to the upcycling practice.

The impediment to facilitating conditions is perceived as having no moderate or strong correlation with any other dimension, as a lack of these variables (among them: space, time, support policies, knowledge, information, and so on) can be considered a common barrier to upcycling. In many cases, re-signifying an object using materials that have reached the end of their useful life becomes a challenge because there is a requirement for knowledge about material selection, finish type, and the creativity involved in this transformation into a quality article with perceived value (SANTOS; CAVALCANTI, 2016).

As a result, the goal of the regression analysis was to determine which factors increase and explain the frequency of upcycling. Thus, the dependent variable was frequency, and the independent variables were subjective norm, personal norm, beliefs, behavior, intention, and facilitating conditions. The backward method was used, in which all variables begin in the initial model and only those that are significant are kept in the final model. The analysis produced four regression models, the fourth of which was deemed the most significant, with three dimensions and an adjusted R2 value of 0.287. Despite its low value, the model suggests ways to improve the practice of upcycling.

Table 5 presents the resulting model, which is made up of three dimensions and shows that "intention" has greater explanatory power than "frequency," as indicated by the highest Beta value of the analysis.

Table 5 - Multiple regression model coefficients

Model	Non-standard coefficients		Standard coefficients		
	B	Standard error	Beta	t	Sig.
(Constant)	1.998	.575		3.473	.001
subjective_norm	.271	.102	.215	2.663	.009
intention	.390	.086	.371	4.536	.000
facilitating_cond	-.395	.103	-.266	-3.813	.000

Source: Created by the authors (2021).

According to the data in Table 5, those who have a stronger intention to upcycle tend to do so more frequently at first. If the other values are held constant, an increase of one point on the intention scale results in an increase of 0.390 on the frequency scale. Furthermore, the lower the frequency of upcycling, the higher the value that impedes the facilitating conditions. The facilitating conditions factor presented the following question to study participants: *"To what extent do you think the following factors have hindered your upcycling practice? Lack of …1.Space; 2. Appropriate tools; 3.Products, components or materials used; 4.Professors or instructors; 5.Knowledge; 6.Skills; 7.Imagination; 8.Inspiration; 9.Information; 10. Collaborators/Company; 11.Free time; 12. Upcycling support culture; 13. Upcycling support policies; 14.Financial incentives; 15.Money for the purchase of materials and tools"* with a response option of 1 = strongly disagree to 7 = strongly agree for all factors considered as potential barriers to upcycling practice.

Analyzing the aspects of the impediments to facilitating conditions dimensions, the items "Free time" (mean=5.24) and "Culture to support upcycling"(mean=5.20) stand out as the options with the highest mean, regarded by respondents as significant impediments to upcycling. The available period in which the respondent can devote themselves to the practice of reusing a product or material in the creation or adaptation of something new is referred to as free time. On the other hand, considering the upcycling support culture, it is clear that, even though the practice first appeared in the 1990s, it is still underutilized and undervalued in Brazil. Consumerism became an integral part of the economy as a result of industrialization, and consumers began to rely increasingly more on the fashion industry's style standards. Several brands produce multiple annual collections, and the rapid commercialization of products contributes to the obsolescence of collections that are no longer considered trendy. Therefore, it is necessary to adhere to upcycling, primarily the fashion industry and major trendy brands, so that there is acceptance and change to a sustainable practice, considering not only the economic value, but also the social and environmental value of the existing processes behind each piece developed through upcycling.

The subjective norm factor, which was also present in the model, covered four questions about the respondent's opinion of people who are important to them: "*1. Most people who are important to me are familiar with upcycling; 2.[...], they think I should practice upcycling; 3. [...], they expect me to practice upcycling; 4. [...] they would approve that I practice upcycling,*" with a response scale from 1= strongly disagree to 7= strongly agree. According to the opinion of the

respondent's important people, the subjective norm factor influences the frequency of upcycling. Thus, the variable with the highest mean significance was item 4, with a mean of 4.63, which explores whether the respondent's important people approve of upcycling.

Finally, the opinion of people important to the study participants, the respondent's intention, and the conditions that enable the respondent to actually practice upcycling more frequently can all help to increase the frequency of upcycling practice.

One of the major problems associated with sustainable development is the disposal of materials nearing the end of their useful life, and one of the ways to reduce the damage caused to the planet is reuse, which provides a new way of using what would otherwise go to waste. Environmental awareness gave rise to a new type of consumer, with attitudes increasingly aligned with conscious consumption, with products aligned with environmental causes, and concerned about how organizations have handled the subject (BORDIN; PASQUALOTTO, 2013).

According to Sebrae (2018), upcycling can be seen as a consumption trend for the coming years, with an emphasis on products from brands with clear principles, in which one of the sustainable alternatives occurs through the reuse of materials that appeared to be of no further use. According to the same source, businesses can use this practice as a business strategy to reduce waste and create value through products with high added value, involving creativity and design, a unique product with history and differentiation competing in the market.

It was identified that the intention dimension has a strong influence on consumer adoption of the upcycling practice. Although some enabling conditions are considered a significant impediment to individual upcycling, an opportunity for organizations seeking to reach the ethical consumer arises through intention. According to Pecoraro and Uusitalo (2014), ethics in consumption can be described as a behavioral pattern, a daily challenge regarding the moral reconsideration of consumption, as ethical consumers make choices based on moral and personal beliefs (KRUPA, 2013).

Companies from various segments have seen an opportunity in the upcycle that combines responsible production, conscious consumption, and business (SEBRAE, 2018), with the main opportunity being in the profile of consumers, who are increasingly concerned with socio-environmental issues. This public is looking for sustainable products that are not conventional, which are two very noticeable characteristics in garments made from reused products.

In the case of companies that operate in networks, in addition to the benefits provided by the cluster itself, such as knowledge dissemination, local productive and business capacity, wage levels, and high jobs (GORDON; KOURTIT, 2020), in which small businesses perpetuate an opportunity for growth through joint action involving not only economic, but also social issues, there are also opportunities to add environmental value, mainly in clusters in the textile and clothing segment, which, through the reuse of materials, can envision a sustainable market that is constantly growing.

Final Considerations

Consumption has become an integral part of the economy as a result of industrialization, and the concern for sustainable development has been debated within organizations that seek ways to contribute to the future of the planet while minimizing environmental and social impacts. Because of the low durability of materials and clothing, as well as the influence of personal style, which is constantly changing, the fashion industry is regarded as one of the largest generators of waste.

There are significant environmental effects generated during the product life cycle, which includes pre-production, production, distribution, utilization, and disposal (MALAGUTI, 2005). Faced with so many issues, it is worth noting that the fashion industry has been raising awareness and implementing methods to reduce impacts, one example being the adoption of upcycling. In Brazil, companies from various sectors saw upcycling as a business opportunity when combined with responsible production, conscious consumption, and business (SEBRAE, 2018): the company Rust Miner, which produces rustic artisanal accessories from materials that have reached the end of their useful life; Ignis Industrial, which mines raw materials from places like junkyards and antique shops and transforms them into industrial-style furniture; and Insecta Shoes, which reuses used fabrics or materials that have been discarded due to minor defects and transforms them into shoes.

Since the primary goal of upcycling is to reduce environmental impacts through the reuse of materials, the purpose of this study was to assess the final consumer profile in terms of adherence to upcycling as a business strategy aimed at clusters in the textile and clothing segment. As a result, it appears that there are opportunities in consumer profile, who is increasingly demanding with regard to sustainable issues, which is verified based on intention. However, individual practice

becomes difficult in the face of conditions that impede them, such as time and support culture. According to the findings, a business opportunity exists for companies seeking market space through the commercialization of products derived from sustainable practices, particularly upcycling.

Based on the quantitative survey of final consumer perception toward upcycling, some preliminary action plans for companies present in cluster environments, primarily in the textile and apparel sectors, can be presented: (i) bilateral education; (ii) collection centers; (iii) upcycling services; and (iv) a digital trading platform. With regard to **bilateral education**, which consists of initiatives on the part of government and clothing companies, Cuba (2010) argues that environmental education, particularly in schools, has the potential to effectively mobilize a better quality of life guided by environmental values. According to Batista (2020), companies can educate their customers about clothing disposal and its effects. Thus, it is implied that these two positions converge for effective communication.

The study reveals that consumers are generally unaware of the upcycling culture. However, there is an opportunity for public authorities, in collaboration with clusters, to act as educators and/or communicators with consumers through associated companies. This type of action meets the principles of social responsibility, which, according to Magalhães (2009), consists of voluntarily contributing to the country's social and environmental development. As a result of effective communication, consumers will be able to perform or request upcycling services from companies in the clusters.

Collection centers must be encouraged for upcycling to take place. Those for used clothing can be established through cluster coverage, allowing consumers to get rid of their items. These clothes can then be sent to clothing companies that specialize in upcycling to create new items. This fashion design strategy presents itself as a relevant way to create value, increasing the efficient use of finite resources, reducing waste generation, adding value to the product, and promoting company competitiveness (PINHEIRO, 2020).

The next step is **upcycle services**. According to the findings of the study, one of the reasons for not upcycling is a lack of time and skills. The clusters, in collaboration with the participating companies, can then offer services aimed at extending the lifespan of clothing and components through upcycling. This action can allow clothing to add another source of value that is not solely

related to the production of new clothes (MORLET et al., 2017). Finally, a **digital trading platform**, such as "Depop" (FRANCIS; HOEFEL, 2018), can be created to market upcycling articles.

In terms of theoretical implications, this study seeks to contribute to a topic that is considered relevant in modern times, when sustainable development is gaining popularity. It is the responsibility of the private sector, in collaboration with the government and society, to work towards a just world, considering a satisfactory level of economic and social development, which includes the prudent use of natural resources without jeopardizing future generations. In terms of practical implications, the study aims to assist companies, particularly those operating in textile and clothing cooperation networks, in understanding the final consumer's opinion in order to generate subsidies for the adoption of upcycling as a business strategy, something to consider in the face of a consumption system that has been generating increasingly more waste, and sustainable concerns are becoming progressively visible.

Future research should focus on testing the model using structural equation modeling, as well as on the perceptions of companies in the textile and clothing sectors that operate in clusters, to verify the maturity of their processes and ways of incorporating upcycling practices into their production procedures.

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