

## Article

# The Role of Packaging in Sustainable Omnichannel Returns—The Perspective of Young Consumers in Poland

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**Abstract:** The e-commerce market is continuously expanding; thus, many businesses are implementing their own omnichannel strategies. Many stores offer very liberal return policies that exceed statutory obligations to boost their revenue. Consumers are becoming used to new return opportunities, which leads to an increased percentage of returned orders. As a result, the sustainability of the delivery process of purchases made through omnichannel is jeopardized. The aim of this work was to assess the attitude of young consumers towards packaging in omnichannel returns. This study involved 446 young consumers (aged 18–25) and focused on delivery and return processes with emphasis on the packaging. It was found that the most common method of delivery is through parcel lockers (49%), although consumers usually have the possibility to choose from at least three different delivery options (77%). The product is shipped in a box in two out of every three cases, while filling of the package is below 80% in half of them. Consumers also prefer to return their goods in parcel lockers (45%), but they often cross channels and use different return options (to the way it was delivered). Consumers want to return their products in the same packaging, but this is usually only possible when the package is delivered in a box. Young consumers are pragmatic with their deliveries and returns, but environmental aspects are also very important to them.

**Keywords:** e-commerce; packaging preferences; sustainable packaging; reverse logistics; circular economy; omnichannel packaging



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## 1. Introduction

The e-commerce market size is valued at over 9 trillion US dollars, and it is estimated that it will grow at a compound annual growth rate of almost 15% during the third decade of the XXI century [1]. The COVID-19 pandemic has contributed to a substantial increase in online purchases and has forced many small stores to develop their own online platforms [2]. As a result, consumer purchasing habits have irreversibly shifted [3], and currently the fastest pace of development is in areas that are commonly not linked with e-commerce, such as groceries [4]. Those aforementioned rapid changes have become a major issue for the sustainability of online purchases. According to various researchers, online purchases may result in 70% or 84% higher emissions of CO<sub>2</sub> when compared to traditional purchases, and e-commerce is a suitable solution for non-urban delivery only [2].

The shopping experience of in-store purchases is vastly different and cannot be fully substituted even by well-designed online platforms [5]. During an in-store purchase, the consumer will usually have the possibility to familiarize themselves with product features and functionalities, which is not possible during online shopping [6]. For the above reason, in most countries, consumer purchase rights are enforced by law through the right to return. In the European Union, consumers can return almost any purchase within 14 days without

justification [7]. On the other hand, in the United States, there is no federal law on returns and refunds, but return policies should be posted conspicuously on store websites [8]. In contrast, in China, a 7-day unreasonable return policy is enforced [3]. Despite quite liberal return rights for online purchases, many online sellers impose even more liberal return policies, including extensions of the time for return or the possibility of return in other distribution channels (omnichannel) [3,5,6,9]. Researchers have indicated that those types of return policies encourage placing larger orders by alleviating the risk associated with improper product choices [5].

Nevertheless, consumers are becoming used to those policies and abusing the right to return by planning to return the purchased item during the order [5,9]. Despite this type of occurrence, it is believed that liberal return policies provide benefits that overall result in greater profits [3,9]. This is partially related to the fact that along with clients who abuse return policies, two other types of consumers are identified, i.e., those who return products only because they find it to be a good deal and those that are ashamed by the return of the product [5,9]. In addition, some segments in e-commerce reach very high return rates, reaching 50%; this is especially evident for the clothing and footwear industries [5]. Considering that fashion is the most popular category of products bought online [10], this poses a major logistics and environmental problem. The aforementioned fashion return phenomenon is driven by several habits of the customers, including, among other habits, ordering two or three sizes of the same product just to check the fitting size, ordering several products of the same type with the intention of selecting only one product, “rental” (using the product once), etc. [5]. This consumer conformity leads to unnecessary emissions, related not only to the logistics of the last mile, but also to the generation of unnecessary packaging waste [2,11], which results in 9 million tons of paper and 1.8 million tons of plastic waste [12].

Despite the rapid growth of e-commerce, the form of product packaging has not significantly changed since the dawn of the digital revolution. In fact, the classic cardboard box introduced in the 19th century is visually quite similar to currently used cardboard packaging. During the 20th century, the packaging industry slightly evolved and new forms and materials were introduced, including metal, glass, and polymers [2,13]. Nevertheless, to date, the most common packaging used for omnichannel distribution is made from cardboard/paper, whereas polymers are used to a lower extent. During the e-commerce era, many innovative products were introduced to the market. Most of these provided an additional function, but at an elevated cost [2]. Some of the innovations were abused by consumers, i.e., in cases in which reusable packaging was not returned [14]. Nevertheless, companies as well as scientists are seeking new ways to reduce the environmental impacts of packaging that are driven not only by cost reductions but also by an effort to improve their image and build brand attachment [2,11,15,16].

Consumers often emphasize how important environmental aspects are to them, including packaging functions [17]. More than two in three consumers would be willing to buy again if they were given environmentally friendly packaging [2]. Moreover, consumers are willing to pay for “green” packaging [18]. Nevertheless, many of them use product returns as a form of trying on a product or as a form of market research, not taking into consideration the environmental impact of that behavior [5]. This contradiction in consumer actions is the main point of this study. Therefore, the aim of this work is to assess the attitude of young consumers towards packaging in omnichannel returns, with an emphasis on the sustainability of the packaging process. The undertaken research aligns with the twelfth goal (ensuring sustainable consumption and production patterns) of the United Nations Sustainable Development Goals (SDGs) [19] by unveiling the areas for improvement in omnichannel logistics processes.

## 2. Literature Review

The literature search was based on the Web of Science Core Collection and was carried out in February 2024 (data upload 10 February 2024). In each case, phrases were searched

using topic function, thus including title, abstract, and author keywords. The relationship between the investigated phrases (Table 1) was achieved by pairing with the AND operator. The most studied topic was related to packaging that was investigated with regard to any of analyzed topics in 12,594 cases. The second topic studied (8787 articles) was with regard to the sustainability of any research area analyzed. It should be noted that preferences towards sustainability were excluded from that analysis, as this area was not within the scope of the research and would lead to inclusion of a vast amount of unrelated research. The topic of consumer preference was discussed to a similar extent with 6612 articles published, followed by e-commerce with 3939 manuscripts. Topics discussed in relation to omnichannel, or product returns were discussed to much smaller extent with 287 and 273 articles, respectively.

**Table 1.** Number of publications on selected topics in the Web of Science Core Collection.

	Packaging	Omnichannel	Product Returns	Preferences	Sustainable	e-Commerce
Packaging		7	21	4366	7679	521
Omnichannel	7		30	54	36	160
Product returns	21	30		35	79	108
Preferences	4366	54	35		not studied	2157
Sustainable	7679	36	79	n/d		993
E-commerce	521	160	108	2157	993	

The database was further analyzed with regard to three topics simultaneously, providing:

- E-commerce and product returns and packaging—three results:
  - This article investigates the relationships between YouTube product reviews, customer satisfaction, and product return intention. The authors proposed a theoretical model and investigated a hypothesized relationship based on data from 302 young adult respondents in Indonesia. It was found that YouTube product reviews, product fit uncertainty, and customer satisfaction influence the product return intention. At the same time, the credibility of the review affects the last two parameters, indicating that the quality and credibility of the review will influence the customer experience and the return rate of the product [20].
  - The manuscript proposes practices to reduce the impact of product returns in multichannel retail. The manuscript research methodology is based on qualitative research via semi-structured interviews with experts (practitioners). The research revealed that retailers have begun to pay attention to the financial impact of returns, but there is little awareness of the scale of environmental impact of that problem. There is a lack of scientific understanding of the unsustainability of the return process. In addition, retailers lack a comprehensive approach to address the environmental impact of product returns. Currently, retailers focus mainly on early-stage return prevention, digital return systems, and improving visibility and routing of the returned systems. The framework proposed by the authors for the environmental sustainability of product returns does not directly discuss packaging issues [21].
  - This article compares the energy consumption of e-commerce with conventional trade channels with regard to packaging, last mile, unsold products and returns. The methodology of this paper relies on a structured literature review that quantifies qualitative data. The authors highlight that it is crucial to analyze energy consumption factors separately, since ordering and delivery methods are becoming more often mixed (omnichannel). Moreover, the authors indicate

that unsold products and product returns have a significant impact on energy efficiency and that e-commerce generally consumes more energy in packaging, but less in transportation [22].

- E-commerce and product returns and sustainable—four results
  - The authors develop and study a framework for handling e-commerce returns. The employed methodology consists of three stages: hierarchical clustering of product returns with geographical constraints, solution by circular economy network, and a mathematical model formulation. Finally, the model is validated on Brazilian e-commerce public dataset. The proposed approach can save between 28% and 40% of return costs [23].
  - Case study of the implementation of the collaborative buffering strategy to reduce distribution cost and improve product returns. The framework aims to reduce storage and distribution costs. Finally, the strategy is validated using multiple return scenarios. The proposed model outperforms all the models compared, and it is found that distribution costs are linearly correlated with the buffering space required [24].
  - The manuscript aims to provide an evaluation process for e-commerce businesses in determining the optimized reverse logistics partners (outsourcing) employing a multicriteria fuzzy decision-making approach. The selected approach considers 15 criteria including, i.e., emissions, green technology, disposal, recycling, but not only. Finally, three out of eight suppliers are chosen, according to the methodology presented [25].
  - Duplicate result [21]
- E-commerce and product returns and preferences—five results
  - The manuscript studies cross-border logistics models that incorporate consumer time preference to reduce product return rates in e-commerce. The authors developed 3 models and analyzed product return rates and optimal retail quantities in each scenario. It was found that in the domestic-to-domestic scenario, products with higher estimated return rates have lower optimal order quantities [26].
  - The paper studies the optimal supply chain strategy of online and offline sales channels from the perspective of consumer return. The authors have found that while cross-channel returns are more convenient, the extent of use of this option has on profit of centralized supply chain. However, in a decentralized scenario, crossing the return channel by consumers will decrease the profit of suppliers and increase the profit of retailers [27];
  - The authors try to identify factors that ensure a comfortable shopping experience. Afterwards, the selected attributes are analyzed with chance to meet the consumer requirements. Finally, the effect of providing additional information is studied. Research states that availing information on key attributes can give brands a competitive advantage in e-commerce. This strategy may also help to reduce impulsive e-purchases that are often returned [28].
  - Study on consumer preferences in choosing a specific channel in multichannel strategy, as well as with regard to sales tax employing game-theoretic models. The researchers found that consumer showrooming may reduce product returns. The authors also propose that the government could impose a higher tax rate for channels with a greater environmental impact [29].
  - Duplicate result [25]

The search was followed using the phrase omnichannel instead of e-commerce without success, this indicates that while the area of returns in e-commerce is studied (108 articles), the distribution via different channels is analyzed to a much smaller extent. Nevertheless, it should be noted that few papers are considering dual-channel or multichannel strategy in the scope of the research [21,22,27,29]. In summary, the topic of return in e-commerce

with regard to packaging or sustainability has been of some interest (7 articles), but the omnichannel approach is not fully undertaken. Furthermore, it should be noted that research on consumer preferences was not yet focused on product packaging. Moreover, it can be clearly seen that while the topic of sustainability of product packaging is the most studied, this topic in relation to returns is studied to a much lower extent. Following this phenomenon along with a detailed analysis of the data published in summarized articles, points to the fact that there is a clear research gap in relation to sustainability of packaging in omnichannel reverse logistics processes.

The aim of the work was to assess the attitude of young consumers towards packaging in omnichannel returns, with an emphasis on the sustainability of the packaging process. As a result, key aspects related to the sustainability of packaging are identified during the delivery and return process. This enables obtaining data necessary for improvement or development of new strategies and frameworks for packaging in omnichannel logistics processes.

### 3. Materials and Methods

#### 3.1. Study Group

This study was conducted using the CAWI method (Computer Assisted Web Interview). The group of respondents was selected on purpose, not accidentally. It consisted of young people aged 18–25 (students in higher education). Assuming the population of people aged between 18 and 25 in Poland, which is 3,232,297 [30], the significance level of  $\alpha = 0.05$  and the permissible error at the level of 5.0%, the study sample size consists of 385 people. This study was conducted from December 2022 to May 2023 and resulted in the receipt of 446 correctly completed questionnaires. This surpasses the minimum requirement, enhancing the robustness of this study's findings and ensuring a higher level of confidence in the generalizability of the results within the specified population and region.

This purposive selection strategy was deemed the most appropriate for the study objectives, enabling a focused exploration of the research questions within a relevant and accessible population. The choice of this method and the successful recruitment of participants beyond the minimum required number underscore the methodological rigor of this study and the reliability of its conclusions within the context defined by the sample.

To clarify the selection methodology of our sample, we acknowledge the absence of detailed information on this aspect. It is clarified that the sample was chosen through purposive sampling, targeting students from four different universities in Poznań. This approach was adopted to ensure a focused examination of the attitudes and behaviors of young individuals within a specific educational and demographic context. By concentrating on this subgroup, this study aimed to gain insights into the packaging preferences and the sustainability perspectives prevalent among young adults in higher education.

The following research questions were posed:

Q1: In customers' opinion, what is the filling level of the package used during delivery in the context of reducing the amount of used up material and created waste?

Q2: Do customers who use various service channels prefer to return goods in the same packaging?

Q3: What is in customers' opinion about the importance of selected packaging attributes used in the return process of goods.

#### 3.2. Survey Questionnaire

The survey questionnaire consisted of 14 questions, divided into 3 sections.

The first section of the questionnaire "Packaging" included questions about: type of product purchased, type of packaging in which a product was delivered, and the material of which it was made of, as well as the degree of matching the size of the packaging with its product and the filling used to fill the empty space. The second section of the survey "Omnichannel" included questions about the availability, as well as the channels used for deliveries and returns. The last section of the survey "Preferences" included questions

about the repeated usage of the packaging in the return process, as well as the importance of its attributes that the customers want or are bothered by them.

The survey consisted of various sections aimed at understanding consumer preferences and behaviors with respect to packaging. The following is the translation of the survey structure and questions:

- What product did you buy?
- In what type of packaging did you receive the product? Options: Cardboard/box, Envelope, Bag.
- What material was the packaging made of? Options: Cardboard/paper, Plastic/film.
- Estimate how much space the product occupied inside the packaging [%].
- Was the filling material used inside the packaging? If so, what kind? Multiple responses are allowed. Options: Bubble wrap, Crumpled paper, Cardboard shreds, Cardboard shreds.
- How did you receive the product? Options: Personal pickup in a retail store, Home delivery by a courier, Personal pickup point (gas station, kiosk, convenience store, etc.), Parcel locker.
- How did you return the product? Options: In-store, Courier delivery, Personal pickup point (gas station, kiosk, convenience store, etc.), Via parcel locker.
- Was there an alternative option to return the product? If yes, what was it?
- Did you return the product in the same packaging?
- In what packaging would you prefer to receive the product you purchased?
- In what packaging would you prefer to send the returned product?
- Which packaging features are important to you? Rating on a five-point scale, where 1 is the least important and 5 is the most important. Options: Appearance/esthetics of the packaging, Re-sealability (tear strip for resealing), Small size/fit of packaging to the item, Possibility of reuse, Ecological aspects.
- Which packaging features do you find the most bothersome? Rating on a five-point scale, where 1 is the least important and 5 is the most important. Options: Excess filling material, Messy filling material, Difficulty in opening, Necessity to damage the packaging to open, Lack of a return label, Lack of a return form, Insufficient protection of the product.

This survey seeks to gather comprehensive data on consumer preferences regarding packaging, focusing on aspects such as the type and material of packaging, the efficiency and eco-friendliness of the packaging, as well as the convenience and esthetics of the packaging used in the delivery and return of products.

### 3.3. Statistical Analysis

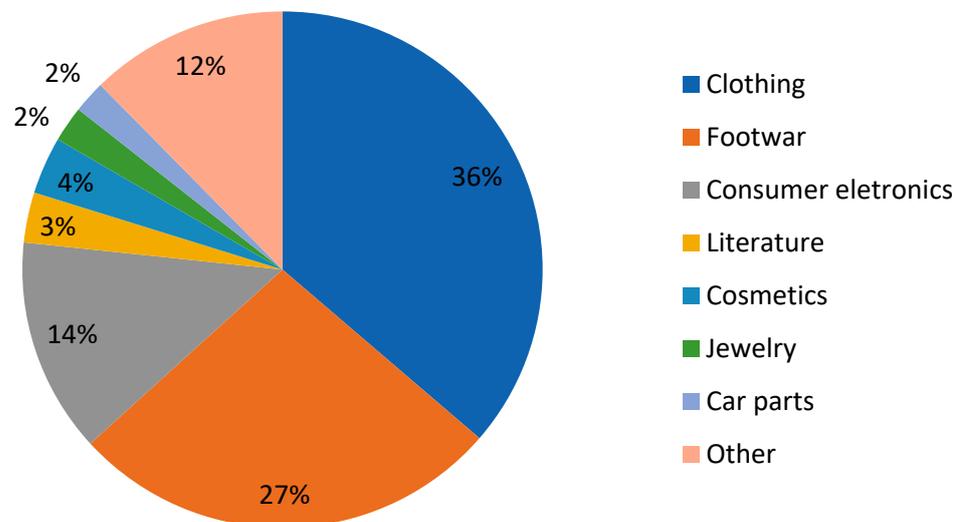
To analyze the results, basic descriptive statistics (average value, percentage, standard deviation) was used. Furthermore, statistical analysis was used to determine significant relationships between the measured parameters. The significance level of  $\alpha = 0.05$  was adopted with two-sided hypothesis system. Multiway tables were built followed by chi-square test. In every case, the Cochran condition was checked and if not fulfilled, the Fisher exact test was used. Statistical analysis was performed using PQStat Software v.1.8.6.116. The primary objective was to explore attitudes and behaviors related to packaging preferences and sustainability issues among young Polish consumers. Furthermore, the design and objectives of this study were geared towards understanding patterns and preferences rather than establishing causality or direct correlations between variables.

## 4. Results

### 4.1. Packaging

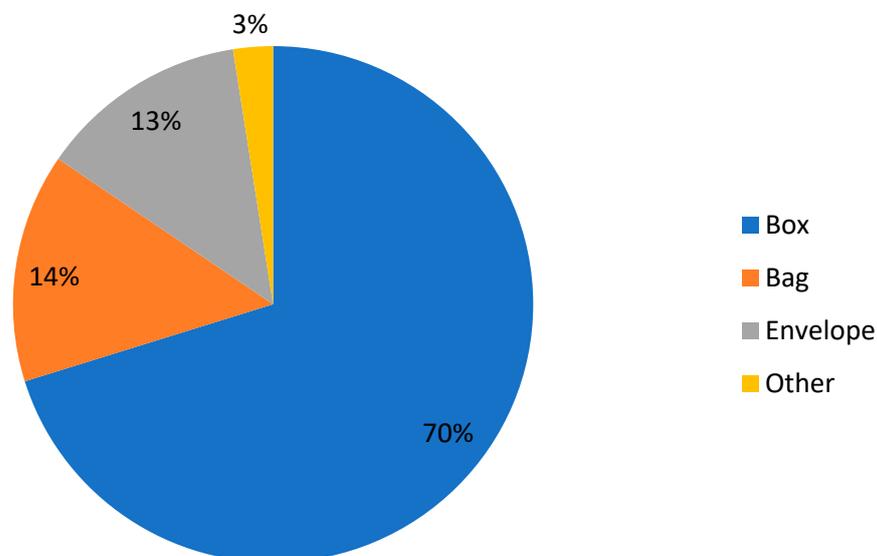
The obtained results show the basic characteristics of the packages used in shipping to customers. A total of 446 correctly filled survey questionnaires qualified for analysis. Quantitative analysis of the types of goods bought (Figure 1) shows that 77% of them

were: clothing, footwear, and consumer electronics). The volume structure of the delivered products can have a significant influence on the type of packaging used.



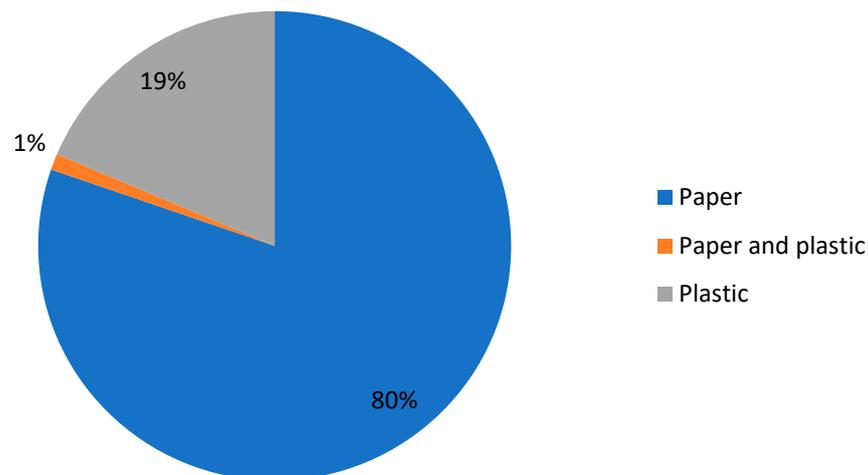
**Figure 1.** Type of purchased product.

The main type of packaging used in deliveries (Figure 2) was box (70%), next was bag (14%) and envelope (13%), what accounts for 97% of the analyzed cases.



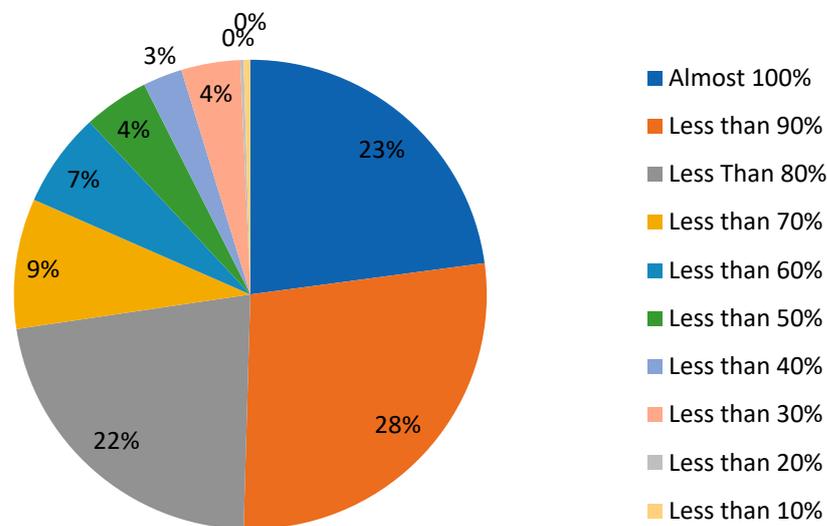
**Figure 2.** Type of packaging in which the product was delivered.

Packaging used for deliveries were the most common (80%), made of paper (including cardboard) or plastic (19%), and only in 1% of cases was a combination of paper and plastic used (Figure 3).



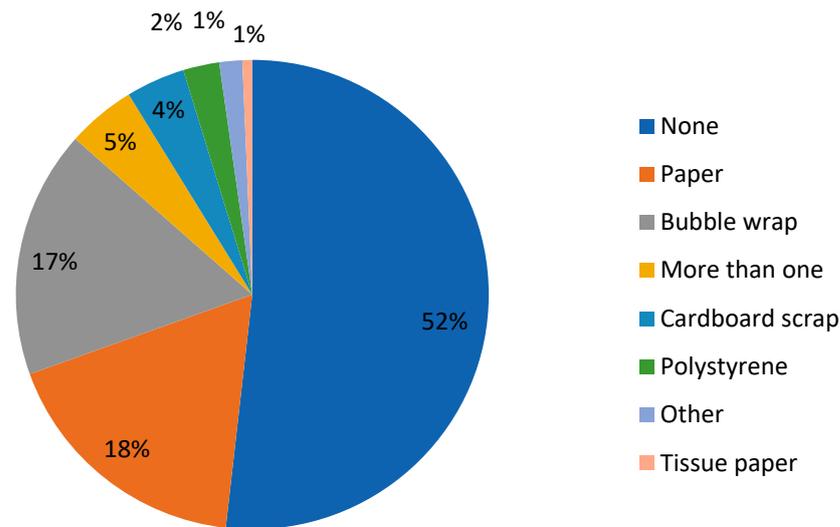
**Figure 3.** Type of material used for packaging production.

In the next question, the surveyed customers were asked to estimate how much space a product took inside the packaging (Figure 4). The answers obtained enabled us to assess the degree of packaging used in terms of proper fit. In 23% of cases, the packaging was filled to almost 100%, indicating a proper fit. The next ranges of filling inform about their percentage involvement in all analyzed cases. For instance, less than 90% means filling estimated in the range 80–89% and less than 80% filling in the range of approximately 70–79%. Nearly half (49%) were filled to a lower degree than 80% (the sum of answers from 79% to 20%).



**Figure 4.** How much space did the product occupy in the package?

The previous question about filling of the packaging space is supplemented with information on the type of filling material empty space in the packaging (Figure 5). In the majority of cases (52%), there was a lack of filling. In the case of filling with the most popular material, it was paper (18%) and bubble wrap (17%). In 5%, there was a mixture of filling material.



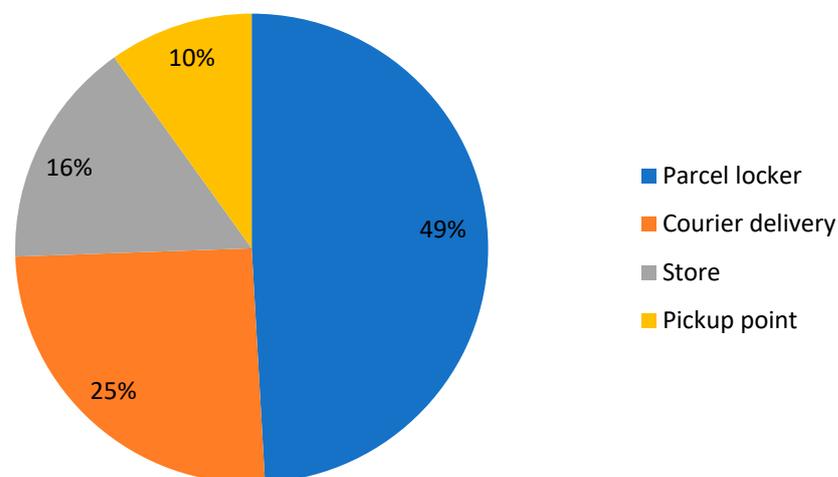
**Figure 5.** Type of filling material that was used (if any).

While the results indicating that over half of the shipments do not consist of filling at all might seem satisfactory, the dispersion of the results in cases where filling was used is not satisfactory. Moreover, only a minority of boxes included reused material (cardboard scraps); therefore, the sustainable option was chosen 56% of the time. On the other hand, some of the stores decided to use more than one filling material, what may lead to problems with recycling process if paper material was mixed with synthetic polymers (bubble wrap or polystyrene).

#### 4.2. Omnichannel

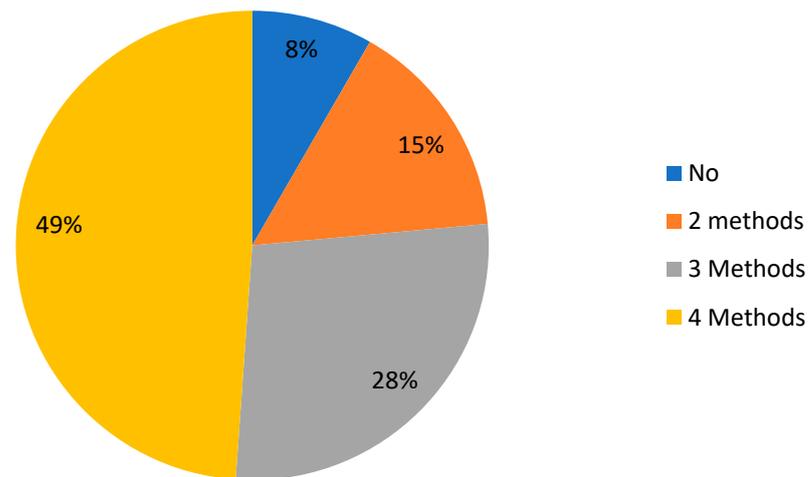
The next question concerned the customer service channel which the surveyed customers used. At this stage of development, e-commerce offers customers the possibility of service according to the concept of multichannel (many alternative channels) and even the concept of omnichannel (freedom to choose a channel on each stage of purchasing and returning goods).

Nearly 50% of deliveries were made to parcel lockers and the remaining methods of deliveries were: (Figure 6) courier delivery (25%), personal collection by the customer in the store (16%) or pickup point (10%). Nevertheless, the more sustainable methods of delivery to collective drop points accounted for 75% of total shipments.

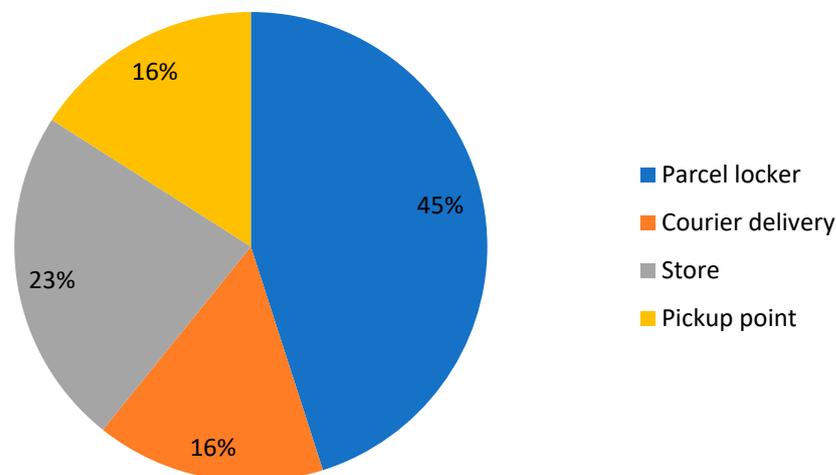


**Figure 6.** How was the product delivered?

In nearly 50% of the cases, the surveyed customers could choose four methods of delivery, and three methods of delivery were available in 28% of the cases (Figure 7). Products were returned using various methods (Figure 8). The most popular return channel was the parcel locker (45% of responses) and delivery to the store (23%). It should be noticed that for analyzed cases, there was a huge variety of possible return channels (for 49% of cases, four alternatives). The possibility of returning goods through at least two methods or more was available in 76% of cases (Figure 9). Such results enable us to assume that the choice of return channel by the customer was not motivated by the necessity resulting from the lack of alternatives, but a decision resulting from their preferences.

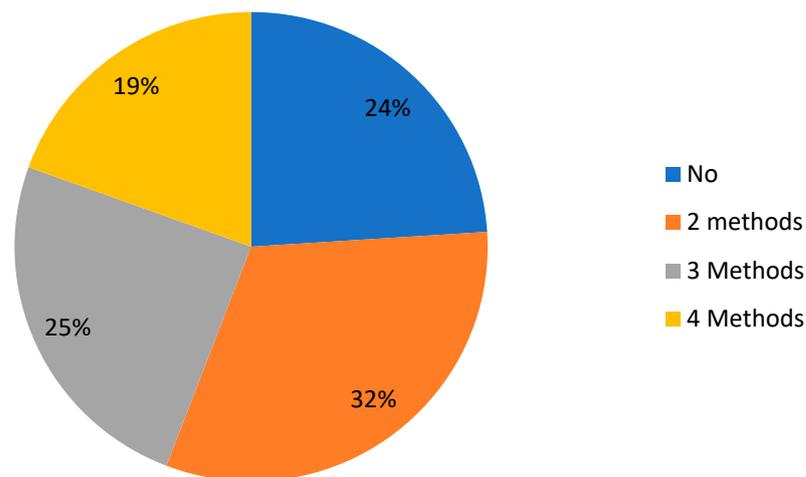


**Figure 7.** How many other channels of delivery were available?



**Figure 8.** How was the product returned?

It should be noted that consumers have more freedom to choose a channel during the delivery stage than during the return by a large margin. All possible channels are available during 49% of deliveries, but this number is more than halved during the return process. Moreover, in less than ten of the cases, the consumer did not have the opportunity to choose a different delivery channel, and this was true during return for almost one-quarter of them.

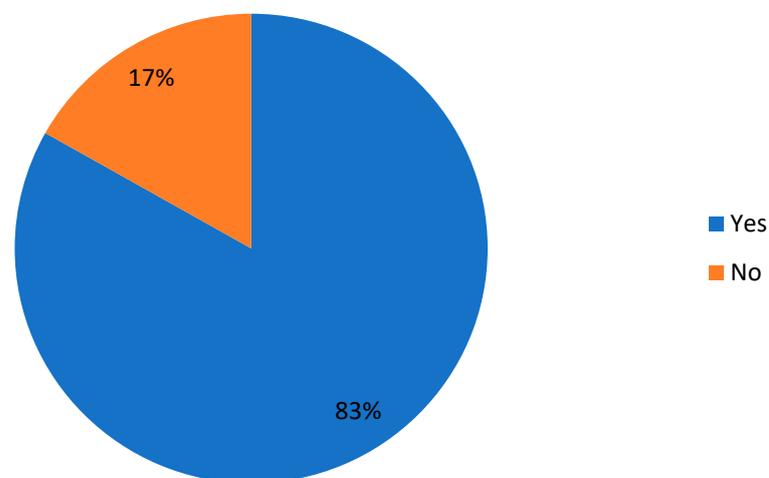


**Figure 9.** How many other channels of return were available?

#### 4.3. Preferences

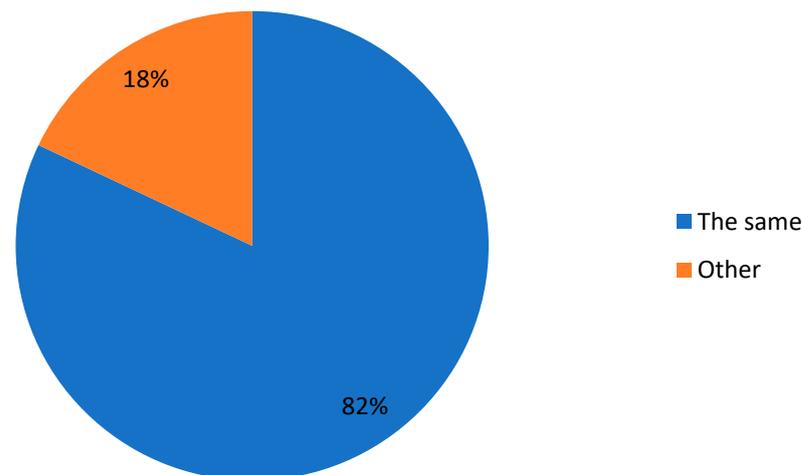
Based on the questions from the next sections of the survey questionnaire, results were obtained in the range of preferences of the respondents about the packaging used at the stage of return of goods.

In more than 80% of the cases, consumers return the product in the same package (Figure 10), which coincides with their preferences in this regard (Figure 11) because more than 80% of the respondents declare a willingness to return the goods in the same package they arrived in.



**Figure 10.** Did the consumer return the product in the same package?

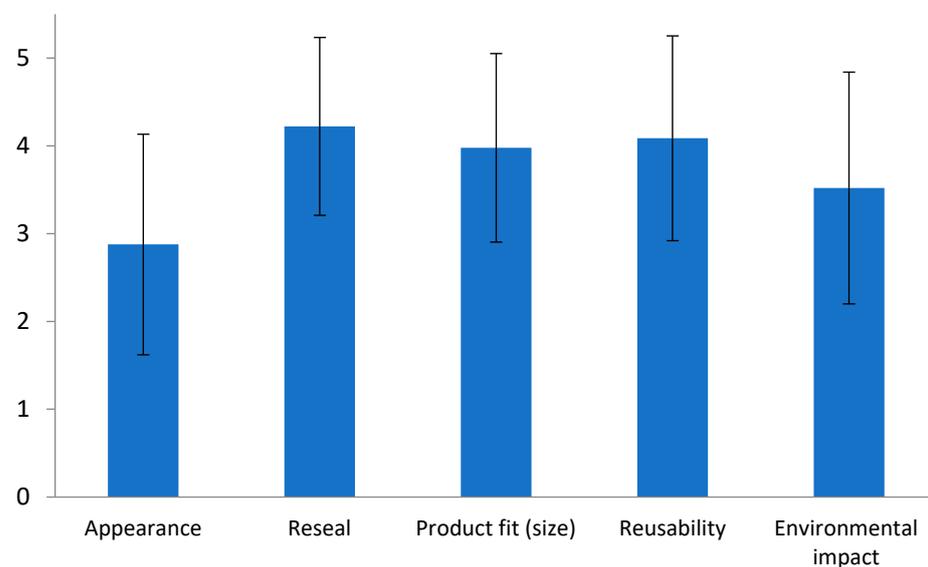
Attributes such as appearance, reseal, product fit (size), reusability, and environmental impact have been assessed (Figure 12). The surveyed customers assessed the importance of those particular characteristics on a scale of 1 to 5 (1—least important, 5—most important). For the most important to consumers, this study helped to identify attributes such as.



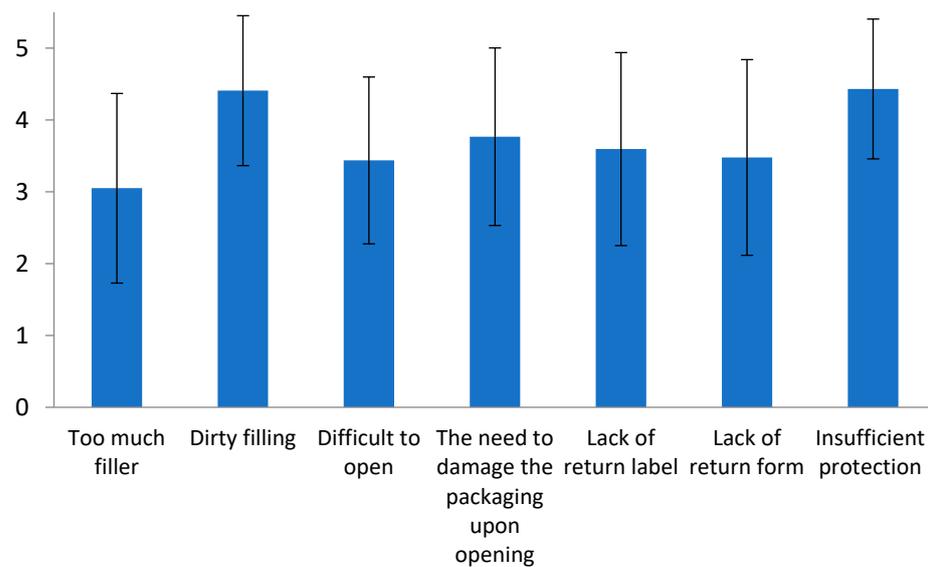
**Figure 11.** What is the preferred package for product return?

- The ability to reseal (e.g., tearable tape, which enables reseal)—over 50% of consumers assessed this trait as very important;
- The ability to reuse—over 50% of consumers rated this as high as possible;
- Small size/fit of the package to the product—more than 40% rated this as 5.

To complete the information, the surveyed customers were also asked about the attributes of packaging used in the return process that are the most bothersome. Attributes such as too much filler, dirty filling, difficult to open, the need to damage the packaging upon opening, lack of return label, lack of return form, and insufficient protection (Figure 13) have been assessed. The surveyed customers assessed the importance of those particular attributes on a scale of 1 to 5 (1—least important, 5—most important).



**Figure 12.** How important are the selected attributes of packaging to the consumers? Results are expressed as the mean value  $\pm$  standard deviation.



**Figure 13.** What attributes of packaging bother consumers the most? Results are expressed as the mean value  $\pm$  standard deviation.

These were mentioned as the most important attributes that bother the surveyed customers:

- Dirty filling—nearly 70% gave this a rating of highest importance;
- Insufficient protection—nearly 70% gave this a rating of highest importance;
- The need to damage the packaging upon opening—nearly 40% gave this a rating of highest importance;
- Lack of return label—approximately 37% gave this a rating of highest importance.

The obtained characteristics of customers' preferences show their practical approach to the subject of returns, because attributes that enable for convenient return without additional steps to the original packaging and its labelling/addressing are significant.

#### 4.4. The Relationship between Product Type, Packaging and the Processes of Delivery and Return

The relationship between the type of product purchased by consumers and the type of package they received was analyzed with respect to responses related to the delivery and return process (Table 2). It was found that the calculated  $p$ -value in most cases was below 0.05, indicating significant differences between the answers of customers who bought different products or obtained different packaging.

Almost all types of products were shipped predominantly in box packaging with a proportion of at least 2/3. The only exception was clothes that were almost equally shipped in a box (39%), a bag (33%) or an envelope (27%). This resulted in a substantial increase in the plastic material used for packaging. While all products were predominantly shipped in packaging derived from paper, plastic was used to a lower extent (<18%)—34% of clothing products were wrapped in plastic. On the other hand, since clothes are not fragile, the products were mainly shipped without filling (>80%). The second category of products in that ranking was literature, with 57% of parcels shipped without filling, while the rest of the products, which were more fragile, were shipped to a much lower extent <40% without filling. Consumers mostly choose to ship their products to parcel lockers—this is especially true for cosmetics (63%) and books (79%). More expensive products are likely to be shipped directly to home—jewelry (60%) and car parts (44%). As for electronics, consumers prefer to redeem them in store (35%), but parcel lockers are also chosen (37%). Few consumers choose pickup points with a selection factor of a dozen or less percent, the only exception being car parts (33%). The weaker performance of pickup points may be related to the fact that it is the least available option, usually with coverage of less than 2/3 orders.

**Table 2.** Mann–Whitney test results for selected responses to the surveyed questions.

Question Answer	Number	Product Category <i>p</i> -Value	Product Packaging <i>p</i> -Value
product category	1		0.0001
product packaging	2	0.0001	
packaging material	3	0.0001	0.0001
amount of free space	4	0.0001	0.0064
type of filling	5	0.0001	0.0001
delivery method	6	0.0001	0.0281
alternative delivery—pickup point	7.1	0.0130	0.0375
alternative delivery—store	7.2	0.2867	0.1517
alternative delivery—courier	7.3	0.2486	0.5566
alternative delivery—parcel locker	7.4	0.2462	0.4297
return method	8	0.0001	0.1933
alternative return possibility	9	0.0699	0.5817
return in the same packaging	10	0.0019	0.0001

Different colours indicate groups of test results with similar *p*-values.

The most common type of return process is that of the shipment method—consumers usually use parcel lockers, with the exception of electronics (that is returned in store), jewelry (courier) and car parts (courier). This behavior may also be driven by the characteristics of the product. Consumer electronics are fragile, and it is safer to return them personally, whereas car parts can be heavy and bulky, thus not fitting in parcel lockers or meeting the requirement of pickup points. Most consumers decide to return their product in original packaging regardless of the type of product, with the percentage of reused packaging oscillating at 80% for most products. Footwear is returned in the original packaging to a larger extent, reaching over 93%. On the other hand, jewelry is returned in the same packaging only in every second case. The relationship between packaging type and material is obvious. Regarding products that can be manufactured from both cardboard/paper and plastics, the bags were manufactured from synthetic polymer in almost 80% of cases, contrary to envelopes in only 25% of cases. In very few cases, <2%, the product was shipped in packaging manufactured from a composite of plastic and paper. Bags and envelopes are usually shipped without filling—88 and 66%, respectively—while almost 60% of the boxes were used with filling that is usually in the form of crumpled paper or bubble wrap. The channel through which the product was purchased had limited influence on the type of packaging, with the exception of store, where envelopes are used to a much smaller extent.

## 5. Discussion

The analysis of packages used for delivery to customers shows that those made of cardboard and paper (boxes, bags, envelopes) are predominant. It is a typical basic material from which packaging is made. This is also consistent with consumer expectations, as 84% of them prefer a cardboard box vs. plastic [31]. Crucial for the volume of consumption of this material (considered both in economic and ecological aspects) is the level of filling in the package. According to the estimates of the surveyed customers, approximately 50% of packages were filled to a lower degree than 80%. A total of 31% of packages were filled to the range of 60–80% and the rest were filled to below that level. Therefore, the results obtained can be considered unsatisfactory. However, only 7% of the delivered goods would not meet the requirements of the planned revision of the Packaging and Packaging Waste Directive of the European Parliament [32]. The analysis of practices by logistic operator managing delivery shows that they use a few sizes of cardboard packaging in order to match to the ordered items (and their original packaging). It is a good practice, but if we accept the 80% filling as satisfactory, it should be noted that this condition was not met in 50% of the cases. It should also be noticed that to fill unused package space, special material

is used, such as paper or plastics (48% pointed out by the surveyed customers), which is a source of waste. From that point of view, the most optimal type of packaging seems to be a bag, as it was twice as often filled to maximum extent than other common types of packaging. On the other hand, bags are mainly produced from synthetic polymers of different types and colors, which hinders the recycling process. A solution to this problem might be the implementation of reusable bag products, but this attempt has failed so far in the Polish market [14]. Nevertheless, consumers are willing to use recyclable packaging and green packaging, and expect logistics operators, retailers as well as authorities to actively switch to environmentally friendly packaging (Chinese case) [33].

To sum up, matching the sizes of packaging and matters connected to filling the empty space is still crucial and unresolved to a satisfactory degree. Considering this matter in terms of ecology and economy, another aspect of customer service quality should be added. Customers often point out the inconveniences associated with the amount of waste generated by deliveries, which is perceived negatively (as bothersome and harmful to the environment). On the other hand, it should be noted that consumers are willing to deal with the inconveniences associated with sustainable packaging (in the Indian case) [17]. Meanwhile, consumers that indicate their intention to switch to a green return service (package free return at store) suggest that they will be more loyal to the given e-shopping platform, but the return process must be convenient [34]. The obtained results answer the research question, Q1.

The analysis of results in terms of available customer service channels which the surveyed customers used both at the stage of delivery and returns shows their diversity. At least two alternative methods of delivery were present in 92% of cases; and in the case of returns, at least two alternatives were present in 76% of cases. Customers willingly use the available alternatives, as the results obtained show (Figures 6 and 8). The freedom to choose a channel at each stage of purchase is undoubtedly an achievement in terms of customer service. Additionally, the ability and ease (due to available alternatives) of returns of goods is an appreciated aspect by customers. However, this level of customer service is a challenge and its realization should consider both economic and ecological aspects. A great number of returns obviously generates additional demand for transportation. This is, without a doubt, an adverse factor and requires proper logistic system management to minimize CO<sub>2</sub> emissions and other pollution. It is also a matter of demand for packaging that meets customer requirements and requirements arising from the waste handling hierarchy. In reference to packaging in sustainable omnichannel returns, important aspects are preventing the formation of waste and their reuse. The first of those aspects can be realized by limiting the size of packing due for better fit, and thus further restrictions of materials used to fill the empty spaces (or replacing their single-use form with a multiuse form that can be used repeatedly). Reuse of packaging, considering the current high levels of return in e-commerce, is a necessity. Assessment of attributes of packaging in which returns are made gives some substantive information on the needs of customers. Research results (Figures 12 and 13) show that all attributes, with the exception of “appearance” received an average importance evaluation of 3 or more (on a 5-point scale). This confirms their usefulness in the process of choosing or designing packages with new functionalities [2]. Both data on desired attributes and those considered to be bothersome can be used to formulate a list of requirements that packaging should meet in the process of returns with the usage of different channels (omnichannel). The results confirm the willingness of the surveyed customers to make returns (Figure 11) in the same packaging. From that perspective, logistics centers should focus on the implementation of box packaging only, as consumers who received their package in a box predominantly declared that they returned their items in the same package. On the other hand, products shipped in bags and envelopes were returned in a new type of packaging. The solution to shipment of less fragile products in bags (which were found to be optimal when adjusting to the size of the product) could be the implementation of resalable or reusable bags, as currently most packaging needs to be

torn apart to be opened. The obtained results enable answering the research questions, Q2 and Q3.

## 6. Conclusions

This study analyzed the purchase and return process of young consumers (aged 18–25) in the omnichannel with respect to packaging and its sustainability. It was found that consumers predominantly return fashion products (clothes and footwear), almost 2/3 of total returns. Most of the time, the purchased goods are shipped in boxes, with 4/5 packaging derived from paper. Filling of the packages is unsatisfactory, with 1/2 of products taking less than 80% of the space available. This results in the use of filling material that is made of paper as well as plastic, which is chosen equally as often. Taking into account the SDGs of the United Nations and economic reasons, this area requires further investigation to resolve this mismanagement. Consumers are eager to return their products in the same packaging in which they received the product, but usually do so only if the product was originally shipped in a box. Most offered products are sold using at least three distribution channels, but young consumers usually choose sustainable methods of delivery, with collective parcel-collecting points constituting 3/4 of deliveries and 3/5 of returns. Nevertheless, they are prone to crossing delivery and return channels, which might be more convenient and also help to reduce environmental impact. Young consumers are also pragmatic with regard to packaging preferences—protection of the product and reducing environmental impact are more important than esthetics or convenience (to a lower extent).

## 7. Limitations and Directions for Further Research

The territorial scope of this study applies to Poland. Therefore, the picture of the phenomenon is adequate only for Poland—no generalization of the results to other countries can be made. In future research, it is planned to repeat this study with colleagues from other countries. The purpose will be to identify similarities and differences in the use of packaging determined by nationality (the culture of the country).

The survey's subject coverage includes only young people in Poland (in this case, university students). Therefore, the results only apply for this demographic—no generalization of the results to other demographics can be made. In future research, it is planned to repeat this survey with colleagues from other institutions, such as high schools or research institutes, in order to also survey younger and older respondents than university students. The purpose will be to identify similarities and differences in the use of packaging according to age (life view).

The first two parts of the survey assessed the status quo—opinions mainly on packaging and returns. The third part of the survey evaluated preferences in this regard. As a direction for future research, these expectations would need to be confronted with the capabilities of suppliers' logistics systems. The purpose will be to evaluate the efficiency of suppliers' logistics systems in the new reality, along with the identification of bottlenecks, distribution links that require organizational and/or technological changes.

A survey questionnaire was used as a research tool, and this may introduce sample biases and subjective factors. In future research, another research method will be used in parallel. The purpose is to cross-check the validity of the results obtained.

In summary, consumers are currently taking advantage of new opportunities in the market and are increasing the relative share of returned goods that were purchased online. On the one hand, this phenomenon will be influenced by technological developments in handling, buying and selling processes—ordering methods, payment methods, delivery, and return methods. On the other hand, it will be strongly influenced by the design of environmentally friendly logistics (transport) packaging—the construction and the type of materials used.

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