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RISK AWARENESS IN MAKING CONSUMER ONLINE DECISIONS DURING COVID-19 PANDEMIC

ABSTRACT

Purpose: Every organization operating in the 20s of the 21st century struggles with operating in a turbulent environment. The effects of the Covid-19 pandemic, which are still being felt today, cause some changes in customer behavior. This article focuses on the study of this phenomenon in relation to the risk perceived by customers in making online purchases. The article's purpose is to identify the broad management implications of online shopping risk perceptions among consumers during the Covid-19 pandemic.

Methods: The research conducted concerns customers' purchasing risk perceptions. An analysis is made of the countermeasures respondents use to minimize purchasing risks. The research used a diagnostic survey on a sample of 1,000 consumers.

Results: The results of the conducted surveys indicate that consumers in general are aware of the risks associated with purchasing various goods via the Internet. In addition, it can be concluded that age is not significant when it comes to the perception of purchasing risks when shopping online, while concerns about buying online are dependent on the respondents' sex. There is also a statistically significant difference between the respondents' sex and sensitivity to purchase risk in various aspects.

Conclusions: This paper fulfils a gap in knowledge about shopping risk perceptions among consumers during the Covid-19 pandemic.

KEYWORDS: *risk, consumer decisions, consumer behavior, COVID-19 pandemic, marketing*

INTRODUCTION AND LITERATURE REVIEW

Global retail e-commerce sales reached around $4.9 trillion in 2021 and are expected to increase by 50% to about $7.4 trillion by 2025 (E-commerce success…,2023). The findings indicate that, as a result of the Covid-19 risk, a greater number of individuals opted to increase their spending on online purchases in preference to other shopping methods such as curbside pickup or in-store shopping. The current extremely dynamic times in the post-pandemic and during the war in Ukraine, raise questions about the risks taken by consumers when operating in a global market. According to the Gemius report 'E-commerce in Poland 2020' from mid-2020, as many as 73% of

internet users made purchases online and their number increased by 11 percentage points. Compared to previous years' data, 62% of surveyed Internet users in 2019, 56% in 2018 and 54% in 2017 (E-commerce w Polsce…, 2022). Particularly when shopping online, this risk is often noticed by customers. They are also noticed by companies offering their services and products online. Risk constitutes a factor that not only deters customers but also increases a business's failure probability. Increased risk can result in decreased customer confidence in all aspects of the online purchasing process. Reduced customer confidence in online shopping can result in a loss of loyalty, which is highly desirable if only from a customer relationship management perspective. In contrast, online shopping has recently become an everyday occurrence for many customers and businesses (eCommerce Trends…, 2023).

Research regarding customers' purchasing risk perceptions conducted before 2020 did not include the customer action of the difficult epidemiological situation. Therefore, it has become extremely important to repeat the research and modify it in expectation of new and interesting results. It is worth referring to several studies conducted in different years with different research groups. It would seem important in this case to check the research performed among Polish respondents to find an appropriate economic, social and cultural reference. The way in which people perceive the safety of sharing sensitive or personal data, for example, when making purchases online, differs between nations (Amirtha, Sivakumar, and Hwang, 2020). Occasionally, this type of survey is conducted in relation to the Family Life Cycle (FLC), where a breakdown by sex, age and family status of the respondent is relevant. Term *sex* generally is taken to refer to reproductive biological differences between men and women, the concept of 'gender' was introduced to distinguish biological 'sex' from the social, cultural, and historical construction of gender (Connell, 2002). This article considers the biological difference between men and women, so the term *sex* will be used. Biological sex is a demographic variable often used in marketing research.

This was the case with the 2021 survey, whose findings indicate that specific types of risks had varying impacts on the buying decisions of women in different stages of their FLC. Therefore, that study highlights the significance of categorizing individuals according to their FLC stage in online marketing

and how it can assist in making informed marketing choices (Gąsior, 2015). Although this article did not focus on FLCs, the research showed some correlations between household size, respondent age, occupational status or sex and responses to specific questions.

Already during the Covid-19 pandemic, research was conducted on the risk perceptions of consumers worldwide in a pandemic situation. Such research has also been conducted previously in relation to general consumer risk perception. An instance of providing evidence is to refer to a research study that utilized a mixed-method qualitative-quantitative technique to evaluate how consumers perceive risk and reliable sources of information about food safety amid the pandemic. Over a period of five months, starting from April to August 2020, a total of 3,584 online surveys were distributed among a US consumer panel consisting solely of primary food preparers and grocery shoppers, with at least 700 surveys administered each month. Additionally, 43 participants were recruited from the first wave of survey respondents to participate in online focus groups conducted via Webex from May to July 2020. The research study concentrated on exploring topics concerning perceptions of food safety risks and dependable sources of information throughout the pandemic (Thomas and Feng, 2021). And research has also been carried out to examine how consumer online shopping behavior during the Covid-19 pandemic is affected by perceived health risk and customer perception of online retail ethics. The study looked at seven variables, including perceived health risk, security, privacy, non-deception, reliability fulfilment, service recovery, and online shopping behaviour (Fihartini et al., 2021). However, research presented in the article 'Consumer's Behaviour Regarding Cashless Payments during the Covid-19 Pandemic' revealed that the pandemic affected customers' attitudes towards cashless payments, including in terms of risk. The research presented aforementioned indicates that the pandemic has caused changes in customers' attitudes towards the purchasing process, also in the context of the risks associated with online shopping. The studied population (of Polish consumers) were less willing to pay with cash during the pandemic than beforehand (Kulisz, Bojanowska, and Toborek, 2021). However, research conducted in India in 2021 showed that the way Indian consumers shop online has been greatly affected by the Covid-19 pandemic. A study has revealed

that this impact is linked to several factors including how willing consumers are to use technology, how much risk they perceive in online transactions, how much trust they have in online technologies, and how likely they are to purchase grocery products online. This information can help businesses understand the changes in consumer behaviour and adapt accordingly (Habib and Hamadneh, 2021).

The way in which consumers make purchases online is influenced by various factors, including their income level, educational background, age group, and values associated with the products they are interested in buying. These factors play a significant role in determining whether or not a consumer decides to make an online purchase (Mitchell, 1998). When examining the impact of age, it is important to avoid conflating the underlying causes of that impact. For instance, seniors may possess greater purchasing expertise. Even though they tend to be more cautious with risk, it can be challenging to isolate the effects of other age-related factors such as life experience, familial obligations, financial circumstances, and health issues (Mitchell and Boustani, 2015). During the Covid-19 pandemic, various research studies were conducted on risk perceptions when shopping online. Among other things, it was found that age has a moderating effect on the relationship between product, security and privacy risks and attitude towards online shopping (Makhitha and Ngobeni, 2021). The main target group for online retailers constitute consumers born between 1980 and 2000 (Gurău, 2012), also known as is the Generation Y (Ladhari, Gonthier, and Lajante, 2019), the Millenials or iGen (Krbová and Pavelek, 2015). On their subject, for example, the 2021 study was conducted on determinants of millennials' behaviour in online shopping. The results revealed that Millennials are satisfied with previous experience in online shopping (Melović et al., 2021). Which could indicate a low sensitivity to risk in this age group. The authors of this article decided to investigate, in Polish conditions, who is more willing and more aware of purchasing risks – younger or older customers.

Not only the age but also the sex of respondents is important for perceptions of different economic and purchasing phenomena. For example, a study conducted in Poland in 2013 showed that when considering the reduction of perceived risk by e-consumers according to their sex, it can be seen that

women are clearly more likely than men to reduce their perceived risk through recommendations from friends and ensuring that they can exchange goods/return money. Men, on the other hand, are much more likely than women to reduce the risk by checking the reliability of the online shop and its offerings and ordering products only from reputable brands (Maciejewski, 2010). In general, studies on the effect of sex on risk taking have indicated a greater propensity for males to take higher risk (Kogan, 1978 and Shukla, 2022). The 2021 study, in turn, showed that perceived risk has a negative and insignificant influence on working women's purchase intention for online shopping (Lipowski, 2015). At the same time, sensitivity to purchasing risk can be considered in various aspects. Total perceived risk is rather a category composed of many variables that constitute its sum. It involves the consumer's uncertainty avoidance in purchasing situations (Littler, 2006). In this context, the perceived risk category in the 1970s was broken down into subcategories, functional, physical (security), financial, psychological and social risks (Pieter, 1967). During the 2021 Covid-19 pandemic, a study was conducted on the influence of demographic factors on perceived risks affecting attitudes towards online shopping. It indicated that no moderating effect of sex on the relationship between risks and attitudes towards online shopping (Makhitha and Ngobeni, 2021). During the same year, research was also conducted on the effects of hedonic shopping motivations and sex differences on compulsive online buyers. This research, in turn, showed that gratification seeking and idea shopping are key motivations for compulsive online buyers (females are mostly gratification seekers, while males are mostly information seekers). On the other hand, engaging in value-oriented shopping and role-playing can decrease the tendency towards compulsive online shopping, especially among females. However, for males, there appears to be no significant relationship between role-play shopping and compulsive online buying (Wang et al., 2022).

In Maciejewski's research, conducted among Polish consumers, it was examined what actions e-consumers take to reduce the perceived risk of a failed purchase. The results of this survey indicated that customers try to minimize the risk of an unsuccessful online purchase mainly by checking certificates such as 'trusted seller', 'reputable seller', etc.; buying from online stores recommended by friends and also by verifying the reliability of the

online store and the credibility of its offerings (e.g., through telephone contact) (Maciejewski, 2010). During the pandemic, the online shopping cart abandonment (OSCA) theme was studied in China. The results indicate that when customers hesitate during checkout, it leads to an increase in OSCA. Additionally, when customers feel emotionally conflicted and experience OSCA, it can affect their decision to buy from a physical store. Moreover, using fear-based marketing tactics seems to reduce the impact of OSCA on the decision to buy from a physical store (Wang et al., 2022). The 2020 study also examined using website information to reduce postpurchase dissonance. Results, in this case, showed that higher-quality website information is associated with a lower level of postpurchase dissonance. In addition, a lower perceived risk or attractiveness of alternatives strengthens the association between website information and postpurchase dissonance (Li and Choudhury, 2021). There are also interesting conclusions from the 2021 survey on online purchase intention to explore the relationships in the proposed theoretical model for an electronic commerce environment in Taiwan. The findings of this research suggest that online businesses could promote greater engagement among their customers in online information, despite the potential risks involved. While perceived risk can negatively affect the intention of online shoppers to make purchases, online operators can transform such risks into advantages for e-commerce, by leveraging the benefits of online involvement and electronic word-of-mouth (e-WOM) (Liao et al., 2021).

The article's purpose is to identify the broad management implications of perceived purchasing risk associated with online shopping. The research conducted concerns customers' perceptions of purchase risk. An aspect that was considered additionally was the countermeasures (countermeasure analysis) that respondents (respondents) used to minimize purchasing risks. Considerations were narrowed down to the Polish online shopping market. The research conducted on this topic to date was conducted before the pandemic, and the pandemic situation has changed a lot in the attitude of customers towards shopping in general, especially online shopping. Therefore, it is important for the various management systems functioning in enterprises to verify how consumers react during emergencies such as a pandemic.

Based on the above literature considerations, it was examined how sex differentiates risk awareness concerns accompanying online shopping and sensitivity to the risks involved. It also examined how customers minimize their purchasing risks. The following research hypotheses were formulated:

H1: Consumers are aware of the risks associated with purchasing various goods via the Internet;

H2: Younger respondents are more willing to take shopping risks;

H3: Younger respondents are more aware of their concerns about online shopping;

H4: Concerns about buying online during a pandemic depend on the respondents' sex;

H5: There is a statistically significant difference between the sensitivity level to purchasing risk in a pandemic situation according to sex;H6: To minimize unacceptable purchasing risks during the Covid-19 pandemic, consumers are taking appropriate countermeasures.

Methodology of the original research

A representative group of 1,000 Polish consumers was selected for the survey. The research method used was a diagnostic survey and the research tool was a survey questionnaire.

The hypotheses were analyzed based on the questions presented in the following tables. The questionnaire questions and scale were subjected to a reliability assessment in the pilot study. The point scales used are based on the Likert scale. The construction of this scale is widely described in the psychological, sociological and marketing literature on the subject. This scale consists of a series of equivalent items that are indicators of the measured, one-dimensional latent trait. These items are parallel in nature and are reflexive indicators of the latent trait being measured. The Likert-type scale is also used to capture qualitatively data that is difficult to measure or addresses a sensitive topic, to which a respondent would likely not respond, or would response falsely if asked directly. The scale was inspired by a wide range of research works (Yadav, 2017).

Table 1. *Questionnaire – question one.*

1. WHEN PURCHASING A PRODUCT VIA THE INTERNET/ONLINE STORE, TO WHAT EXTENT ARE YOU CONCERNED THAT...	
(a five-point response scale, where: 1 – indicates the lowest level of concern and 5 – the highest)	
1.1.	I will overpay
1.2.	I will spend money unnecessarily
1.3.	seller will cheat me
1.4.	product will not be delivered on time
1.5.	product will not be delivered at all
1.6.	product will be delivered damaged
1.7.	product will not be worth the price
1.8.	product will not meet my expectations because I cannot check/touch/see it
1.9.	quality of the product will be unsatisfactory
1.10.	purchase will be criticized by my environment
1.11.	product will be too difficult to use
1.12.	I will make the wrong choice

Source: Own work.

Table 2. *Questionnaire – second question.*

2. TO WHAT EXTENT DO THE FOLLOWING FACTORS INCREASE YOUR CONCERNS, AND DOUBTS WHEN SELECTING AND PURCHASING VARIOUS PRODUCTS ONLINE?	
(seven-point response scale, where: 1 – means: do not increase concerns at all, and 7 – increase concerns to a very high degree)	
2.1.	very large product selection, each of which has significant pros and cons
2.2.	lack of experience when buying a particular product (a product still unknown to me)
2.3.	frequent changes in product features (new versions, models, etc.)
2.4.	short shelf-life/use-by date
2.5.	frequent changes in product prices (increases and decreases)
2.6.	high purchase weight due to its purpose (such as a gift for a loved one)
2.7.	a long period of time since the last purchase
2.8.	large one-time purchase size (e.g., potatoes for the entire winter)
2.9.	the fact that the product may endanger the environment
2.10.	the existence of a lot of contradictory information about the product
2.11.	negative experience with a similar product
2.12.	unknown product brand
2.13.	novelty – the product has just appeared on the market
2.14.	haste
2.15.	the product is not used by my friends, people I value and admire
2.16.	high product price
2.17.	high costs of acquiring/reaching the product (e.g., long commute)
2.18.	high expectations towards the product (e.g. it should serve long and trouble-free)
2.19.	purchase during sales, various promotional activities
2.20.	purchase via the Internet, telephone

Source: Own work.

Table 3. *Questionnaire – question three.*

	3. PLEASE RESPOND TO THE FOLLOWING STATEMENTS:
	(seven-point response scale, where: 1 – means: totally disagree and 7 – totally agree)
3.1.	The higher the product price, the greater the risk of making the wrong decision.
3.2.	The risk is lower when the purchase is financed by additional income (bonus, winnings, nest-egg).
3.3.	The shorter the time to make a decision, the greater the risk that it will be wrong.
3.4.	The risk is lower when the decision's consequences rest only on me and bypass my family members.
3.5.	The risk of buying a product is lower when the consequences of a wrong decision are short-term.
3.6.	The risk is greater when one intends to buy a product unfamiliar/new to oneself.
3.7.	I risk less when I buy in a store rather than over the phone or on the Internet.
3.8.	The risk is greater when the salesperson strongly encourages us to buy the product.

Source: Own work.

Table 4. *Questionnaire – question four.*

	4. WHAT DO YOU DO TO REMOVE OR AT LEAST LIMIT THE RISK RELATED TO SELECTING AND PURCHASING DIFFERENT PRODUCTS ONLINE?
	(semantic response scale, YES or NO)
4.1.	I buy a smaller amount first for a trial.
4.2.	I buy from a reputable, proven shop, from a seller I know.
4.3.	I check the opinion on taste, and smell, check the packaging, and expiry date or see how the goods work in others' opinion.
4.4.	I compare offers from several manufacturers/service providers.
4.5.	I ask about the terms of the warranty (length, service availability, delivery and collection costs, etc.).
4.6.	I consult family members, friends, acquaintances or other consumers.
4.7.	I look for as much information as possible about the product on its packaging and/or carefully read the accompanying leaflets and instructions for use.
4.8.	I look for as much product information as possible on the manufacturer's/service provider's website.
4.9.	I look for as much information as possible about a particular product in the press, guidebooks and/or consumer organisations.
4.10.	I use the same product all the time (proven, same brand, same manufacturer).
4.11.	I choose the most expensive model, the best product grade.
4.12.	I choose from widely reputable, well-known product brands.
4.13.	I direct others to the store's website or make decisions together with others.
4.14.	I ensure that I can exchange the goods, give a refund in the event of cancellation, etc.
4.15.	I pay attention to the origin country (e.g. made in Poland, bar code 590…).
4.16.	Different (how?)

Source: Own work.

Statistical analysis was performed using Statistica TIBCO 13.3, and a significance level of $p = 0.05$ was assumed for all analyses. The first step of the statistical analysis conducted was to assess the survey instrument reliability

and question consistency using Cronbach's alpha coefficient. A correlation matrix between sub-questions was determined for all questions analysed. For Questions 1 to 3, all sub-questions correlated 'in the same direction' (positive signs of correlation coefficients). For question 1, Cronbach's alpha coefficient was 0.91, for question 2 it was 0.83, and for question 3 it was 0.93, indicating very high sub-question consistency. Question 4 received correlation coefficients between sub-questions at lower levels than the previously considered questions – the last three sub-questions had virtually zero correlation compared to the others. Cronbach's alpha was determined for all sub-questions in question 4 and a low coefficient value of 0.65 was obtained. After the removal of the last three sub-questions, the value of this coefficient increased to 0.67. In some sources, it can be found that the minimum value of Cronbach's alpha coefficient is 0.7, but values between 0.6 and 0.7 are sometimes allowed (it is often called conditional). Due to obtained results, variables were aggregated: in question 1, all values of sub-questions were summed, similarly in questions 2 and 3. In question 4, sub-questions 4.1-4.11 were summed.

These questions were compared for differences in average response rates using Mann-Withney U tests (for metric questions having two variants) and Kruskal Wallis for metric questions with more than two variants. Subsequently, for questions with more than two-element grouping factors, multiple comparison tests were conducted.

RESULTS

DESCRIPTION OF THE RESEARCH SAMPLE

The research sample, according to the research assumptions, included people over the age of 18 making purchasing decisions in the consumer market (Table 5). The questionnaire was completed by 1,000 people – 501 women and 499 men. Six age classes are included. 706 of the respondents are professionally employed, and 294 are not. The results analysis was presented in two stages, the first involved a simple analysis of the results, which was evaluated qualitatively, while the second involved a statistical analysis of the questionnaire responses according to the metric questions.

Table 5. *Research sample characteristics.*

Age						
	18 – 24	25 – 34	35 – 44	45 – 54	55 – 64	65<
Sample size	127	241	258	168	135	71
Education						
	primary	lower secondary school	vocational	secondary	higher education	
Sample size	10	23	82	484	403	
Financial situation (self-esteem on a seven-point scale, where 1 means the worst financial situation and 7 means the best)						
	1	2	3	4	5	6	7
Sample size	16	25	93	314	389	138	25
The number of persons in the household						
	1	2	3	4	5	6+ (6 and more)	
Sample size	81	208	294	268	106	43	
Place of residence						
	Rural	City with up to 50,000 inhabitants		City with 50,000 to 200,000 inhabitants	City with 200,000 inhabitants and more	
Sample size	202	233		287	278	

Source: Own *work.*

RESEARCH RESULTS

For the first question, the least concern customers expressed was that they would overpay for the product; that the purchase would be criticized by those around them; and that the product would be too difficult to use. A very large number of responses indicate that buyers have a neutral attitude toward the risks associated with various aspects of online shopping. In this situation, some people fear that the product will not meet their expectations because they can't check/touch/see it and that the quality of the product will be unsatisfactory. Regardless of the risk factors indicated by respondents, it is noticeable clearly that they are aware of these risks in any case. Certainly, depending on the factor to varying degrees. A detailed summary of the responses to this question is included in Table 6.

Table 6. *Detailed summary of responses to question 1.*

Note	WHEN PURCHASING A PRODUCT VIA THE INTERNET/ONLINE STORE, TO WHAT EXTENT ARE YOU CONCERNED THAT...											
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	1.11	1.12
1	347	220	181	158	259	121	110	100	85	430	422	189
2	218	219	247	233	246	246	184	158	186	218	232	239
3	230	256	289	309	219	279	322	321	302	220	224	306
4	128	187	177	193	147	204	233	247	269	87	84	170
5	77	118	106	107	129	150	151	174	158	45	38	96

Source: Own work.

Regarding the second question, respondents indicated that their concerns and doubts are least likely to be caused by the long period since the last purchase, as well as the large one-time purchase size (e.g., potatoes for the entire winter) and the fact that the product is not used by their friends, people they value and admire. Respondents seem to pay the strongest attention to the high product price. A detailed summary of respondents' answers to question 2 is included in Table 7.

Table 7. *Detailed summary of responses to question 2.*

Note	TO WHAT EXTENT DO THE FOLLOWING FACTORS INCREASE YOUR CONCERNS, AND DOUBTS WHEN SELECTING AND PURCHASING VARIOUS PRODUCTS ONLINE?																		
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.10	2.11	2.12	2.13	2.14	2.15	2.16	2.17	2.18	2.19
1	188	171	154	157	129	115	259	241	179	96	120	101	106	120	237	81	111	92	123
2	135	146	148	148	108	97	152	155	165	105	120	110	114	119	154	83	73	76	108
3	187	179	176	177	189	168	185	150	143	159	137	164	177	144	200	133	151	171	171
4	230	204	223	176	221	224	187	187	223	236	196	218	235	208	196	196	210	229	222
5	150	156	173	150	184	196	126	144	133	195	181	213	213	190	121	197	186	229	194
6	66	91	84	106	102	112	51	69	74	112	137	116	97	135	52	144	139	104	99
7	44	53	42	86	67	88	40	54	83	97	109	78	58	84	40	166	130	99	83

Source: Own work.

For question three, in which respondents were asked to respond to the statements given, the statement 'The shorter the time to make a decision, the greater the risk that it will be wrong' received the highest marks, followed by

the following statements: 'I risk less when I buy in a store rather than over the phone or on the Internet', 'The risk is greater when one intends to buy a product unfamiliar/new to oneself', and 'The risk is greater when a salesperson strongly encourages us to buy the product'. In this case, customers' risk perception is also evident. They are aware of it, but their approach to risk is different. A detailed summary of respondents' answers to this question is included in Table 8.

Table 8. *Detailed summary of responses to question 3.*

Note	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8
1	107	153	60	103	77	62	91	60
2	101	122	81	104	91	69	85	58
3	147	159	149	153	163	132	151	130
4	238	228	205	249	255	192	204	242
5	167	154	202	176	222	240	174	234
6	120	115	158	109	110	172	151	148
7	120	69	145	106	82	133	144	128

Source: Own work.

As solutions aimed at eliminating or at least reducing the risks associated with the selection and purchase of various products over the Internet, respondents primarily indicated the answer related to checking reviews on taste, smell, checking packaging, expiration date or how the goods work (93% of respondents). Subsequently, in terms of the number of positive responses, they indicate the following responses – advice from family members, friends, acquaintances or other consumers (89.2% of respondents), directing others to the store's website or making decisions together with others (87.6% of respondents), or looking for as much information as possible about the product on its packaging and/or carefully reading the accompanying leaflets and instructions for use (86.5% of respondents). The least frequently indicated answer was to use the same product (proven, same brand, same manufacturer) all the time (24.6% of respondents). A detailed summary of respondents' answers to question 4 is included in Table 9. Respondents' own answers included statements such as I order with cash on delivery, I buy from verified stores/websites, I first check

in a stationary store and then possibly buy online, I always check product reviews also on social media or I buy Polish products. Analyzing the answer to this question, it is possible to positively verify hypothesis 6, which states 'To minimize unacceptable purchasing risks during the Covid-19 pandemic, consumers are taking appropriate countermeasures'. These activities are presented above in the analysis provided.

Table 9. *Detailed summary of responses to question 4.*

Note	WHAT DO YOU DO TO REMOVE OR AT LEAST LIMIT THE RISK RELATED TO SELECTING AND PURCHASING DIFFERENT PRODUCTS ONLINE?													
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10	4.11	4.12	4.13	4.14
Yes	757	824	930	832	700	892	865	550	545	246	705	600	876	620
No	243	176	70	168	300	108	135	450	455	754	295	400	124	380

Source: Own work.

A basic analysis of the survey results showed that respondents are aware of online shopping risks in various aspects. Accordingly, the first research hypothesis was confirmed. Some factors are causing less, others more customer concern. The research results are analysed in detail below.

Statistical analysis for questions 1-4 by respondents' sex using the Mann-Withney U test is shown in Table 10. Based on it, it can be concluded that there is a statistically significant difference between men and women when answering questions 1-3, women indicated higher scores (on a scale of 1-5/1-7) compared to men when answering these questions. For question 4, such a statistically significant difference does not exist.

Table 10. *Analysis conducted with the Mann-Whitney U test by respondents' sex.*

Question	Sum rang women	Sum rang men	The value of the Z test statistic	p-value
1	264153.5	236346.5	2.935	0.003337
2	260809.5	239690.5	2.202610	0.027623
3	260566.5	239933.5	2.149398	0.031604
4	248556.5	251943.5	-0.480333	0.630991

Source: Own work.

For question 1 – 'When purchasing a product via the Internet/online store, to what extent are you concerned that…' taking into account the 5 factors that received the maximum number of points, women are most concerned that the product will not be delivered or will be delivered damaged, not worth

the price, will not meet expectations because it could not be checked/touched/ seen before purchase, as well as that the quality of the product may be unsatisfactory. Men, on the other hand, are concerned that the product will be delivered damaged, not worth the price, will not meet expectations because it could not be checked/touched/seen before purchase, as well as that the quality of the product may be unsatisfactory or that they will spend money unnecessarily. The above analysis allows positive verification of hypothesis 4, which states: 'Concerns about buying online during a pandemic depend on the respondents' sex'.

Regarding the factors that increase respondents' fears or doubts when choosing and purchasing various products over the Internet, considering the 6 factors that received the maximum number of points, in the case of women they are: high product price, high cost of acquiring/reaching the product, negative experience with a similar product, high expectations towards the product (e.g., it is supposed to serve a long and trouble-free), high purchase weight due to its purpose, and the existence of a lot of contradictory information about the product. For men, these include factors such as the high product price, the high cost of acquiring/reaching the product (e.g., a long commute), negative experiences with a similar product, high expectations of the product (e.g., it is supposed to last long and trouble-free), the existence of a lot of contradictory information about the product, and haste.

When analyzing the answers to question 3, both women and men believe that the shorter the time to make a decision, the greater the risk that it will be wrong. In addition, they state that they risk less when they buy in a store rather than over the phone or online and that the risk is greater when they intend to buy an unfamiliar/new product for themselves. Additionally, they believe that the risk is greater when the salesman strongly encourages us to buy the product. They indicated the same statements, but overall women indicated higher scores for all statements than men. Considering the analysis of the above two questions based on them, hypothesis No. 5 can be positively verified, which reads, 'There is a statistically significant difference between the sensitivity level to purchasing risk in a pandemic situation according to sex'.

For statistical analysis of the analysed questions by age, the Kruskal Wallis test was used. For question 1 H=12.95006, p=0.0239, for question 2 H=23.0172,

p=0.0003, and for question 3 H=22.06637, p=0.0005, so for these questions there is a statistically significant difference between the responses of respondents of different ages. Respondents in the 18-24 and 25-34 age groups indicated higher responses compared to other respondents, supporting hypothesis No. 3 that 'Younger respondents are more aware of their concerns about online shopping'. Multiple comparison tests were conducted to determine which age groups differ from the others. As a result of this analysis, for question 1, tests of multiple comparisons showed that there were no such differences, for question 2 it can be concluded that the group of respondents aged 18-24 and 25-34 is different from the 45-54 group , and for question 3 the 35-44 group has a significantly lower value compared to the 18-24, 25-34 and 65+ groups, and not significantly different from the 45-54 and 55-64 groups. For question 4, there were no statistically significant differences between respondents of different ages (H=4.734171, p=0.4492).

In order to validate hypothesis H2 'Younger respondents are more willing to take shopping risks', a statistical analysis of sub-question 3.7 'I risk less when I buy in-store rather than over the phone or online' was performed by age. The results of the Kruskal Wallis test were H=10.937, p=0.526 showing that there is no statistically significant difference in this case, therefore the hypothesis should be rejected.

Considering the respondents' education for question 1 H=2.654094, p=0.6173, for question 2 H=7.424988, p=0.1151, for question 3 H=5.372534, p=0.2512, and for question 4 H=1.666872, p=0.7967, therefore for these questions there is no statistically significant difference between the respondents' answers and their education. Analysing respondents' work activity by 'working' and 'not working' for questions 1 and 2, there were no statistically significant differences, while for questions 3 and 4 such significance exists, those working indicated a higher point scale than those not working, as shown in Table 11.

Table 11. *Analysis conducted with the Mann-Withney U test due to the respondents' employment activity.*

Question	Sum rang working	Sum rang not working	The value of the Z test statistic	p-value
1	351420.0	149080.0	-0.46443	0.642342
2	351024.5	149475.5	-0.55947	0.575838
3	344979.0	155521.0	-2.01235	0.044183
4	362522.5	137977.5	2.20353	0.027558

Source: Own work.

Statistical analysis for questions 1-4 by respondents' financial situation using the Kruskal Wallis test is presented in Table 12. Based on this, it can be concluded that there is no statistically significant difference in the answers to the questions analysed depending on the respondents' financial situation. Based on this, it can be concluded that there is no statistically significant difference in the answers to the questions analysed depending on the respondents' financial situation. Taking into account the of people in your household (Table 12), statistically significant differences can only be observed for question 2.

Table 12. *Analysis using the Kruskal Wallis test with regard to the respondents' financial situation and the number of persons in the household.*

Financial situation		
Question	the Kruskal Wallis test: H	p-value
1	9.739986	0.136
2	3.393797	0.7580
3	2.007420	0.9190
4	6.166229	0.4048
Number of people in your household		
Question	the Kruskal Wallis test: H	p-value
1	8.591006	0.1265
2	16.80389	0.0049
3	5.861566	0.3199
4	8.388468	0.1361

Source: Own work.

Statistical analysis for questions 1-4 according to a place of residence for question 1 H=1.7368, p=0.6288, for question 2 H=5.5082, p=0.1381, for question 3 H=4.3071, p=0.2302, and for question 4 H=1.40221, p=0.7050, therefore

for these questions there is no statistically significant difference between respondents' answers and their place of residence.

Concluding the statistical analysis, it can be said that a statistically significant difference in respondents' answers is found by sex and age for questions 1 to 3, while for working and non-working respondents such a significant statistical difference can be observed for questions 3 and 4. Considering the number of persons in the household, a significant statistical difference is found only for respondents' answers to question 2.

Conclusions

This article identifies the extensive management implications arising from perceptions of purchase risk when shopping online among Polish consumers and during the Covid-19 pandemic. The intention of the authors of this article was to check whether the pandemic situation influenced changes in consumer behavior and feelings regarding the perception of purchasing risk. Higher risk aversion with age and men being less risk averse than women is nothing new, but it was necessary to determine whether new conditions in the environment did not change this regularity.

The research conducted for this article allowed for the verification of the formulated hypotheses. Consumers in general are aware of the risks associated with purchasing various goods via the Internet. Younger respondents are not more willing to take purchasing risks. They are also not aware of their concerns about online shopping. Hence, it can be concluded that age is not essential regarding the perception of purchasing risk when shopping online. Concerns about buying online are instead dependent on the respondents' sex. There is also a statistically significant difference between the respondents' sex and sensitivity to purchasing risk in various aspects. In order to minimize unacceptable purchasing risks, consumers take certain countermeasures that they can specifically identify. Studies investigating the effect of gender identity on consumers' impulse buying behavior and whether this effect differs in terms of biological sex are quite limited (Akçay , 2019). This may be an area for further research.

However, a limitation of the research conducted in this article is the lack of a culturally and sociologically diverse survey group from different countries. Conclusions can be generalized but the question is whether they are universal for every country and every community.

The practical implications of the research conducted in this article can apply to any e-business stakeholders. This is important from the perspective of effective customer relationship management, as well as other management systems in such businesses, as customer concerns affect many aspects of their operations.

Meanwhile, the theoretical implications of the research conducted in the paper may relate to the expansion of knowledge in the field of customer relationship building, and management systems in relation to knowledge about customers, their behavior and decision-making. The article reveals certain behavioral patterns and their implications also for management theory.

Further research directions include the emergence of new technologies and opportunities such as the use of IoT or neural networks for building and managing customer relationships. It is also important to pay particular attention to the current role of online whisper marketing in brand building and PR activities in e-business. Combining this with knowledge of customer concerns and constraints related to online shopping can point to new directions for e-business. It is also important to continue such research and repeat it when there are various changes in the global environment, such as epidemiological threats, economic crises or warfare, which change customers' attitudes towards risk perception. It would also be possible to develop research on the role of whisper marketing in social media marketing on the topic in question.

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