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Impact of war-crisis perception on consumer purchasing behaviour: the case in Odesa of consumers' segmentation

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Resumo

O presente estudo analisa o impacto de vivência em contexto de crise, devido a guerra, nas decisões de compra e de consumo, considerando a Ucrania. Quais são actualmente os sentimentos da sociedade e como mudaram as suas preferências de compra desde o início da guerra em 2022? Hoje a população Ucraniana experencia consequências negativas da guerra, a qual afectou significativamente o rendimento, saúde e segurança.

Um inquérito foi submetido a residentes na Ucrania com o objectivo de comparar as necessidades e comportamento dos consumidores, nos momentos antes e durante a guerra, relativamente à compra e consumo de bens alimentares. Desta amostra de conveniência, foram recolhidas 302 respostas. Da análise descritiva dos dados, com recurso ao software IBM SPSS Statistics, versão 28, identificaram-se as fornecer as variáveis base de segmentação.

O método *Two-Step Clustering* permitiu identificar dois grupos de sujeitos que evidenciam uma tendência crescente na diminuição do rendimento, aumento da compra *online*, bem como a diminuição de procura de alguns bens e da procura de marcas estrangeiras pertencentes a empresas que apoiam o país agressor. Verifica-se uma mudança substancial do processo de decisão de compra e de hábitos de consumo com o contexto de guerra.

Palavras-Chave: comportamento de compra do consumidor, crise, guerra na Ucrânia, segmentação dos consumidores, produtos alimentares.

JEL:

M31-Marketing

P36- Consumer Economics • Health • Education and Training • Welfare, Income, Wealth, and Poverty

Abstract

The present study analizes the impact of living in a crisis context, due to war, on purchasing and consumption decisions, with a focus on Ukraine. What are society's current sentiments, and how have purchasing preferences changed since the start of the war in 2022? Today, the Ukrainian population experiences negative consequences from the war, which has significantly impacted income, health, and security.

A survey was conducted with residents in Ukraine to compare consumer needs and behaviour regarding food purchasing and consumption before and during the war. From this convenience sample, 302 responses were collected. The descriptive analyses od the data, using the IBM SPSS Statistics software, version 28, the base segmentation variables were identified.

The Two-Step Clustering allowed us to identify two groups of subjects that show a growing trend in income reduction, an increase in online shopping, and a decrease in demand for certain food items, especially foreign brands associated with companies supporting the aggressor country. A substantial shift in purchasing decisions and consumption habitshas been observed in the wartime context.

Keywords: consumer purchasing behaviour, crisis, war in Ukraine, consumers'segmentation, food products

JEL:

M31 – Marketing

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1. Introduction

The crisis caused by martial law has affected consumers both socially and financially. In addition, unemployment has increased, inflation has risen, wages have been reduced or frozen, and purchasing power has declined. Unfortunately, this is a reality for many people, and it affects their purchasing behaviour. Many families have suffered financially and have been forced to rethink their spending and shopping habits. Research on the impact of war (due to armed conflict) is multidisciplinary, as it covers "impact" in terms of economics, finance, environment, health, and sociology (Lim et al., 2022).

The unpredictability, uncertainty, volatility, complexity and any turbulence in an enterprise's macro environment are forcing companies to adjust their marketing activities in line with consumer demands (Grunert et al., 2023; Murphy et al. 2021; Wang, 2021; Sheth, 2020; Grant, 2003). In the long term, the crisis could become an opportunity for marketing innovation and transformation, which will lead to business growth and sustainable competitive advantage (Ding et al., 2021).

Risk and uncertainty are key components in the decision-process and consumer behavior in a risk-related crisis is driven by different factors for different consumer segments (Pennings et al., 2002).

At the same time, research on the impact of war (due to armed conflict) is multidisciplinary, as it covers "impact" in terms of economics, finance, environment, health, and sociology (Lim et al., 2022). Specifically, there have been calls for further research on the field of marketing and customer interaction in the condition of wartime in Ukraine (Dubovyk et al., 2022), to define the state for developing marketing component during wartime in Ukraine (Korneyev et al., 2022). But, there are still lack of knowledge on the impact of the wartime on the consumer purchasing behavior. We intend to address this gap in the literature by identifying and understanding the profile of consumers' segments and how their purchase behavior change under a wartime context. Thus, we propose a framework that identifies the most relevant shopping behaviour determinants and their role as segmentation criteria, comparing the scenario before the war with the one now, during the war.

Addressing this research problem proves to be relevant as it is a necessary step to help managers of enterprises to study economic behaviour of consumers during instability in the conditions of wartime uncertainty (Omelchyk et al., 2022), to form marketing development strategies of the enterprise in the crisis conditions of martial law (Gyrich, 2024; Bulyk, 2023; Prohorovs, 2022), a change in food-related behaviours where thriftiness and mindfulness come together (Grunert et al., 2023).

The impact of the wartime, the perception of economic crisis and consumer behaviour are critical issues, not only in the short-term plans of Ukrainian companies, but also in the medium- and long-term revision of their strategies. In this context, determining the impact of the wartime on consumer purchasing behaviour is also of utmost importance.

In this sense, we formulated the following questions that we intend to answer with the research:

RQ1:What are the common features of consumer buying behaviour during the martial law crisis?

RQ2: How the conditions of the martial law crisis affected the purchasing behaviour of consumers?

In the present dissertation, we start by contextualizing and defining the problem we are going to address, its relevance, and the research purpose and questions. Then, we review the literature that led us to develop the conceptual hypothesis and the methodology we intend to use.

2. Literature Review

Under a war crisis context both companies and citizens need to adapt consumption patterns in order to survive. Production and logistic resources higly reduce under the destruction environment change, which significantly change people life style, demand and social habits. Consumers health and financial patterns as well rethink the purchase decision-making independently of the belonged segment profile. This chapter review the main concepts and variables of the consumer shopping process, namely considering the influence of the crisis context, and the most update studies to understand the challgenges coming from the war. Also the segmentation criteria are analysed.

2.1 The consumer purchase decision making

The formation of a model of consumer behaviour involves the allocation of stages of consumption with the obligatory identification of extensive and intensive factors of influence (Nie et al., 2010). In particular, the model of consumer behaviour includes the following successive stages, is considered to be a classic or generalized model - awareness of the need:

- search and evaluation of information;
- making a purchase decision;
- assessment of the correctness and rationality of consumer choice.

The initial stage of the consumer behaviour model is the process of forming, realizing and developing a need based on understanding the difference between the desired state and the existing one, which, in turn, is influenced by a number of exogenous and endogenous factors (Lee et al., 2003).

The group of exogenous dominants includes:

- economic factors (economic stability, market price, real incomes, utility of goods);
- political factors (type of state system, political regime, political ideology, level of political socialization of citizens);
- social factors (social status, reference groups, family, social roles, group interests);
- national and cultural factors (mentality, consumer culture, social values).

In the group of endogenous factors, it is important to indicate age, stage of the family life cycle, lifestyle, beliefs, occupation, personal values, experience and knowledge, economic status, etc. Individual characteristics of a person not only influence his or her economic behavior, but also shape the individual's affiliation with a particular type of consumer. In particular, the most detailed typology of consumers (Eriksson, 2020):

- the discerning consumer - sets high demands on the quality of goods and services;
- rational consumer - is aware of trademarks and makes purchasing decisions based on the principle of optimal price-quality ratio;
- innovator (fashionista) - focused on innovative products and fashion trends;
- amateur - considers "shopping" as a form of recreation and leisure;
- frugal consumer - based on the principle of economy;
- impulsive consumer (wasteful) - makes purchasing decisions spontaneously, without thinking about the rationality and real expediency of the purchase;
- independent consumer (traditionalist) - in his choice he is guided by established habits and traditions.

After realizing the need, the consumer is ready to satisfy it, which primarily involves searching for and analyzing consumer information.

The main channels for disseminating consumer information are: personal (family, friends, colleagues); commercial (advertising, sellers, packaging); public (mass media, conferences, seminars); and empirical (experience, tests). The array of information that a consumer receives from these sources contributes to the formation of an idea of goods and services: the consumer makes a conclusion about the properties of the product, its compliance with his or her needs and ability to satisfy them (Voinea, 2011).

The prerequisite for making a purchase decision is to evaluate alternatives according to a certain set of criteria and their significance (price, quality, brand name, warranty, environmental friendliness, compliance with fashion trends, etc.).

The next stage of the consumer behaviour model is the process of making a purchase decision. Despite the system of external and internal factors, the company's marketing policy (pricing strategies, marketing communications, PR, etc.) plays an important role in encouraging consumers to make the final choice (Salzman, 2010).

The final stage of the consumer behaviour model is the assessment of the consumer decision based on the contrast between the predicted effect of consumption and the received one, the expected quality and the actual one, and the promised properties of the product and the real ones. At this stage of the consumer behavior model, the phenomenon of "post-purchase dissonance" may occur, when, due to the complexity of the choice and the importance of the decision, the consumer has some doubts about the correctness of the decision.

The process of making a purchase decision is relevant in the consumer behaviour analysis. It consists of five consecutive steps: awareness of the need, search for information, making the purchase decision, making the purchase, and evaluating the correctness of the purchase (Grunert et al., 2023).

At any given moment in life, a person experiences many needs. Some of them are biogenic in nature, arising during a certain physiological state of the body - hunger, thirst, discomfort. Others are psychogenic in nature and result from states of psychological stress, such as a person's need for recognition, honor, or spiritual intimacy. Many needs do not require immediate fulfillment. A need becomes a motive when it forces a person to act, and its satisfaction reduces psychological tension (Vartanova et al., 2023).

However, in most cases, the buying process is a classic sequence of actions, the starting point of which is the realization of a need. As a rule, people make simple decisions on their own, while more complex ones can be stimulated (for example, by advertising).

After making a decision, the consumer searches for relevant information. Such a search can be internal (in memory) or external (if the existing experience is not enough and the probability of making a wrong decision is quite high). Sources of information during an external search can include personal connections (friends, relatives), public organizations, and trade events (exhibitions, advertising, and salespeople) (Sheth, 2020).

The collected information offers the consumer alternatives, i.e., purchase options. To evaluate them, objective and subjective evaluation criteria are used. Objective criteria are the characteristic features of a product or brand (functional characteristics), while subjective criteria are the buyer's personal attitude to the product or brand, such as prestige (Omelchyk et al., 2022).

The use of evaluation criteria allows you to choose an alternative, i.e., make a purchase decision. But often, despite the availability of prior information, purchase decisions are made impulsively (spontaneously) based on emotions or feelings that emerge from examining the product or viewing its advertising. This is how one third of purchases are made (Cepeda-Carri et al., 2017).

The final stage of the consumer decision-making process is post-purchase behaviour. Comparing the outcome of the purchase with one's expectations leads to satisfaction or disappointment. If you are disappointed, you need to find out what caused it. Maybe the product has defects (shortcomings), or maybe the consumer's expectations are too high? (Zurawicki et al., 2005).

Often, a consumer chooses between two or more attractive alternatives (product offers). The feeling of psychological tension that arises after making a purchase is called cognitive discrepancy (dissonance). To eliminate it, the consumer tries to find information that would confirm the choice. Therefore, advertising is often used to convince consumers that their decision is correct. Along with the classical one, there are some other options for making purchasing decisions (Kim, 2020).

For example, a typical way to buy cheap goods is to solve the problem routinely. In this case, the consumer spends almost no effort searching for information and evaluating alternatives. The decision is familiar and traditional. When purchasing medium-priced goods, consumers use a certain number of evaluation criteria, relying on someone, such as friends, to help them evaluate alternatives (Grunert et al. 2023).

When making decisions about purchasing high-value goods, extended problem solving is used. In this case, the consumer makes significant efforts and spends more time going through all the stages of decision making.

The process of making the above decisions is shaped by five situational influences (Cepeda-Carri et al., 2017):

- purpose of purchase (for whom the product is purchased - for oneself or for someone else)
- social environment (who is present during the purchase decision);
- physical environment (e.g., store design, seller's face);
- time effect (time available to the consumer to make a purchase decision);
- previous state (mood, experience, amount of cash).

In any product or service, consumers want to see a solution to their problems and do not want to see risk (Kumar et al., 2016). For this reason, each purchase is also accompanied by an assessment of the arguments against the purchase. This stage of the purchase decision process comes immediately after the assessment of purchase support.

2.2. The influence of war-crisis on purchase behaviour

2.2.1 Purchase behaviour changes under general crisis context

Crises affect social life, as well as the business world and the economy, and can change people's social lives and living standards in a short period of time. These changes affect both the social habits of consumers and their purchasing decisions. Consumers are rethinking their purchasing decisions due to health concerns, economic issues, resource scarcity and panic buying (Prentice et al., 2021). Drivers of consumer behaviour in crises scenarios are commonly looked at from the perspective of consumers' risk perceptions and risk attitude (Amalia et al., 2009). Consumers develop two types of responses against a crisis: reactive and proactive responses. Reactive response occurs when the consumer adapts to the current situation,changes their priorities by reassessing the needs and postpones or eliminates unnecessary costs, and prioritizes purchasing basic needs. In proactive response, assets are monetized to obtain cash and other types of responses such as saving, different types of loans or applying for a second job and taking part in illegal activities occur (Zurawicki et al., 2005).

Major changes in consumer behavior in the event of economic uncertainty are related to the following aspects (Nie et al., 2010; Pennings et al., 2002).

- With the decrease in consumer confidence due to economic uncertainty, expenditure budgets are significantly reduced as well. Consumers regulate their future consumption by shopping less and reducing their purchasing frequency.
- Consumers tend to be more rational and more sensitive to the prices of products or services. Consumers change their current purchasing habits and they worry about price and quality as they buy more goods.
- Consumers show an interest in various changes in promotional tools. They assume a more logical and calm approach during economic crises and care about product prices and costs.
- In crises, consumers change their shopping channels. They prefer online shopping as it enables them to compare prices in addition to being practical, fast, convenient, and more affordable (Wang et al., 2023; Nie et al., 2010).

According to the same authors, in crises, such as an economic crisis, food crisis or war related crisis, the panicked consumer tends to overreact and drastically cut spending, whereas the prudent consumer carefully plans spending and postpones major purchases.

Crises that cause negative perceptions among individuals adversely affect their mental state and feelings and thoughts about the future. In particular, high crisis perception may lead to anxiety, pessimism, panic, and depression in the long term (Jasiulewicz, 2012). These perceptions that emerged due to a crisis affect consumers' purchasing behaviors as well as their values and opinions on different issues (Lee et al., 2003).

The study of consumers' economic behaviour, when faced with instability, led to the following conclusions. The concerned consumers also plan their spending carefully, remaining loyal to certain brands, but they may be ready to try new and innovative products in spite of the hard times. The rational consumers in turn are not risk averse and their behaviour remains essentially unchanged. Panic as a state of intense fear and high arousal may trigger major changes in consumer behaviour (Eriksson et al., 2020).

Pricing is one of the most salient issues affecting both consumer decision making in the context of economic crises. The research from previous crises shows distinct changes in price-related attitudes: consumers are more sales prone (Shipchandler, 1982) and seek greater price knowledge (Estelami et al., 2001). The behaviours are reflective of greater price consciousness, the degree to which the consumer focuses exclusively on low prices (Lichtenstein et al., 1993).

2.2.2 The influence of the war-crisis on the purchase behaviour, namely in Ukraine

Today, the consequences of Russia's military aggression against Ukraine are being felt all over the world, acting as a powerful factor in the turbulence of the external environment (Dubovyk et al., 2022). The war in Ukraine significantly changed purchasing behaviour consumers, forcing them to reconsider their priorities, spending and product choices (Gyrich, 2024; Bulyk, 2023; Shkoda et al., 2022).

Indeed, researchers note that when consumers are influenced by wars, they first opt for products and brands either domestically produced or imported from countries they hold favorable attitudes. Works of literature provide evidence that the origin of a product can affect consumers' choice, and when consumers feel animosity towards a country, they are more likely to reject to purchase products originating from this country (Riefler, 2007; Özsungur, 2023). If a product is originated in a county that consumers have positive associations, the purchase likelihood is higher.

According to the study by the Association of Retailers of Ukraine and the Ukrainian Council of Shopping Centers the cumulative losses of retail trade enterprises from the war exceeded UAH 50 billion, more than 40% of which fell on core assets in June 2022. Each retail chain lost an average of 10 stores. 60% of the amount of losses from military actions falls precisely on the sphere of food retail, the total losses of which are about UAH 30 billion (Calboli et al., 2022).

Researchers indicate (Mashchak, 2023; Korneyev et al., 2022; Yassin, 2022) problematic issues faced by business in wartime such as: change of market segments, change of target audience, search for opportunities to enter foreign markets, cost growth, staff reduction, etc. The solution of all these problems requires a serious transformation of marketing.

Today, there is a revival of retail trade in regions where there are no hostilities and which returned to Ukraine after de-occupation (Omelchyk, 2022). At the same time, it is necessary to state the change in the structural ratio of demand, which occurred due to the military aggression of the Russian Federation, namely: the geographical redistribution of consumption to the western regions of Ukraine, a noticeable emphasis on the purchase of cheaper and promotional goods, basic necessities (Diia.Business, 2022).

Also, first the pandemic reality, and later the military one, turned retail into a branch of work with a flexible, remote or mixed schedule for a large list of employees: online sales managers, online store sellers, content managers, copywriters, RRS specialists, SEO specialists, business analysts (Ritson, 2022; Shkoda et al., 2022; Vovchanska et al., 2022).

Despite the colossal losses from military operations, retailers are actively involved in military and humanitarian aid, in the creation of headquarters and hubs that help displaced persons from temporarily occupied territories, volunteers and all those in need of help in difficult wartime.

Among the urgent problems of Ukrainian consumers, the challenges generated by Russian aggression are at the forefront: ensuring their own physical security, economic and psychological adaptation to the new reality, cyber security in a complex information space against the background of an aggressive information war on the part of the Russian Federation, the problem of establishing life in conditions of power outages (Gyrich, 2024; Bulyk, 2023; Shkoda et al., 2022).

In times of war, consumer behavior shows certain changes related to shifting priorities in demand. The vectors of such changes were substantiated by Ukranian scientists in their works (Mashchak, 2023; Kavilanz, 2022; Shkoda et al., 2022). Based on an examination of their research, the main changes can be highlighted:

- Decrease in demand for goods that are not essentials, and the determining factor for successful product promotion in the market is its price;
- Loss of interest in prestigious branded goods, branded goods that are too expensive, which slows down their sales;
- Buyers pay less attention to the external attractiveness of the product (packaging, design, advertising and marketing subtleties not related to the price).
- Safety is one of the main determinants of consumer behaviour in martial law. The military conflict has led to an increased sense of threat among the population. People are concerned about their own safety and the safety of their loved ones, which affects their consumer choices. Customers may avoid public places where there is an increased likelihood of terrorist attacks or choose goods and services that guarantee their safety, even at a higher price. The deterioration in customer security has led to a shift in consumer priorities and a redistribution of spending.

Another important determinant is economic instability. The military conflict is accompanied by a decline in economic activity and investment, inflation, and rising unemployment (Grunert et al., 2023). This leads to a reduction in household incomes and, accordingly, a change in their consumption activity. Customers are becoming more cautious about their spending, refusing to make expensive purchases and paying attention to goods and services with greater discounts and offers (Gyrich, 2024).

The third determinant is the psychological aspects of the military conflict. Stress, anxiety, and uncertainty associated with martial law definitely affect customers' decisions and consumer sentiment. Some customers may feel the need for relaxation and psychological support, while others may forgo luxuries and focus on necessary and important expenses (Bulyk, 2023).

Other determinants include changes in the category of products priorities. For example, an armed conflict leads to an increase in demand for security-related goods and services (protective equipment or security services) and a decrease in demand for goods that were previously popular (entertainment or travel) (Skowron et al., 2023; Wołowiec et al., 2022; Artyukhova et al., 2022).

Since the beginning of Russia's full-scale invasion of Ukraine, the purchasing behaviour of Ukrainian consumers in many categories of goods and services has changed significantly. First of all, there is a trend towards rationalization of purchases, as consumers are reducing impulse purchases, with 76% of Ukrainians visiting stores with pre-compiled shopping lists according to their needs. In addition to becoming more conscious, purchases have also started to be based on expediency and priority (Omelchyk et al., 2022).

The war has reduced the number of stores and shopping centers in some cities and regions, which has also led to a change in shopping behaviour and a shift to online shopping, where you can read reviews, compare options and buy cheaper or at a better deal (Korneyev et al., 2022). In addition, based on the studies of Gradus Research Company (2023) the demand for Ukrainian brands is constantly growing, and 83% of Ukrainians consciously choose domestic products. Such support is beneficial for all parties: the country's economy, Ukrainian producers, and consumers, who make their purchases have a positive impact on the first two.

Since the beginning of the military invasion, Ukrainian consumers have adapted and learned to live under martial law, changing their priorities and factors that influence their purchasing decisions. Ukrainian businesses, for their part, have also responded to these changes and adapted their operations to continue to function fully and meet the needs and demands of their customers (Dubovyk et al., 2022).

Due to the war, retailers have faced difficult challenges, such as staff and customer safety, restoration of destroyed stores and warehouses, changing supply chains and establishing new supply channels, and negotiating flexible lease terms with landlords (Lim et al., 2022). Let's identify the main areas of improvement in the context of the military lockdown:

- Introducing a self-service format, increasing the number of such cash registers in salesrooms, restoring the functioning of online orders, further developing online sales, and trying to increase their share.
- Switching from Russian automation and accounting systems to European or domestic ones.
- Development of own marketplaces in large retail chains.
- Involvement of chatbots to expand and improve communication with customers.
- Development of omnichannel, i.e. a combination of online and offline sales. Consumers could shop through several channels at once - from traditional online purchases to click and collect format, i.e., collect a basket online and receive the order at the nearest point of delivery.
- Due to cash shortages, retailers have been massively introducing card withdrawal services at supermarket checkouts. After all, at the beginning of the hostilities, many cash collectors went to the front, and it was not always possible to transport cash in a timely

manner.

- They actively encouraged customers to use their mobile app to scan barcodes on goods, as there were not enough hands to update price tags in the first weeks. In addition, in the first weeks there were long queues in a number of supermarkets, so the mobile app was especially popular for the "Vilnokasa" service, which allows you to scan goods yourself and then make a purchase at a self-service checkout by scanning a QR code.
- The occupation of some regions, where there are mainly large manufacturers and suppliers of goods, has led to the fact that market players had to transform the procurement system (Mashchak, 2023).

2.2.3 The martial law consequences on the consumer buying process in Ukraine

During the war, Ukrainians began to think more about the ethical aspect of consumption. Studies from Ministry of Economy of Ukraine and international organizations show that many consumers have started to prefer goods made in Ukraine, which supports the local economy. This not only contributes to the country's recovery, but also emphasises national pride and patriotism (Ministry of Economy of Ukraine, 2024; Expert organization CSR Ukraine, 2024).

According to research by the Deloitte retail and wholesale distribution group in Ukraine, it was found that consumers in Ukraine are actively involved in charitable initiatives. Many brands are launching campaigns with a portion of their profits going to help those affected by the war. That is why the majority of Ukrainians buy the products of such socially responsible brands. For example, since the beginning of the full-scale invasion, trading network «Auchan Ukraine» has stopped all marketing activities and allocated its advertising budget to humanitarian aid to the country. Since the end of May, the grocery chain has introduced promotional offers for the most essential categories of goods, including some household goods (Deloitte's retail and wholesale distribution group in Ukraine. 2024; UNIAN News Agency, 2024). Trading network «NOVUS» has started active charity work together with their Lithuanian foundation Food for Ukraine. To date, the company has been providing humanitarian aid to Ukrainians in need, primarily to socially vulnerable people - low-income families, people with disabilities, people with special needs, and the elderly (Grunert et al. 2023). Supermarket chain «ATB» provides product support to internally displaced persons, residents of the combat zone, medical institutions and volunteer organizations affected by missile strikes (Terendii, 2023). At the end of February, Supermarket chain «Silpo» joined the fundraising campaign for the Come Back Alive Foundation. In its mobile app, the retailer gave guests the opportunity to donate their points to charity, which they converted into money and donated to the foundation (Letunovska et al., 2023).

Thus, the majority of Ukrainians support companies engaged in charity and social assistance, which underlines the importance of social responsibility for modern food consumers.

There is a growing demand among Ukrainians for ethical and sustainable brands that adhere to environmental standards and responsible business practices. Ocially responsible consumer behaviour in Ukraine during the war demonstrates the growing awareness and active participation of people in supporting social initiatives. Supporting local producers, participating in charity events and choosing ethical brands have become important components of a new consumer culture that is shaping positive changes in society.

The largest retail chains have become humanitarian hubs for the army and civilian Ukrainians. The basements of the largest markets have been converted into shelters and the collection of "suspended" food for the army and territorial defense has become a powerful channel for supplying food to checkpoints and the front line (Vovchanska et al., 2022).

It should be noted that not only large retail chains, but also consumers are becoming more socially responsible in the context of the war. The Ukranian consumers become more socially responsible and change their habits towards sustainable development. In the context of the war, Ukrainians have become more conscious of the importance of reducing food waste as access to food has become limited. This process often involves reducing food waste and avoiding the use of harmful packaging, which are important aspects of sustainability. Today, there is a growing awareness of the environmental consequences of waste and the need to save resources is contributing to people becoming more mindful of their shopping and cooking (Filippov et al., 2023). This demonstrates the growing awareness and desire of Ukrainian consumers to conserve resources, support local producers, and reduce the negative environmental impact of the war.

2.2.3.1 The increase of social responsibility on food purchases and buying local brands

The war in Ukraine has seen a significant shift in consumer habits, including an increase in the popularity of local brand products. This trend is driven by a number of factors that have influenced the consumer behaviour of Ukrainians. Patriotism is one of the main reasons why Ukrainians are more likely to buy local brand products. In difficult times, many people want to support the national economy and help local producers.

In times of war, when infrastructure has been damaged, buying local products ensures greater security of supply. Consumers are aware that local brands can respond more quickly to changes in demand and offer products that may be difficult to access through international sourcing. Consumers are increasingly paying attention to product quality, which also influences their choice in favour of local brands. Local producers usually offer fresh products that are grown or produced in Ukraine. This is especially true in the agricultural sector, where consumers try to buy fruit and vegetables grown on local farms. Social media has become a powerful tool for promoting local brands. Many companies have intensified their social media marketing campaigns, encouraging consumers to support Ukrainian producers. Users also share their shopping experiences and choose products that meet their ethical standards (Bulyk, 2023).

Thus, the purchase of local food products in Ukraine during the war is the result of patriotic feelings, the desire to support the national economy, and the need for quality and fresh products. Consumers have become more conscious when choosing local products and are actively supporting local initiatives, which contributes to economic recovery in a crisis situation.

According to the results of the analysis of the research company Gradus Research, it was found that Ukrainians consciously. Support for Ukrainian producers has been an important factor in the choice of most citizens since the beginning of Russia's full-scale war against Ukraine. Currently, 69% of respondents say they consciously choose products of Ukrainian brands. And 56% of those who started buying new brands during the war do so to support Ukrainian producers (Gradus Research Company, 2023).

Under martial law, consumers pay more attention to improving the quality and affordability of goods. Most consumers are willing to buy goods that are not just cheap, but also of appropriate quality (Hayda et al., 2023). That is why consumers are attracted to private labels, which allow retailers to reduce the price of goods and compete with other market players. Consumers are also attracted by the development of e-commerce and online sales, which allows retailers to expand their product range and reduce overhead costs for keeping goods in real stores (Letunovska et al., 2023). Consumers also value economic sustainability, which means ensuring sustainable business growth by rationalizing costs, introducing new technologies and processes, and increasing market competitiveness (Wołowiec et al., 2022).

2.2.3.2 The changes in food-related Ukraines lifestyle

Under martial law, many Ukrainians found themselves with limited access to healthy and high-quality food, which resulted in a change in eating habits and less consumption of vegetables and fruits and more consumption of fast food. Thus, a typical trend at the beginning of the war was the consumption of instant or ready-to-eat foods. Such food allowed to save cooking costs, but also had a certain negative impact on the health of citizens. There is also a tendency to consume sweets in larger than usual quantities. This can be partly explained by the release of glucose, and thus a false sense of happiness, which is so lacking on anxious days. The need to get a dose of pleasure, quick simple carbohydrates for energy, is what helped some groups in society feel better (Gradus Research Company, 2023). There has been a reduction in the amount of, or even elimination of, certain foods from the diet due to rising costs, which is related to resource conservation. But by the beginning of 2024, Ukrainians began to return to a rational diet with a set of balanced products. While consumption of meat and fish has significantly decreased, there has been an increase in the consumption of chicken, dairy products, vegetables and fruits (Gyrich, 2024).

Therefore, it can be noted that Ukrainians have started to monitor their weight and take care of their health. Currently, society is striving to get as close as possible to the pre-war diet, to return to its own "norm". To achieve this goal, various means are used, such as cooking according to familiar recipes and maintaining traditions related to gastronomy. Saving on food/ trying not to buy expensive products/cooking meals with inexpensive ingredients. In times of war, there is uncertainty and the inability to plan ahead, so saving money becomes a choice for a certain part of the population. As a result, partial belt-tightening becomes the norm, and people may avoid familiar products in favour of cheaper analogues.

The preparation of strategic food stockpiles in times of war is common in Ukrainian society. Already after the full-scale invasion itself, Ukrainian citizens realised that they did not have sufficient food reserves and realised the importance of preparing such a reserve.

Panic buying is often the result of large-scale, serious natural disasters, pandemics or war. Consumers tend to stock up on staple foods (e.g. rice, pasta, flour) and other essential goods that they believe can help them get through a crisis and in anticipation of supply shortages (Yoona et al., 2018).

Therefore, those who did not plan to build up such a reserve before the war could do so during the fighting in calmer regions after the shops reopened, which increased their sense of security and safety.

Unfortunately, due to logistical problems under martial law, the termination of some contracts, the suspension of operations of businesses in the temporarily occupied territories, and a number of other reasons, certain categories of food products were in short supply during the first period of the war, and indeed now, and their prices have risen (Terendii, 2023). This applies to almost all types of food products. There is also a decrease in the variety of products of the same type, shortages and price increases, the cessation of imports of certain types of products, the reorientation of these producers to meet the needs of the Armed Forces (Letunovska et al., 2023).

It should be noted that food plays an important communication function, both in everyday life and in war. However, during the war, this function has somewhat different characteristics (Filippov et al., 2023). Traditional rituals of cooking ans eating as protection of the psyche and a sense of the "pre-war period" (allowed to feel in conditional security; observance of family or collective traditions in gastronomic practices (celebrating Easter, birthdays, etc.) allowed to relax and feel happy) (Shkoda et al., 2022; Vovchanska et al., 2022).

- Eating food as a means of communication, spending time together, discussing events (the practice of group meals involves a communication practice that intensified during the war).
- Preparing food for others and providing food to those who are unable to take care of themselves as an act of support for both people and abandoned animals (satisfaction from social approval and one's own internal emotional uplift from volunteer support in the form of cooking and distributing food).
- Exchange of recipes and development of culinary skills during the war (due to displacement, changes in access to certain products, switching responsibilities, desire for exchange and communication, mutual understanding of different cultures within and between countries, etc.).
- Cooking as a form of psychotherapy (associated with the desire to do something that is both calming and useful).
- More frequent preparation of favourite dishes, without a "special" occasion (associated with the desire to live "here and now", to feel joy today, without putting life off for later).

- Increased attention to the country of origin of a particular product brand and/or support for domestic producers (refusal to buy products from the Russian Federation and friendly countries; support for domestic producers).
- Returning to a normal diet (after establishing relative calm or after adapting to life in the war condition) (Dvornyk, 2023).

Accordingly, the majority of respondents believe that they currently prefer a healthy lifestyle, although at the beginning of the full-scale war, in the phase of acute anxiety, they experienced significant difficulties with this. They also understand a healthy lifestyle in the current situation as a combination of abandoning bad habits, forming new healthy habits and following existing ones (Ministry of Economy of Ukraine, 2024).

2.3 Segmentation criteria and the typologies of purchase

Market segmentation has both strategic and operational dimensions. As a strategic decision, segmentation involves determining the characteristics and number of segments for which separate marketing programmes should be developed to reach the market. As an operational decision, segmentation involves allocating resources to segments to optimise a particular objective (e.g. profit or sales) (Wedel et al., 2000).

The mass marketing approach cannot satisfy the needs of diverse customers today. This diversity should be satisfied using segmentation that divides markets into customer clusters with similar needs and/or characteristics that are likely to exhibit similar purchasing behaviors (Dibb, 1998). Segmentation theory proposes that groups of customers with similar needs and purchasing behaviors are likely to demonstrate a more homogeneous response to marketing programs that target specific consumer groups. With proper market segmentation, enterprises can arrange the right products, services and resources to a target customer cluster and build a close relationship with them. Market segmentation has consequently been regarded as one of the most critical elements in achieving successful modern marketing and customer relationship management.

A critical issue to successful market segmentation is the selection of the segmentation variables. Segmentation variables can be broadly classified into general variables and product specific variables (Wedel et al., 2000). The general variables include the customer demographics and lifestyles. The product specific variables involve customer purchasing behaviours and intentions.

Market segmentation is carried out on the following grounds: characteristics of consumers and goods, purchase motives, market geography, forms of sales, distribution channels, etc. Often, segmentation is carried out on several grounds simultaneously.

On this basis, it is possible to segment the market using the following characteristics (Dibb, 2001; Hunt et al., 2001; Piercy et al., 1993).

- geographical features, i.e. geographical features of demand for products in different countries, regions, taking into account historical and climatic features, with regard to the type of settlement, population density and number, etc;
- demographic characteristics - age, gender, life cycle and family composition, special tastes depending on nationality and race (Hamad et al., 2019);
- socio-economic factors - occupation, housing conditions, income, spending patterns (Sostar et al., 2023);
- cultural factors - education, traditions, religion, leisure activities (Shavitt, 2016);
- psychographic characteristics - social groups, lifestyle, personal qualities (Akkaya, 2021);
- behavioural parameters - degree of need for the product, reason for purchase, degree of randomness of purchase, search for benefits, user status, loyalty status, brand loyalty, degree of readiness to make a purchase, emotional attitude to the product, degree of awareness (Pelau et al., 2013).

The segmentation process should be carried out in several stages. The first stage is initial segmentation, when market research results are used to divide product markets into segments, i.e. homogeneous groups of consumers with similar product requirements and benefits that differ from other segments depending on the data’s proximity. The second stage is the selection of target segments. One or more target segments can be selected depending on the attractiveness of the market, the entrepreneur's capabilities and objectives. The third stage, which is mandatory after market segmentation, is positioning. For each segment, a certain position should be determined in relation to potential customers and competitors (Dibb, 2001; Hunt et al., 2001; Piercy et al., 1993).

Thus, market segmentation is the process of dividing the target audience into several groups based on similar characteristics and needs: location, gender, age, interests, type of activity, and much more. Segmentation allows you to identify and select two or more groups, the study of which will help you identify common features for consumers.

3. Conceptual Framework and Hypotheses' Development

The literature review emphasize several determinants that may explain a consumer purchase and consumption behaviour under a scenario of war-crisis. Also, these determinants may constitute criteria of segmentation to a cluster identification. To analyse these issues a methodology procedure will be used considering a descriptive and cluster analysis applied to the Ukranian respondents of a survey in Odesa.

The following conceptual framework is built in order to identify the most relevant segmention criteria and to analyse the reasons of consumer buying change due the war. The scenario of the Ukranian war is the chosen one to analyse the impact of the war on the consumer buying and consumption behavior. The analysis of these factor that have an impact on the purchse behavior due the war and are also include as segmentation criteria to distinguish several consumers segments

Pricing is one of the most salient issues affecting consumer decision making in the context of crises, namely economic ones. But also, under a war scenario the population income decrease as well as the country industrial activity in pair with a huge costly destruction. The research from previous crises shows distinct changes in price-related attitudes: consumers are more sales prone (Shipchandler, 1982) and seek greater price knowledge (Estelami et al., 2001). The behaviors are reflective of greater price consciousness, the degree to which the consumer focuses exclusively on low prices (Lichtenstein et al., 1993). Consumers are rethinking their purchasing decisions due to health concerns, economic issues, resource scarcity and panic buying (Prentice et al., 2021). So, the war context impact a decrease or income, which leads to the H1.

H1: Income changes will have an impact on buying food behaviour.

First the pandemic reality, and later the military one, turned retail into a branch of work with a flexible, remote or mixed schedule for a large list of employees: online sales managers, online store sellers, content managers, copywriters, RRS specialists, SEO specialists, business analysts (Ritson, 2022; Shkoda et al., 2022; Vovchanska et al., 2022). Safety is one of the main determinants of consumer behavior in martial law. The military conflict has led to an increased sense of threat among the population. People are concerned about their own safety and the safety of their loved ones, which affects their consumer choices. Customers may avoid public places where there is an increased likelihood of terrorist attacks or choose goods and services that guarantee their safety, even at a higher price. The deterioration in customer security has led to a shift in consumer priorities and a redistribution of spending and switching from physical shop to online ordering (Shkoda et al., 2022; Vovchanska et al., 2022; Wasserman, 2022). The war has reduced the number of stores and shopping centers in some cities and regions, which has also led to a change in shopping behavior and a shift to online shopping, where you can read reviews, compare options and buy cheaper or at a better deal (Korneyev et al., 2022). This determine the H2.

H2: It is expected switching from physical shop to online ordering.

Since the beginning of Russia's full-scale invasion of Ukraine, the purchasing behavior of Ukrainian consumers in many categories of goods and services has changed significantly. Unfortunately, due to logistical problems under martial law, the termination of some contracts, the suspension of operations of businesses in the temporarily occupied territories, and a number of other reasons, certain categories of food products were in short supply during the first period of the war, and indeed now, and their prices have risen (Terendii, 2023). This applies to almost all types of food products. There is also a decrease in the variety of products of the same type, shortages and price increases, the cessation of imports of certain types of products, the reorientation of these producers to meet the needs of the Armed Forces, etc (Letunovska et al., 2023). This explains the reasonment for the H3.

H3: It is expected several types of reactions due to prices increases during the war (buying less, switching to a cheaper brand, or even stop buying).

According to authors, in crises, such as an economic crisis, food crisis or war related crisis, the panicked consumer tends to overreact and drastically cut spending, whereas the prudent consumer carefully plans spending and postpones major purchases (Nie et al., 2010; Pennings et al., 2002). Crises that cause negative perceptions among individuals adversely affect their mental state and feelings and thoughts about the future. In particular, high crisis perception may lead to anxiety, pessimism, panic, and depression in the long term (Jasiulewicz, 2012). These perceptions that emerged due to a crisis affect consumers; purchasing behaviors as well as their values and opinions on different issues (Lee et al., 2003). Panic as a state of intense fear and high arousal may trigger major changes in consumer behavior (Eriksson et al., 2020). All these lead to the propose of the H4.

H4: During war crisis consumers tend to adopt a panic buying behaviour.

During the war, Ukrainians began to think more about the responsible aspect of consumption. Many consumers have started to prefer goods made in Ukraine, which supports the local economy. This not only contributes to the country's recovery, but also emphasises national pride and patriotism (Grunert et al., 2023; Letunovska et al., 2023). There is a growing demand among Ukrainians for ethical and sustainable brands that adhere to environmental standards and responsible business practices. Ocially responsible consumer behaviour in Ukraine during the war demonstrates the growing awareness and active participation of people in supporting social initiatives (Korneyev et al., 2022). In the context of the war, Ukrainians have become more conscious of the importance of reducing food waste as access to food has become limited. This process often involves reducing food waste and avoiding the use of harmful packaging, which are important aspects of sustainability. Today, there is a growing awareness of the environmental consequences of waste and the need to save resources is contributing to people becoming more mindful of their shopping and cooking (Filippov et al., 2023). So, it is suggested the H5.

H5: Responsible consumption has a great influence on food consumers in the crisis conditions of war.

Researchers note that when consumers are influenced by wars, they first opt for products and brands either domestically produced or imported from countries they hold favorable attitudes (Shkoda et al., 2022; Vovchanska et al., 2022; Wasserman, 2022). Many consumers have started to prefer goods made in Ukraine, which supports the local economy. This not only contributes to the country's recovery, but also emphasises national pride and patriotism (Grunert et al. 2023; Letunovska at al., 2023). In addition, the demand for Ukrainian brands is constantly growing, and 83% of Ukrainians consciously choose domestic products. Such support is beneficial for all parties: the country's economy, Ukrainian producers, and consumers, who make their purchases have a positive impact on the first two. In times of war, when infrastructure has been damaged, buying local products ensures greater security of supply. Consumers are aware that local brands can respond more quickly to changes in demand and offer products that may be difficult to access through international sourcing (Vartanova at al., 2023; Letunovska at al., 2023; Skowron at al., 2023), which lead to the H6.

***H6:* Consumers prefer products of local brands.**

4. Methodology

4.1. Research Approach

This study utilized a quantitative research design with a cross-sectional survey methodology. The primary aim was to explore potential changes in purchasing behaviour in Odesa, Ukraine.

The sample was drawn using convenience sampling, a non-probabilistic method. The survey was conducted online among a diverse group of respondents in Odesa, Ukraine, in the Ukrainian language. A pre-test was carried out with 10 people prior to collecting the main data to ensure the survey questions were straightforward, exact, and consistent.

The questionnaire also included questions about purchasing frequency and demographic information, such as gender, age, household composition, and professional occupation. The survey was created using Google Forms. To ensure broad outreach, the survey link was shared via social media platforms such as Instagram, Facebook, LinkedIn, email lists, and some face-to-face interviews.

The analysis was performed using SPSS Statistics, version 28, which included Descriptive Statistics to profile the respondents and summarize their demographic characteristics, as well as an exploratory data analysis in principal components to reduce the dimensionality of the data concerning the Food related lifestyle dimension and the Two-Step clustering analysis.

4.2. Measuring the relevant items of several constructs

Changes in food-related lifestyle:

Changes in food-related lifestyle were measured using 24 items of a 7-Likert scale, ranging from 1 (indicating much less than before) to 7 (indicating much more than before). This construct's scale was adopted on the basis of research from Grunert at al., 2023.

Table 1: Dimension measurement od Changes in food-related lifestyle dimension and its items

Constructs	Items
Changes in food-related lifestyle Adapted from Grunert et al., 2023	I often purchase food I had not planned to purchase at the store I compare product information on food labels to decide which brand to buy. I want to see, touch and/or smell food products before buying them. I always check prices, even on cheaper food items. I buy pre-packed items instead of unpacked. When cooking or eating, I first and foremost consider the taste. I always check the packed on and use by dates to ensure that I am buying the freshest products. Frozen food account for a large part of the food products I use in my household. I prefer to eat food which is locally produced. I prefer to purchase unpacked food or food with recyclable / biodegradable packing because of the environment. I prefer to purchase packaged food because of hygienic concerns. I try to avoid products with artificial additives or preservatives. I pay attention to my diet to control my weight. I indulge myself by buying tasty treats and delicacies. I like to experiment with new ideas/recipes when cooking I enjoy spending time cooking in the kitchen. I use a lot of ready-to-eat foods in my household. I eat foods which are familiar to me. Eating and food are an important part of my social role. I eat a lot of snacks rather than having set mealtimes. We eat dinner at the table together as a household. Eating is to me a matter of touching, smelling, tasting, and seeing all the senses are involved. It is a very exciting sensation. I end up throwing food away. I talk to people about what I cook for dinner or share it on social media.

Perceived scarcity during a war crisis:

Perceived scarcity during a war crisis was measured using 4 items of a modified 5-point Likert scale. This construct's scale was adopted on the basis of research from Yassin, (2022).

Table 2: Dimension measurement of Perceived scarcity and its items

Construct	Items
Perceived scarcity during a war crisis Adapted from Yassin, 2022	The products that I wanted to buy will be very limited during crises. The product brand availability will be very limited during crises. The sizes of a product will be very limited during crises. The types of products will be very limited during crises

Panic buying behaviour:

Panic buying behaviour was assessed by including six items of a modified 5-point Likert scale of agreement. This construct's scale was adopted on the basis of research from Yassin (2022).

Table 3: Dimension measurement of Panic buying behaviour and its items

Construct	Items
Panic buying behaviour Adapted from Yassin (2022)	I had the urge to buy products immediately. I found several things and I wanted to grab even though they were not on my shopping list. I spontaneously grabbed the product of interest. I bought more products than I usually would.

5. Data Analysis

5.1 Demographic profile

Regarding demographic characteristics of the respondents, shown in Figure 1, it can be said that, from a total of 302 respondents with a mean age of 38.4 years old, being the youngest age level the most frequent category, most of them are female (58.3%). Most frequent category of Education levels is *master's degree* with 41.1% of the respondents while only 6.3% of them has a *secondary degree* background.

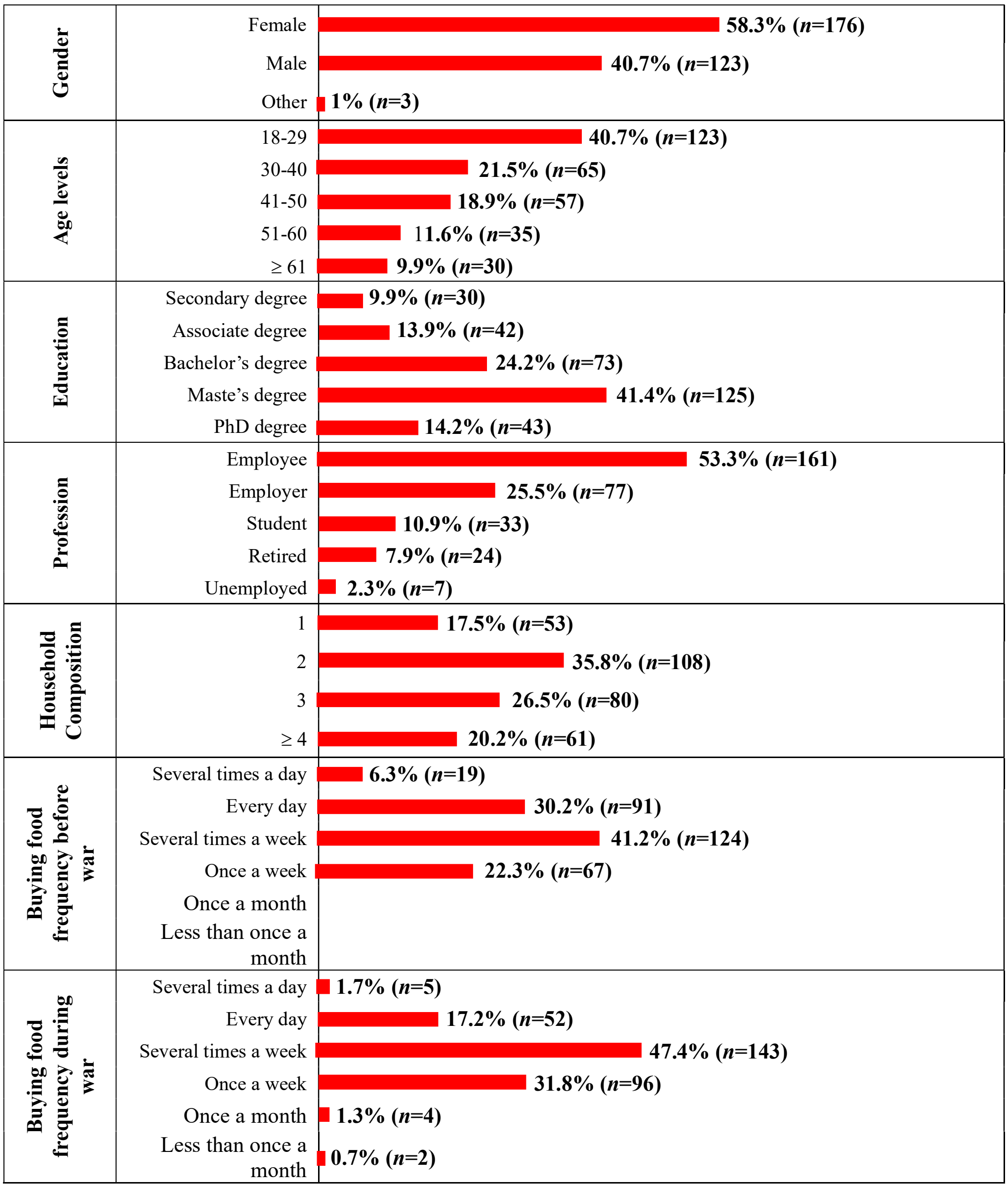


Figure 1 – Demographic profile

Concerning Profession (Figure 1), most respondents are employed (53.3%) and 25.5% are self-employers. Just 2.3% of the respondents are unemployed. Households with two members constitute the most common composition (35.8%).

5.2 Tematic profile

FREQUENCY OF SHOPPING FOOD

Concerning the frequency of shopping food before the Ukraine war (Figure 2), respondents were used to buy food *several times a week* (41.2%) and *every day* (30.2%); but, during the war, this frequency slightly decreased and now they are buying it *several times a week* (47.4%) and *once a week* (31.8%), and a small part of them is buying it *once a month* (1.3%) or *less than once a month* (0.7%).

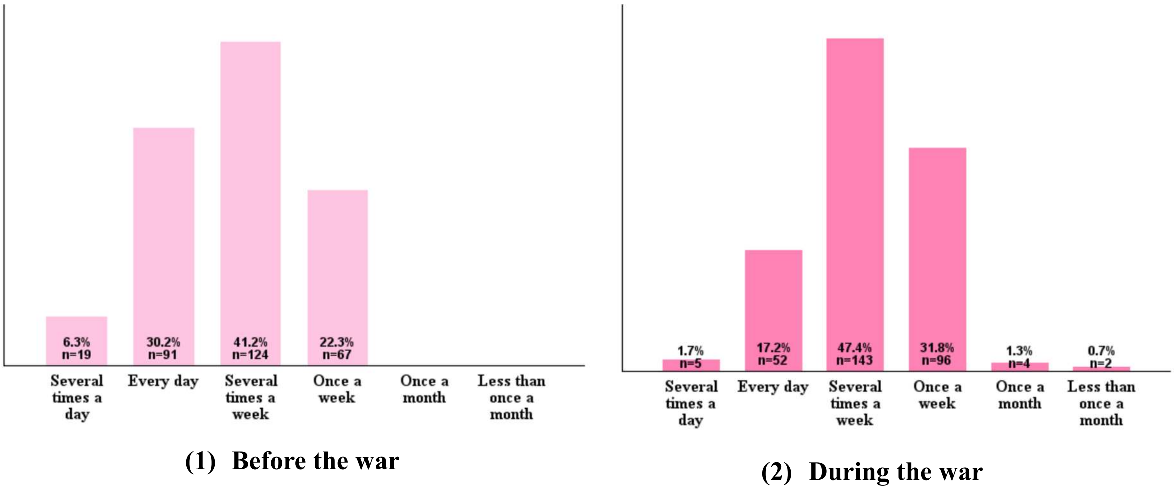


Figure 2 – Frequency of shopping food before and during the Ukraine war

FREQUENCY OF SHOPPING OTHER PRODUCTS THAN FOOD

Respondents were used to buy other products than food *once a week* (41.1%), before the Ukraine war (Figure 3).

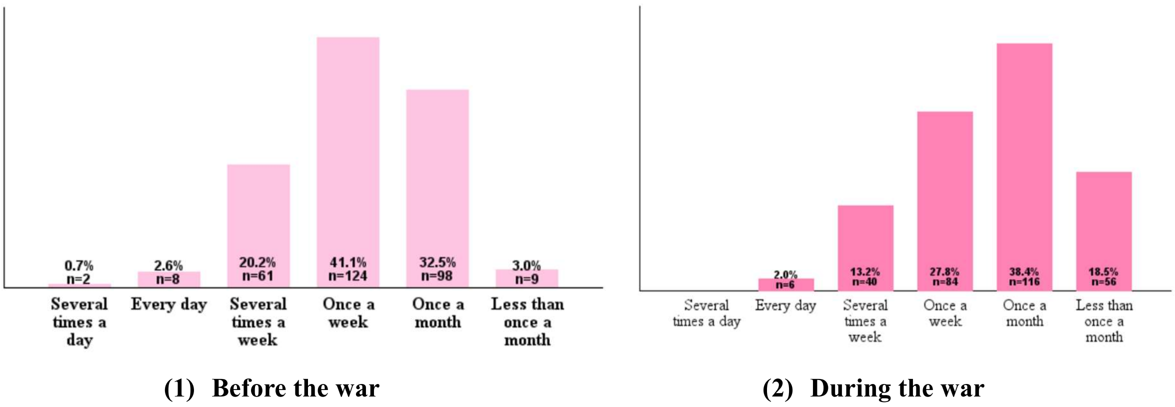


Figure 3 – Frequency of shopping other products than food before and during the war

But during the war, there is a slight change since they are buying them *once a month* and *less than a month* (38.4% and 18.5%, respectively).

INCOME CHANGES AND MONTHLY INCOME

Most respondents (59.6%) either earn low monthly income (21.5%) or average monthly income (38.1%) and most of them (60.9%) registered a decreased in their income during the Ukraine war (Table 4).

Table 4: Relationship between Income changes and earned Monthly income

			What is your monthly income during the war?			
			Low (Up to 290 €)	Average (291–450€)	High (≥ 451 €)	Total
Did your income change during the war in Ukraine?	Decreased	Count	27	**83**	74	*184*
		% within row	14.7%	45.1%	40.2%	100.0%
		% within column	41.5%	72.2%	60.7%	60.9%
		% of Total	8.9%	27.5%	24.5%	60.9%
	Increased	Count	4	14	**31**	49
		% within row	8.2%	28.6%	63.3%	100.0%
		% within column	6.2%	12.2%	25.4%	16.2%
		% of Total	1.3%	4.6%	10.3%	16.2%
	Not changed	Count	**34**	18	17	69
		% within row	49.3%	26.1%	24.6%	100.0%
		% within column	52.3%	15.7%	13.9%	22.8%
		% of Total	11.3%	6.0%	5.6%	22.8%
Total		Count	65	*115*	*122*	302
		% within row	21.5%	38.1%	40.4%	100.0%
		% within column	100.0%	100.0%	100.0%	100.0%
		% of Total	21.5%	38.1%	40.4%	100.0%

But, from those that state a decreased in their monthly income during the war, 45.1% have an average income and 40.2% have a high monthly income. From the respondents that saw an increase in their monthly income (16.2%), 63.3% receive a high monthly income. The respondents that did not registered any change in their income, 49.3% receive a low income.

AVOIDING TO BUY PRODUCTS FROM FOREIGN MANUFACTURES THAT CONTINUE TO WORK ON THE TERRITORY OF THE AGRESSOR COUNTRY

The next table reveals that a dominant percentage (81.1%) of the participants totally agree (54.6%) or agree (26.5%) with that sentence. Therefore, they prefer to buy from local products and **hypothesis 6 is validated** for this sample.

Table 5: Distribution of Avoid buying products from manufacturers that work on the aggressor country

	Frequency	Percent	Cumulative Percent
Totally disagree	9	3.0	3.0
Disagree	20	6.6	9.6
Neither agree nor disagree	28	9.3	18.9
Agree	80	26.5	45.4
Totally agree	165	54.6	100.0
Total	302	100.0	

PREFERRED WAYS TO SHOP FOOD

Before the Ukraine war (Table 6), most respondents would use to buy food in *physical supermarkets* (79.5% of the cases) and *physical farmer's market* (48.7% of the cases). During the Ukraine war (Table 7), respondents are still using *physical supermarkets* (87.4% of the cases) and are also using *online ordering* (58.9% of the cases), as expected. Thus, **hypothesis 2 is validated for this sample.**

Table 6: Where did you usually shop before the war in Ukraine?

	Responses		Percent of Cases
	N	Percent	
Physical Hypermarket	119	17.1%	39.4%
PhysicalSupermarket	240	34.5%	79.5%
Physical Traditional store	93	13.4%	30.8%
Physical Farmer's mkrt	147	21.1%	48.7%
Physical Organic shop	53	7.6%	17.5%
Online ordering	44	6.3%	14.6%
Total	696	100.0%	230.5%

Table 7: Where do you usually shop during the war in Ukraine?

	Responses		Percent of Cases
	N	Percent	
Physical Hypermarket	51	7.3%	16.9%
PhysicalSupermarket	264	37.8%	87.4%
Physical Traditional store	78	11.2%	25.8%
Physical Farmer's mkrt	104	14.9%	34.4%
Physical Organic shop	23	3.3%	7.6%
Online ordering	178	25.5%	58.9%
Total	698	100.0%	231.1%

FOOD GROUPS USUALLY BOUGHT

Comparing the food groups that were usually bought before the war and that are usually bought during the war (Tables 8 and 9), it is noticed the following:

The consumption of red meat, fish, crisps and snacks, chocolates and sweets, alcoholic beverages, and non-alcoholic beverages decreases against the other group. It looks like that these Ukraine respondents are trying to keep a healthy diet during war times.

The consumption of red meat, fish, crisps and snacks, chocolates and sweets, alcoholic beverages, and non-alcoholic beverages decreases against the other group. It looks like that these Ukraine respondents are trying to keep a healthy diet during war times.

Table 8: What food groups did you usually buy before the war?

	Responses N	Responses Percent	Percent of Cases
Red meat	231	7.1%	76.5%
Fish	242	7.4%	80.1%
Chicken	276	8.4%	91.4%
Dairy	280	8.6%	92.7%
Cereals	269	8.2%	89.1%
Fruits	287	8.8%	95.0%
Vegetables	294	9.0%	97.4%
Flour products	276	8.4%	91.4%
Crisps and snacks	221	6.8%	73.2%
Chocolates and sweets	258	7.9%	85.4%
Alcoholic beverages	196	6.0%	64.9%
Non-alcoholic beverages	235	7.2%	77.8%
Convenience food	203	6.2%	67.2%
Total	3268	100.0%	1082.1%

Table 9: What food groups do you usually buy during the war?

	Responses N	Responses Percent	Percent of Cases
Red meat	150	5.3%	49.7%
Fish	166	5.9%	55.0%
Chicken	281	10.0%	93.0%
Dairy	276	9.8%	91.4%
Cereals	259	9.2%	85.8%
Fruits	269	9.6%	89.1%
Vegetables	284	10.1%	94.0%
Flour products	265	9.4%	87.7%
Crisps and snacks	156	5.5%	51.7%
Chocolates and sweets	202	7.2%	66.9%
Alcoholic beverages	152	5.4%	50.3%
Non-alcoholic beverages	183	6.5%	60.6%
Convenience food	171	6.1%	56.6%
Total	2814	100.0%	931.8%

Crossing the informations about 'What food groups do you usually buy during the war?' with 'Did your income change during the war in Ukraine?', several graphs were constructed that show the importance of the *income decreased.*

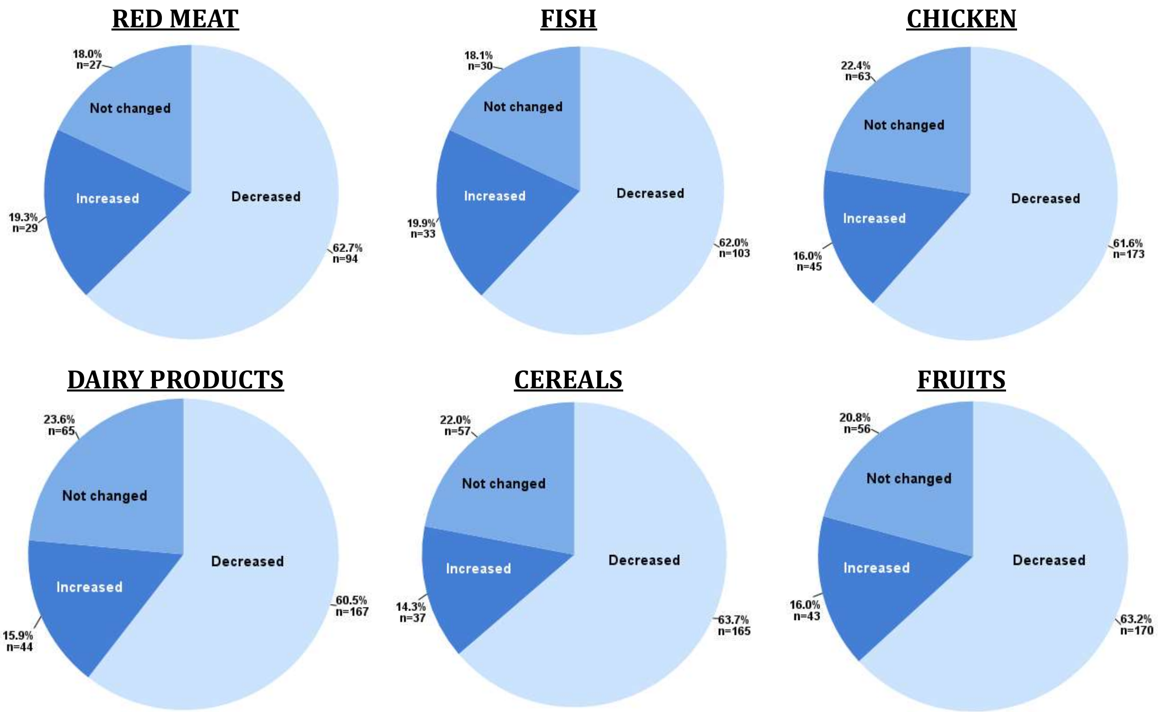


Figure 4 – Relation between Income changes and Several food groups

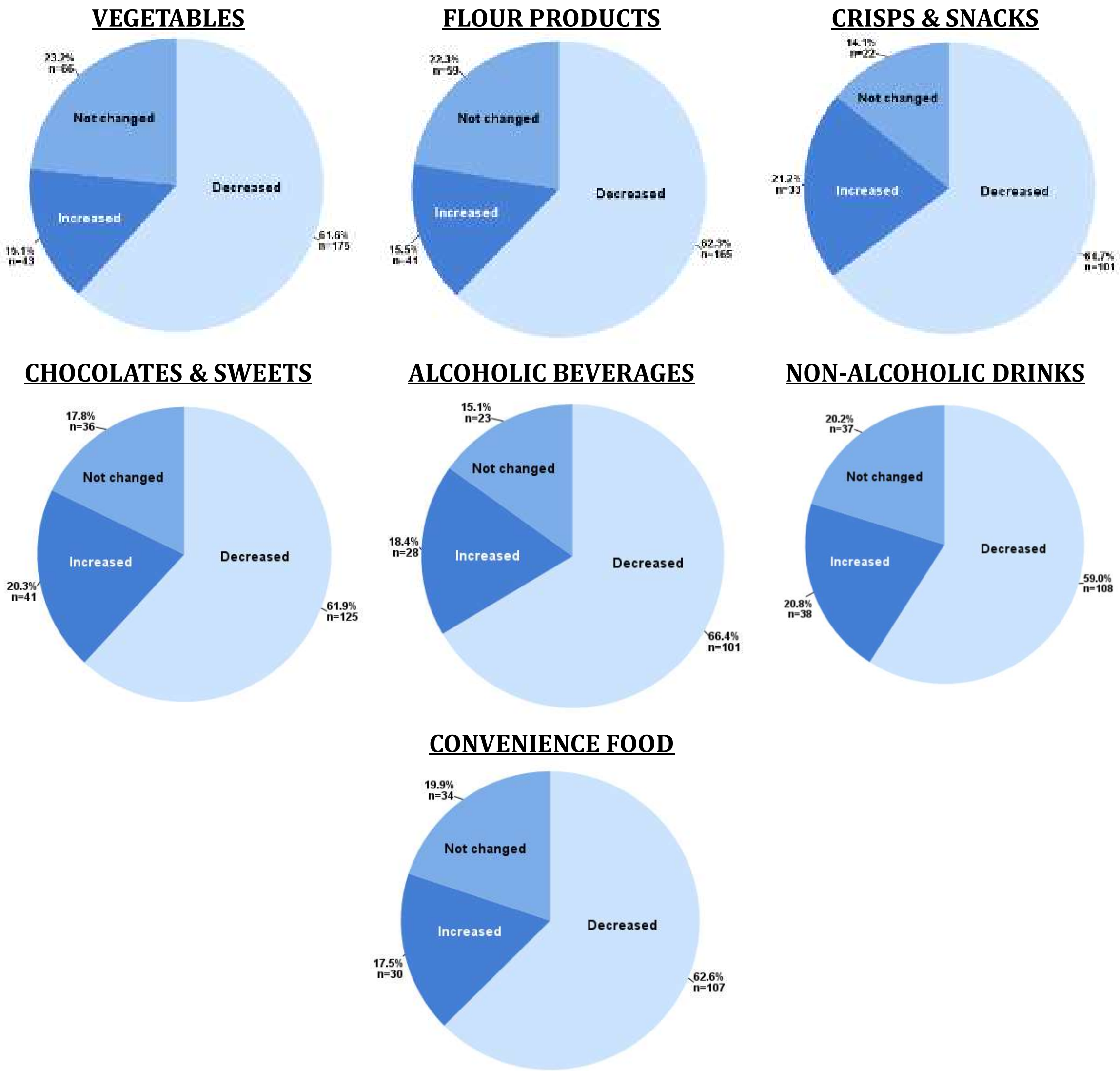


Figure 5 – Relation between Income changes and Other food groups

The common information revealed in Figures 4 and 5 is that, for the most respondents who still buy these food groups, they experience a decreased in their income during the Ukraine war. Thus, **hypothesis 1 is validated for these respondents.**

FOOD CONSUMPTION REACTIONS TO PRICE INCREASES

According to the information in Annex B, it is noticed the existence of three groups:

- Group 1 – it is formed by red meat, fish, and chicken in which it is registered a decrease in the consumption of these food groups since the majority of the respondents is *buying less* or *stop buying* (60.9% for read meat and fish and 60.6% for chicken).
- Group 2 – it is constituted by the dairy products, cereals fruits, vegetables, flour products, and crisps and snacks in which most participants are *buying online*, *swicthing to a cheaper brand, buying in another shop* or even are *buying without changes.*

- Group 3 – where respondents are buying chocolates and sweets as well as non-alcoholic beverages but in a lower percentage than 50%; that is, they are buying these food types *online*, *swicthing to a cheaper brand, buying in another shop* or even are *buying without changes* (45.7% for the first one and 44.6% for the second one).

In sum, the data indicates that many respondents are changing their food purchasing habits. Many respondents are buying less red meat, fish, and chicken, with some even stopping completely. For dairy products and cereals, while some are buying less, others are continuing to buy as usual, likely due to their importance in daily diets. There is also a noticeable increase in online shopping, especially for fruits, vegetables, alcoholic beverages, and convenience foods. Additionally, many respondents are looking or cheaper brands or switching to different stores, reflecting an effort to save money. Overall, the data suggests that people are either buying less or seeking more affordable or convenient alternatives.

CHANGES IN FOOD CONSUMPTION DUE TO CHANGES IN PRICE

Information in Annex C reveals that there is a *significant decrease* (49,3%) or a general *decrease* (25.2%) in the consumption of red meat. Similarly, for fish, there is a *significant decrease* (49.3%) and a *decrease* (26.8%). Chicken consumption shows *no changes* (36.1%) for many respondents, while others report a *decrease* (29.1%). For dairy products, 48% of respondents report a *decrease*, while 29.1% see *no changes*. Cereal consumption shows a *decrease* (45.4%), while 32.1% report *no changes*. Regarding fruits, there is a *decrease* (46.1%) and *no change* (28.1%). In terms of vegetables, 39.4% report a *decrease* (39.4%), and 33.8% report *no change*. For flour products, there is *decrease* (33.4%), while 37.1% report *no change*. Consumption of crisps and snacks shows a *significant decrease* (35.1%) and a general *decrease* (34.4%). There is a *decrease* (43.0%) and a *significant decrease* in the consumption of chocolates and sweets. For alcoholic beverages, there is a significant *decrease* (33.1%) and a *decrease* (29.8%). Most respondents report a *decrease* (37.4%) and a *significant decrease* (28.5%) in non-alcoholic beverages. Regarding, convenience food, there is a *decrease* (37.4%) and a *significant decrease* (23.5%).

In sum, several inconsistenies were detected from where the consumption of these food groups are measured as a nominal variable with seven categories (I'm buying online, I'm buying less, I'm switching to a cheaper brand, I stopped buying, I'm buying in another shop, I buy without changes, and, I do not use this product at all) or when they are measured in an ordinal variable (significant decrease, decrease, no changes, increase, amd significant increase). These inconsistencies are viewed in the following food groups: chicken, dairy products, cereal, fruits, crisps and snacks, chocolates and sweets, alcoholic beverages, and convenience food.

In spite of these inconsistencies, some changes occurred or are occurring. **Therefore, hypothesis 3 is validated.**

The observed decrease in consumption across various food categories may suggest a shift towards healthier eating habits among respondents. The significant reductions in red meat, alcoholic beverages, and convenience food may indicate a trend away from foods typically linked to higher health risks. Overall, the data implies that many respondents are consciously making healthier food choices.

FOOD-RELATED LIFESTYLE DIMENSION

Regarding the items for Food-Related Lifestyle dimension, one item, *I end up throwing food away,* was removed. This item did not load onto any of the six extracted-components and its removal increased the Cronbach's alpha coefficient to 0.855, indicating that ist removal improved internal consistency. Exploratory factor analysis (EFA) using principal components analysis (PCA) was conducted to reduce the dimensionality of this set of items. A varimax rotation was applied to facilitate the interpretation of the extracted components. The data was suitable for this multivariate procedure as evidenced by a Kaiser-Meyer-Olkin (KMO) value of 0.829 and a significant Bartlett's test of sphericity ($\chi^2_{253} = 2868.6; p < 0.01$).

Table 10: Extraction of six components from Food related lifestyle dimension

	Component					
	1	2	3	4	5	6
I always check prices, even on cheaper food items	**0.794**	-0.016	-0.062	-0.052	-0.025	0.018
I prefer to eat food which is locally produced	**0.792**	-0.046	0.15	0.219	-0.036	0.026
I always check the packed on and use by dates to ensure that I am buying the freshest products	**0.730**	0.111	0.169	0.111	0.152	-0.063
I prefer to purchase unpacked food or food with recyclable / biodegradable packing because of the environment	**0.721**	-0.002	0.084	0.251	-0.178	-0.088
I try to avoid products with artificial additives or preservatives	**0.491**	0.211	0.290	0.244	0.181	-0.288
I prefer to purchase packaged food because of hygienic concerns	-0.1	**0.822**	-0.008	-0.028	0.004	0.064
I buy pre-packed items instead of unpacked	-0.039	**0.802**	0.041	-0.034	0.144	-0.008
I use a lot of ready-to-eat foods in my household	-0.049	**0.630**	0.137	-0.007	-0.182	0.474
I want to see, touch and/or smell food products before buying them	0.164	**0.578**	0.082	0.056	0.571	-0.145
I eat food which is familiar to me	0.282	**0.534**	0.305	0.143	0.016	0.006
When cooking or eating, I first and foremost consider the taste	0.188	**0.530**	0.431	0.161	0.277	-0.096

Table 11: Continuation

	Component					
	1	2	3	4	5	6
I like to experiment with new ideas/recipes when cooking	0.035	-0.001	**0.857**	0.174	0.180	0.062
I enjoy spending time cooking in the kitchen	0.118	0.067	**0.792**	0.207	0.014	0.034
I pay attention to my diet to control my weight	0.4	0.189	**0.549**	0.193	0.156	-0.217
Eating and food are an important part of my social role	0.308	0.324	**0.516**	0.357	-0.060	0.088
I talk to people about what I cook for dinner or share it on social media	0.052	0.006	0.172	**0.768**	0.175	-0.108
We eat dinner at the table together as a household	0.217	-0.035	0.174	**0.752**	0.055	0.036
Eating is to me a matter of touching, smelling, tasting, and seeing all the senses are involved. It is a very exciting sensation	0.33	0.139	0.311	**0.660**	0.115	-0.004
I often purchase food I had not planned to purchase at the store	-0.144	-0.042	0.182	0.262	**0.690**	0.192
I indulge myself by buying tasty treats and delicacies	-0.163	0.107	0.474	0.058	**0.565**	0.162
I compare product information on food labels to decide which brand to buy	0.25	0.49	-0.095	0.111	**0.559**	-0.111
Frozen food account for a large part of the food products I use in my household	-0.21	0.159	-0.02	0.081	-0.030	**0.723**
I eat a lot of snacks rather than having set mealtimes	0.163	-0.132	0.073	-0.177	0.325	**0.711**
% of total variance explained	**14.420**	**13.644**	**12.217**	**9.515**	**8.123**	**6.664**

Six components were extracted, explaining 64.58% of the total variance (Table 10). These six components are named as (1) Responsible consumption, (2) Safety-oriented consumers, (3) Cooking-oriented consumer, (4) Eating as a ritual experience, (5) Well-informed consumers, and (6) Fast-oriented consumption.

Some of these newly extracted latent variables will contribute to the segmentation goal of this study playing the role of being the input variables. By using these components, we can better identify distinct groups within the sample based on their food-related lifestyles. The segmentation analysis will allow for a deeper understanding of how different consumer segments behave and how their attitudes and behaviours toward food vary across these latent dimensions.

SCARCITY BUYING BEHAVIOUR

Most of the respondents at least aggre with the items (1) *The product brand availability will be very limited during crises* (74.8%), (2) *The volume of a product will be very limited during crises* (57.9%), and (3) *The types of products will be very limited during crises* (70.2%). Only with the item *The products that I wanted to buy will be very limited during crises,* the respondents are more divided with their level of agreement: 47% of them at least agree, while 31.8% disagree.

Table 12: Analysis of the dimension perceived scarcity buying behaviour

		Count	%
The products that I wanted to buy will be very limited during crises	Totally disagree	8	2.6%
	Disagree	96	31.8%
	Neutral	56	18.5%
	Agree	113	37.4%
	Totally agree	29	9.6%
The product brand availability will be very limited during crises	Totally disagree	6	2.0%
	Disagree	35	11.6%
	Neutral	35	11.6%
	Agree	142	47.0%
	Totally agree	84	27.8%
The volume of a product will be very limited during crises	Totally disagree	3	1.0%
	Disagree	63	20.9%
	Neutral	61	20.2%
	Agree	133	44.0%
	Totally agree	42	13.9%
The types of products will be very limited during crises	Totally disagree	3	1.0%
	Disagree	43	14.2%
	Neutral	44	14.6%
	Agree	164	54.3%
	Totally agree	48	15.9%

These four items demonstrate to be reliable and consistent, indicating that they effectively measure the same dimension ($Cronbach's\ Alpha = 0.839$). Therefore, the scarcity buying behaviour dimension due to the Ukraine war could be computed as the mean of all items. On average, respondents tend to agree with this buying behaviour ($\bar{x} \approx 3.56$), with small deviations from this mean ($s' = 0.826$), indicating consistent responses across respondents (see Annex D).

PANIC BUYING BEHAVIOUR

It is noticed from Table 13 that the item *I bought more products than I usually would* gathers the greatest possible consensus among respondents since most of them agree or totally agree (71.2%).

Table 13: Comparing the items of Panic Buying Behaviour

		Count	%
I had the urge to buy products immediately	Totally disagree	11	3,6
	Disagree	77	25.5
	Neutral	66	21.9
	Agree	107	35.4
	Totally agree	41	13.6
I found several things and I wanted to grab even though they were not on my shopping list	Totally disagree	8	2.6
	Disagree	54	17.9
	Neutral	56	18.5
	Agree	136	45.0
	Totally agree	48	15.9

Table 14: Continuation

		Count	%
I spontaneously grabbed the product of interest	Totally disagree	11	3.6
	Disagree	83	27.5
	Neutral	55	18.2
	Agree	109	36.1
	Totally agree	44	14.6
I bought more products than I usually would	Totally disagree	12	4.0
	Disagree	36	11.9
	Neutral	39	12.9
	Agree	142	47.0
	Totally agree	73	24.2

The same conclusion is taken from Figure 4 which shows the mean agreement for all items that are above from the middle-point of the ordinal scale (3). But, the item *I try to avoid buying products from foreign manufacturers that continue to work on the territory of the aggressor country* shows the greatest mean level (4.2). **Therefore, hypothesis 4 is validated for the sample.**

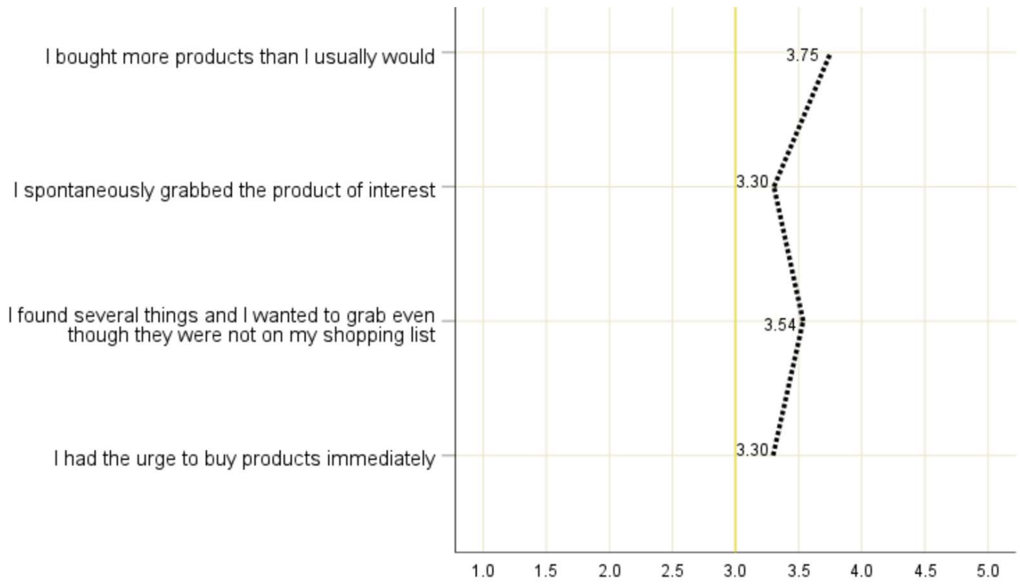


Figure 6 – Mean agreement levels of the items for dimension Panic buying behaviour

The four items related to consumers' reactions through panic buying behavior during the war exibit consistency in measuring the same dimension $(Alpha = 0.820)$ shown in Annex E. Consequently, the panic buying behaviour dimension due to the Ukraine war is computed as the mean of all items. This new variable shows that, on average, respondents tend to agree with this behaviour $(\bar{x} \approx 3.5)$ with small deviations around this mean $(s' = 0.875)$.

5.3 Segmentation analysis

The variables that are going to be the input variables to segment these respondents in different clusters are viewed in the next table.

Table 15: Identification of the segmentation variables

Selecting the variables to segment subjects before the Ukraine war	Selecting the variables to segment subjects during the Ukraine war
Frequency of buying food before the war Frequency of buying general products (except foods) before the war	Frequency of buying food during the war Frequency of buying general products (except foods) during the war Responsible consumption Safety-oriented consumers Cooking-oriented consumer Eating as a ritual experience Well-informed consumers Fast-oriented consumption Consumers buying behaviour under perceptions of scarcity during the war crisis Panic buying behaviour during the war crisis

The method Two-Step clustering was used to segment these respondents according to the chose input variables. This method is a hybrid clustering algorithm that combines both hierarchical and k-means clustering techniques to group data efficiently. It is particularly useful for large datasets and can handle both continuous (numerical) and categorical (nominal) variables, which many clustering algorithms cannot do simultaneously.

- In the first step, the data is scanned to identify "pre-clusters" or small clusters by using a sequential clustering algorithm with the goal of reducing the complexity of the dataset.
- In the second step, the algorithm performs a modified version of hierarchical clustering to group the pre-clusters into the final clusters, where clusters are grouped by similarity.

One of the advantages of using this type of method is that it allows to use mixed data, both numerical and categorical data, which is rare in clustering algorithms and it can automatically determine the optimal number of clusters by using information criteria like the Akaike Information Criterion (AIC) or Bayesian Information Criterion (BIC). But, like many clustering algorithms, its performance can vary based on initial parameter settings such as the distance measures or the maximum number of clusters. It is commonly used in marketing and data mining where large, mixed datasets are common.

5.3.1 Segmentation results for 'before the Ukraine war'

With two classification variables, it was identified four groups where the silhouette measure of cohesion and separation of the clusters is equal to 0.5, revealing that the clusters have a fair quality. The cluster sizes are well-balanced, varying from 19.9% to 32.9%.

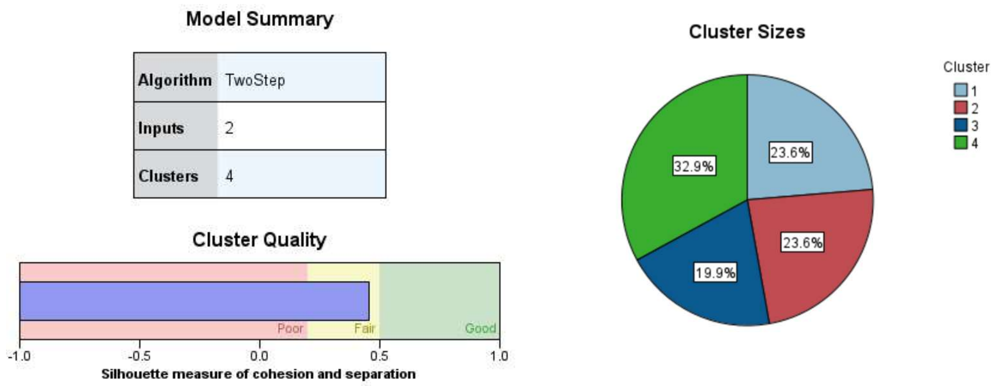


Figure 7 – Model summary of extracting four clusters of respondents

The input variable more important in this segmentation is 'How often did you shop food before the war?' with an importance of 1 compared with the other input variable 'How often did you shop general products (except food) before the war?', which only has an importance of 0.48.

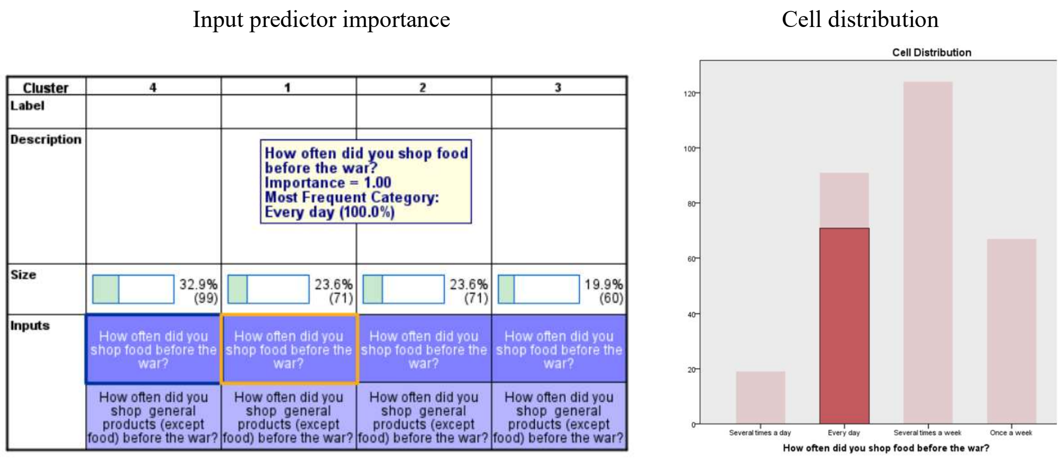


Figure 8 – How often did you buy food before the Ukraine war? in cluster 1

With 71 respondents (23.6%) in cluster 1, the category that is exclusive as being the only category of the cell distribution of shopping food before the war in cluster 1 is *every day* (Figure 8).

Input predictor importance

Cell distribution

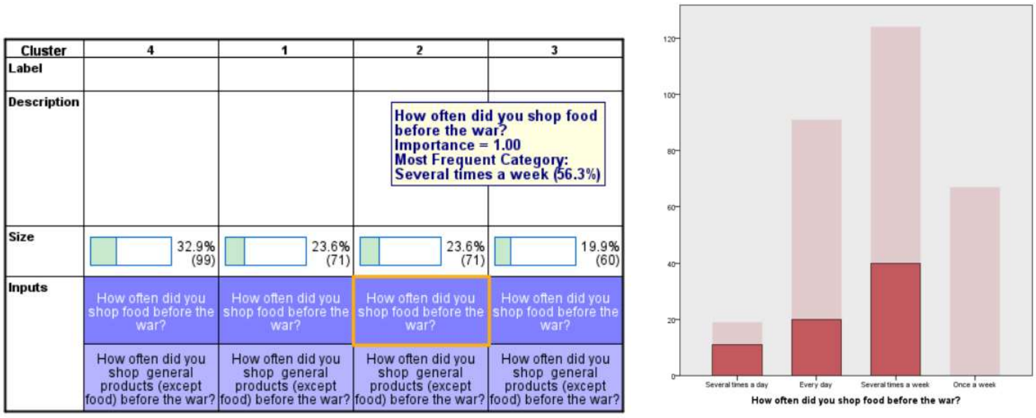


Figure 9 - How often did you buy food before the Ukraine war? in cluster 2

Cluster 2 (Figure 9), with the same number of subjects belonging to cluster 1 (71), reveals that most respondents buy food *several times a week* before the war (56.3%). However, all the 60 respondents of cluster 3 (Figure 10) would buy food before the war *once a week*.

Input predictor importance

Cell distribution

Figure 10 - How often did you buy food before the Ukraine war? in cluster 3

Cluster 4, with the highest number of subjects (99), buy food several times a week in 84.8% of the cases (Figure 11).

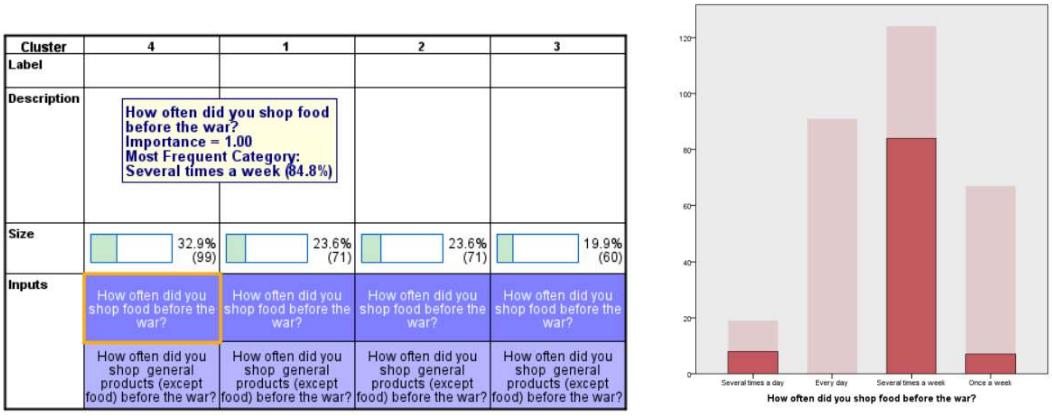
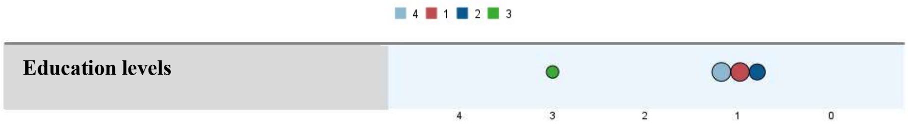


Figure 11 - How often did you buy food before the Ukraine war? in cluster 4

A similar analysis is done for the other input variable, *How often did you buy other products than food before the Ukraine war, in cluster i* $(i = 1, 2, 3, 4)$, which only has an importance of 0.48 (see Annex F).

Table 16: Clusters' comparison according to personal variables

Personal Variables	*Cluster 1* $\binom{n = 71}{23.6\%}$	*Cluster 2* $\binom{n = 71}{23.6\%}$	*Cluster 3* $\binom{n = 60}{19.9\%}$	*Cluster 4* $\binom{n = 99}{32.9\%}$
Gender	Most frequent category: 0 (60.6%)	Most frequent category: 0 (60.6%)	Most frequent category: 0 (56.7%)	Most frequent category: 0 (55.6%)
Age levels	Most frequent category: 1 (33.8%)	Most frequent category: 1 (40.8%)	Most frequent category: 1 (38.3%)	Most frequent category: 1 (38.4%)
Education levels	Most frequent category: 1 (56.3%)	Most frequent category: 1 (42.3%)	Most frequent category: 3 (30.0%)	Most frequent category: 1 (41.4%)
Household composition	Most frequent category: 3 (40.8%)	Most frequent category: 3 (32.4%)	Most frequent category: 3 (41.7%)	Most frequent category: 3 (31.3%)
Professional occupation	Most frequent category: 0 (46.5%)	Most frequent category: 0 (46.5%)	Most frequent category: 0 (70.0%)	Most frequent category: 0 (53.5%)

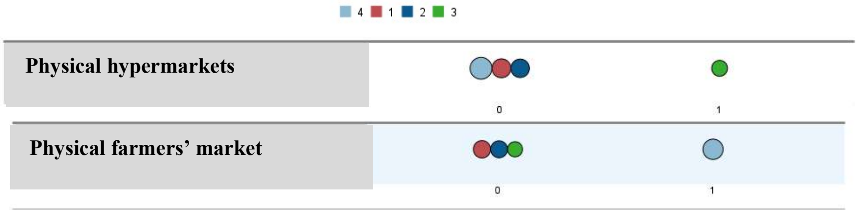


From the selected personal variables, only education levels can distinguish these clusters (Table 16). For example, 30% of the 60 respondents that belong to cluster 3 (18 respondents), has a bachelor's degree, while in clusters 1 and 4, the category 1 (secondary degree) is more frequent.

Table 17 reveals that there are two stores that distinguish these clusters from the variable *Where did you usually shop before the war in Ukraine?* The stores are (1) physical hypermarket and (2) farmers' market: 63.6% out of 99 respondents (66) in cluster 4 usually used hypermarkets to purchase food; 56.6% out of 99 respondents (56) grouped in cluster 4 used to go to farmers' market to purchase food.

Table 17: Clusters' comparison according to other variables than personal variables

	Cluster 1 $\binom{n = 71}{23.6\%}$	***Cluster 2*** $\binom{n = 71}{23.6\%}$	***Cluster 3*** $\binom{n = 60}{19.9\%}$	***Cluster 4*** $\binom{n = 99}{32.9\%}$
Where did you usually shop before the war in Ukraine?				
Physical Hypermarket	Most frequent category: 0 (66.2%)	Most frequent category: 0 (63.4%)	Most frequent category: 0 (55.0%)	Most frequent category: 1 (63.6%)
Physical Supermarket	Most frequent category: 0 (81.7%)	Most frequent category: 0 (81.7%)	Most frequent category: 0 (58.3%)	Most frequent category: 0 (88.9%)
Physical Traditional store	Most frequent category: 0 (69.0%)	Most frequent category: 0 (77.5%)	Most frequent category: 0 (70.0%)	Most frequent category: 0 (63.6%)
Physical Farmers' market	Most frequent category: 0 (55.7%)	Most frequent category: 0 (54.9%)	Most frequent category: 0 (51.7%)	Most frequent category: 1 (56.6%)
Physical Organic shop	Most frequent category: 1 (66.2%)	Most frequent category: 1 (94.4%)	Most frequent category:1 (95.0%)	Most frequent category: 1 (88.9%)
Online ordering	Most frequent category: 0 (87.3%)	Most frequent category: 0 (81.7%)	Most frequent category: 0 (96.7%)	Most frequent category: 0 (79.8%)



The 13 food groups (from red meat and fish up to convenience food) usually purchased before the Ukraine war do not characterize any of these four clusters.

5.3.2 Segmentation results for 'during the Ukraine war'

This segmentation started using 11 input variables, However, the Silhouette coefficient, a measure of cohesion within cluster and separation between clusters, revealed a poor-quality segmentation. Consequently, it was decided to remove *Cooking-oriented consumer* component (PC3) and Eating as a ritual experience component (PC4). The variable *How often do you shop general products (except food) during the war?* was also eliminated from the analysis. Thus, the final number of input variables used in this segmentation is eight variables.

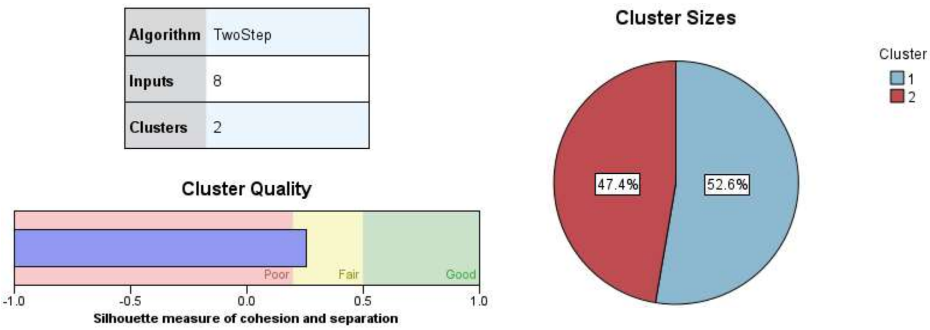


Figure 12 - Model summary of extracting two clusters of respondents

With eight input variables, it is identified two clusters with a fair silhouette measure of cluster quality equal to 0.3 (Figure 12).

The input variables that most differentiate between clusters are *income changes* during the war since it is the most important input variable to explain this formation, followed by the *Frequency of buying food*, followed by *Safety-oriented consumers*, *Responsible consumption*, *Perceived scarcity* and *Panic Buying behaviour*.

Table 18: Input variables and their importance and characteristics

Input variables	**Cluster 1** $(n = 160; 53\%))$	**Cluster 2** $(n = 142; 47\%)$
Did your income change during the war? (Importance = 1)	Not changed (43.4%)	Decreased (100%)
How often do you shop food during the war? (Importance = 0.42)	Several times a week (43.4%)	Several times a week (50.9%)
Responsible consumption (Importance = 0.23)	$Mean = -0.39$	$Mean = 0.35$
Safety-oriented consumers (Importance = 0.23)	$Mean = 0.39$	$Mean = -0.35$
Perceived scarcity during a war crisis (Importance = 0.17)	$Mean = 3.28$	$Mean = 3.82$
Panic buying behaviour (Importance = 0.17)	$Mean = 3.29$	$Mean = 3.79$
Well-informed consumers (Importance = 0.06)	$Mean = 0.19$	$Mean = -0.17$
Fast-oriented consumption (Importance = 0.03)	$Mean = -0.12$	$Mean = 0.11$

- Income changes – from the 160 respondents that were grouped in cluster 2, 53% (85 participants) registered no change in their income, while 100% out 142 respondents in cluster 1 report a decreased in their income. **Hypothesis 1 is also revealed from this segmentation**.
- Food-related lifestyle - it can be said that the following:
  - Responsible consumption – the 160 respondents that belong to cluster 2 evaluate this food-related lifestyle negatively, in average, while the 142 subjects of cluster 1 evaluate it positively. **Hypothesis 5 is also revealed from this segmentation.**
  - Safety-oriented consumers – the assement that these respondents made in this type reveals that the 160 respondents that belong to cluster 2 evaluate this food-related lifestyle positively, in average, while the 142 subjects of cluster 1 evaluate it negatively.
- Panic buying behaviour – it also discriminates between these clusters: while the 160 respondents from cluster 2 tend to be indifferent (neither agree nor disagree) on average (3.29) with this construct, the respondents from cluster 1 tend to agree, on average (3.79).

Hypothesis 4 is also revealed in this segmentation.

From the demographics, just the monthly income can characterize the clusters in the sense that in cluster 1, 47.8% of 159 respondents (76 respondents) earning a low income is the most frequent category, while in cluster 2, 42.7% of 143 respondents (61 respondents) earning a high income is the most frequent category (Figure 13).

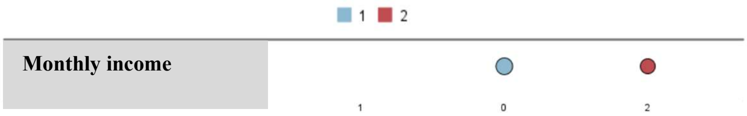


Figure 13 – Clusters characterization from earned monthly income

From the thematic variables that play a role as characterization set of variables, *Where do you usually shop during the war in Ukraine?,* only the *online ordering* characterizes the formation of these two clusters (Figure 14). **The hypothesis 2 is also revealed from this segmentation.**

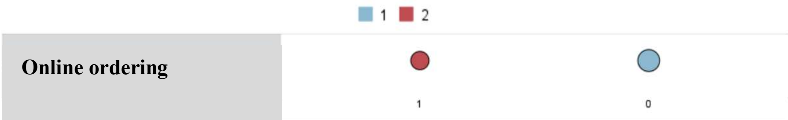


Figure 14 – Clusters' characterization from the online way to shop during the war in Ukraine

In cluster 1, most participants use the way online ordering to purchase food, while in cluster 2, most participants do not use frequently the online ordering.

Regarding the set of food groups that are usually bought during the war, the relevant items that distinguish the two clusters are *red meat*, *crisps and snacks*, and *alcoholic beverages* (Figure 15). **Thus, hypothesis 3 is also revealed here.**

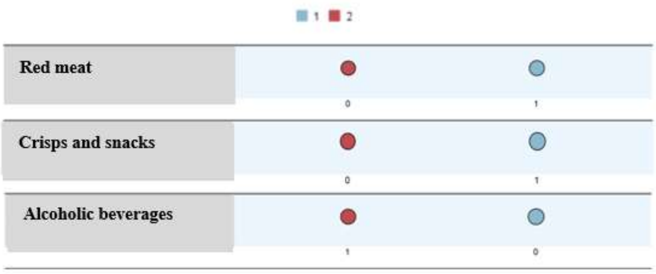


Figure 15 – Clusters' characterization from the three food groups usually bought

5.3.3 Comparing the segmentation results before the war and during the war

Income emerged as a crucial factor during the war, as many participants faced financial strain due to decreased earnings. Perceived sense of scarcity and panic buying replaced typical consumption patterns across both groups during the Ukraine war.

Shopping behaviours shifted substantially before and during the conflict. Prior to the war, purchasing habits were categorized by frequency - some individuals bought food daily or several times a week, while others made weekly trips to supermarkets or farmers' markets. However, during the war, most people began purchasing food several times a week, regardless of their previous routines. Additionally, many consumers transitioned to online shopping as the war progressed. Consumption of products like red meat, crisps and snacks, and alcoholic beverages declined, giving way to other food groups.

The war triggered a shift from routine shopping habits to more urgent, necessity-driven behaviour, with many people shopping as responding to uncertainty by stockpiling essential goods. How much money people had/has and how they dealt with shortages and panic buying became some of the main differences between the two clusters.

Table 19: Summary table of segmentation results

<table>
<tr><th colspan="2"></th><th>Before the war</th><th>During the war</th></tr>
<tr><td colspan="2" rowspan="5">Shopping food frequency</td><td>Importance = 1.00</td><td>Importance = 0.42</td></tr>
<tr><td>Daily in cluster 1 (100% = 71)</td><td>Several times a week in cluster 1 (50.9% from 160)</td></tr>
<tr><td>Several times a week in clusters 2 (56.3% from 71) and 4 (84.8% from 99)</td><td rowspan="2">Several times a week in cluster 2 (43.4% from 143)</td></tr>
<tr><td>Weekly in cluster 3 (100% = 60)</td></tr>
<tr></tr>
<tr><td colspan="2" rowspan="2">Shopping other products than food frequency
(Importance = 0.48)</td><td>Once a week in cluster 1 (57.7%), and 4 (60.0%)</td><td rowspan="2">—————</td></tr>
<tr><td>Once a month in cluster 2 (85.9%) and 3 (61.7%)</td></tr>
<tr><td colspan="2" rowspan="2">Income changes during the war
(Importance = 1)</td><td rowspan="2">—————</td><td>Cluster 1: 43.4% out of 160 participants register that income did not change</td></tr>
<tr><td>Cluster 2: all participants registered an income decreased (100%).</td></tr>
<tr><td rowspan="4">Consumer types according to changes in food-related lifestyle[1]</td><td rowspan="2">Responsible consumption
(Importance = 0.23)</td><td rowspan="2">—————</td><td>Cluster 1: register a negative mean agreement (−0.39)</td></tr>
<tr><td>Cluster 2: register a positive mean agreement (0.35)</td></tr>
<tr><td rowspan="2">Safety-oriented consumers
(Importance = 0.23)</td><td rowspan="2">—————</td><td>Cluster 1: register a positive mean agreement (0.39)</td></tr>
<tr><td>Cluster 2: register a negative mean agreement (-0.35)</td></tr>
</table>

[1] Standardized variables.

Table 20: Continuation

	Before the war	During the war
Perceived scarcity during a war crisis (Importance = 0.17)	——————	Cluster 1: They are indifferent, in average (3.28)
		Cluster 2: Tend to agree, in average (3.82)
Panic buying behaviour (Importance = 0.17)	——————	Cluster 1: They are indifferent, in average (3.29)
		Cluster 2: Tend to agree, in average (3.79)

In short, the war caused a shift from regular shopping habits to more urgent buying, with many people shopping more often and reacting to uncertainty by stocking up on essentials.

Thus, we define six proposed research hypotheses. After the data analysis in this chapter, all hypotheses were validated for this sample. The segmentation tool could reveal several identical conclusions that were taken from the univariate and bivariate descriptive analysis. However, the main advantage of using this segmentation analysis is that it is known the most important input variables (from a set of eight variables) that are the basis for the formation of these groups.

6. Conclusion

6.1 Results' discussion

This study investigates the impact of war on consumer behavior in Ukraine, focusing on shifts in consumer decision-making criteria and changes in purchasing behaviours compared to the pre-war period. A literature review was conducted to contextualize the study, covering topics such as consumer purchase decisions (Kim, 2020), the impact of military crises on purchase behaviour (Grunert et al., 2023), changes in consumer behaviour during crises (Jasiulewicz, 2012; Amalia et al., 2009; Zurawicki et al., 2005), and the specific effects of the military crisis on Ukrainians' purchasing processes (Shkoda et al., 2022). Additional topics included increased social responsibility in food purchases and the preference for local brands (Bulyk, 2023), changes in Ukrainian lifestyles related to food (Dvornyk, 2023).

To gather relevant data, a consumer survey questionnaire was developed, and a quantitative cross-sectional survey design was applied. The study focused on identifying potential shifts in purchasing behavior in Odesa, Ukraine, utilizing constructs adapted from Yassin (2022) and Grunert et al. (2023). Past crises have shown that consumer attitudes toward price change significantly, with consumers seeking discounts (Shipchandler, 1982), being more price-sensitive (Estelami et al., 2001), and focusing on low-cost options due to reduced income (Lichtenstein et al., 1993). This thesis has revealed that military crises similarly affect income which, in turn, impact in consumer purchasing decisions.

Additionally, the pandemic followed by military conflict has significantly increased online orders (Ritson, 2022; Shkoda et al., 2022; Vovchanska et al., 2022), as safety concerns drive consumers away from public places with potential security threats. Our study also noted a marked shift to online shopping among food consumers in Odesa.

Literature indicates that crises, whether economic, food-related, or war-related, often lead to negative consumer perceptions and can contribute to anxiety, pessimism, panic, and depression (Wang et al., 2023; Voinea, 2011; Jasiulewicz, 2012). Our study confirmed that during military crises, intense fear and panic can provoke significant changes in consumers, particularly intensifying panic buying (Prentice et al., 2021; Eriksson et al., 2020; Lee et al., 2003).

The war has also led to greater emphasis on responsible consumption, with an increase in social initiative support among Ukrainians (Korneyev et al., 2022). There is a growing trend toward minimizing food waste, reducing harmful packaging, and supporting ethical and local brands committed to environmental standards and responsible business practices (Grunert et al., 2023; Letunovska et al., 2023; Filippov et al., 2023). The survey analysis of food consumers in Odesa confirmed that responsible consumption practices significantly influence consumer behavior during the crisis.

The literature review highlights that, during wartime, consumers tend to favor domestic brands or goods from countries they perceive positively (Shkoda et al., 2022; Vovchanska et al., 2022; Wasserman, 2022). Our study aligns with Ukrainian researchers (Bulyk, 2023; Mashchak, 2023; Letunovska at al., 2023), showing a preference among consumers for local brands, as these brands can offer competitive prices and provide products that may be scarce in international markets.

6.2 Theoretical contributions/ implications

The findings of this article confirm the conclusions of previous studies that martial law crisis conditions influence changes in consumer purchasing behaviour (Grunert et al. 2023; Yassin, 2022; Lim et al., 2022).

Although war is a widely researched topic in history, it remains relatively under-researched in relation to marketing. To address this gap, this paper investigates the impact of war on the purchasing behaviour of Ukrainian consumers in the city of Odesa.

This article contributes to the consumer behaviour literature by exploring changes in purchasing behaviour caused by crises, building on some of the research used in the literature, including others (Ritson, 2022; Prentice et al., 2021; Cici Karaboğa et al., 2021; Amalia et al., 2009; Riefler et al., 2007). Panic scales used in other contexts, such as the Covid, have been adapted to survey consumers in war contexts (Yassin, 2022; Grunert et al., 2023).

This study explores what are the common features of consumer purchasing behaviour during the martial law crisis and how did martial law conditions affect consumer purchasing behaviour in Ukraine (Mashchak, 2023; Bulyk, 2023; Shkoda, 2022).

New paradigms of consumer behaviour emerge in times of crisis. Attitudes towards risk and its perception are two of the most important aspects that shape consumer purchasing behaviour during a crisis. A consumer's perception of risk is reflected in his or her attitude to risk. Risk perception reflects how the customer evaluates the risk content (Ang et al., 2000).

In other words, economic instability is an important factor that changes consumer purchasing behaviour under martial law. A military conflict is accompanied by a decline in economic activity and investment, inflation, and rising unemployment. This leads to a reduction in household incomes and, consequently, a change in their consumption activity. Consumers are becoming more cautious about their spending, refusing to make expensive purchases and looking for goods and services with greater discounts and offers. The military conflict has led to an increased sense of threat among the population. People are concerned about their own safety and the safety of their loved ones, which affects their consumer choices, so most shoppers are turning to online food orders. The stress, anxiety and uncertainty associated with martial law also significantly affect customers' decisions and consumer attitudes, which changes their lifestyle in relation to food. Through conceptual analysis, the interviews highlight the specific reasons for these factors and a concrete explanation for the results.

6.3 Managerial Implications

Thus, the growing price sensitivity of Ukrainian consumers requires companies to adapt their operational and logistics systems to reduce costs by increasing efficiency and productivity. The high demand for online shopping gives Ukrainian companies the opportunity to expand their product range. Grocery companies can not only sell international brands but also develop their own production partnerships with international brands. They can also increase customer retention by providing simple cooking recipes on their website to help consumers have healthy and affordable meals. The challenges of martial law will be an opportunity for Ukrainian companies to innovate their digital resources and develop a customer-centric approach to developing operating systems for order tracking and personalised customer service. Solving the problems of Ukrainian retailers in wartime requires a comprehensive approach that includes logistics support, financial stability, safety and security, digitalisation and business adaptation to new conditions. The key to success is flexibility, innovation and cooperation between business, government and the international community to overcome current challenges and build a sustainable future for Ukrainian business.

6.4 Limitations and future/ further research

This study has several limitations. One of the challenges faced in conducting the survey in an online environment. This posed difficulties in reaching consumers over the age of 65 since they are still using outdated phone models that do not allow them to fill out the survey online. Because of that, the sample was predominantly composed of individuals under 65 years old.

Furthermore, the study is merely descriptive and it has its focus on Odesa, Ukraine, and therefore, cannot be generalized for the population. Also, the data is based on self-reported information rather than observed behaviour which can be a limitation to data quality due to lack of memory when it is implemented a comparative study between 24 February 2022 and 2024.

The military crisis follows the COVID-19 pandemic, marking yet another large-scale crisis with both economic and psychological impacts due to disrupted social life and widespread loss. As such, traditional economic crisis scales may not fully capture the nuances of this ongoing period of instability, revealing a gap in empirical studies on consumer behaviour's dimensions under wartime uncertainty.

Future research could investigate whether shifts in consumer and purchasing behaviour these changes in consumption and purchasing behaviour is long-term in this crisis, and explore other factors influencing consumption and purchasing behaviour.

This study encourages further research into the effects of the military crisis on global consumer behaviour around the world as the crisis has shaken the global economy.

Bibliography

Adam, I., Adongo, C. A. & Amuquandoh, F. E. (2019). A structural decompositional analysis of eco-visitors' motivations, satisfaction and post-purchase behaviour. *Journal of Ecotourism*, 18(1), 60-81.

Akkaya, M. (2021). Understanding the impacts of lifestyle segmentation & perceived value on brand purchase intention: An empirical study in different product categories. *European research on management and business economics*, 27. https://doi.org/10.1016/j.iedeen.2021.100155

Amalia, P., & Ionut, P. (2009). Consumers' Reaction and Organizational Response in Crisis Context. *Annals of the Faculty of Economics*, 4, 779-782.

Ang, S. H., Leong, S. M., & Kotler, P. (2000). The Asian apocalypse: crisis marketing for consumers and businesses. *Long Range Planning*, 33(1), 97-119.

Armstrong, J.S. (1991). Prediction of consumer behavior by experts and novices. *Journal of Consumer Research*, 18(2), 251-256.

Artyukhova, N., Tiutiunyk, I., & Bogacki, S. (2022). Scenario Modeling of Energy Policies for Sustainable Development. *Energies,* 15, 7711. doi:10.3390/en15207711

Aschemann-Witze, l. J, de Hooge IE, & Almli VL (2021). My style, my food, my waste! consumer food waste-related lifestyle segments. *Journal of Retailing and Consumer Services*. doi:10.1016/j.jretconser.2020.102353

Badgaiyan, A. J., & Verma, A. (2015). Does urge to buy impulsively differ from impulsive buying behaviour? Assessing the impact of situational factors. *Journal of Retailing and Consumer Services*, 22, 145-157.

Bila I., Zakrevska L., & Kovalchuk I. (2023). Adaptation of business and consumers to modern challenges in Ukraine. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu,* 5, 178-185. https://doi.org/10.33271/nvngu/20235/178

Brunsø Karen, Birch Dawn & Memery Juliet (2021). Core dimensions of food-related lifestyle: A new instrument for measuring food involvement, innovativeness and responsibility. *Food Quality and Preference*, 91(2), https://doi.org/10.1016/j.foodqual.2021.104192

Bulyk O., Havryliuk I. (2023). The impact of war on consumer purchasing behaviour. *Entrepreneurship and social aspects of agricultural policy. Bulletin of Lviv National*

University of Life and Environmental Sciences. Series "Ekonomika APK", 30, 175-178. https://doi.org/10.31734/economics2023.30.175

Calboli, I., & Sevastianova, V. (2022). Fashion in the Times of War: The Recent Exodus of Luxury Brands from Russia and What It Means for Trademark Law. *Harvard Journal of Sports & Entertainment Law*, 13. https://ssrn.com/abstract=4077865

Cepeda-Carrion, I., Martelo-Landroguez, S., Leal-Rodríguez, A. L., & Leal-Millan, A. (2017). Critical processes of knowledge management: An approach toward the creation of customer value. *European Research on Management and Business Economics*, 23(1), 1–7.

Cici Karaboğa, E. N. & Bilginer Özsaatci, F. G. (2021). The Impact of Crisis Perception on Consumer Purchasing Behaviors During the COVID-19 (Coronavirus) Period: A Research on Consumers in Turkey. *Eskişehir Osmangazi Üniversitesi İİBF Dergisi,* 16(3), 727 – 754.

Deloitte's retail and wholesale distribution group in Ukraine (2024). Consumer sentiment of Ukrainians in the second year of of the full-scale invasion. https://www2.deloitte.com/ua/en/pages/press-room/press-release/2024/consumer-behavior.html

Dia.Business (2022). Survey of state and needs of business in Ukraine. September 2022. Center of innovations' development, Office on entrepreneurship and export development, national project Dia.Business and strategic agency Advanter Group. https://business.diia.gov.ua/

Dibb, S. (1998). Market segmentation: strategies for success. *Marketing Intelligence & Planning*, 16 (7), 394-406.

Dibb, S. (1995). Developing a Decision Tool for Identifying Operational and Attractive Segments. *Journal of Strategic Marketing,* 3 (3), 189-203.

Dibb, S. (2001). New Millennium, New Segments: Moving Towards the Segment of One? *Journal of Strategic Marketing,* 9 (3), 193-213.

Ding, A. W. & Shibo, L. (2021). National response strategies and marketing innovations during the COVID-19 pandemic. *Business Horizons,* 64, 295-306.

Dvornyk, M. S. (2023). Promotion of a healthy lifestyle of the individual in the conditions of war: conceptual foundations of the study. *Problems of political psychology*, 13(27), 57-64.

Dubovyk,T., Buchatska, I., & Zerkal, A. (2022). Digital Marketing in the Condition of Wartime Posture in Ukraine. *International Journal of Computer Science and Network Security*, 22, 7. http://paper.ijcsns.org/07_book/202207/20220725.pdf

Eriksson, N. & Stenius, M. (2020). Changing Behavioral Patterns in Grocery Shopping in the Initial Phase of the Covid-19 Crisis - A Qualitative Study of News Articles. *Open Journal of Business and Management*, 8, 1946-1961..

Estelami, H., Lehmann, D.R, & Holden, A.C. (2001). Macro-Economic Determinants of Consumer Price Knowledge. *International Journal of Research in Marketing*, 18 (4), 341 - 355.

Expert organization CSR Ukraine (2024). Ukrainian business and war: a unique catalogue from CSR Ukraine. https://csr-ukraine.org/news/ukrainskiy-biznes-i-viyna-unikalni/

Flatters, P. & Willmott, M. (2009). Understanding the post-recession consumer. *Harvard Business Review,* 7, 106-112.

Gradus Research Company. Social trends 2023: how the war turned Ukrainians into a more conscious nation. Retrieved from https: https://gradus.app/en/open-reports/gradus-report-social-trends-2023-ua/

Grant, R. M. (2003). Strategic planning in a turbulent environment: evidence from the oil majors. *Strategic management journal*, 24 (6), 491–517.

Grunert, K., Chimisso C., & Lähteenmäki L. (2023). Food-related consumer behaviours in times of crisis: Changes in the wake of the Ukraine war, rising prices and the aftermath of the COVID-19 pandemic. *Food Research International,* 173, 1-12. doi:10.1016/j.foodres.2023.113451

Grunert, K.G., Brunsø K. & Bredahl L. (2001). Food-related lifestyle: A segmentation approach to European food consumers. *Food, People and Society*, pp. 211–230.

Gyrich, S. (2024). Problems of trade enterprises under martial law and ways to solve them. *Economy and Society*, 59. https://doi.org/10.32782/2524-0072/2024-59-79

Hamad, H., Schmitz M. (2019). The Impact of Demographic Variables and Consumer Shopping Orientations on the Purchasing Preference for Different Product Categories in the Context of Online Grocery Shopping. *An International Peer-reviewed Journal.* 52, 21-32. doi: 10.7176/JMCR

Hayda, Y., Dluhopolskyi, O., & Zatonatska, T., (2023). Solid waste market: cross-country analysis. *9th International Scientific Conference on Sustainability in Energy and Environmental Science. Worldwide Online Conference.* 1150. doi: 10.1088/1755-1315/1150/1/012012

Hoekstra, J. C., & Leeflang, P. S. H. (2020). Marketing in the era of COVID-19. *Italian Journal of Marketing*, 249–260.

Hunt, S.D., Duhan, D.F. (2001). Competition in the Third Millennium: Efficiency or Effectiveness? *Journal of Business Research,* 55 (2), 97-112.

Hunt, S.D., Lambe, C.J. (2000). Marketing's Contribution to Business Strategy: Market Orientation, Relationship Marketing, and Resource-Advantage Theory. *International Journal of Management Review,* 2 (1), 17-43.

Jasiulewicz, A. (2012). Economic crisis influence on the Polish consumer behaviour. *Overcoming the Crisis: Economic and Financial Developments in Asia and Europe.* https://zalozba.upr.si/ISBN/978-961-6832-32-8/papers/jasiulewicz.pdf

Kavilanz, P. (2022). A shoemaker, a pizza shop and a bakery in Kyiv pivot to serve their country. https://edition.cnn.com/ 2022/04/12/business/ukraine-small-businesses-war-pivot/index.html

Kemp, E., Bui, M., & Porter, III, M. (2021). Preparing for a crisis: examining the influence of fear and anxiety on consumption and compliance. *Journal of Consumer Marketing*, 38 (3), 282-292.

Kim, R. Y. (2020). The Impact of COVID-19 on Consumers: Preparing for Digital Sales. *IEEE Engineering Management*. doi:10.1109/EMR.2020.2990115.

Korneyev, M., Berezhniuk, I., & Dzhyndzhoian, V. (2022). Business marketing activities in Ukraine during wartime. *Innovative Marketing.* 18(3), 48-58.

Kumar, V., & Reinartz, W. (2016). Creating enduring customer value. *Journal of Marketing*, 80(6), 36–68.

Lee, Y., Kozar, K. A., & Larsen, K. R. (2003). The Technology Acceptance Model: Past, present, and future. *Communications of the Association for Information Systems,* 12(50), 750-782.

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69–96.

Letunovska, N., Kashcha, M. & Dluhopolskyi, O. (2023). Health Risks and Country Sustainability: The Impact of the COVID-19 Pandemic with Determining Cause-and-Effect Relationships and Their Transformations. *Sustainability*, 15, 222. https://doi.org/10.3390/su15010222

Lichtenstein D.R., Ridgway N.M. & Netemeyer R.G. (1993). Price perceptions and consumer shopping behaviour. *Journal of Marketing Research*, 30(2), 234–245. https://doi.org/10.2307/3172830

Lim, W. M., Chin, M. W. C. & Ee, Y. S. (2022). What is at stake in a war? A prospective evaluation of the Ukraine and Russia conflict for business and society. *Global Business and Organizational Excellence*, 1-14. https:// doi.org/10.1002/joe.22162

Mansoor, D. (2011). The Global Business Crisis and Consumer Behavior: Kingdom of Bahrain as a Case Study. *International Journal of Business and Management,* 6 (1), 104-115.

Mashchak, N. (2022). Changes in consumer markets under the influence of the post-pandemic COVID-19. *Economy and Society*, 42. https://doi.org/10.32782/2524-0072/2022-42-19

Mashchak, N., & Vorona, D. (2023). Research of the behaviour of Ukrainian consumers in the market of goods for active recreation in the conditions of war. *Economy and Society,* 53. https://doi.org/10.32782/2524-0072/2023-53-26

McKinsey and Company. (2020). COVID-19: Implications for business. https://www.mckinsey.com/business-functions/risk/our-insights/covid-19-implications-for-business.

Ministry of Economy of Ukraine (2024**).** Everyone Benefits When It Is Made in Ukraine: retailers joined the campaign to support Ukrainian manufacturers. https://me.gov.ua/?lang=en-GB

Molina-Azorín & Francisco, J. (2016). Mixed methods research: An opportunity to improve our studies and our research skills. *European Journal of Management and Business Economics,* 25 (2), 37-38.

Murphy, R., & Seriki, O. (2021). The impact of environmental turbulence on the strategic decision-making process in Irish quantity surveying (QS) professional service firms (PSFs). *Construction Management and Economics*, 39:9, 739–758.

Nguyen, G. (2022). Googles Russian invasion of Ukraine results includes new search features. *Search Engine Land*. https:// searchengineland.com/googles- russian-invasion-of-ukraine- results-includes-new-search-fea-tures-382156

Nie, B., Zhao, F., & Yu, J. (2010). The Impact of the Financial Crisis on Consumer Behaviour and the Implications of Retail Revolution. In Marketing Science Innovations and Economic Development. *Proceedings of 2010 Summit International Marketing Science and Management Technology Conference Sydney*. *Orient Academic Forum*, 487-493.

Filippov, V.Yu., & Sagitova, R. (2023). Analysis of the Current Situation and Measures to Prevent Food Loss and Food Waste in Ukraine. *Economic journal Odessa polytechnic university*, 3(25), 71-87.

Omelchyk, O., Ivanashko, O. & Sipko, L. (2022). Economic behavior of consumers during instability. *Journal of Interdisciplinary Research,* 12 (02), 89-95.

Özsungur, Fahri (2023). Handbook of Research on War Policies, Strategies, and Cyber Wars. 463 p.

Pelau C., Stamule T. (2013). Analysis of the consumer's reasons and driving factors for buying. *International Journal of Economic Practices and Theories. 3(1), 60-66.*

Pennings, J., Wansink, B., & Meulenberg, M. (2002). A note on modeling consumer reactions to a crisis: The case of the mad cow disease. *International Journal of Research in Marketing,* 19, 91-100. https://doi.org/10.1016/S0167-8116(02)00050-2

Piercy, N.F., Morgan, N.A. (1993). Strategic and Operational Market Segmentation: A Managerial Analysis. *Journal of Strategic Marketing,* 1 (2), 123-140.

Prentice, C., Quach, S., & Thaichon, P. (2021). Antecedents and consequences of panic buying: The case of COVID-19. *International Journal of Consumer Studies*. 1-15. https://doi.org/10.1111/ijcs.12649

Prohorovs, A. (2022). Russia's War in Ukraine: Consequences for European Countries' Businesses and Economies. *Journal of Risk and Financial Management,* 15, 295. https://doi.org/10.3390/jrfm15070295

Ravi Shukla (2022). Review study on factors affecting consumer behavior. *Asian Journal of Management and Commerce*, 3 (1), 49-52.

Riefler, P., & Diamantopoulos A. (2007). Consumer animosity: A literature review and a reconsideration of its measurement. *International Marketing Review*, 24(1), 87–119.

Ritson, M. (2022). At times of war marketing is rendered superficial and ridiculous. https://www.marketingweek.com/mark-ritson-war-marketing-rendered-superficial-ridiculous/

Romani, S., Grappi, S. & Bagozzi, R.P. (2018). Domestic food practices: a study of food management behaviors and the role of food preparation planning in reducing waste. *Appetite 121*, 215–227.

Salzman, M. & O'Reilly, A. (2010). 10 Trends in Mindful Consumption. Thenewconsumer. com. http://www.thenewconsumer.com/2010/10/29/10-trends-in-mindful-consumption

Scholderer, J, Grunert, K. (2005). Consumers, food and convenience: The long way from resource constraints to actual consumption patterns. *Journal Economic Psychologie*, 26, 105–128.

Shakina, E., & Barajas, A. (2020). Innovate or Perish?: Companies under crisis. *European Research on Management and Business Economics*, 26(3), 145–154.

Shao, C. (2013). The Impact of Financial Crisis on Consumer Buying Behavior. *Chinese, Marketing Management Garden*, 6.

Sharma, V., & Sonwalkar, J. (2013). Does Consumer Buying Behavior Change during Economic Crisis? *International Journal of Economics & Business Administration,* 1, 33-48.

Shavitt S., & Cho H. (2016). Culture and Consumer Behavior: The Role of Horizontal and Vertical Cultural Factors. *Current Opinion in Psychology. 8, 149-154.* https://doi.org/10.1016/j.copsyc.2015.11.007

Sheth, J. (2020). Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, 117, 280–283. https://doi.org/10.1016/j. jbusres.2020.05.059.

Sheu, J. B., & Kuo, H. T. (2020). Dual speculative hoarding: A wholesaler-retailer channel behavioural phenomenon behind potential natural hazard threats. *International Journal of Disaster Risk Reduction,* 44, https://doi.org/10.1016/j.ijdrr.2019.101430

Shkoda, T., & Savych, O. (2022). Transformation of marketing in wartime and postwar. *Baltic Journal of Economic Studies*, 8(5), 209-216. https://doi.org/10.30525/2256-0742/2022-8-5-209-216.

Shipchandler, Z.E. (1982). Keeping down with the Joneses: stagflation and buyer behavior. *Business Horizons*, 25(6), 32–38. https://doi.org/10.1016/0007-6813(82)90006-4

Sostar, M., & Ristanovic, V. (2023). Assessment of Influencing Factors on Consumer Behaviour Using the AHP Model. *Sustainability*, *15*(13). https://doi.org/10.3390/su151310341

Tambunan, T. T. (2019). The impact of the economic crisis on micro, small, and medium enterprises and their crisis mitigation measures in Southeast Asia with reference to Indonesia. *Asia & the Pacific Policy Studies*, 6(1), 19-39.

Terendii, A. (2023). Trends in consumer behavior of households in the food market of Ukraine. *Economic Space*, 184, 62-66.

UNIAN News Agency (2024). Time to work: how Ukrainian business has recovered and adapted during the year of war. https://www.unian.ua/economics/finance/chas-dlya-roboti-yak-vidnovlyuvavsya-ta-adaptuvavsya-ukrajinskiy-biznes-za-rik-viyni-12154170.html

Vartanova, O., & Tsalko, T. (2023). Consumer behavior: revitalization of the concept and core models. *Economy and Society*, 50. https://doi.org/10.32782/2524-0072/2023-50-36

Voinea, L. & Filip, A. (2011). Analyzing the Main Changes in New Consumer Buying Behavior during Economic Crisis. *International Journal of Economic Practices and Theories*, 1, 14-19.

Vovchanska, O., & Ivanova, L. (2022). Features of the implementation of marketing tools under the conditions of marital state. Economy and society, (38). https://doi.org/10.32782/2524-0072/2022-38-32

Wang, M.C., Chen, P.C., & Fang, S.C. (2021). How environmental turbulence influences firms' entrepreneurial orientation: the moderating role of network relationships and organizational inertia. *Journal of Business & Industrial Marketing*, 36(1), 48–59. https://doi.org/10.1108/JBIM-05-2019-0170

Wang, Y., El-Said, Ahmed, Ahtamad, Mujthaba & Ozden, Mucahit (2023). Understanding consumer buying behaviour in times of panic: development of a relationship framework of influencing factors. *In: 28th Annual Logistics Research Network Conference 2023*, Edinburgh, Scotland, 6-8 Sep 2023. Published in: Full papers of the Logistics Research Network Conference 2023. http://wrap.warwick.ac.uk/180315

Wasserman, T. (2022). Marketing During Wartime: A Chance To Take Sides. https://www.mediapost.com/publications/article/371738/marketing-during-wartime-a-chance-to-take-sides.html

Wedel, M., Kamakura, W.A. (2000). The Historical Development of the Market Segmentation Concept. *Market Segmentation*. *International Series in Quantitative Marketing*, 3-6. https://doi.org/10.1007/978-1-4615-4651-1_1

Wołowiec, T., Kolosok, S., & Vasylieva, T. (2022). Sustainable Governance, Energy Security, and Energy Losses of Europe in Turbulent Times. *Energies*, 15, 8857. https://doi.org/10.3390/en15238857

Yassin C.A. (2022). What is Enough? The Impact of the Russia-Ukraine Crisis on Consumers' Panic-Buying Behaviour. *The Academic Journal of Contemporary Commercial Research. 2(3), 29-46***.**

Yoona J., Narasimhan R., & Kima M.K. (2018). Retailer's sourcing strategy under consumer stockpiling in anticipation of supply disruptions. *International Journal of Production Research,* 56 (10), 3615-3635.

Zurawicki, L. & Braidot, N. (2005). Consumers during crisis: Responses from the middle class in Argentina. *Journal of Business Research*, 58 (8), 1100–1109.

Annexes

ANNEX A: Questionnaire

QUESTIONNAIRE

Dear respondent!

I'm Veronika Bakhchevan, master's student in Marketing at ISCTE-Business School, Lisbon.
I'm writing to you to ask you to participate in my research on "Potential changes in purchasing behaviour of consumers in Odesa, Ukraine".
Your participation in this short survey, which will take approximately 10 minutes, will provide valuable information for my thesis.
Your answers will remain anonymous and will be used for academic purposes only.

PERSONAL CHARACTERISTICS

1. Gender
   - Male ☐
   - Female ☐
   - Other ☐

2. Age (write the number) ______

3. Educational level
   - Secondary school ☐
   - Associate degree ☐
   - Bachelor's degree ☐
   - Master's degree ☐
   - PhD ☐

4. Household composition:
   - 1 ☐
   - 2 ☐
   - 3 ☐
   - ≥ 4 ☐

5. Professional occupation:
   - Employee ☐
   - Employer ☐
   - Student ☐
   - Unemployed ☐
   - Retired ☐

OTHER CHARACTERISTICS

6.a1 How often did you shop food before the war?
   - Several times a day ☐
   - Every day ☐
   - Several times a week ☐
   - Once a week ☐
   - Once a month ☐
   - Less than once a month ☐

6.a2 How often did you shop general products (except food) before the war?

- Several times a day ☐
- Every day ☐
- Several times a week ☐
- Once a week ☐
- Once a month ☐
- Less than once a month ☐

6.b1 How often do you shop food during the war?

- Several times a day ☐
- Every day ☐
- Several times a week ☐
- Once a week ☐
- Once a month ☐
- Less than once a month ☐

6.b2 How often do you shop general products (except food) during the war?

- Several times a day ☐
- Every day ☐
- Several times a week ☐
- Once a week ☐
- Once a month ☐
- Less than once a month ☐

7. Did your income change during the war in Ukraine?

- Decreased ☐
- Increased ☐
- Not changed ☐

8. What is your monthly income during the war?

- Low (Up to 290 €) ☐
- Average (291– 450€) ☐
- High (≥ 451 €) ☐

9. Comment the following sentence according to the ordinal scale of agreement:

	Totally disagree	Disagree	Neutral	Agree	Totally agree
I try to avoid buying products from foreign manufacturers that continue to work on the territory of the aggressor country.					

10.a Where did you usually shop before the war in Ukraine? (multiple options).

- Physical hypermarket ☐
- Physical supermarket ☐
- Physical traditional store ☐
- Physical Farmers' market ☐
- Physical Organic shop ☐
- Online ordering ☐

10.b Where do you usually shop during the war in Ukraine? (multiple options).

- Physical hypermarket ☐
- Physical supermarket ☐
- Physical traditional store ☐
- Physical Farmers' market ☐
- Physical Organic shop ☐
- Online ordering ☐

11.a What food groups did you usually buy before the war? (multiple options).

- Red meat ☐
- Fish ☐
- Chicken ☐
- Dairy products ☐
- Cereals ☐
- Fruits ☐
- Vegetables ☐
- Flour products ☐
- Crisps and snacks ☐
- Chocolates and sweets ☐
- Alcoholic beverages ☐
- Non-alcoholic beverages ☐
- Convenience food ☐

Note: Convenience food means: prepared salads, frozen pizza, frozen meals, canned soups, semi-finished products, etc.

11.b What food groups do you usually buy during the war? (multiple options).

- Red meat ☐
- Fish ☐
- Chicken ☐
- Dairy products ☐
- Cereals ☐
- Fruits ☐
- Vegetables ☐
- Flour products ☐
- Crisps and snacks ☐
- Chocolates and sweets ☐
- Alcoholic beverages ☐
- Non-alcoholic beverages ☐
- Convenience food ☐

Note: Convenience food means: prepared salads, frozen pizza, frozen meals, canned soups, semi-finished products, etc.

12. What is your reaction to price increases during the war?

	1 I'm buying online	2 I'm buying less	3 I'm switching to a cheaper brand	4 I stop buying	5 I'm buying in another shop	6 I buy without changes	7 I do not use this product at all
Red meat	☐	☐	☐	☐	☐	☐	☐
Fish	☐	☐	☐	☐	☐	☐	☐
Chicken	☐	☐	☐	☐	☐	☐	☐
Dairy products	☐	☐	☐	☐	☐	☐	☐
Cereals	☐	☐	☐	☐	☐	☐	☐
Fruits	☐	☐	☐	☐	☐	☐	☐
Vegetables	☐	☐	☐	☐	☐	☐	☐
Flour products	☐	☐	☐	☐	☐	☐	☐
Crisps and snacks	☐	☐	☐	☐	☐	☐	☐
Chocolates and sweets	☐	☐	☐	☐	☐	☐	☐
Alcoholic beverages	☐	☐	☐	☐	☐	☐	☐
Non-alcoholic beverages	☐	☐	☐	☐	☐	☐	☐
Convenience food	☐	☐	☐	☐	☐	☐	☐

Note: Convenience food means: prepared salads, frozen pizza, frozen meals, canned soups, semi-finished products, etc.

13. For food groups that registered changes in price, please characterize the changes in your consumption during the war.

	Significant decrease	Decrease	No changes	Increase	Significant increase
Red meat					
Fish					
Chicken					
Dairy products					
Cereals					
Fruits					
Vegetables					
Flour products					
Crisps and snacks					
Chocolates and sweets					
Alcoholic beverages					
Non-alcoholic beverages					
Convenience food					

Note: Convenience food means: prepared salads, frozen pizza, frozen meals, canned soups, semi-finished products, etc.

14. For food consumption, please characterize the changes in your food-related lifestyle?

	Much less than before	Less than before	A little less than before	No changes	A little more than before	More than before	Much more than before
1 I often purchase food I had not planned to purchase at the store							
2 I compare product information on food labels to decide which brand to buy							
3 I want to see, touch and/or smell food products before buying them							
4 I always check prices, even on cheaper food items							
5 I buy pre-packed items instead of unpacked							
6 When cooking or eating, I first and foremost consider the taste							
7 I always check the packed on and use by dates to ensure that I am buying the freshest products							
8 Frozen food account for a large part of the food products I use in my household							
9 I prefer to eat food which is locally produced							
10 I prefer to purchase unpacked food or food with recyclable / biodegradable packing because of the environment							
11 I prefer to purchase packaged food because of hygienic concerns							
12 I try to avoid products with artificial additives or preservatives							
13 I pay attention to my diet to control my weight							
14 I indulge myself by buying tasty treats and delicacies							
15 I like to experiment with new ideas/recipes when cooking							
16 I enjoy spending time cooking in the kitchen							
17 I use a lot of ready-to-eat foods in my household							
18 I eat food which is familiar to me							
19 Eating and food are an important part of my social role							
20 I eat a lot of snacks rather than having set mealtimes							
21 We eat dinner at the table together as a household							
22 Eating is to me a matter of touching, smelling, tasting, and seeing all the senses are involved. It is a very exciting sensation							
23 I end up throwing food away							
24 I talk to people about what I cook for dinner or share it on social media							

15. During the war crisis, consumers perceive scarcity by adjusting their buying behaviour accordingly.
Please, register below your agreement with each sentence.

	Totally disagree	Disagree	Neutral	Agree	Totally agree
The products that I wanted to buy will be very limited during crises	☐	☐	☐	☐	☐
The product brand availability will be very limited during crises	☐	☐	☐	☐	☐
The volume of a product will be very limited during crises	☐	☐	☐	☐	☐
The types of products will be very limited during crises	☐	☐	☐	☐	☐

16. During the war crisis, consumers react by adopting a panic buying behaviour.
Please, answer below your agreement with each sentence.

	Totally disagree	Disagree	Neutral	Agree	Totally agree
I had the urge to buy products immediately	☐	☐	☐	☐	☐
I found several things and I wanted to grab even though they were not on my shopping list	☐	☐	☐	☐	☐
I spontaneously grabbed the product of interest	☐	☐	☐	☐	☐
I bought more products than I usually would	☐	☐	☐	☐	☐

THANK YOU!

ANNEX B: Food consumption reaction to price increases

		Count	%
Red meat	I'm buying online	16	5.3
	I'm buying less	107	35.4
	I'm switching to a cheaper brand	7	2.3
	I stop buying	77	25.5
	I'm buying in another shop	17	5.6
	I buy without changes	31	10.3
	I do not use this product at all	47	15.6
Fish	I'm buying online	16	5.3
	I'm buying less	107	35.4
	I'm switching to a cheaper brand	7	2.3
	I stop buying	77	25.5
	I'm buying in another shop	17	5.6
	I buy without changes	31	10.3
	I do not use this product at all	47	15.6
Chicken	I'm buying online	13	4.3
	I'm buying less	110	36.4
	I'm switching to a cheaper brand	16	5.3
	I stop buying	73	24.2
	I'm buying in another shop	22	7.3
	I buy without changes	29	9.6
	I do not use this product at all	39	12.9
Dairy products	I'm buying online	26	8.6
	I'm buying less	105	34.8
	I'm switching to a cheaper brand	22	7.3
	I stop buying	7	2.3
	I'm buying in another shop	43	14.2
	I buy without changes	96	31.8
	I do not use this product at all	3	1.0
Cereals	I'm buying online	28	9.3

	I'm buying less	94	31.1
	I'm switching to a cheaper brand	53	17.5
	I stop buying	11	3.6
	I'm buying in another shop	40	13.2
	I buy without changes	67	22.2
	I do not use this product at all	9	3.0
Fruits	I'm buying online	89	29.5
	I'm buying less	67	22.2
	I'm switching to a cheaper brand	45	14.9
	I stop buying	6	2.0
	I'm buying in another shop	26	8.6
	I buy without changes	58	19.2
	I do not use this product at all	11	3.6
Vegetables	I'm buying online	76	25.2
	I'm buying less	86	28.5
	I'm switching to a cheaper brand	19	6.3
	I stop buying	11	3.6
	I'm buying in another shop	37	12.3
	I buy without changes	65	21.5
	I do not use this product at all	8	2.6
Flour products	I'm buying online	87	28.8
	I'm buying less	73	24.2
	I'm switching to a cheaper brand	19	6.3
	I stop buying	4	1.3
	I'm buying in another shop	38	12.6
	I buy without changes	80	26.5
	I do not use this product at all	1	0.3
Crisps and snacks	I'm buying online	32	10.6
	I'm buying less	68	22.5
	I'm switching to a cheaper brand	37	12.3
	I stop buying	10	3.3
	I'm buying in another shop	57	18.9
	I buy without changes	89	29.5
	I do not use this product at all	9	3.0
Chocolates and sweets	I'm buying online	66	21.9
	I'm buying less	50	16.6
	I'm switching to a cheaper brand	33	10.9
	I stop buying	53	17.5
	I'm buying in another shop	15	5.0
	I buy without changes	24	7.9
	I do not use this product at all	61	20.2
Alcoholic beverages	I'm buying online	74	24.5
	I'm buying less	62	20.5
	I'm switching to a cheaper brand	49	16.2
	I stop buying	43	14.2
	I'm buying in another shop	14	4.6
	I buy without changes	32	10.6
	I do not use this product at all	28	9.3
Non-alcoholic beverages	I'm buying online	58	19.2
	I'm buying less	43	14.2
	I'm switching to a cheaper brand	43	14.2
	I stop buying	47	15.6
	I'm buying in another shop	11	3.6
	I buy without changes	23	7.6
	I do not use this product at all	77	25.5
Convenience food	I'm buying online	69	22.8
	I'm buying less	63	20.9
	I'm switching to a cheaper brand	34	11.3

	I stop buying	42	13.9
	I'm buying in another shop	16	5.3
	I buy without changes	37	12.3
	I do not use this product at all	41	13.6

ANNEX C: Changes in consumption for food groups price changes

		Count	%
Red meat	Significant decrease	146	48.3
	Decrease	76	25.2
	No changes	61	20.2
	Increase	16	5.3
	Significant increase	3	1.0
Fish	Significant decrease	149	49.3
	Decrease	81	26.8
	No changes	50	16.6
	Increase	15	5.0
	Significant increase	7	2.3
Chicken	Significant decrease	28	9.3
	Decrease	88	29.1
	No changes	109	36.1
	Increase	67	22.2
	Significant increase	10	3.3
Dairy products	Significant decrease	30	9.9
	Decrease	145	48.0
	No changes	88	29.1
	Increase	30	9.9
	Significant increase	9	3.0
Cereals	Significant decrease	19	6.3
	Decrease	137	45.4
	No changes	97	32.1
	Increase	40	13.2
	Significant increase	9	3.0
Fruits	Significant decrease	32	10.6
	Decrease	140	46.4
	No changes	85	28.1
	Increase	36	11.9
	Significant increase	9	3.0
Vegetables	Significant decrease	17	5.6
	Decrease	119	39.4
	No changes	102	33.8
	Increase	50	16.6
	Significant increase	14	4.6
Flour products	Significant decrease	18	6.0
	Decrease	101	33.4
	No changes	112	37.1
	Increase	61	20.2
	Significant increase	10	3.3
Crisps and snacks	Significant decrease	106	35.1
	Decrease	104	34.4
	No changes	67	22.2
	Increase	20	6.6
	Significant increase	5	1.7
Chocolates and sweets	Significant decrease	85	28.1
	Decrease	130	43.0
	No changes	60	19.9
	Increase	21	7.0
	Significant increase	6	2.0
Alcoholic beverages	Significant decrease	100	33.1
	Decrease	90	29.8
	No changes	78	25.8
	Increase	31	10.3
	Significant increase	3	1.0

Non-alcoholic beverages	Significant decrease	86	28.5
	Decrease	113	37.4
	No changes	77	25.5
	Increase	20	6.6
	Significant increase	6	2.0
Convenience food	Significant decrease	71	23.5
	Decrease	113	37.4
	No changes	75	24.8
	Increase	33	10.9
	Significant increase	10	3.3

ANNEX D: Computing the variable Perceived scarcity buying behaviour

The Cronbach' alpha coefficient

Reliability Statistics

Cronbach's Alpha	N of Items
.839	4

Some descriptive measures of Perceived scarcity

N	Valid	302
	Missing	0
Mean		3.5637
Median		3.7500
Mode		4.00
Std. Deviation		.82644
Skewness		-.492
Std. Error of Skewness		.140
Kurtosis		.029
Std. Error of Kurtosis		.280
Minimum		1.00
Maximum		5.00
Percentiles	25	3.0000
	50	3.7500
	75	4.0000

ANNEX E: Computing the variable Panic buying behaviour

The Cronbach' alpha coefficient

Reliability Statistics

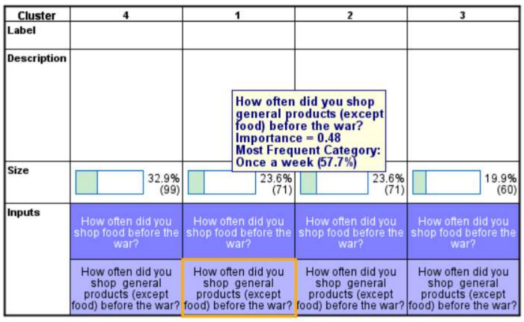
Cronbach's Alpha	N of Items
.820	4

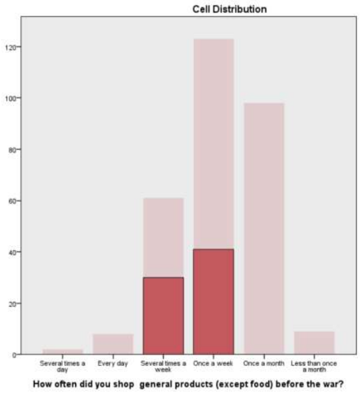
Some descriptive measures of Panic buying behaviour

N	Valid	302
	Missing	0
Mean		3.474
Median		3.500
Mode		4.000
Std. Deviation		.875
Skewness		-.249
Std. Error of Skewness		.140
Kurtosis		-.230
Std. Error of Kurtosis		.280
Range		4.000
Percentiles	25	3.000
	50	3.500
	75	4.000

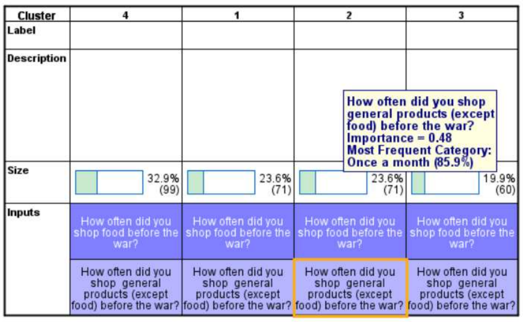
ANNEX F: Segmentation characteristics of the frequency of buying general products before the war

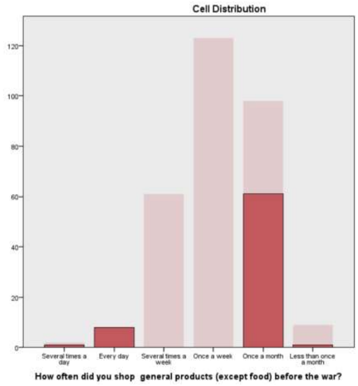
Cluster 1





Cluster 2





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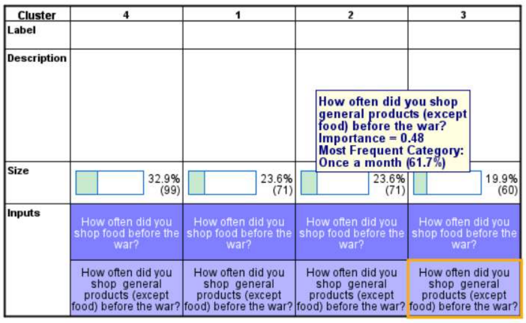

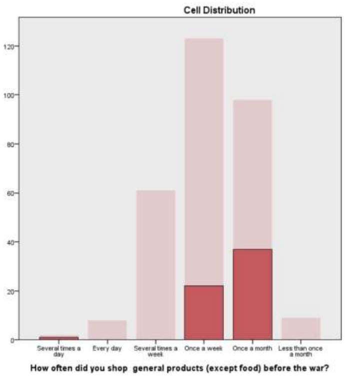

Cluster 4