THE DETERMINANTS OF CONSUMERS' SHOPPING CART ABANDONMENT: AN EMPIRICAL RESEARCH IN TURKEY

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The Determinants of Consumers' Shopping Cart Abandonment:

An Empirical Research in Turkey

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ABSTRACT

The Determinants of Consumers' Shopping Cart Abandonment:

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The landscape of commerce has undergone a profound transformation with the exponential rise of E-commerce sales, where products and services are accessed and ordered through online platforms. This digital revolution has been further accelerated by the unprecedented global events surrounding the COVID-19 pandemic, which have compelled individuals to embrace online shopping as an integral part of their daily lives. However, in the midst of this digital transformation, there's a significant problem that stands out: Shopping cart abandonment which is characterized by the act of prospective customers loading their virtual carts with desired items only to exit the transaction process before completing their purchase, stands as a formidable impediment to the revenue-maximizing aspirations of E-commerce companies. This phenomenon has become increasingly prominent, urging businesses to go deeper into understanding its causes and exploring predictive patterns that can illuminate the path to a solution. Within this context, this research aims to provide invaluable insights to empower E-commerce companies, not only in reducing cart abandonment rates but also in enhancing the overall consumer journey. Through this endeavour, the study seeks to chart a course that not only benefits E-commerce businesses but also contributes to the evolution and sustainability of the Turkish E-commerce ecosystem.

ÖZET

Tüketicilerin Satın Alma Kartlarını Terk Etmelerini Belirleyici Faktörler:

Türkiye'de Ampirik Bir Araştırma.

E-ticaret satışları, ürünlerin ve hizmetlerin çevrimiçi platformlar aracılığıyla erişilip sipariş edildiği bir dönüşümle büyük bir değişim geçirdi. Bu dijital devrim, COVID-19 pandemisinin küresel olaylarının etkisiyle daha da hızlandı ve insanları çevrimiçi alışverişi günlük yaşamlarının ayrılmaz bir parçası olarak benimsemeye zorladı. Ancak bu dijital dönüşümün ortasında dikkat çeken önemli bir sorun var: Alışveriş sepeti terk etme potansiyel müşterilerin istedikleri ürünleri sanal sepetlerine ekleyip satın alma işlemini tamamlamadan çıkma eylemi olarak tanımlanır. Bu fenomen, e-ticaret şirketlerinin gelirlerini maksimize etme arzularını engelleyen büyük bir sorun olarak duruyor. Bu sorun giderek daha belirgin hale gelmiş, işletmeleri nedenlerini anlama ve çözüm yolunu aydınlatabilecek tahminsel desenleri keşfetme konusunda daha derinlemesine araştırmalara itmiştir. Bu bağlamda, bu araştırma sepet kullanımı ve terkini inceleyerek, e-ticaret şirketlerine sepet terk oranlarını azaltma konusunda ve genel tüketici deneyimini iyileştirme konusunda iç görüler sağlamaya yöneliktir. Bu çaba aracılığıyla, çalışma e-ticaret işletmelerine yarar sağlamanın ötesinde Türk e-ticaret ekosisteminin evrimine ve sürdürülebilirliğine katkıda bulunmayı amaçlamaktadır.

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CHAPTER 1

INTRODUCTION

According to the Internet World Statistics (2022), there are 5.4 billion people who can access the internet, 69% of the world population. World Internet usage and population statistics are presented in Table 1. With the increase of online shopping alternatives and the accessibility of the internet, more attention has been paid to understand the consumers' online shopping behaviour and increase the sales done by the internet both on mobile devices and computers.

Table 1. World Internet Usage and Population Statistics (World Internet Users Statistics and 2022 World Population Stats, 2022)

World Regions	Population (2022 Est.)	Population % of World	Internet Users 30 June 2022	Penetration Rate (% Pop.)	Growth 2000-2022	Internet World %
Africa	1,394,588,547	17.6 %	652,865,628	46.8 %	14,362 %	11.9 %
Asia	4,352,169,960	54.9 %	2,934,186,678	67.4 %	2,467 %	53.6 %
Europe	837,472,045	10.6 %	750,045,495	89.6 %	614 %	13.7 %
Latin America / Carib.	664,099,841	8.4 %	543,396,621	81.8 %	2,907 %	9.9 %
North America	374,226,482	4.7 %	349,572,583	93.4 %	223 %	6.4 %
Middle East	268,302,801	3.4 %	211,796,760	78.9 %	6,378 %	3.9 %
Oceania / Australia	43,602,955	0.5 %	31,191,971	71.5 %	309 %	0.6 %
World Total	7,934,462,631	100.0 %	5,473,055,736	69.0 %	1,416 %	100.0 %

While much research is conducted on how to sell to new consumers with an improved consumer experience, a significant amount of research is also done to

retain the existing consumers. Somewhere in between acquiring a new customer and keeping the existing one, understanding consumers' shopping cart abandonment can provide useful strategies that can change the game in the new digitised business.

Before going deeper on drivers and motivations related to shopping cart abandonment, it is important to know that there have been different definitions on shopping cart abandonment in the literature. Cho et al. (2006) defined checkout hesitation as "postponing or deferring product purchases by having additional processing time before making final product-purchases on the Internet" (p. 261). Kukar-Kinney and Close (2010) described "consumers' placement of item(s) in their online shopping cart without making a purchase of any item(s) during that online shopping session" (p. 240). Huang et al. (2018) took into consideration the abandonment on mobile channels and stated that "the behavioural outcome of leaving items in a mobile shopping cart without completing a purchase session" (p. 165). Kukar-Kinney et al. (2022) referred to cart abandonment "when consumers decide to leave the shopping session without purchasing the item(s) placed in the cart as opposed to completing the transaction by purchasing the item(s) placed into the cart during the online shopping session" (p. 962). Song (2019) defined online cart abandonment in his study "a shopper's act of deleting all or some products from the shopping cart or leaving the product(s) in the cart until the system deletes it/them automatically" (p. 339).

Even though there seems to be promising and fast-growing market trends with the proliferation of e-commerce, there is also a huge deficiency due to cart abandonment ratios. While online shoppers place items in online shopping carts, they often abandon them. A recent industry research has shown that the average cart abandonment rate is 69.9% which means that almost every 2 out of 3 users choose to

abandon their purchase which ends up approximately $21.7 trillion worth of lost orders for 2023 (Baymard Institute, 2022). In order to sustain a healthy growth in ecommerce sales and avoid possible financial losses due to not finalised shopping carts, it is crucial for the e-commerce companies to understand the reasons behind the online shopping cart abandonment. Especially, if cart abandonments and checkout abandonments mostly result from unavoidable due to the nature of how users browse e-commerce sites. Many users will browse, compare prices, save items for later, explore gift options, etc. and will change their minds at the purchase decision stage.

As the final step in the online consumer decision making process, the e-commerce platforms are most affected by the abandonment rate, since they are the intermediaries in the B2C process (Khan et al., 2022). Traditionally, corporations do not take cart abandonment as a good sign because they negatively affect shopping rates or may be the signal of an unwanted consumer experience (Teng et al., 2007). The rising interest in understanding the consumers' shopping cart behaviour can be seen from a recent survey paper by Wang et al. (2022). According to the study, the number of the studies on the subject in the last three years is way higher than the total number of studies between 2003 and 2019. By having 53.8% of the articles during the 2019-2022 period, it can be said that online shopping cart abandonment has recently received increased research interest as presented in Appendix B, Figure 1. Besides, Wang et al. (2022) classified the literature in 4 categories as the determinants after analysing the literature: contextual factors, perceived risk factors, personal factors, and technological factors. They also classify positioned mediators and moderators with the outcomes of online shopping cart abandonment (OSCA) as presented in Appendix B, Figure 2 (Wang et al., 2022).

Figure 1. Publication trends of online shopping cart abandonment articles from 2003 to 2022 (Wang et al., 2022)

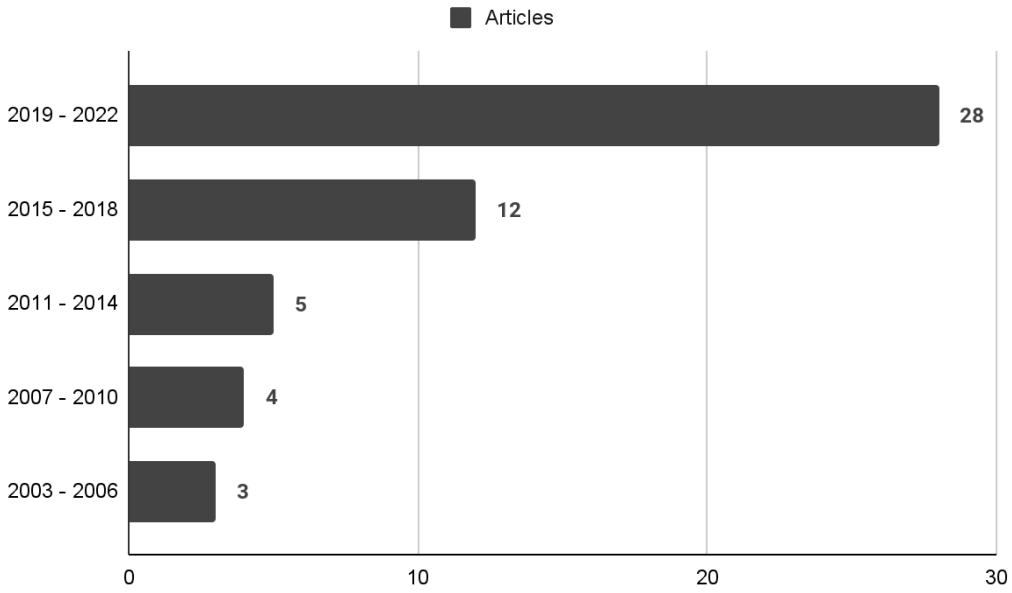
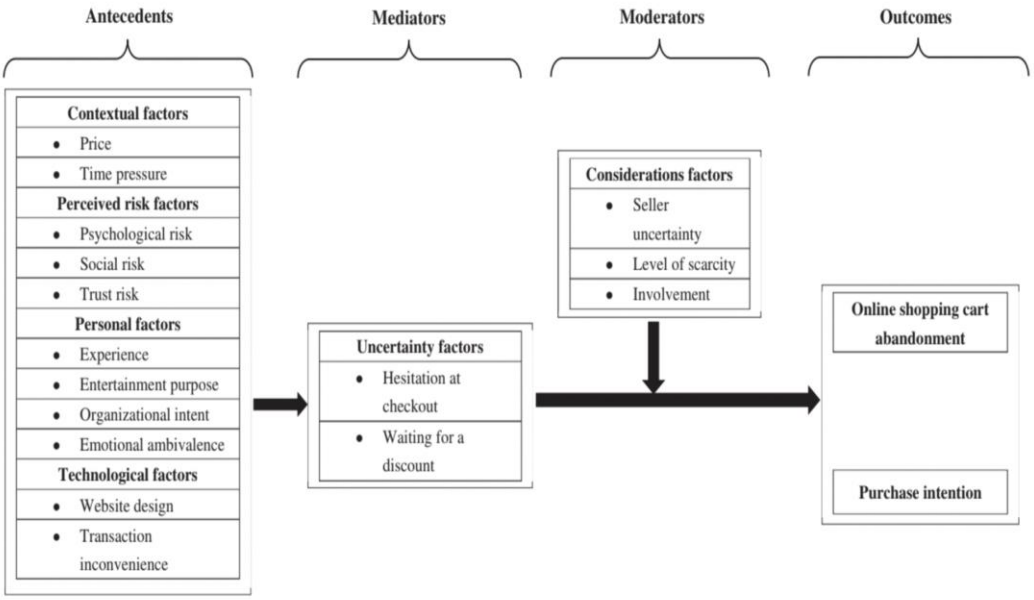


Figure 2. Integrated conceptual framework (Wang et al., 2022)



In the literature, as it will be explored in detail in the next chapter, majority of the previous studies focused on the drivers and motives of the cart abandonment by taking into consideration of what consumers faced either on the shopping cart such as: perceived waiting time, perceived risk and transaction inconvenience (Rajamma et al., 2009) or earlier before starting that buying journey as a past experience (Cho et al., 2006; Khan et al., 2022). There are also some other findings claiming that promotions affect the purchase intention and so shopping cart abandonment behaviour as a side effect (Oliver & Shor, 2003) or the effects of company's reputation as the same (Moore & Mathews, 2008). Kukar-Kinney and Close (2010) evaluated online cart abandonment behaviour differently and analysed the cart abandonment behaviour with the context of cart usage purpose for US Citizens. On the other hand, Alalwan et al., (2017) stated that a significant part of the reason for the rise in abandonment ratio is in the culture and personality of the person and interpreting the buying behaviour of consumers will prevent shopping cart abandonment. According to Shin & Lin (2016) the behavioural responses of a person have a crucial impact on the decision to purchase something.

The scholars are paying an increasing attention to the online shopping abandonment issue as the share of e-commerce activities are growing in trade. However, there is a gap in the literature regarding the consumers' shopping cart abandonment behaviour in developing higher middle-income countries where e-commerce has a high potential.

The potential of e-commerce in the Turkish market is quite huge. The volume is in an exponential increase. Data show that the growth has reached double digits. According to Statista (2023), Turkey's eCommerce market is poised for significant

growth with an estimated revenue of $19.22 billion by 2023 - which was $15.27 billion for 2022 and is projected to be $23.19 billion for 2024. Anticipated compound annual growth of 13.6% from 2023 to 2027 is expected to drive market volume to $31.98 billion by 2027. This mirrors the broader trend of increasing eCommerce sales on a global scale in the coming years.

In this study, both culture and shopping cart usage purpose will be taken into consideration in order to understand if they are affecting the abandonment behaviour differently.

CHAPTER 2

LITERATURE REVIEW

There have been some studies investigating the factors behind the shopping cart abandonment throughout the online shopping process in different aspects. Rajamma, Paswan, and Hossain (2009) have addressed the outline of the fundamental factors by focusing on three situational factors: perceived waiting time, perceived risk and transaction inconvenience as potential determinants of the decision to abandon shopping carts. In their research, Rajamma et al. (2009) stated that there is a positive correlation between abandonment and transaction inconvenience and perceived risk. However, they found the last element, perceived waiting time, did not correlate with abandoning the shopping cart up to some point.

Rajamma et al. (2009) expounded that online shoppers might not be affected negatively from the small delays on the checkout steps however they highlighted that long duration delays could be perceived as transaction inconvenience and so might cause an abandonment action at the end of the day. Rajamma et al. (2009) proposed a strategy for addressing delays in online shopping experiences. Their recommendation involves optimizing web pages, particularly checkout pages, by minimizing graphics and limiting textual content. This approach is essential given the global nature of online retail, as it acknowledges the diverse data transfer speeds available in different regions worldwide.

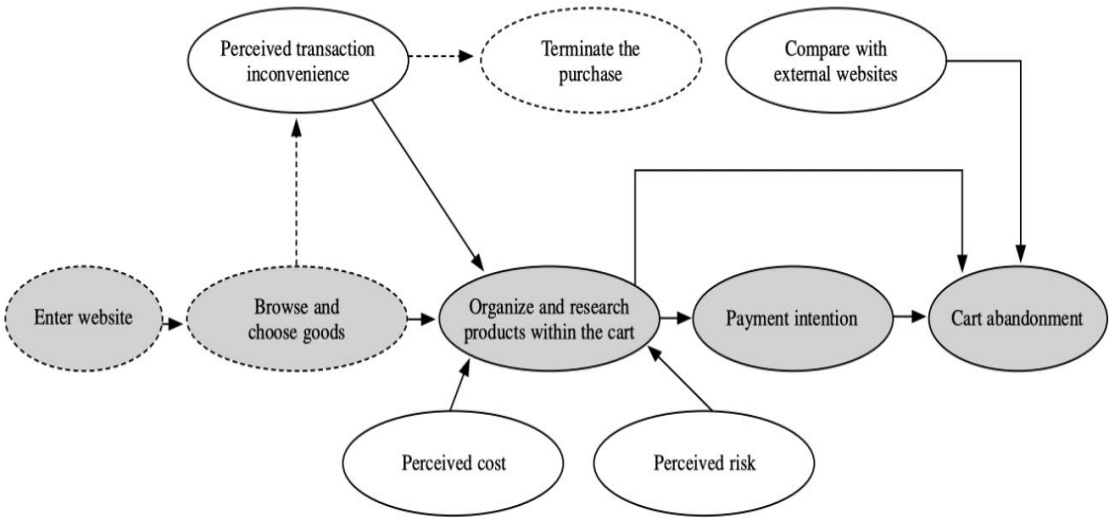
Addition to the recommendation on perceived waiting time, Rajamma et al. (2009) advised online retailers to not to use mandatory subscription with long forms on the checkout steps or eliminate the unnecessary input areas to decrease the transactional inconvenience since the online shoppers tend to abandon the shopping

cart if the checkout steps are too detailed and long. In today's world, companies are more data-oriented even before and they are willing to pay excessive prices to consumers first party data to use and optimise their targeting strategies. However, consumers are also living their fastest times and there is a fast consumption culture everywhere. So, this is like a double-edged sword and even using one extra input area to collect additional information about the consumers might end up increasing abandonment ratios and might cause revenue loss for the companies.

Kukar-Kinney and Close (2010) defined the online shopping cart abandonment (OSCA) as "consumers' placement of item(s) in their online shopping cart without making a purchase of any item(s) during that online shopping session". The authors highlighted that in order to comprehend the online shopping cart abandonment behaviour and the reasons behind, it is imperative to understand consumers' perspectives whether they intend to complete that purchase both online and offline or not at all. Some motivations of adding any products to an online shopping cart might not be for completing shopping at all, or the other elements that the consumers faced might affect them negatively to finalise the checkout process. According to Kukar-Kinney and Close (2010), "the factors influencing consumer online search, consideration, and evaluation play a larger role in cart abandonment than factors at the purchase decision stage" (p. 240). With this motivation, the authors conducted research to find out what factors are related with shopping cart use and what is the correlation of these factors with the shopping cart abandonment behaviour. It has been found that there is a significant and direct influence for entertainment purposes, use of cart as research & organisational tool, current purchase intention of the users on shopping cart us and indirect influence for perceived cost concerns and price sensitivity.

Following the first two research, Xu and Huang (2015) constructed a new model of cart abandonment on top of them in order to determine the direct and indirect effects of each online shopping stage on cart abandonment behaviour. The authors first showed the basic steps of online shopping and then matched the factors that could affect the users of online shopping sites either directly or indirectly, presented in Appendix B, Figure 3. According to their research outcomes, the cart usage for the research and organisational purposes is the most distinguishable variable on online shopping cart abandonment. Xu and Huang (2015) addressed that "perceived cost and perceived risk did not directly affect cart abandonment but did exert an indirect influence on cart abandonment through the mediator of organisation and research of products within the cart" (p. 1625).

Figure 3. Conceptual model of the online cart abandonment process (Xu & Huang, 2015, 1619)



There has been some other research done on shopping cart abandonment by only focusing on mobile devices as a purchasing channel. In comparison with

traditional e-commerce, mobile commerce differs in user design & experience, interactivity, universality, and on the spot fulfilment (Wang et al., 2019). Besides, according to the research done by Statista (2022), 6.5 billion smartphone subscriptions worldwide were counted, almost doubling during the last 5 years. With the proliferation of smartphone usage, mobile retail commerce got its importance with it and experienced an exponential increase within the total retail online shopping share. The expectation of the retail commerce percentage generated by mobile commerce is 72.9% in 2021, up from 58.9% in 2017 (Statista, 2022). The potential of mobile commerce looks relishing but due to this high potential, the risk of shopping cart and the loss of the unfinished shopping is also high. The higher the volume of traffic, the higher the number of abandoned carts. Kapoor and Vij (2021) conducted research by defining the motivations and obstacles of the mobile experience and evaluated the online abandonment by splitting it to either leaving at the cart or during the checkout stage. The two variables in question are characterized as follows: "Shopping cart abandonment" refers to the occurrence when a prospective customer exits the online purchase process before finalizing the transaction. In this context, any item that is placed in the shopping cart but does not progress to the payment stage is classified as "abandoned." Conversely, "checkout abandonment" pertains to situations where a shopper commences the checkout process but fails to complete the final purchase (Kapoor and Vij, 2021).

Bolt (n.d.) defined that while checkout abandonment is frequently equated with cart abandonment, the two are fundamentally different. The former is calculated with a simple calculation of dividing completed transactions by the initiated transactions. And user experience issues in the payment process are usually signalled by high rates. On the other hand, cart abandonment does not necessarily have to be

done on payment step. It could be on searching a product, reading reviews or interacting with the website after adding a product for purchase and then leaving without finalising the purchase. The calculation is the division of completed transactions by the created carts on the first time (Bolt, n.d.). Kapoor and Vij (2021) also emphasised the main difference between these two concepts as "the stage" that users leave. The findings of the authors' research state the leading factors to cart or checkout abandonments. Cart abandonment as cross channel price disparity, free shipping, ratings and review, platform user experience as design, checkout abandonment as account fatigue and shipping procedures. Kapoor and Vij (2021) also mentioned the relation between the age and marital status of the users on the abandonment decisions in their research.

Consistent with the findings of Kapoor and Vij (2021), Kukar-Kinney et al. (2022) stated that seeing too many product reviews or switching in between product pages while browsing on an e-commerce website is related with both the increased possibility of abandonment and the increased number of the shopping cart usage. On the contrary with the previous research done with a self-submitted survey, Kukar-Kinney et al. (2022) used clickstream data on their last research. Bucklin and Sismeiro (2009) defined clickstream data as online consumers' collected usage records via third party cookies or web servers. These kinds of data collection methods can provide detailed and natural insights into online consumer behaviour regarding how consumers use the website without any artificial interruptions on their daily patterns (Bucklin & Sismeiro, 2009). Kukar-Kinney et al. (2022) also listed the significant and insignificant behaviour between the greater cart usage and abandonment. They found that removing any existing product from the cart is

positively related with cart abandonment whereas having an existing shopping cart is negatively related.

The findings of the research by Khan et al. (2022) states that the act of avoiding advertisement can be used by consumers to learn about shopping cart abandoned by a brand or product if they are interrupted by a pointless message. Monsuw´e et al. (2004) mentioned in their research that existence of any earlier experience on online shopping can form a person's actions and thoughts on the next experience. Align with the study by Cho et al. (2006), Khan et al. (2022) propose that negative past experiences can greatly influence purchasing decisions and increase the chance of cart abandonment.

CHAPTER 3

RESEARCH METHODOLOGY

Self-submitted surveys have been previously used by other scholars to study cart abandonment as a quantitative approach (e.g., Rajamma et al., 2009; Kukar-Kinney and Close, 2010; Xu and Huang, 2015; Kapoor and Vij, 2021). Kukar-Kinney and Close (2010) classified the purpose of cart use under entertainment, shopping research & organisational tool, price & cost concern. The authors defined entertainment purposes as "the extent to which consumers place items in their online shopping cart for purposes such as to entertain themselves and to alleviate boredom" (p. 242). Kukar-Kinney and Close (2010) also highlighted checking the total cost and the additional costs such as delivery or custom may trigger the consumers to use the shopping cart even though they do not have the intention to finalise the shopping transaction. Kapoor and Vij (2021) also defined the similar statements regarding the cart usage due to price concerns. According to the findings of Close and Kukar-Kinney (2010), the reasons for using a shopping cart might not be directly related with the purchase intention and could be seen as a tool to reach discounts or promotions on the basket, organising products, getting more details about the products or entertainment.

In this study, a self-submitted questionnaire was used following the study by Kukar-Kinney and Close (2010). In addition to the existing questions, additional questions were added to the survey to evaluate the impact of long membership steps and other user comments and to contribute to the literature. The respondents answered the questions regarding their opinions on online shopping experience on cart usage, cart abandonment, shopping cart frequencies and demographics on age,

gender, education and income level through an online questionnaire. The preliminary questionnaire was tested on twelve Turkish respondents. After feedback collection and evaluation, the final survey was conducted. It was targeted to reach enough respondents to have the diversity in general except one condition that the participants should experience online shopping at least once in a life. Answers were collected via using a self-administered survey distributed through the internet. Google Forms online survey tool was used to present the questions between 25 February and 27 March 2023. 3 of the responses were removed since it has been stated that the respondent had never shopped online. The study addressed the research question whether there is a correlation between the purpose of shopping cart usage and the shopping cart abandonment behaviour for Turkish consumers as the literature claims in general. Turkish versions of the research questions can be found in Appendix. The data analysis was performed using the Statistical Package for the Social Sciences (SPSS 29). Descriptive statistics, Pearson Correlation, ANOVA, and independent sample t-test were utilised for the statistical analysis. Initially, a descriptive statistics analysis was conducted to examine the research variables.

CHAPTER 4

ANALYSES AND RESULTS

4.1 Descriptive statistics

Gender, age, education, income level, shopping frequencies and monthly online shopping spending patterns were analysed in terms of demographic characteristics. The number of female respondents is comparatively higher than male respondents as 64.3% female and 35.7% male respondents as shown in Table 2.

Table 2. Gender Characteristics

	Frequency	Percent	Valid Percent	Cumulative Percent
Woman	92	64.3	64.3	64.3
Man	51	35.7	35.7	100
Total	143	100	100	

During the research process, participants were initially categorised into five different groups based on their age: under 18, 18-25, 26-35, 36-45, 45-55, and 56 and above. However, due to insufficient data in certain age categories, it was necessary to consolidate the groups into three broader categories: "Below 25" "25-35" and "Above 35" with 18.9%, 57.3% and 23.8% respectively as shown in Table 3. This consolidation allowed for a more balanced distribution of participants across the age range, ensuring that each group had a sufficient sample size for meaningful analysis. By regrouping, the study aimed to address the limitations posed by the lack of data in specific age brackets and facilitate more robust analysis and interpretation of the results within the available data constraints.

Table 3. Age Characteristics

	Frequency	Percent	Valid Percent	Cumulative Percent
Below 25	27	18.9	18.9	18.9
25-35	82	57.3	57.3	76.2
Above 35	34	23.8	23.8	100
Total	143	100	100	

Similarly, the same approach was applied to the educational background variable in order to address the issue of insufficient data in certain groups. Initially, participants were classified into four distinct educational groups: high school, university, master's degree, and doctoral degree. However, due to limited data availability in the high school and doctoral degree categories, it was necessary to combine these groups into two broader categories: "High School and University Group" and "Higher Education Group" as shown in Table 4.

Table 4. Education Characteristics

	Frequency	Percent	Valid Percent	Cumulative Percent
High School and University	111	77.6	77.6	77.6
Higher Education Group	32	22.4	22.4	100
Total	143	100	100	

As fourth descriptive statistics, income level was initially classified into five groups, but due to limitations in data availability, the groups were consolidated into three broader categories: "Low Income," "Middle Income," and "High Income" as shown in Table 5. The consolidation for the income levels refer to “Lower than 10,000 TL” and “10,001 TL – 20,000 TL” as Low Income, “20,001 TL – 30,000 TL”

and “30,001 TL – 40,000TL” as Middle Income and lastly “Higher than 40001 TL” as High Income. After the consolidation, the distribution of participants across these categories was as follows: 46.2% fell into the "Low Income" category, 32.9% belonged to the "Middle Income" category, and 21.0% were classified under the "High Income" category. This grouping allowed for a more balanced representation of participants across different income levels, ensuring that each category had a sufficient sample size for meaningful analysis.

Table 5. Income Characteristics

	Frequency	Percent	Valid Percent	Cumulative Percent
Low Income	66	46.2	46.2	46.2
Middle Income	47	32.9	32.9	79
High Income	30	21	21	100
Total	143	100	100	

The frequency of monthly shopping and the monthly amount spent were also examined using descriptive statistics. The frequency of monthly shopping was initially categorised as “Rarely”, “Occasionally” and “Frequently.” “Once or twice a year” and “Once every 2-3 months” was labelled as “Rarely”, “Once a month”, “More than twice a month” and “Once a week” as “Occasionally” and lastly “More than twice a week” and “Every Day” as “Frequently” as shown in Table 6. After analysing the data, the distribution of participants across these categories was as follows: 9.8% for the "Rarely" category, 60.1% for the "Occasionally" category, and 30.1% belonged to the "Frequently" category.

Similarly, the findings for the amount spent indicated that 24.5% of participants were identified as belonging to the “Low spending” category, while the majority, comprising 64.3% of participants, fell into the “Moderate spending” category. On the other hand, 11.2% of participants were classified under the “High spending” category as shown in Table 7. The consolidation was done by grouping “Higher than 10,001 TL”, “7,501 TL – 10,000 TL” and “5,001 TL – 7,500 TL” as “High spending”, “2,501 TL - 5000 TL” and “1,001 TL – 2,500 TL” as “Moderate spending” and lastly, “Lower than 1,000 TL” as “Low spending”.

These categorizations allowed for a comprehensive understanding of participants' shopping habits in terms of both frequency and expenditure. By consolidating the data into meaningful categories, the study aimed to gain insights into patterns and trends related to shopping behaviour.

Table 6. Online Shopping Monthly Frequency Characteristics

	Frequency	Percent	Valid Percent	Cumulative Percent
Rarely	14	9.8	9.8	9.8
Occasionally	86	60.1	60.1	69.9
Frequently	43	30.1	30.1	100
Total	143	100	100	

Table 7. Online Shopping Monthly Spending Characteristics

	Frequency	Percent	Valid Percent	Cumulative Percent
Low Spending	35	24.5	24.5	24.5
Moderate Spending	92	64.3	64.3	88.8
High Spending	16	11.2	11.2	100
Total	143	100	100	

4.2. Pearson correlation analyses

The respondents were asked about both their shopping cart usage along with their abandonment frequencies and their shopping cart abandonment reasons along with frequencies. The Pearson correlation coefficients obtained in the analysis of the master's thesis were interpreted based on the criteria provided by Köklü, Büyüköztürk ve Bökeoğlu (2006) as shown in Table 8.

Table 8. Pearson Correlation Criteria Table	
Size of Correlation	Interpretation
0.00 = rp	There is no relationship.
0.00 < rp < 0.29	There is a low level of correlation.
0.30 < rp < 0.69	There is a moderate relationship.
0.70 < rp < 0.99	There is a high level of correlation.
1.00 = rp	There is a perfect relationship

The correlation analysis presented in Table 9, examines the relationship between variables related to online shopping cart usage motivation and cart abandonment frequencies. Followingly, Table 10 examines the relationship between variables related to shopping cart abandonment reasons and frequencies. Based on the criteria provided, which outlines the interpretation of Pearson correlation coefficients, the correlations found in the analysis can be interpreted as follows:

The correlations between the variables "Abandonment Frequency" and the online shopping cart usage motivation are:

- There might be a discount because I am keeping products in my cart: There is a low positive correlation (rp = 0.033, p = 0.697) between this statement and the Abandonment Frequency which is not significant.
- I use my cart as a comparison list: There is a low positive correlation (rp = 0.1, p = 0.234) between this statement and the Abandonment Frequency which is not significant.
- I use my cart as a list for future purchases: There is a low positive correlation (rp = 0.15, p = 0.074) between this statement and the Abandonment Frequency.
- I use my cart to quickly track changes in product prices: There is a low negative correlation (rp = -0.014, p = 0.868) between this statement and the Abandonment Frequency which is not significant.
- I think holding items in my cart for a while gives me extra time to keep stock: There is a low positive correlation (rp = 0.018, p = 0.827) between this statement and the Abandonment Frequency which is not significant.
- I enjoy adding and removing items even though I know I won't buy: There is a low positive correlation (rp = 0.033, p = 0.697) between this statement and the Abandonment Frequency which is not significant.

Based on these correlations, it can be concluded that the frequency of cart abandonment is not strongly associated with the provided statements. The relationships are negligible, indicating that other factors may have a more significant influence on cart abandonment behaviour.

Table 9. Abandonment Frequencies and Shopping Cart Usage Correlation

		1	2	3	4	5	6	7
1.Abandonment Frequency	rp	1	0.03	0.1	0.15	-0.01	0.018	0.033
	p		0.7	0.23	0.074	0.868	0.827	0.697
2.There might be a discount because I am keeping products in my cart.	rp		1	0.12	-0.02	.245**	.166*	-0.001
	p			0.16	0.845	0.003	0.048	0.987
3.I use my cart as a comparison list.	rp			1	0.072	.211*	0.025	0.025
	p				0.395	0.011	0.764	0.771
4.I use my cart as a list for future purchases.	rp				1	-0.03	-.165*	-.384**
	p					0.721	0.048	<.001
5.I use my cart to quickly track changes in product prices.	rp					1	0.021	0.03
	p						0.801	0.725
6.I think holding items in my cart for a while gives me extra time to keep stock	rp						1	0.01
	p							0.904
7.I enjoy adding and removing items even though I know I won't buy	rp							1
	p							

Note: ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

On the other hand, when the Pearson correlation analysis results for abandonment frequencies and shopping cart reasons are interpreted it can be segmented by low and moderate correlations:

- Low level of correlations with "Abandonment Frequency" are;
  - "Being Bored" as 0.273
  - "Info Collection" as 0.190
  - “Waiting for Discount” as 0.264
  - “Total Price on Checkout” is 0.220

- “Searching for Better Discount” as 0.033, which is also not significant (p = 0.691)
- Better Discount Physical Store” as 0.159
- “Delivery Fee on Checkout” as 0.035, which is not significant (p = 0.678).
- “Negative Reviews” as 0.142
- “Long Basket Process” as 0.063, which is also not significant (p = 0.456).
- “Offline Store Try” as -0.01, which is also not significant (p = 0.991).

- Moderate level of correlation with "Abandonment Frequency" is;
  - "Abandonment Frequency" and "Narrowing Options" as 0.308

Table 10. Abandonment Frequencies and Abandonment Reasons Correlation

		1	2	3	4	5	6	7	8	9	10	11	12
1.Abandonment Frequency	rp	1	.273**	.308**	.190*	0.03	.264**	.220**	0.159	0.035	0.142	0.063	-0.01
	p		<.001	<.001	0.023	0.69	0.001	0.008	0.058	0.678	0.091	0.456	0.991
2.Being Bored	rp		1	.373**	.343**	-0.03	0.15	.282**	0.034	0.066	.186*	0.072	-0.01
	p			<.001	<.001	0.68	0.074	<.001	0.689	0.436	0.026	0.396	0.931
3.Narrowing Options	rp			1	.489**	-0.01	.168*	.208*	0.085	0.064	.313**	.197*	0.064
	p				<.001	0.94	0.045	0.013	0.313	0.448	<.001	0.019	0.445
4.Info Collection	rp				1	0.11	0.128	0.118	0.05	-0.01	.167*	0.096	0.126
	p					0.19	0.128	0.16	0.557	0.93	0.047	0.256	0.134
5.Searching for Better Discount	rp					1	.369**	0.058	.263**	.228**	0.128	.168*	.339**
	p						<.001	0.495	0.002	0.006	0.127	0.045	<.001
6.Waiting for Discount	rp						1	.300**	0.124	.386**	.274**	0.149	.244**
	p							<.001	0.141	<.001	<.001	0.077	0.003
7.Total Price on Checkout	rp							1	.246**	.273**	0.121	.176*	.213*
	p								0.003	<.001	0.15	0.035	0.011
8.Better Discount Physical Store	rp								1	.183*	0.075	0.051	.470**
	p									0.029	0.374	0.543	<.001
9.Delivery Fee on Checkout	rp									1	0.147	.226**	.169*
	p										0.08	0.007	0.043

10.Negative Reviews	rp	1	.234**	0.076
	p		0.005	0.368
11.Long Basket Process	rp		1	0.153
	p			0.069
12.Offline Store Try	rp			1
	p			

Note: ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

Lasty, the correlations between Abandonment Frequency, Income Level, Shopping Frequency and Monthly Spending have been also examined by correlation analysis. Table 11 presents the Pearson correlation coefficients and corresponding significance levels (2-tailed) for each pair of variables.

- Abandonment Frequency and Income Level have a very low negative correlation (-0.045), but it is not statistically significant ($p = 0.597$).
- Abandonment Frequency and Shopping Frequency have a very low negative correlation (-0.056), but it is also not statistically significant ($p = 0.506$).
- Abandonment Frequency and Monthly Spending have a low negative correlation (-0.185), it is statistically significant at the 0.05 level ($p = 0.027$).
- Income Level and Shopping Frequency have a low positive correlation (0.185), and it is statistically significant at the 0.05 level ($p = 0.027$).
- Income Level and Monthly Spending have a moderate positive correlation (0.404), and it is statistically significant at the 0.01 level ($p < 0.001$).
- Shopping Frequency and Monthly Spending have a moderate positive correlation (0.379), it is statistically significant at the 0.01 level ($p < 0.001$).

Table 11. Abandonment Frequency, Income & Spending Variables Correlation

		Abandonment Frequency	Income Level	Shopping Frequency	Monthly Spending
Abandonment Frequency	rp	1	-0.045	-0.056	-.185*
	p		0.597	0.506	0.027
Income Level	rp	-0.045	1	.185*	.404**
	p	0.597		0.027	<.001
Shopping Frequency	rp	-0.056	.185*	1	.379**
	p	0.506	0.027		<.001
Monthly Spending	rp	-.185*	.404**	.379**	1
	p	0.027	<.001	<.001	

Note: **. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

4.3 ANOVA and independent t-test analyses

The ANOVA analysis was conducted to examine the relationship between age and abandonment frequency in the context of online shopping. The descriptive results in Table 12 shows that the mean age for the "Below 25" group is 2.26, for the "25-35" group is 1.99, and for the "Above 35" group is 1.88. The ANOVA results in Table 13 indicate that there are statistically significant differences in age across the abandonment frequency groups ($F = 4.714$, $p = 0.010$).

Table 12. ANOVA Descriptive Results of Age by Abandonment Frequency

	N	Mean	St. Dev.	St. Error
Below 25	27	2.26	.447	.086
25-35	82	1.99	.533	.059
Above 35	34	1.88	.409	.070
Total	143	2.01	.503	.042

Table 13. ANOVA Analysis Results of Age by Abandonment Frequency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.270	2	1.135	4.714	.010
Within Groups	33.702	140	.241		
Total	35.972	142			

The post hoc analysis in Table 14 provides additional insights into these differences. The mean difference between the "Below 25" and "25-35" groups is 0.271 (p = 0.037), indicating that the younger age group has a slightly higher abandonment frequency. Similarly, the mean difference between the "Below 25" and "Above 35" groups is 0.377 (p = 0.009), suggesting that the youngest age group exhibits higher abandonment rates compared to the oldest age group. Conversely, there is no significant difference in abandonment frequency between the "25-35" and "Above 35" age groups (p = 0.544).

Table 14. ANOVA Post Hoc Analysis Results of Age by Abandonment Frequency

					95% Confidence Interval	
(I) Age	(J) Age	Mean Difference (I-J)	St. Error	Sig.	Lower Bound	Upper Bound
Below 25	25-35	.271*	.109	.037	.01	.53
	Above 35	.377*	.126	.009	.08	.68
25-35	Below 25	-.271*	.109	.037	-.53	-.01
	Above 35	.105	.100	.544	-.13	.34
Above 35	Below 25	-.377*	.126	.009	-.68	-.08
	25-35	-.105	.100	.544	-.34	.13

*The mean difference is significant at the 0.05 level.

Overall, these findings suggest that age is a significant factor influencing abandonment behaviour in online shopping, with younger customers demonstrating a

higher likelihood of abandoning their carts. This information is valuable for e-commerce businesses as they seek to understand and address the needs and behaviours of different customer age segments, ultimately aiming to reduce cart abandonment rates and improve customer satisfaction.

Table 15 outlines the average abandonment rates across three income categories: Low, Middle, and High Income. While Low-Income shoppers show a slightly higher abandonment rate, the differences appear minimal. Table 16 presents the ANOVA results, and with a p-value of 0.777, it suggests that income level doesn't significantly impact abandonment frequency. In essence, these findings indicate that income is not a key driver for variations in online shopping cart abandonment rates.

Table 15. ANOVA Descriptive Results of Income by Abandonment Frequency

	N	Mean	St. Dev.	St. Error
Low Income	66	2.05	.593	.073
Middle Income	47	1.98	.489	.071
High Income	30	2	.263	.048
Total	143	2.01	.503	.042

Table 16. ANOVA Analysis Results of Income by Abandonment Frequency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.130	2	.065	.253	.777
Within Groups	35.842	140	.256		
Total	35.972	142			

The post hoc analysis in Table 17 examined the relationship between income and abandonment frequency. The results indicate that there are no significant

differences in abandonment frequency across income groups. The mean difference between the "Low Income" and "Middle Income" groups is 0.067 (p = 0.769), suggesting that there is no significant disparity in abandonment rates between these two income segments. Similarly, the mean difference between the "Low Income" and "High Income" groups is 0.045 (p = 0.912), indicating no significant difference in abandonment frequency between these income categories. Additionally, there is no significant difference in abandonment rates between the "Middle Income" and "High Income" groups (mean difference = -0.021, p = 0.982). These findings suggest that income does not play a significant role in influencing abandonment behaviour in online shopping. This information can be useful for businesses, as they may focus on other factors such as user experience, pricing strategies, or product selection to reduce abandonment rates, rather than solely targeting customers based on their income levels.

Table 17. ANOVA Post Hoc Analysis Results of Income by Abandonment Frequency

					95% Confidence Interval	
(I) Income	(J) Income	Mean Difference (I-J)	St. Error	Sig.	Lower Bound	Upper Bound
Low Income	Middle Income	.067	.097	.769	-.16	.30
	High Income	.045	.111	.912	-.22	.31
Middle Income	Low Income	-.067	.097	.769	-.30	.16
	High Income	-.021	.118	.982	-.30	.26
High Income	Low Income	-.045	.111	.912	-.31	.22
	Middle Income	.021	.118	.982	-.26	.30

. Table 18 presents average abandonment rates for three spending groups, showing that low spenders have a slightly higher abandonment rate. In Table 19, the

p-value of 0.077 suggests a marginal significance in abandonment differences between spending groups. This hints at a potential but not highly significant relationship between monthly spending and cart abandonment.

Table 18. ANOVA Descriptive Results of Monthly Spending by Abandonment Frequency

	N	Mean	St. Dev.	St. Error
Low spending	35	2.17	.514	.087
Moderate spending	92	1.98	.513	.053
High spending	16	1.88	.342	.085
Total	143	2.01	.503	.042

Table 19. ANOVA Analysis Results of Monthly Spending by Abandonment Frequency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.294	2	.647	2.612	.077
Within Groups	34.678	140	.248		
Total	35.972	142			

As another post hoc analysis presented in Table 20, the relationship between monthly spending and abandonment frequency was examined. The results show that there are significant differences in abandonment frequency across different levels of monthly spending. The mean difference between the "Low Spending" and "Middle Spending" groups is 0.193 (p = 0.128), suggesting a significant difference in abandonment rates between these two spending categories. Similarly, the mean difference between the "Low Spending" and "High Spending" groups is 0.296 (p = 0.123), showing a significant difference in abandonment frequency between these spending levels. Additionally, there is a significant difference in abandonment rates

between the "Middle Spending" and "High Spending" groups (mean difference = 0.103, p = 0.724). As a summary, it can be said that monthly spending has a significant impact on abandonment behaviour in online shopping. Customers with higher monthly spending levels are more likely to have lower abandonment rates compared to those with lower spending levels.

Table 20. ANOVA Post Hoc Analysis Results of Monthly Spending by Abandonment Frequency

					95% Confidence Interval	
(I) Monthly Spending	(J) Monthly Spending	Mean Difference (I-J)	St. Error	Sig.	Lower Bound	Upper Bound
Low Spending	Middle Spending	.193	.099	.128	-.04	.43
	High Spending	.296	.150	.123	-.06	.65
Middle Spending	Low Spending	-.193	.099	.128	-.43	.04
	High Spending	.103	.135	.724	-.22	.42
High Spending	Low Spending	-.296	.150	.123	-.65	.06
	Middle Spending	-.103	135	.724	-.42	.22

In Table 21, participants are categorized into three groups based on their shopping frequency: Rarely, Occasionally, and Frequently. The mean abandonment rates for these groups are quite similar, with little variation. Table 22, however, reveals that the p-value is 0.802, which is much higher than the common significance level of 0.05. This high p-value indicates that there is no significant difference in abandonment frequency based on shopping frequency. In summary, these tables suggest that shopping frequency does not appear to significantly impact online shopping cart abandonment rates.

Table 21. ANOVA Descriptive Results of Shopping Frequency by Abandonment Frequency

	N	Mean	St. Dev.	St. Error
Rarely	14	2.07	.616	.165
Occasionally	86	2.02	.460	.050
Frequently	43	1.98	.556	.085
Total	143	2.01	.503	.042

Table 22. ANOVA Analysis Results of Shopping Frequency by Abandonment Frequency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.113	2	.057	.221	.802
Within Groups	35.859	140	.256		
Total	35.972	142			

The post hoc analysis results in Table 23 revealed that there were no statistically significant differences in abandonment frequency based on shopping frequency ($p > .05$). Specifically, the mean difference between the "Rarely" and "Occasionally" groups was .048 ($p = 0.942$). Similarly, the mean difference between the "Rarely" and "Frequently" groups was -.095 ($p = 0.816$).

Furthermore, there was no significant difference in abandonment rates between the "Occasionally" and "Frequently" groups (mean difference = 0.047, $p = 0.875$). These findings suggest that shopping frequency alone may not be a significant predictor of online shopping abandonment, and other factors may play a more prominent role in influencing abandonment behaviour.

Table 23. ANOVA Post Hoc Analysis Results of Shopping Frequency by Abandonment Frequency

(I) Shopping Frequency	(J) Shopping Frequency	Mean Difference (I-J)	St. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Rarely	Occasionally	.048	.146	.942	-.30	.39
	Frequently	.095	.156	.816	-.27	.46
Occasionally	Rarely	-.048	.146	.942	-.39	.30
	Frequently	.047	.095	.875	-.18	.27
Frequently	Rarely	-.095	.156	.816	-.46	.27
	Occasionally	-.047	.095	.875	-.27	.18

Table 24 categorizes participants into five groups based on the product category: Fashion, Electronic, Home, Cosmetics & Personal Care, and Other. It shows the average abandonment rates for each category. While there are slight variations, no significant differences are evident. In Table 25, the p-value is 0.218, considerably higher than the conventional significance level of 0.05. This shows that no significant difference is found in abandonment frequency among the product categories.

Table 24. ANOVA Descriptive Results of Product Category by Abandonment Frequency

	N	Mean	St. Dev.	St. Error
Fashion	64	2.06	.531	.066
Electronic	35	2.03	.453	.077
Home	10	1.9	.568	.180
Cosmetics & Personal Care	15	2.13	.516	.133
Other	19	1.79	.419	.096
Total	143	2.01	.503	.042

Table 25. ANOVA Analysis Results of Product Category by Abandonment Frequency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.459	4	.365	1.459	.218
Within Groups	34.513	138	.250		
Total	35.972	142			

Table 26 contains the post hoc analysis results, specifically investigating how different product categories may affect abandonment frequency. It provides a comprehensive comparison of abandonment frequency mean differences between various pairs of product categories. The results show that the mean differences in abandonment frequency between product categories are generally quite small, with p-values indicating non-significance. This suggests that there are no statistically significant variations in abandonment frequency associated with different product categories. For instance, when comparing the "Fashion" and "Electronic" product categories, the mean difference is minimal (0.034), and the p-value is not significant (0.998), signifying that there is no substantial difference in abandonment frequency between these two categories. Similar results are observed for comparisons with other product categories, including "Home," "Cosmetics & Personal Care," and "Others."

In summary, the post hoc analysis implies that the type of product category does not significantly impact abandonment frequency. Customers appear to exhibit similar cart abandonment behaviour across various product categories, as the differences observed are not statistically significant.

Table 26. ANOVA Post Hoc Analysis Results of Product Category by Abandonment Frequency

(I) Product Category	(J) Product Category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Fashion	Electronic	.034	.105	.998	-.26	.32
	Home	.163	.170	.874	-.31	.63
	Cosmetics & Personal Care	-.071	.143	.988	-.47	.33
	Others	.273	.131	.230	-.09	.63
Electronic	Fashion	-.034	.105	.998	-.32	.26
	Home	.129	.179	.952	-.37	.62
	Cosmetics & Personal Care	-.105	.154	.961	-.53	.32
	Others	.239	.143	.451	-.15	.63
Home	Fashion	-.163	.170	.874	-.63	.31
	Electronic	-.129	.179	.952	-.62	.37
	Cosmetics & Personal Care	-.233	.204	.783	-.80	.33
	Others	.111	.195	.980	-.43	.65
Cosmetics & Personal Care	Fashion	.071	.143	.988	-.33	.47
	Electronic	.105	.154	.961	-.32	.53
	Home	.233	.204	.783	-.33	.80
	Others	.344	.173	.276	-.13	.82
Others	Fashion	-.273	.131	.230	-.63	.09
	Electronic	-.239	.143	.451	-.63	.15
	Home	-.111	.195	.980	-.65	.43
	Cosmetics & Personal Care	-.344	.173	.276	-.82	.13

The independent t-test analysis results in Table 27 compared abandonment frequency based on gender. The results represent that there was no statistically significant difference in abandonment frequency between genders ($p > .05$). When

assuming equal variances, the t-value was .247 with a corresponding p-value of .403. When equal variances were not assumed, the t-value was .241 with a p-value of .405. The mean difference in abandonment frequency between genders was .022. The confidence interval of the difference ranged from -.153 to .196 when assuming equal variances and from -.157 to .201 when equal variances were not assumed. These findings suggest that gender is not a significant factor in predicting online shopping abandonment. Additionally, the Levene's test for equality of variances showed no significant difference between genders in terms of abandonment frequency.

Table 27. Independent t-test Analysis Results of Gender by Abandonment Frequency

		t-test for Equality of Means							
				Significance				95% Confidence Interval of the Difference	
		t	df	One-Sided p	Two-Sided p	Mean Diff	Std. Error Diff	Lower	Upper
Abandonment Frequency	Equal variances assumed	.247	141	.403	.806	.022	.088	-.153	.196
	Equal variances not assumed	.241	97.015	.405	.81	.022	.09	-.157	.201

		Levene's Test for Equality of Variances	
		F	Sig.
Abandonment Frequency	Equal variances assumed	.066	.798
	Equal variances not assumed		

Lastly, t-test analysis conducted in Table 28 explored the relationship between education and abandonment frequency. The findings revealed that there was no substantial disparity in abandonment frequency based on educational attainment

(p > .05). When assuming equivalent variances, the t-value was .576 with a corresponding p-value of .283. When equal variances were not assumed, the t-value amounted to .601 with a p-value of .275. The mean difference in abandonment frequency across various education levels was .058. The confidence interval for the difference ranged from -.142 to .258 under the assumption of equal variances, and from -.136 to .253 without assuming equal variances. These results suggest that education level does not exert a significant influence on the occurrence of online shopping abandonment. Moreover, the Levene's test for equality of variances indicated no noteworthy variation in abandonment frequency among different educational levels.

Table 28. Independent t-test Analysis Results of Education by Abandonment Frequency

		t-test for Equality of Means							
				Significance				95% Confidence Interval of the Difference	
		t	df	One-Sided p	Two-Sided p	Mean Diff	Std. Error Diff	Lower	Upper
Abandonment Frequency	Equal variances assumed	.576	141	.283	.566	.058	.101	-.142	.258
	Equal variances not assumed	.601	53.707	.275	.550	.058	.097	-.136	.253

		Levene's Test for Equality of Variances	
		F	Sig.
Abandonment Frequency	Equal variances assumed	.203	.653
	Equal variances not assumed		

4.4 Regression analyses

Starting with regression analysis on abandonment reason by examining the p-values, it has been observed that some predictors have p-values below the chosen significance level (e.g., 0.05), indicating that they are statistically significant predictors of the abandonment frequency. Table 29 provides a model summary, indicating that the predictors collectively explain 20.9% of the variability in abandonment frequency. Table 30 shows ANOVA results. The predictors are related to abandonment reasons. The p-value is less than 0.001, suggesting that the model significantly explains the variance in abandonment frequency.

The significant predictors include "Narrowing Options" (p = 0.053) and "Waiting for Discount" (p = 0.008). Additionally, "Better Discount Physical Store" (p = 0.043) was also found to be a significant predictor, suggesting that customers may be more likely to abandon their online shopping because they believe that better discounts can be found at brick-and-mortar retail stores as shown in Table 31. The other predictors may have some impact, but their significance levels are not strong enough to draw a definitive conclusion.

Table 29. The Effect of Abandonment Reason on Abandonment Frequency - Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.457[a]	.209	.142	.466

a. Predictors: (Constant), Offline Store Try, Being Bored, Long Basket Process, Delivery Fee on Checkout, Negative Reviews, Info Collection, Searching for Better Discount, Total Price On Checkout, Better Discount Physical Store, Waiting for Discount, Narrowing Options

Table 30. The Effect of Abandonment Reason on Abandonment Frequency - Anova[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.500	11	.682	3.137	<.001[b]
	Residual	28.472	131	.217		
	Total	35.972	142			

a. Dependent Variable: Abandonment Frequency

b. Predictors: (Constant), Offline Store Try, Being Bored, Long Basket Process, Delivery Fee on Checkout, Negative Reviews, Info Collection, Searching for Better Discount, Total Price on Checkout, Better Discount Physical Store, Waiting for Discount, Narrowing Options

Table 31. The Effect of Abandonment Reason on Abandonment Frequency - Coefficients

	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p
(Constant)	1.408	.216		6.522	<.001
Being Bored	.040	.027	.133	1.500	.136
Narrowing Options	.053	.027	.189	1.951	.053
Info Collection	.006	.024	.023	.249	.804
Searching for Better Discount	-.011	.028	-.035	-.383	.702
Waiting for Discount	.076	.028	.255	2.698	.008
Total Price on Checkout	.024	.026	.082	.922	.358
Better Discount Physical Store	.071	.035	.186	2.04	.043
Delivery Fee on Checkout	-.028	.023	-.107	-1.218	.226
Negative Reviews	-.004	.033	-.010	-.113	.910
Long Basket Process	.002	.024	.008	.091	.928
Offline Store Try	-.049	.030	-.153	-1.638	.104

Dependent Variable: Abandonment Frequency

Table 32 presents the results of the regression analysis examining the effect of abandonment reasons on abandonment frequency for customers below the age of 25. The model shows a relatively high R square value of 0.693, indicating that approximately 69.3% of the variance in the abandonment frequency can be explained by the selected predictors. The analysis in Table 33 reveals that abandonment reasons have a statistically significant impact on online shopping cart abandonment frequency, as indicated by a p-value of 0.023. Among the identified predictors, "Narrowing Options" appears to have the most significant impact on abandonment frequency. This suggests that customers below the age of 25 are more likely to add items to the basket while wandering around the e-commerce site and use the basket as a narrowing option on the buying decision process.

Table 32. The Effect of Abandonment Reason on Abandonment Frequency for Age Below 25 - Model Summary

Model	R Age = Below 25 (Selected)	R Square	Adjusted R Square	Std. Error of the Estimate
1	.833[a]	.693	.468	.326

a. Predictors: (Constant), Offline Store Try, Being Bored, Long Basket Process, Delivery Fee on Checkout, Negative Reviews, Info Collection, Searching for Better Discount, Total Price on Checkout, Better Discount Physical Store, Waiting for Discount, Narrowing Options

Table 33. The Effect of Abandonment Reason on Abandonment Frequency for Age Below 25 - Anova[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.595	11	.327	3.082	.023[c]
	Residual	1.591	15	.106		
	Total	5.185	26			

a. Dependent Variable: Abandonment Frequency
b. Selecting only cases for which New Age = Below 25
c. Predictors: (Constant), Offline Store Try, Being Bored, Long Basket Process, Delivery Fee on Checkout, Negative Reviews, Info Collection, Searching for Better Discount, Total Price on Checkout, Better Discount Physical Store, Waiting for Discount, Narrowing Options

Additionally, "Searching for Better Discount" and "Being Bored" also show significant positive relationships with abandonment frequency, with p values 0.042 and 0.044, respectively as shown in Table 34.

Table 34. The Effect of Abandonment Reason on Abandonment Frequency for Age Below 25 - Coefficients

	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p
(Constant)	.901	.508		1.774	.096
Being Bored	.084	.038	.405	2.203	.044
Narrowing Options	.196	.060	.755	3.290	.005
Info Collection	-.112	.061	-.438	-1.839	.086
Searching for Better Discount	.148	.066	.567	2.220	.042
Waiting for Discount	.011	.050	.042	.225	.825
Total Price on Checkout	.066	.048	.257	1.361	.194
Better Discount Physical Store	.060	.078	.181	.778	.449
Delivery Fee on Checkout	-.031	.037	-.147	-.835	.417
Negative Reviews	-.023	.070	-.067	-.325	.750
Long Basket Process	-.003	.043	-.014	-.080	.937
Offline Store Try	-.112	.061	-.459	-1.847	.085

Dependent Variable: Abandonment Frequency
Selecting only cases for which Age = Below 25

When comparing the results with the previous regression analysis which is without age split (Table 29) for the overall model, it is evident that the model's R square value is higher for the age group below 25 (0.693 vs. 0.209). This suggests that the selected predictors have a stronger influence on the abandonment frequency for this specific age group. Moreover, the significance of "Narrowing Options" as a predictor remains consistent in both analyses, suggesting its robust impact across different age groups. However, it is important to note that some predictors that were significant in the overall model, such as "Waiting for Discount" and "Better Discount

Physical Store," are not significant in the analysis for the age group below 25. This highlights the importance of segmenting the data and considering demographic variables to gain a more comprehensive understanding of the factors influencing abandonment behaviour in e-commerce.

The second regression analysis was conducted for the effect of cart usage on abandonment frequency. Table 35 presents the results of the regression analysis examining the effect of cart usage on abandonment frequency. The model shows a relatively low R square value of 0.046, indicating that only 4.6% of the variance in the abandonment frequency can be explained by the selected predictors.

Table 35. The Effect of Cart Usage on Abandonment Frequency - Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.213[a]	.046	-.004	.504

a. Predictors: (Constant), Basket Usage Other, Basket Usage Comparison List, Basket Usage Fun, Basket Usage Reserving Stock, Basket Usage Waiting for Discount, Basket Usage Tracking Price, Basket Usage Reminder List

Table 36 presents the results of an ANOVA analysis, indicating that cart usage factors do not significantly impact online shopping cart abandonment frequency, as evidenced by a non-significant p-value of 0.493. Table 37 offers coefficients for the included cart usage factors. It indicates the strength and direction of the relationship between each factor and abandonment frequency. While some factors show positive or negative associations, many have non-significant "p" values, implying limited practical significance in explaining variations in abandonment frequency. In summary, these tables collectively suggest that cart usage factors have

a limited impact on online shopping cart abandonment frequency, and the model's explanatory power is relatively low, as indicated by the modest R-squared values in Table 35 and non-significant results in Table 36.

Table 36. The Effect of Cart Usage on Abandonment Frequency - Anova[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.639	7	.234	.921	.493[b]
	Residual	34.333	135	.254		
	Total	35.972	142			

a. Dependent Variable: Abandonment Frequency

b.Predictors: (Constant), Basket Usage Other, Basket Usage Comparison List, Basket Usage Fun, Basket Usage Reserving Stock, Basket Usage Waiting for Discount, Basket Usage Tracking Price, Basket Usage Reminder List

Table 37. The Effect of Cart Usage on Abandonment Frequency - Coefficients

	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p
(Constant)	1.751	.121		14.414	<.001
Basket Usage Waiting for Discount	.046	.137	.029	.334	.739
Basket Usage Comparison List	.093	.093	.086	.994	.322
Basket Usage Reminder List	.252	.118	.207	2.134	.035
Basket Usage Tracking Price	-.041	.111	-.033	-.373	.710
Basket Usage Reserving Stock	.060	.105	.050	.573	.568
Basket Usage Fun	.177	.144	.114	1.229	.221

Dependent Variable: Abandonment Frequency

In the below part, table 38 presents the results of the regression analysis examining the effect of cart usage on abandonment frequency for customers below the age of 25. However, the adjusted R-squared is negative (-0.027), suggesting that

the model may not be a good fit for explaining abandonment frequency in this age group.

Table 38. The Effect of Cart Usage on Abandonment Frequency for Age Below 25 - Model Summary

Model	R Age = Below 25 (Selected)	R Square	Adjusted R Square	Std. Error of the Estimate
1	.458[a]	.210	-.027	.453

a. Predictors: (Constant), Basket Usage Other, Basket Usage Comparison List, Basket Usage Fun, Basket Usage Reserving Stock, Basket Usage Waiting for Discount, Basket Usage Tracking Price, Basket Usage Reminder List

Table 39 provides the ANOVA results for the model with the non-significant p-value (0.523) which suggests that the included cart usage factors do not have a statistically significant impact on abandonment frequency for individuals below 25 years of age. Table 40 provides coefficients reflecting the relationships between cart usage factors and abandonment frequency for individuals under 25 and the majority have p-values that are not statistically significant.

Table 39. The Effect of Cart Usage on Abandonment Frequency for Age Below 25 - Anova[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.089	6	.182	.887	.523[c]
	Residual	4.096	20	.205		
	Total	5.185	26			

a. Dependent Variable: Abandonment Frequency
b. Selecting only cases for which Age = Below 25
c. Predictors: (Constant), Basket Usage Other, Basket Usage Comparison List, Basket Usage Fun, Basket Usage Reserving Stock, Basket Usage Waiting for Discount, Basket Usage Tracking Price, Basket Usage Reminder List

In summary, these tables collectively indicate that cart usage factors have restricted explanatory capability in forecasting online shopping cart abandonment frequency for individuals below 25. The model's effectiveness within this specific age category is relatively weak, as highlighted by the adjusted R-squared in Table 38 and the non-significant findings in Table 39.

Table 40. The Effect of Cart Usage on Abandonment Frequency for Age Below 25 - Coefficients

	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p
(Constant)	1.764	.386		4.570	<.001
Basket Usage Waiting for Discount	-.238	.308	-.171	-.774	.448
Basket Usage Comparison List	.382	.253	.338	1.509	.147
Basket Usage Reminder List	.468	.386	.336	1.212	.240
Basket Usage Tracking Price	-.322	.276	-.285	-1.166	.257
Basket Usage Reserving Stock	-.021	.226	-.021	-.094	.926
Basket Usage Fun	.673	.382	.546	1.761	.094

Dependent Variable: Abandonment Frequency
Selecting only cases for which Age = Below 25

The model shows an R square value of 0.210, indicating that 21% of the variance in the abandonment frequency can be explained by the selected predictors. Among the identified predictors, "Basket Usage Fun" appears to have the most substantial impact on abandonment frequency, with a standardised coefficient (Beta) of 0.546 and a p-value of 0.094. This suggests that younger customers who use the shopping cart for fun activities are more likely to abandon their purchases during checkout. On the other hand, "Basket Usage Waiting for Discount" and "Basket Usage Tracking Price" show negative relationships with abandonment frequency,

although these relationships are not statistically significant with p-values of 0.448 and 0.257, respectively. The other cart usage factors, such as "Comparison List," "Reminder List," and "Reserving Stock," also do not appear to significantly influence abandonment behaviour in this age group.

When comparing the results with the previous regression analysis (Table 35), it is evident that the effect of cart usage on abandonment frequency varies based on age groups. While "Basket Usage Reminder List" showed a significant positive impact on abandonment frequency in the overall analysis, it does not appear to be significant for customers below the age of 25. Additionally, the impact of "Basket Usage Fun" on abandonment frequency is significant for this age group but was not significant in the overall analysis. These differences suggest that cart usage behaviour and its influence on abandonment may differ among different age segments.

The last but not the least regression analysis was conducted to understand the effect between security concerns and abandonment frequencies. At the table 41, the model shows an R square value of 0.030, indicating that only 3% of the variance in the abandonment frequency can be explained by the selected predictors, namely "Importance of Privacy," "Stolen Info Concern," and "Third Party Share Concern" which is a relatively low. However, Table 42 provides ANOVA results for the model in which the p-value is 0.240, indicating that the security concerns, including third-party sharing, privacy importance, and stolen information concern, do not have a statistically significant impact on abandonment frequency. Among the predictors, "Importance of Privacy" appears to have the most substantial impact on abandonment frequency, with a p-value of 0.052 as shown in Table 43. Furthermore, "Stolen Info Concern" and "Third Party Share Concern" show negligible impact on

abandonment frequency, with standardised coefficients of -0.024 and 0.065, respectively, and both predictors have p-values above 0.05. This implies that customers' concerns about stolen information and third-party sharing of their data do not significantly influence their tendency to abandon purchases during checkout.

Table 41. The Effect of Security Concerns on Abandonment Frequency - Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.172[a]	.030	.009	.501

a. Predictors: (Constant), Third Party Share Concern, Importance of Privacy, Stolen Info Concern

Table 42. The Effect of Security Concerns on Abandonment Frequency - Anova[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.069	3	.356	1.419	.240[b]
	Residual	34.903	139	.251		
	Total	35.972	142			

a. Dependent Variable: Abandonment Frequency

b. Predictors: (Constant), Third Party Share Concern, Importance of Privacy, Stolen Info Concern

Table 43. The Effect of Security Concerns on Abandonment Frequency

	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p
(Constant)	2.552	.302		8.456	<.001
Importance of Privacy	-.094	.048	-.175	-1.961	.052
Stolen Info Concern	-.007	.032	-.024	-.212	.833
Third Party Share Concern	.020	.034	.065	.584	.560

Dependent Variable: Abandonment Frequency

Table 44 presents the results of the regression analysis examining the effect of security concerns on abandonment frequency for customers below the age of 25. The model shows an R square value of 0.111 which is higher than overall analysis.

Table 45 examines the influence of security concerns on online shopping cart abandonment frequency specifically for individuals under the age of 25. However, the results indicate that the factors related to security concerns, including third-party sharing, importance of privacy, and stolen information concern, do not have a statistically significant impact on abandonment frequency for this age group, as the p-value (0.428) is not significant.

Table 44. The Effect of Security Concerns on Abandonment Frequency for Age Below 25 - Model Summary

Model	R Age = Below 25 (Selected)	R Square	Adjusted R Square	Std. Error of the Estimate
1	.334[a]	.111	-.005	.448

a. Predictors: (Constant), Third Party Share Concern, Importance of Privacy, Stolen Info Concern

Table 45. The Effect of Security Concerns on Abandonment Frequency for Age Below 25 - Anova[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.577	3	.192	.960	.428[c]
	Residual	4.608	23	.200		
	Total	5.185	26			

a. Dependent Variable: Abandonment Frequency
b. Selecting only cases for which Age = Below 25
c. Predictors: (Constant), Third Party Share Concern, Importance of Privacy, Stolen Info Concern

Among the predictors, "Third Party Share Concern" appears to have the most substantial impact on abandonment frequency, with a standardised coefficient (Beta) of -0.244 and a p-value of 0.387 as shown in Table 46. This suggests that customers below the age of 25 who express higher concerns about third-party sharing of their data are less likely to abandon their purchases during the checkout process. However, the coefficients reveal that none of the predictors have a statistically significant effect

on abandonment frequency in this specific age group. The "p" values for all predictors are not significant. Therefore, it can be concluded that these security concerns have limited explanatory power in predicting abandonment behaviour for this age group.

Table 46. The Effect of Security Concerns on Abandonment Frequency for Age Below 25

	Unstandardized Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	p
(Constant)	2.973	.495		6.005	<.001
Importance of Privacy	-.045	.078	-.122	-.577	.569
Stolen Info Concern	-.009	.069	-.035	-.128	.899
Third Party Share Concern	-.067	.076	-.244	-.881	.387

Dependent Variable: Abandonment Frequency / Selecting only cases for which Age = Below 25

Comparing these results within age groups, it can be said that the influence of security concerns is not particularly strong for both the overall and the younger group. The R square values for both models are relatively low. Additionally, the standardised coefficients and p-values suggest that the selected security concerns may not be robust predictors of abandonment frequency for both customer groups. It's essential to consider that consumers may make critical decisions even before entering an e-commerce website if they have doubts about the website's security measures. This preliminary decision process occurs prior to engaging with the website and may result in potential customers opting not to start the shopping process at all. Unfortunately, this pre-entry decision-making aspect lies outside the scope of this analysis, but it underscores the importance of addressing security concerns comprehensively in e-commerce, as these concerns can deter potential customers from even initiating the shopping journey.

CHAPTER 5

CONCLUSION

5.1 Limitations

While this research provides valuable insights into the determinants of shopping cart abandonment in the Turkish e-commerce landscape, it is essential to acknowledge the limitations that may impact the interpretation and generalizability of the findings. One notable limitation is the reliance on self-submitted survey data. Although this method has been employed by previous scholars to study cart abandonment, it does have inherent biases and may not always accurately represent actual consumer behaviour (e.g., Rajamma et al., 2009; Kukar-Kinney and Close, 2010; Xu and Huang, 2015; Kapoor and Vij, 2021). Future research can benefit from incorporating complementary data sources, such as clickstream data, to provide a more comprehensive understanding of cart abandonment behaviour. However, it is important to note that relying solely on clickstream data also has its own set of limitations, as highlighted by Kukar-Kinney et al. (2022).

To bridge the gap between what consumers say and what they actually do, future studies could explore a mixed-methods approach, combining survey data with in-depth interviews or observations. This integrated approach can offer a more holistic view of consumer motivations and actions related to cart abandonment. Moreover, on-site surveys represent a valuable tool for gathering real-time data on cart abandonment behaviour. Businesses looking to understand and predict cart abandonment reasons should consider implementing on-site surveys as part of their

research strategy. This approach can provide immediate insights into user behaviour and preferences.

In addition to the limitations on the research approach, there are some other limitations in this study due to insufficient data for some questions. In order to minimise the impact of these data limitations and provide a comprehensive analysis within the constraints of the available data, the findings were merged and re- grouped for the following variables: age, education, income level, shopping frequencies, monthly spending, abandonment frequencies, and the last time when abandonment occurred. This circumstance may pose a risk of losing certain details and limit the comprehensive presentation of the results and also may lead us to low sample size with many variables. As a result, there are limitations regarding the interpretation and generalizability of the findings.

5.2 Conclusion and future directions

In conclusion, this research contributes to the understanding of shopping cart abandonment in the context of Turkish e-commerce. However, it is important to recognize the limitations stemming from the research approach and data constraints. Future research in this area should consider the following directions:

1. Mixed-Methods Approach: To bridge the gap between survey responses and actual behaviour, future studies can employ a mixed-methods approach, combining survey data with qualitative methods like in-depth interviews or behavioural observations. This can provide richer insights into the complexities of cart abandonment.
2. Integration of Clickstream Data: Researchers should continue exploring the integration of clickstream data alongside survey data to gain a more

comprehensive understanding of user behaviour. This approach can help identify patterns and discrepancies between stated intentions and actions.

3. On-Site Surveys: Businesses aiming to reduce cart abandonment rates and improve customer experiences should consider implementing on-site surveys to collect real-time data and feedback from their customers. This can inform immediate adjustments to website design and marketing strategies. Expanded
4. Data Collection: Future research should strive to gather more comprehensive data, addressing the limitations related to variables such as age, education, income level, shopping frequencies, and abandonment frequencies. This would enhance the depth and accuracy of the findings.
5. Cross-Cultural Comparisons: Comparative studies across different cultures and regions can provide valuable insights into the variations in cart abandonment behaviour. Such research can help businesses tailor their strategies to specific consumer segments whereas if the cultural differences are huge then there may be misleading or irrelevant results. This study is comparing the previous results of Kukar-Kinney and Close (2010) which was conducted representing the characteristics of the U.S. citizens. In order to minimise such differences, future research may compare to other cultures where the similarity with Turkish consumers is much higher such as Eastern Europe.
6. Addressing the Issue of Outdated Questionnaires: Given that the questionnaire used in this research was based on a study from 2010, it is imperative for future research to update and adapt survey questions to reflect the evolving landscape of e-commerce. This will ensure that the insights

gleaned remain relevant and applicable to the contemporary online shopping environment.

In summary, while this study offers valuable insights into the determinants of cart abandonment in Turkey, it serves as a starting point for more extensive and nuanced research in the field. Recognizing the limitations and building on them, future studies can contribute to a deeper understanding of this complex phenomenon, ultimately benefiting e-commerce businesses and consumers alike.

APPENDIX

RESEARCH INSTRUMENTS

Questionnaire

The Relationship Between the Purposes of Using the Shopping Cart and Abandonment Behaviour of the Cart in Online Shopping

This study is created to examine the relationship between users' intentions for using the shopping cart in online purchases and their behaviour of abandoning the shopping cart before completion. Your responses will be used for my thesis prepared for the Boğaziçi University International Trade Management Master's degree and will be kept strictly confidential.

1- Please select your gender:

Female ___

Male ___

Prefer not to specify ___

2- Please choose the age range that best applies to you:

Under 18 ___

18-25 ___

26-35 ___

36-45 ___

45-55 ___

56 and above ___

3- Please select your educational level:

High School __

University ___

Master's Degree___

Ph.D. ___

Other ___

4- Please select your monthly income range:

Less than 10,000 TL___

Between 10,001 TL – 20,000 TL___

Between 20,001 TL – 30,000 TL___

Between 30,001 TL – 40,000 TL___

40,001 TL and above___

5- How often do you shop online?

Every day ___

More than twice a week___

Once a week ___

More than twice a month___

Once a month ___

Every 2-3 months ___

1-2 times a year ___

I do not shop online ___

6- Please select the average monthly amount you spend on online shopping:

Less than 1,000 TL ___

Between 1,001 TL – 2,500 TL ___

Between 2,501 TL - 5,000 TL ___

Between 5,001 TL – 7,500 TL ___

Between 7,501 TL – 10,000 TL ___

10,001 TL and above___

7- Is internet privacy important to you? Please rate on a scale of 1 to 7, with 1 being "Never" and 7 being "Always."

	1	2	3	4	5	6	7	
Never								Always

8- Are you concerned about your identity and card information being stolen when you shop online? Please rate on a scale of 1 to 7, with 1 being "Never" and 7 being "Always."

	1	2	3	4	5	6	7	
Never								Always

9- Are you concerned that the seller will share your information with third parties? Please rate on a scale of 1 to 7, with 1 being "Never" and 7 being "Always."

	1	2	3	4	5	6	7	
Never								Always

10- Do you sometimes add items to your cart in online shopping but do not complete the purchase?

Yes ___

No ___

I do not remember ___

11- When was the last time you added a product to your online cart but exited the shopping website without making a purchase?

Today ___

In the last week___

In the last month___

In the last three months___

In the last year___

I do not remember ___

12- Can you select the category of the last product you exited without purchasing?

Fashion ___

Electronics ___

Home & Furniture ___

Cosmetics & Personal Care ___

Jewellery & Watches ___

Sports & Outdoor ___

Books, Music, Film, Games ___

Automotive & Motorcycle ___

Maternity & Baby & Toys ___

Pet Shop ___

Supermarket ___

Other ___

13- Can you select the price range of the last product you exited without purchasing?

Less than 250 TL ___

Between 251 TL - 500 TL ___

Between 501 TL - 750 TL ___

Between 751 TL - 1000 TL ___

1001 TL and above ___

I do not remember ___

14- For what purposes do you use your online shopping cart? (You can make multiple selections.)

I think I will get a discount because I have products in my cart. ___

I use my cart as a comparison list. ___

I use my cart as a list for items I plan to buy later. ___

I use my cart to quickly track changes in product prices. ___

I believe that keeping items in my cart for a while gives me extra time when I haven't made a definite decision to purchase. ___

I enjoy adding and removing products from my cart, even when I know I won't buy them. ___

Other ___

Please evaluate the reasons for using your online shopping cart on a scale of 1 to 7, where 1 is 'Never' and 7 is 'Always' for the next 3 questions.

15- I add items to my cart just for fun when I'm bored.

	1	2	3	4	5	6	7	
Never								Always

16- I add items to the shopping cart to narrow down my choices and make a more comfortable selection.

	1	2	3	4	5	6	7	
Never								Always

17- I use the shopping cart as a way to gather information about products.

	1	2	3	4	5	6	7	
Never								Always

Please evaluate the reasons for abandoning the items in your online cart on a scale of 1 to 7, where 1 is 'Never' and 7 is 'Always' for the next 9 questions.

18- I think I can find better discounts in another online store.

	1	2	3	4	5	6	7	
Never								Always

19- I consider waiting for the product to go on sale before making a purchase.

	1	2	3	4	5	6	7	
Never								Always

20- I decide not to make a purchase when I see the total amount at the payment step.

	1	2	3	4	5	6	7	
Never								Always

21- I think I can find better discounts in a physical store.

	1	2	3	4	5	6	7	
Never								Always

22- I abandon the item in my cart to see and try it in a physical store before purchasing.

	1	2	3	4	5	6	7	
Never								Always

23- I decide not to make a purchase when I see the shipping fees for my order.

	1	2	3	4	5	6	7	
Never								Always

24- I am influenced by the reviews I read about the product before purchasing and decide not to buy it.

	1	2	3	4	5	6	7	
Never								Always

25- I become uncomfortable with entering too much membership information to complete the purchase and abandon my cart.

	1	2	3	4	5	6	7	
Never								Always

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