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AI's Role in Shaping Payment Preferences, Consumer Behavior, and Demographic Trends in E-Commerce in Greece

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ABSTRACT

This study investigates the demographic, socioeconomic, and behavioral factors influencing online shopping habits and payment preferences, with a focus on the role of artificial intelligence (AI) in shaping consumer behaviors. Using a cross-sectional survey design, data were collected from 435 participants in Thessaly, Greece, through both online and paper-based questionnaires. The findings reveal that consumer satisfaction, particularly regarding convenience, time savings, and discounts, significantly affects the likelihood of exclusive online shopping.

Gender and age emerged as key determinants in payment preferences, with women favoring debit/credit cards and younger consumers preferring digital payment methods. Regional differences also influenced payment choices, with urban consumers opting for digital methods and rural consumers favoring cash. The study highlights the potential of AI in personalizing the shopping experience, optimizing payment systems, and enhancing security. These insights offer valuable implications for e-commerce businesses seeking to refine strategies and improve consumer engagement in the rapidly evolving digital marketplace.

Keywords: *AI in retail, consumer preferences, E-commerce trends, digital payment, online shopping behavior, payment methods.*

Introduction

The post-COVID-19 pandemic era has ushered in profound and enduring changes in consumer behavior, particularly within the domain of e-commerce. These transformations have been shaped by a convergence of economic disruptions, evolving social dynamics, and rapid technological advancements (Prebreza & Shala, 2021; Cao, 2012). The widespread adoption of e-commerce has fundamentally altered purchasing behaviors, with factors such as income disparities, gender differences, payment preferences, and regional variations playing pivotal roles (Al Hamli & Sobaih, 2023; Gu et al., 2021; Gurupandi et al., 2024). As businesses adapt to these evolving trends, the integration of Artificial Intelligence (AI) into their digital strategies has become essential. AI offers innovative solutions to address the challenges posed by pandemic-driven changes, enabling retailers to understand and respond more effectively to consumers' needs (Shanmugapriya & Pavithra, 2024). Economic factors, such as disposable income, play a significant role in shaping e-commerce behaviors. Research by Selvam and Gomathi (2021) highlights that higher-income groups exhibit a stronger preference for online shopping. AI-driven data analytics empowers businesses to segment consumers by income and demographics, facilitating targeted marketing strategies. Through machine learning algorithms, businesses can analyze purchase histories, browsing behaviors, and demographic data to predict consumer preferences, offering personalized product recommendations and promotions

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(Shrirame et al., 2020). This level of personalization is critical for fostering customer loyalty and improving conversion rates, particularly in an increasingly competitive post-pandemic e-commerce landscape (Bawack et al., 2024). Age and location have also emerged as influential factors in e-commerce trends during and after the pandemic. Younger, urban consumers have demonstrated a growing reliance on digital platforms for acquiring goods such as food delivery, electronics, and home exercise equipment (AbdulHussein et al., 2022; Pšurný, Baláková, & Stávková, 2022).

AI technologies, including chatbots and virtual assistants, enhance the shopping experience for these consumers by providing immediate support and personalized interactions. Furthermore, AI optimizes inventory management by predicting product trends and dynamically adjusting stock levels. By analyzing social media activity, online reviews, and search queries, AI enables businesses to anticipate demand for emerging products and refine their inventory and marketing strategies accordingly (Fedorko et al., 2022). AI also plays a key role in enhancing payment systems, which are increasingly central to consumer trust and satisfaction in the e-commerce ecosystem. During the pandemic, the demand for secure and seamless payment options intensified. AI-powered fraud detection systems improved security by identifying suspicious activities in real-time, thereby boosting consumer confidence (Ieiri, Yamaki, & Hishiyama, 2024; Kunc et al., 2024; Lee et al., 2017). Additionally, AI facilitates frictionless payment processes, such as biometric authentication and intelligent payment routing, enhancing the overall customer experience. These systems also address regional and gender-specific payment preferences by analyzing consumer data to uncover trends, enabling businesses to tailor their strategies to meet diverse consumer needs. The post-pandemic landscape has profoundly transformed consumer engagement with e-commerce platforms, driven by shifts in purchasing behaviors across various demographics. Factors such as economic disruptions, changing social dynamics, and technological advancements have shaped these shifts, prompting businesses to adopt AI-driven approaches (Selvam & Gomathi, 2021; AbdulHussein, Cozzarin, & Dimitrov, 2022; Ma et al., 2022; Pandey & Parmar, 2019). AI's ability to analyze vast amounts of data has proven invaluable for personalizing consumer experiences and ensuring that businesses remain competitive in an evolving digital marketplace (Al Hamli & Sobaih, 2023; Müller-Pérez et al., 2023).

This study aims to investigate the factors influencing online shopping behaviors and payment preferences. The first objective is to examine the relationship between satisfaction with online purchases and the likelihood of exclusively shopping online, considering factors such as time constraints and discounts. The second objective explores gender-based differences in online shopping habits, including initial online purchases, intentions to shop more frequently, and preferred payment methods. The third objective focuses on age-related payment preferences, particularly the choice between cash and bank transfers. The fourth objective addresses regional differences in payment preferences across rural, urban, suburban, and island areas. Lastly, the study examines the payment preferences of household decision-makers, particularly those who favor cash transactions. This research seeks to provide actionable insights into online shopping behaviors and payment preferences, offering valuable guidance to businesses and policymakers in the e-commerce sector.

Demographic Influences, E-Payment Adoption, and the Role of AI in Shaping E-Commerce Trends

As digital platforms continue to grow in importance, understanding the intricate interplay of factors such as gender, education, region, and socio-cultural influences is essential for businesses to craft effective marketing and payment strategies (Williams & Willick, 2023; Zamfirache, et al. 2024; Alimo, 2020). In this evolving landscape, Artificial Intelligence (AI) is emerging as a powerful tool to address these shifts, providing insights into consumer behavior, enhancing payment systems, and improving customer engagement. By integrating AI into e-commerce platforms, businesses can better serve the diverse needs of global consumers. Demographic factors such as gender, education, and region significantly impact online shopping habits (Al Hamli & Sobaih, 2023; Müller-Pérez et al., 2023). AI can leverage machine learning algorithms to analyze these factors, allowing businesses to tailor product offerings and payment options. For example, women tend to purchase more items online than men and prefer credit/debit card payments (Tutar et al., 2024; Piersiala & Kabus, 2023). AI-driven analytics help personalize recommendations, promotions, and advertisements, improving conversion rates. AI can also identify regional differences, such as urban consumers preferring e-wallets while rural shoppers favor cash (Annisaa et al., 2023). By understanding these variations, businesses can optimize payment options and shopping experiences, ensuring higher engagement and customer satisfaction.

The adoption of digital payment methods is influenced by factors such as gender, income, and transaction value, as highlighted by studies from Piersiala & Kabus (2023) and Annisaa et al. (2023). AI plays a key role in optimizing e-payment systems by analyzing consumer preferences and identifying patterns in payment behavior. For instance, AI can leverage the tendency of women to prefer card payments and men to favor bank transfers (Piersiala & Kabus, 2023), recommending the most suitable payment methods at checkout. Additionally, AI can integrate secure payment solutions like biometric authentication and fraud detection to ensure a smooth, secure transaction process. This is crucial as trust in online payments is essential for adoption. AI-driven fraud detection systems can monitor transactions in real time, preventing fraud and boosting consumer confidence. Furthermore, AI can optimize payment methods based on transaction size, with consumers preferring digital payments for larger purchases (Annisaa et al., 2023), enhancing the overall payment experience. This is especially beneficial in markets where payment preferences vary by demographics and transaction type (Necula & Păvăloaia, 2023).

Regional and cultural differences in consumer behavior further underscore the importance of AI in shaping global e-commerce strategies. For example, in South Africa, consumers prioritize reliable order fulfillment over aesthetics (Heyns & Kilbourn, 2022), while in Bangladesh, online shopping is growing rapidly, particularly among women and car owners (Enam et al., 2024). AI can assist businesses by analyzing regional trends and adjusting their offerings to meet local preferences. By tracking consumer sentiment, purchase behavior, and social media trends, AI enables retailers to personalize product assortments, optimize delivery times, and tailor marketing campaigns to specific regions. This ability to adjust and refine strategies in real time gives businesses a competitive edge in a fast-changing global market, ensuring their products and services resonate with diverse consumer demographics (Necula & Păvăloaia, 2023). Gender-based purchasing patterns and regional differences can be leveraged to optimize product recommendations, language, and pricing, creating a more personalized shopping experience (Shanmugapriya & Pavithra, 2024; Nimbalkar & Berad, 2021).

Payment Preferences, Security Concerns, and AI-Driven Personalization in Enhancing E-Commerce Transactions and

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User Experience

The growing reliance on e-commerce has underscored the importance of payment preferences and security concerns influencing consumer behavior (Rahmani & Kordrostami, 2023). Research by Sajid et al. (2022) in Pakistan and Santos et al. (2024) in Indonesia reveals that cash on delivery (COD) remains dominant due to trust issues with online payments. However, a gradual shift toward digital payments has been observed, particularly during the pandemic when contactless methods became essential. AI can address these security concerns by enhancing payment system security through real-time fraud detection using machine learning algorithms. Biometric authentication further strengthens digital transactions, adding an extra layer of safety. AI-powered chatbots can offer instant security guidance, addressing consumer fears and building trust, especially among women, who are often more concerned with security. This can lead to higher adoption of digital payments and improved consumer confidence in e-commerce platforms (Necula & Păvăloaia, 2023).

Studies, such as those by Qian and Palvia (2022), highlight the psychological impact of payment methods on consumer behavior, emphasizing how payment transparency and decoupling (separating the payment process from the consumption experience) influence purchasing decisions, especially for hedonic products. AI enhances both the personalization of payment options and the overall user experience by analyzing consumer behavior, tailoring payment methods based on transaction history, product preferences, and individual habits. AI can suggest payment options like mobile payments or e-wallets for consumers seeking a "decoupled" experience, encouraging impulsive spending. It can also optimize payment choices based on factors such as transaction size, location, and consumer familiarity with technology. For example, AI predicts that urban consumers prefer debit cards or mobile payments for larger transactions, while rural consumers may favor cash on delivery (Ohlan et al., 2019). By offering personalized, region-specific payment options, AI enhances convenience and reduces friction, ensuring a smoother, more efficient checkout process and better user experience (Santos et al., 2024; Necula & Păvăloaia, 2023).

AI-driven solutions enable e-commerce platforms to tailor payment offerings based on demographic insights. Research by Pan (2024) shows that younger, tech-savvy consumers, particularly in high-crime areas, prefer electronic payments due to their convenience and perceived security. By leveraging AI, businesses can segment consumers by age, location, and income, offering personalized payment methods. For instance, younger, digitally engaged consumers may favor mobile payments or digital wallets, while older or less tech-savvy consumers might prefer cash on delivery or bank transfers (Necula & Păvăloaia, 2023). AI also tracks real-time payment trends, enabling businesses to quickly adapt to changes in consumer behavior. During crises like the COVID-19 pandemic, AI helped businesses address the surge in demand for contactless payment solutions, ensuring security and efficiency. By continuously aligning payment methods with consumer preferences, AI enhances user experience, boosts customer satisfaction, and supports long-term business growth (Kolodin et al., 2020).

Theoretical Framework

Integrated Theoretical Framework: Demographics, Payment Preferences, and AI in E-Commerce Consumer Behavior

The Integrated Theoretical Framework for this research examines the complex relationships between demographic factors, payment preferences, and the role of Artificial Intelligence (AI) in influencing consumer behavior within the context of e-commerce. This framework integrates insights from consumer behavior, payment systems, and AI to offer a comprehensive understanding of how businesses can navigate the evolving e-commerce landscape (Fig. 1).

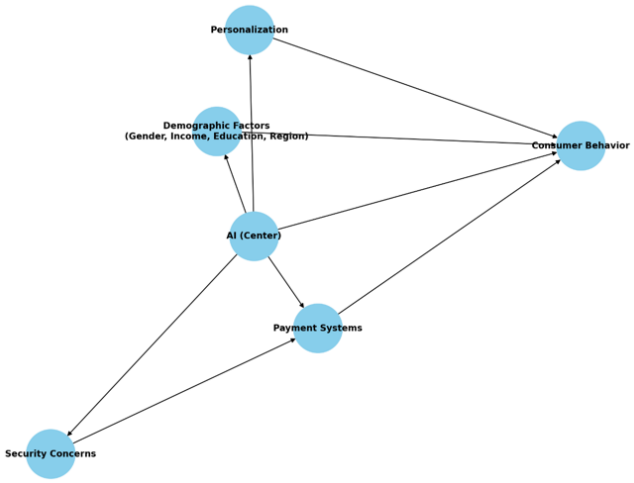

Fig. 1. Integrated Framework: Demographics, Payment Preferences, and AI in E-Commerce Consumer Behavior

It underscores the role of AI in personalizing consumer experiences, enhancing payment systems, improving security, and equipping businesses with the tools necessary to remain competitive in the global marketplace. Demographic factors such as gender, income, education, and region significantly influence consumer behavior in e-commerce (Greenacre & Akbar, 2019; Almanza, et al. 2023; Bareja-Wawryszuk, et al. 2022). For example, research shows that women tend to prefer credit or debit cards for online transactions, while men are more inclined to use bank transfers. Regionally, cash on delivery (COD) remains popular in certain areas due to concerns over the security of online transactions. These variations highlight the importance of understanding consumer preferences and behaviors. AI helps businesses analyze demographic data to identify patterns and customize product offerings, marketing strategies, and payment options accordingly. Payment preferences are influenced by factors like transaction size, trust, and technology adoption. Larger transactions are more likely to be completed with digital payments, such as e-wallets or credit/debit cards, while smaller ones may still be settled via COD (Wang & Chapa, 2021). Consumer trust is a key determinant in payment choices, especially in emerging markets where concerns about cybercrime and fraud are prevalent (Poornima, 2024). AI addresses these issues by providing enhanced security features like real-time fraud detection and biometric authentication (Khurana, 2020). Furthermore, AI personalizes payment options based on consumer behavior, predicting the preferred method for a given transaction, which improves the overall shopping experience. Security concerns are a significant barrier to the widespread adoption of digital payments, particularly due to fears of fraud, privacy violations, and identity theft. These concerns are more pronounced among women, who tend to be more cautious about using digital payment systems. AI mitigates these fears by enhancing security with real-time monitoring, fraud detection algorithms, and biometric verification methods, thus boosting consumer confidence and encouraging the adoption of secure online payment solutions (Shang & Chiu, 2022).

AI-driven customer support, such as chatbots, can also provide immediate responses to security-related inquiries, offering consumers guidance on safe online practices and fostering trust in e-commerce platforms. AI serves as a valuable tool in personalizing

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the online shopping experience. These AI tools can offer guidance on safe online practices, thereby fostering trust and enhancing the overall customer experience. As AI analyzes consumer data, it enables businesses to personalize the online shopping journey by segmenting users based on demographic profiles, preferences, and past behaviors. This segmentation allows businesses to tailor product recommendations, promotions, and even payment methods to individual consumers. For instance, younger, tech-savvy consumers may prefer mobile payments or digital wallets, while older consumers or those in regions with lower technological adoption may opt for traditional methods like cash on delivery (Galushko & Riabchyk, 2024). By predicting preferences based on demographic and behavioral data, AI ensures that businesses cater to the specific needs of each segment, boosting the likelihood of conversion and improving customer satisfaction. Moreover, AI helps businesses respond effectively to regional and cultural differences in consumer behavior. Research highlights that different regions prioritize various aspects of the shopping experience. For example, in South Africa, consumers place a higher value on reliable order fulfillment, while in Bangladesh, online shopping is rapidly growing, particularly among women and car owners. By continuously monitoring regional trends through AI, businesses can adjust their offerings in real-time, ensuring that products, marketing strategies, and payment options align with local preferences. AI can analyze social media, online content, and customer feedback to detect emerging trends, empowering businesses to refine their strategies and stay ahead in a dynamic global marketplace (Mullangi, 2023). The role of AI extends beyond personalization and security to optimizing payment systems. By analyzing transaction data, AI predicts the most suitable payment methods based on transaction size and preferences, ensuring a smooth checkout process. For example, it recommends e-wallets or credit cards for larger purchases and cash on delivery for smaller ones. AI also improves security by detecting fraud and streamlining payment flows, especially in regions with lower digital payment adoption. It helps businesses adapt quickly to changing consumer preferences and regional trends, while also implementing advanced authentication measures to build trust in online transactions (Khurana, 2020).

In conclusion, the Integrated Theoretical Framework highlights how AI, by personalizing consumer experiences, optimizing payment methods, and enhancing security, helps businesses address demographic factors and security concerns, enabling them to remain competitive in the evolving global e-commerce landscape.

Methods

Research Design

This study employed a cross-sectional survey design to investigate demographic, socioeconomic, and behavioral factors influencing shopping habits and perceptions of online shopping. This design facilitated the collection of diverse variables at a single point in time, enabling the analysis of distributions, trends, and relationships among the data. Additionally, the study integrated descriptive and inferential statistical methods to examine associations between demographic characteristics (e.g., age, gender, marital status) and behavioral tendencies (e.g., frequency of online shopping, payment preferences, and satisfaction levels). Statistical tools like chi-square tests and Spearman's correlation were used to identify significant associations and trends in the dataset.

Participants

The study included 435 participants selected through random sampling to represent a diverse cross-section of the Greek population. Most were women (about 75%), with a significant portion being young adults under 24. The sample included individuals from various marital statuses, household sizes, and educational backgrounds, with over half holding university or technical degrees. A majority had recent online shopping experience, reflecting high engagement with e-commerce.

Materials

The study used a structured survey to gather data on participants' demographics, shopping behaviors, and online shopping perceptions. It included sections on age, gender, marital status, household size, education, and shopping habits, such as the frequency of online vs. traditional shopping and preferred product categories. The survey also assessed perceptions through Likert-scale items on satisfaction, factors like discounts and convenience, and barriers to online shopping. Payment preferences, including methods like cash-on-delivery and digital wallets, were also explored. The survey was available online and in paper format for participants in Thessaly.

Procedure

Participants were recruited through online networks and targeted outreach in Thessaly, using random and convenience sampling to ensure diversity in age, education, and shopping experience. Informed consent was obtained, with clear communication on study objectives, voluntary participation, and confidentiality. The survey was available online and in paper format to ensure inclusivity. Data was collected over a week in May 2024 and securely stored. Incomplete or invalid responses were excluded, resulting in 435 valid responses.

Data Analysis

The survey data were analyzed using descriptive and inferential statistics. Descriptive statistics, such as frequencies and percentages, summarized the sample's demographics and responses to key survey items. Chi-square tests examined relationships between categorical variables (e.g., gender, age, shopping behaviors) to identify significant associations. Spearman's rank-order correlation was used to assess relationships between ordinal variables, such as satisfaction with online shopping and the importance of factors like convenience and discounts. SPSS was used for analysis, with a significance level set at $p < .05$ to ensure the reliability of the findings.

Results

Demographic characteristics of participants

The survey revealed that 75.2% of participants were women (n = 327), while 24.8% were men (n = 108). The majority of respondents were young adults, with 48.0% under 24 years of age (n = 209), 22.1% aged 35-44 (n = 96), and 12.4% aged 25-34 (n = 54). A significant proportion of participants were unmarried (59.3%, n = 258), followed by married individuals (34.0%, n = 148) and divorced individuals (5.3%, n = 23). Regarding children, 23.9% had no children, while 14.5% had two children (n = 63) and 8.5% had one child (n = 37). The most common household size was four people (27.6%, n = 120), and 51.5% of respondents held a higher education degree (n = 224). A majority resided in urban areas (63.0%, n = 274), with the largest employment group being private sector workers (34.5%, n = 150). In terms of income, 31.0% of respondents earned between 0 and 299 euros per month (n = 135) (Fig. 2-4).

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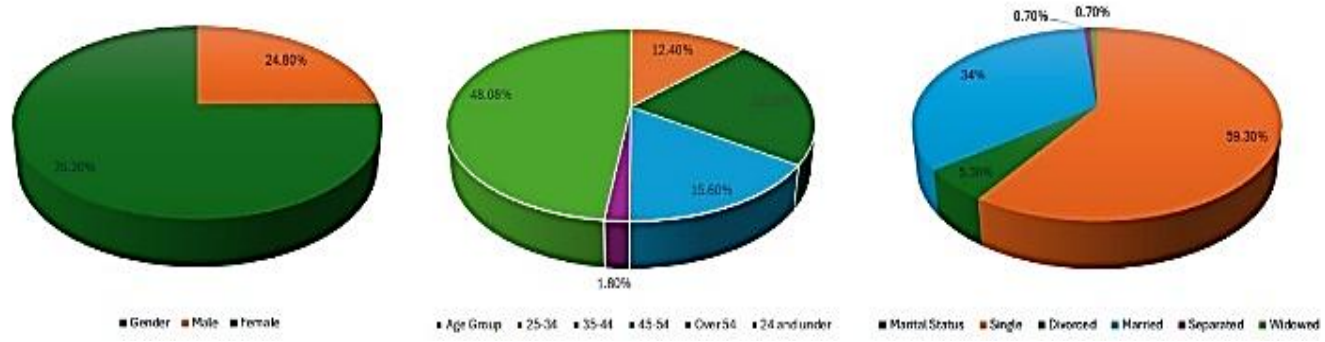

Fig 2. Demographic Profile: Gender, Marital Status, and Age Distribution

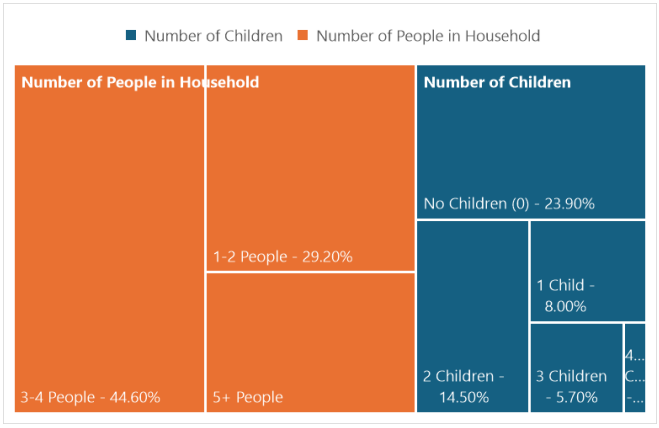

Fig 3. Household Composition: Number of People and Number of Children

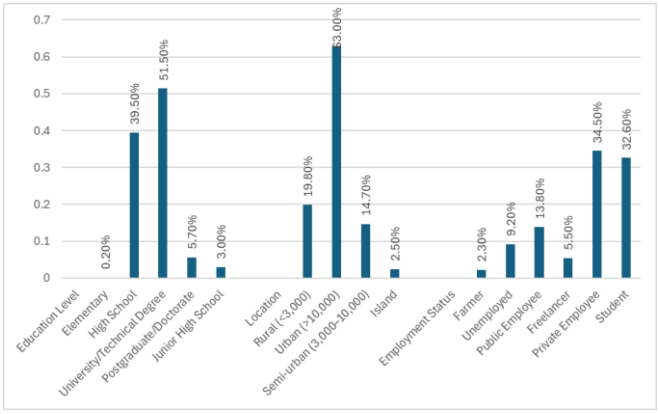

Fig 4. Demographic Information: Education Level, Location, and Employment Status

Shopping Behavior and Perceptions of E-commerce

The survey found that 57.7% of respondents (n = 251) were primarily responsible for household shopping, while 32.9% (n = 143) reported another family member handled it, and 9.4% (n = 41) said their spouse did the shopping. Regarding shopping methods, 72.0% (n = 313) preferred a hybrid of online and traditional shopping, 23.4% (n = 102) favored traditional shopping, and 4.6% (n = 20) preferred online shopping only. In terms of online shopping, 52.2% (n = 227) shopped online frequently, and 39.3% (n = 171) occasionally. Price was considered "very important" by 58.9% (n = 256), and 54.7% (n = 238) rated quality as "very important." Convenience was also crucial, with 52.4% (n = 228) valuing 24-hour access as "very important," and 62.1% (n = 270) considered product variety "very important." Speed was significant for 46.0% (n = 200), while 41.1% (n = 179) deemed it "quite important." On the drawbacks of online shopping, 61.1% (n = 266) viewed financial fraud as a "very significant disadvantage," and 52.6% (n = 229) saw a lack of security similarly. Online fraud concerns were a "very significant disadvantage" for 60.5% (n = 263), and 47.6% (n = 207) rated viruses as a major concern (Fig. 5-7).

Fig 5. Shopping Preferences and Online Shopping Behavior

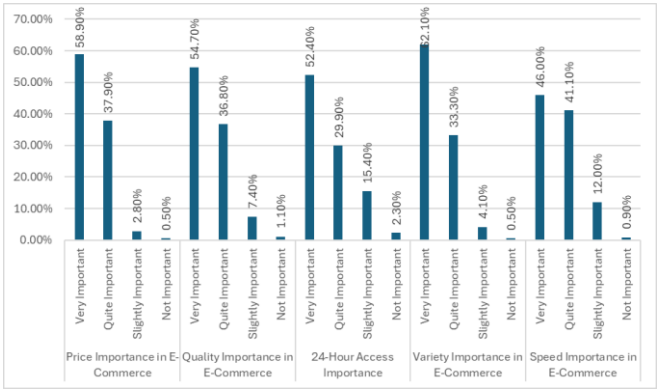

Fig 6. Factors Influencing E-Commerce and Perceived Disadvantages

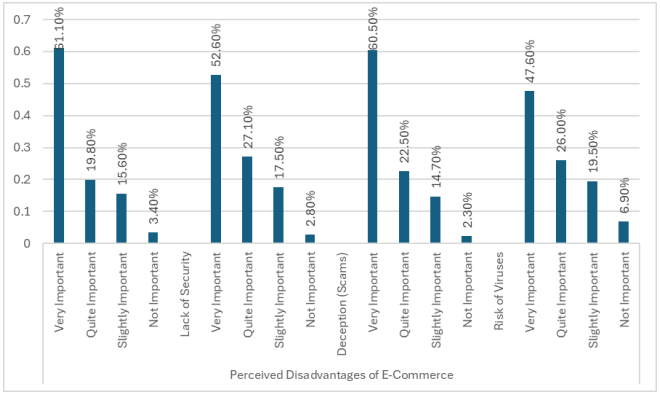

Fig 7. Factors Influencing E-Commerce and Perceived Disadvantages

Online Shopping Trends in Greece

When asked about their first online purchase, 78.4% of respondents

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(n = 341) reported making online purchases before the COVID-19 pandemic, while 19.5% (n = 85) made their first purchase during the pandemic. A small portion (2.1%, n = 9) had never made an online purchase. Regarding the pandemic's impact on shopping habits, 58.4% (n = 254) experienced an increase in online shopping, 39.8% (n = 173) saw no change, and 1.8% (n = 8) had never shopped online. Preferences for online shopping varied by product category. Most respondents (83.4%, n = 363) did not purchase groceries online, while 15.9% (n = 69) did. Electronics and electrical goods were preferred for online shopping by 60.9% (n = 265), while 38.6% (n = 168) did not shop for them online. Pharmacy items showed mixed preferences, with 69.2% (n = 301) not buying them online, but 29.9% (n = 130) did. Footwear and clothing saw a high preference for online shopping (80.2%, n = 349), as did accessories (78.2%, n = 340). Ready-made food had a more balanced preference, with 54.5% (n = 237) purchasing online, and 43.9% (n = 191) not. Coffee was less favored for online shopping, with 40.7% (n = 177) purchasing it online, while 57.9% (n = 252) did not. Lastly, 52.0% (n = 226) of participants bought other products online, and 46.9% (n = 204) did not (Fig. 8-9).

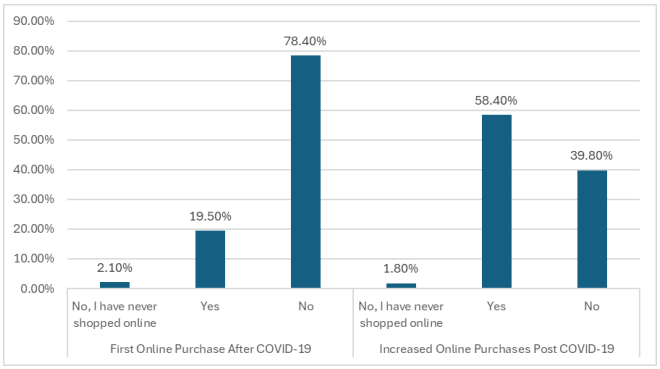

Fig 8. Impact of the COVID-19 Pandemic on Online Shopping Habits and Preferences

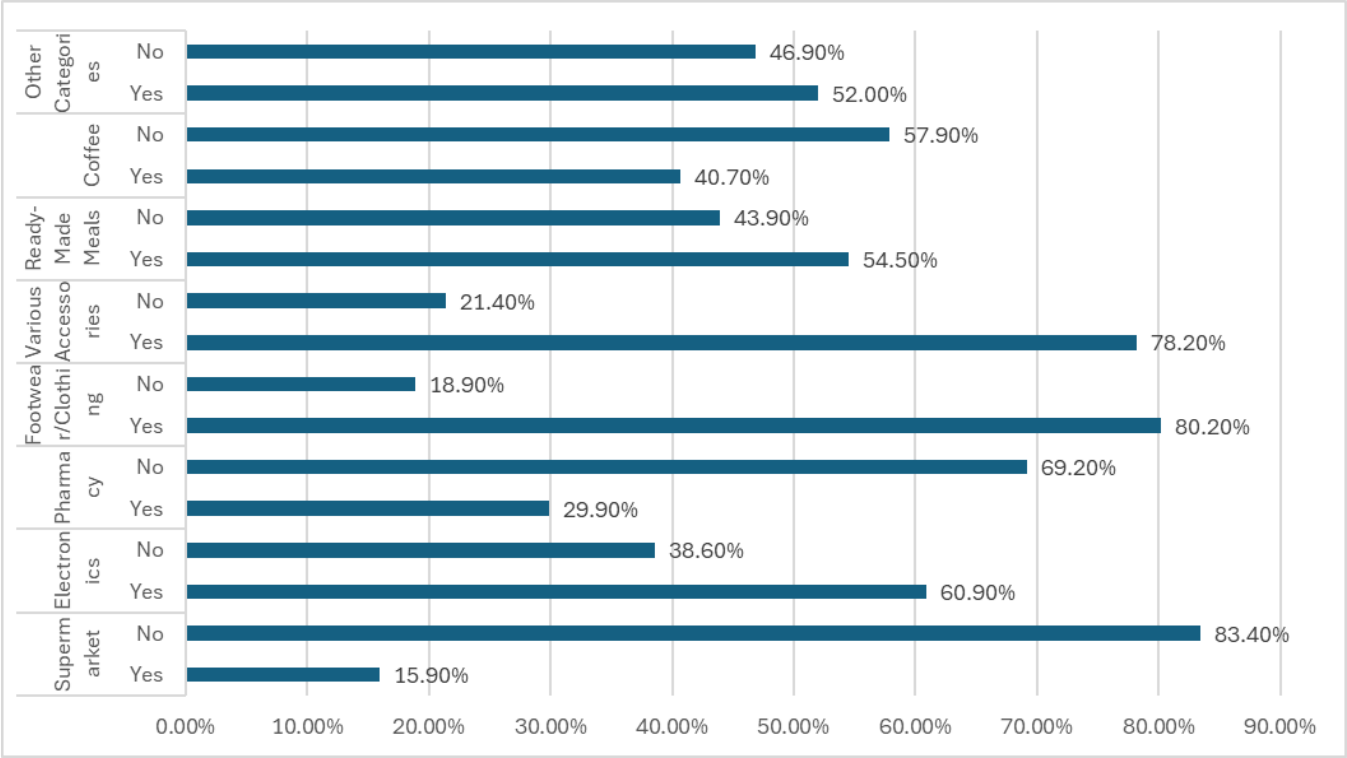

Fig 9. Most Preferred Categories for Online Shopping

Consumer Behavior and Payment Preferences in Online Shopping

The survey revealed that 79.8% of respondents (n = 347) had recently made online purchases, while 20.2% (n = 88) had not, suggesting widespread online shopping adoption, though a subset of consumers still do not engage regularly. Satisfaction with recent online purchases was generally positive, with 53.6% (n = 233) rating their satisfaction as 4 out of 5, and 28.3% (n = 123) giving a perfect score of 5. Time constraints were a significant factor in online shopping decisions, with 35.2% (n = 153) rating time importance as 4 out of 5. In terms of payment methods, 56.1% (n = 244) preferred credit/debit cards, while 76.8% (n = 334) chose cash on delivery, reflecting a preference for flexible payment options. Household support for online shopping was strong, with 68.3% (n = 297) reporting household-wide support. Peer influence was also notable, as 96.3% (n = 419) indicated their friends frequently shop online, reinforcing its social acceptance. Looking to the future, 97.2% (n = 423) expressed a desire to continue shopping online, though only 39.1% (n = 170) planned to increase their online shopping activity. The likelihood of exclusively shopping online was moderate, with 35.2% (n = 153) rating it a 3 out of 5. Discounts played a significant role, with 49.7% (n = 216) rating them highly important in their shopping decisions. Cash on delivery remained the most preferred payment method (69.0%, n = 300) (Fig. 10).

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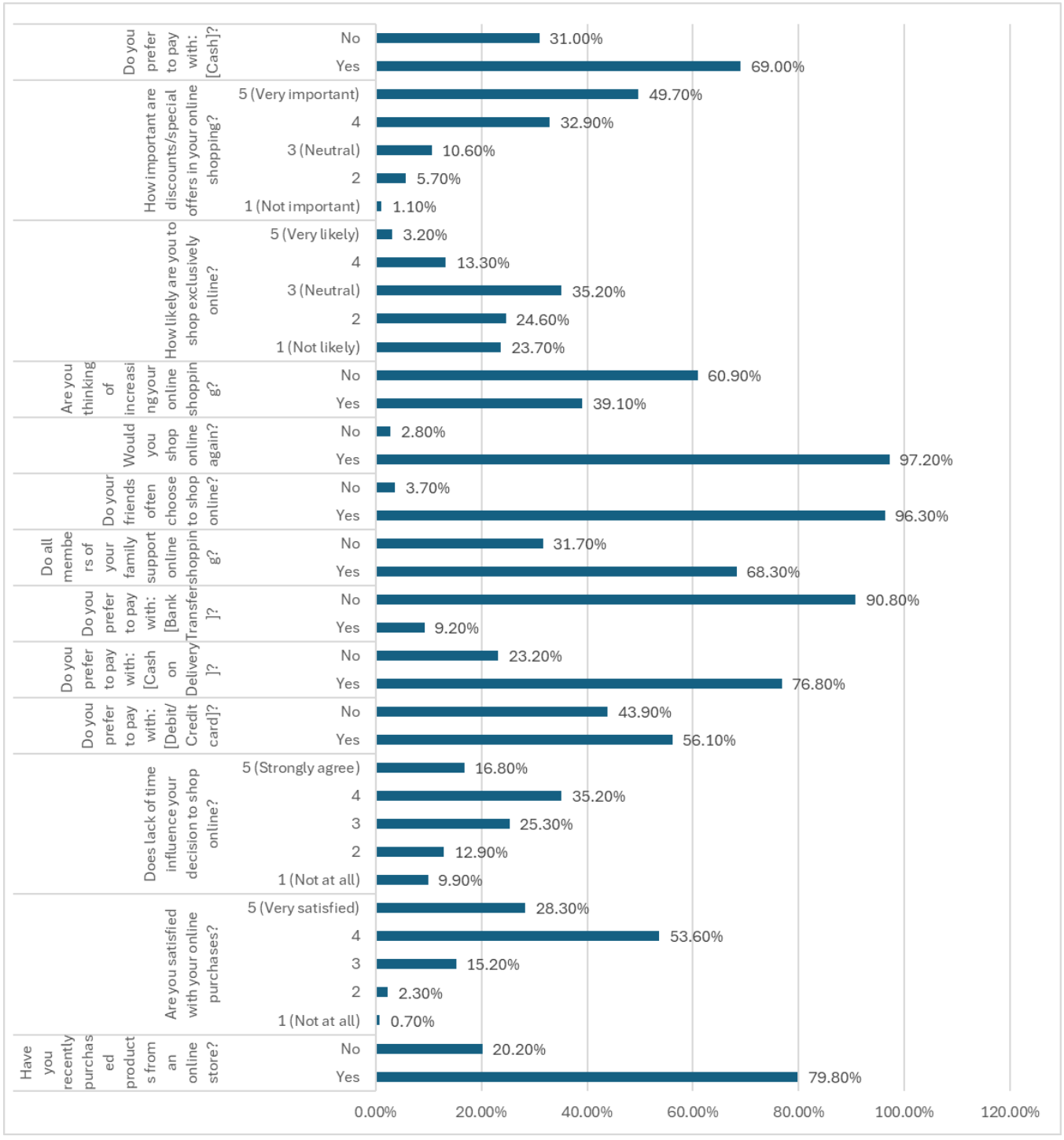

Fig 10. Recent Online Purchases and Payment Preferences

Correlational Analysis of Consumer Satisfaction, Time Constraints, and Incentives in Online Shopping Behaviors in Greece

H1: Higher levels of satisfaction with online purchases will positively correlate with the likelihood of exclusively shopping online, influenced by both time constraints and the importance of discounts or offers.

A Spearman's correlation analysis was conducted to explore the relationships between various factors influencing online shopping behavior. The findings reveal significant relationships among consumer satisfaction, the likelihood of shopping exclusively online, time constraints, and the importance of discounts or offers in shaping online shopping behaviors. Satisfaction with online purchases was moderately associated with the likelihood of shopping exclusively online ($r = .340$, $p < .001$), indicating that consumers who report higher levels of satisfaction are more inclined to prefer online shopping as their primary mode of purchase. Satisfaction was also positively correlated with time constraints influencing online shopping choices ($r = .282$, $p < .001$), suggesting that individuals who shop online due to limited time generally find the experience satisfactory. Additionally, the association between satisfaction and the importance of discounts or offers ($r = .243$, $p < .001$) highlights the role of promotional incentives in enhancing customer satisfaction, albeit to a lesser extent. The likelihood of shopping exclusively online demonstrated the strongest correlation with time constraints ($r = .498$, $p < .001$), underscoring the critical role of convenience in driving consumer preference for online shopping. This relationship suggests that online platforms must prioritize ease of use and efficiency to cater to time-sensitive

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consumers. Moreover, the likelihood of shopping exclusively online was positively associated with the importance of discounts or offers ($r = .270$, $p < .001$), emphasizing that financial incentives also contribute to shaping consumer preferences, although they are less influential than time-related factors. Time constraints were moderately correlated with the importance of discounts or offers ($r = .343$, $p < .001$), indicating that individuals who perceive a lack of time often value promotions as a significant factor when deciding to shop online (Table 1). In this context, AI enhances online shopping behavior analysis by processing large consumer data, identifying patterns, and predicting trends. It can personalize experiences through recommendations based on past purchases, aligning with correlations like satisfaction and online shopping preferences. AI-powered chatbots improve satisfaction by providing real-time assistance, addressing issues, and supporting time-sensitive shoppers. Additionally, AI optimizes promotional strategies, offering timely discounts tailored to consumer behavior, further enhancing satisfaction and influencing purchasing decisions.

Table 1. Correlations between Online Shopping Satisfaction and Related Factors

	Correlation Coefficient	**Sig. (2-tailed)**
Have you been satisfied with your online purchases?		
- Likelihood of shopping exclusively online	.340**	< .001
- Lack of time leading to online shopping choice	.282**	< .001
- Importance of discounts/offers in online shopping	.243**	< .001
Likelihood of shopping exclusively online		
- Have you been satisfied with your online purchases?	.340**	< .001
- Lack of time leading to online shopping choice	.498**	< .001
- Importance of discounts/offers in online shopping	.270**	< .001
Lack of time leading to online shopping choice		
- Have you been satisfied with your online purchases?	.282**	< .001
- Likelihood of shopping exclusively online	.498**	< .001
- Importance of discounts/offers in online shopping	.343**	< .001
Importance of discounts/offers in online shopping		
- Have you been satisfied with your online purchases?	.243**	< .001
- Likelihood of shopping exclusively online	.270**	< .001
- Lack of time leading to online shopping choice	.343**	< .001

Gender Differences in Online Shopping in Greece and the Role of AI

H2: There is a significant difference between male and female respondents in terms of when they first made online purchases (specifically, whether they started purchasing after the emergence of COVID-19), their intention to increase online shopping, and their preference for paying with a debit or credit card.

The chi-square tests conducted in this study revealed significant associations between gender and various online shopping behaviors, highlighting notable trends in consumer preferences. First, the timing of the first online purchase after COVID-19 was significantly associated with gender, $\chi^2(2, N = 435) = 11.659$, $p = 0.003$. Among those who made their first online purchase, a significant majority, 89.4%, were women, compared to only 10.6% men. Even among those who had not made an online purchase, 77.8% were women. Overall, 75.2% of those who made a purchase were women, while 24.8% were men. These findings suggest that women were more likely to initiate online shopping during the pandemic, indicating a potential target audience for future marketing strategies (Table 2). In a similar vein, the likelihood of increasing online shopping post-pandemic was also significantly related to gender, $\chi^2(1, N = 435) = 8.467$, $p = 0.004$. Among those planning to increase their online shopping, 67.6% were women and 32.4% were men. Conversely, among those not planning to increase their shopping, 80.0% were women and 20.0% were men. This suggests that women are more likely to continue increasing their online shopping compared to men, who appear less inclined to do so. This trend reflects broader consumer behavior, with women showing greater engagement in online shopping (Table 3). Lastly, a significant relationship was found between gender and the preference for paying with credit or debit cards, $\chi^2(1, N = 435) = 4.439$, $p = 0.035$. Of the 244 respondents who preferred credit or debit card payments, 71.3% were women and 28.7% were men. In contrast, of the 191 who did not prefer this payment method,

80.1% were women and 19.9% were men. This suggests that women are more likely to favor paying with credit/debit cards, while men may be more inclined toward alternative payment methods, such as cash on delivery (Table 4).

In this context, AI can help retailers analyze and predict shopping patterns by segmenting consumers based on gender and other demographic variables. Machine learning models can be employed to tailor product recommendations, marketing messages, and promotions that resonate with different gender groups, improving engagement and conversion rates. AI-driven tools, like personalized recommendation engines and targeted ads, cater to gender-specific preferences, such as women's higher engagement and preference for credit/debit card payments. Additionally, AI adapts payment solutions to evolving consumer behavior, ensuring businesses stay

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aligned with shifting preferences, driving satisfaction and loyalty across diverse consumer segments.

Table 2. Chi-Square Analysis of First-Time Online Shopping Experience Post-COVID-19 by Gender (N=435)

The first time you made online purchases was after the emergence of COVID-19?				
Gender	**Never Made Online Purchases**	**Yes**	**No**	**Chi-Square**
Male	2 (22.2%)	9 (10.6%)	97 (28.4%)	$\chi^2(2) = 11.659$, $p = 0.003$
Female	7 (77.8%)	76 (89.4%)	244 (71.6%)	

1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.23.

Table 3. Chi-Square Analysis of Gender and Intent to Increase Online Shopping (N = 435)

Are you considering increasing your online shopping?			
Gender	**Yes**	**No**	**Chi-Square Test Results**
Male	55 32.4%	53 20.0%	$\chi^2(1) = 7.819$, $p = 0.005$ Fisher's Exact Test (2-tailed): $p = 0.004$
Female	115 67.6%	212 80.0%	

0 cells (0.0%) have expected count less than 5. The minimum expected count is 42.21.

Table 4. Chi-Square Analysis of Gender and Payment Preference (Debit/Credit Card) (N = 435)

Do you prefer to pay with a debit or credit card?			
Gender	**Yes**	**No**	**Chi-Square Test Results**
Male	70 28.7%	38 19.9%	$\chi^2(1) = 4.439$, $p = 0.035$ Fisher's Exact Test (2-tailed): $p = 0.044$
Female	174 71.3%	153 80.1%	

*0 cells (0.0%) have expected count less than 5. The minimum expected count is 47.42.

Age and Payment Preferences for Online Shopping: Cash vs. Bank Transfer and the Role of AI

H3. There is a significant difference between age groups in terms of their preference for paying with cash and paying via bank transfer for online shopping.

The chi-square tests revealed significant associations between age group and preferences for different payment methods, highlighting distinct trends in payment behavior across generations. Firstly, a significant relationship was found between age group and preference for cash-on-delivery, $\chi^2(4, N = 435) = 35.052$, $p < 0.001$. Younger respondents, particularly those under 24 years old, showed a strong preference for cash-on-delivery, with 56.3% selecting this option. As age increased, the preference for cash payments steadily decreased. Among the 25-34, 35-44, and 45-54 age groups, there was a moderate preference for cash, but the over-54 group showed the least inclination toward this method, with only 0.3% opting for cash-on-delivery. This trend suggests that younger consumers may be more hesitant to adopt digital payment methods, while older groups appear more comfortable with non-cash options, such as digital payments (Table 5). A second significant relationship was found between age group and preference for bank transfers, $\chi^2(4, N = 435) = 13.940$, $p = 0.007$. The 35-44 age group showed the highest preference for bank transfers, with 42.5% selecting this method. This suggests that individuals in this age group may have greater trust in bank transfers for online transactions. Interestingly, 30.0% of respondents under 24 also preferred bank transfers, despite a larger portion of them opting for other payment methods. In contrast, older age groups, particularly those in the 45-54 and over-54 categories, showed less preference for bank transfers, likely favoring more traditional payment methods, such as credit or debit cards (Table 6).

In this context, artificial intelligence (AI) plays an important role in examining and addressing the generational differences in payment preferences identified through the chi-square analyses. It can predict payment preferences, allowing e-commerce platforms to optimize checkout processes by offering younger consumers options like cash-on-delivery, while recommending digital payment methods to older consumers. AI also enhances fraud detection by analyzing payment behaviors across age groups, ensuring security features align with demographic preferences. This personalization improves customer satisfaction, streamlines transactions, and enhances the overall security and efficiency of online shopping.

Table 5. Chi-Square Analysis of Age Group and Preference for Cash Payment (N = 435)

Do you prefer to pay with cash?			
Age Group	**Yes**	**No**	**Chi-Square Test Results**
Up to 24	169 56.3%	40 29.6%	$\chi^2(1) = 4.439$, $p = 0.035$ Fisher's Exact Test (2-tailed): $p = 0.044$
25-34	33 11.0%	21 15.6%	
35-44	55 18.3%	41 30.4%	
45-54	42 14.0%	26 19.3%	
Above 54	1 0.3%	7 5.2%	

0 cells (0.0%) have expected count less than 5. The minimum expected count is 47.42.

Table 6. Chi-Square Analysis of Age Group and Preference for Bank Transfer as a Payment Method (N = 435)

Do you prefer to pay via bank transfer?			
Age	**Yes**	**No**	**Chi-Square Test Results**
Up to 24	12 30.0%	197 49.9%	$\chi^2(4) = 13.94$, $p = .007$
25-34	7 17.5%	47 11.9%	
35-44	17 42.5%	79 20.0%	
45-54	4 10.0%	64 16.2%	

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Above 54	0 0.0%	8 2.0%	

2 cells (20.0%) have expected count less than 5. The minimum expected count is .74.

Household Purchase Decision Makers, Cash Payment Preference, and the Role of AI

H4. There is a significant difference between residential areas in terms of their preference for paying with cash and paying with a debit or credit card for online shopping.

The chi-square tests revealed significant relationships between residential area type and preferences for payment methods, highlighting notable regional differences in consumer payment behavior. Firstly, a significant association was found between residential area type and preference for cash payments, $\chi^2(3, N = 435) = 8.130$, $p = 0.043$. In rural areas with fewer than 3,000 residents, 22.7% of respondents preferred cash-on-delivery, while 16.0% in semi-urban areas (3,000–10,000 residents) also preferred cash. In contrast, urban residents (with populations over 10,000) showed a much lower preference for cash, with only 58.7% selecting this payment method. Island areas had the lowest preference for cash, with just 2.7% of respondents choosing it. These results suggest that residents in rural and semi-urban areas are more inclined to use cash payments, likely due to limited access to digital payment infrastructure (Table 7). A second chi-square test revealed a significant relationship between residential area type and preference for credit or debit card payments, $\chi^2(3, N = 435) = 22.225$, $p < 0.001$. Among urban residents, 72.1% preferred using credit or debit cards, significantly higher than the 13.9% of rural residents who selected this payment method. Semi-urban and island areas showed even lower preferences, with only 11.1% and 2.9% of respondents, respectively, opting for credit or debit cards. These findings indicate that urban residents, who have better access to banking and digital payment services, are more likely to use credit or debit cards. In contrast, residents in rural and semi-urban areas, where such services may be less accessible, tend to favor alternative payment methods (Table 8).

In this context, AI can enhance the adaptation of payment preferences based on regional trends by analyzing consumer behaviors across different residential areas. It can help businesses optimize payment options, such as offering cash-on-delivery in areas with lower digital payment adoption, or recommending mobile payment solutions in rural areas. AI-powered systems can dynamically adjust payment interfaces, showing urban consumers credit/debit card options and offering cash or mobile payments to rural or semi-urban customers. Additionally, AI can identify underserved regions, enabling businesses to improve digital payment infrastructure and ensure a seamless, personalized experience for all consumers.

Table 7. Chi-Square Analysis of Residential Area and Preference for Cash Payments (N = 435)

Do you prefer to pay with cash?			
Residential Area	**Yes**	**No**	**Chi-Square Test Results**
Rural	68 22.7%	18 13.3%	$\chi^2(3) = 8.130$, $p = .043$
Urban	176 58.7%	98 72.6%	
Suburban	48 16.0%	16 11.9%	
Island	8 2.7%	3 2.2%	

1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.41

Table 8. Chi-Square Analysis of Residential Area and Preference for Debit/Credit Card Payments (N = 435)

Do you prefer to pay with a debit or credit card?			
Residential Area	**Yes**	**No**	**Chi-Square Test Results**
Rural	34 13.9%	52 27.2%	$\chi^2(3) = 22.225$, $p < .001$
Urban	176 72.1%	98 51.3%	
Suburban	27 11.1%	37 19.4%	
Island	7 2.9%	4 2.1%	

1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.83.

H5. There is a significant difference between individuals who make purchases for the household in terms of preference for paying with cash.

A chi-square test revealed a significant relationship between preference for cash payments and the person responsible for household purchases, $\chi^2(2, N = 435) = 16.823$, $p < 0.001$. Among those who preferred cash, 53.0% reported making household purchases themselves, while 39.0% delegated this task. In contrast, 68.1% of those who did not prefer cash made the purchases themselves, and 19.3% delegated the task. These findings suggest that individuals who prefer cash payments are more likely to handle household shopping, possibly due to a preference for physical transactions or greater control over spending. Those who prefer digital payments may delegate shopping duties, reflecting a greater reliance on digital or credit-based methods (Table 9).

In this context, AI can be instrumental in analyzing and addressing the relationship between payment preferences and household purchasing responsibilities. By analyzing consumer behaviors, AI can help businesses develop targeted strategies. For example, AI can identify consumers who prefer cash payments and manage household shopping themselves, enabling businesses to tailor marketing efforts. Similarly, AI can recognize consumers who prefer digital payments and delegate shopping tasks, creating opportunities for seamless digital payment solutions. Additionally, AI can optimize the shopping experience by suggesting the most suitable payment methods, providing a more personalized and efficient purchasing journey, ultimately improving customer satisfaction and engagement.

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Table 9. Chi-Square Analysis of Household Purchasing Responsibility and Preference for Cash on Delivery (N = 435)

Do you prefer to pay with cash?			
Who Makes Purchases for the Household	**Yes**	**No**	**Chi-Square Test Results**
Other family member	117 39.0%	26 19.3%	$\chi^2(2) = 16.823$, $p < .001$
Myself	159 53.0%	92 68.1%	
Spouse	24 8.0%	17 12.6%	

0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.72.

The Influence of Preferred Shopping Type on Payment Method Choices and the Role of AI

H6. There is a significant difference between the preferred type of shopping (e-commerce, traditional shopping, or both methods) and the preference for paying with cash or a debit/credit card.

The chi-square tests revealed significant associations between payment method preferences (cash vs. non-cash) and shopping preferences, highlighting notable differences in consumer behavior. First, a significant association was found between payment method preference and overall shopping preferences, $\chi^2(2, N = 435) = 20.937$, $p < 0.001$. Among those who preferred cash, 66.3% favored a mix of online and traditional shopping, while 29.7% preferred traditional shopping alone, and 4.0% preferred shopping online exclusively. In contrast, for those who preferred non-cash methods, 84.4% favored a combination of online and traditional shopping, 9.6% preferred traditional shopping, and 5.9% preferred online shopping exclusively. These findings suggest that both cash and non-cash payers tend to prefer a hybrid shopping approach, with fewer participants opting for traditional shopping alone (Table 10). A further chi-square test revealed a significant relationship between payment method (credit/debit card vs. other payment methods) and shopping preferences, $\chi^2(2, N = 435) = 30.511$, $p < 0.001$. Among credit/debit card users, 81.1% favored a combination of online and traditional shopping, while 13.5% preferred traditional shopping alone, and 5.3% preferred online shopping exclusively. On the other hand, participants who preferred other payment methods showed a slightly lower preference for a hybrid shopping approach, with 60.2% opting for both online and traditional shopping, 36.1% favoring traditional shopping, and 3.7% preferring online shopping only. These results suggest that credit/debit card users are more likely to embrace a hybrid shopping model, likely due to the convenience and flexibility offered by card payments. In contrast, non-credit/debit card users show a stronger inclination towards traditional shopping, though they still favor a mix of both methods (Table 11).

In this context, AI plays a key role in understanding and adapting to the complex relationship between payment preferences and shopping behaviors. By analyzing consumer data, AI helps businesses segment customers based on their payment habits and shopping patterns. For example, AI can identify cash-preferring consumers who prefer a hybrid shopping approach, enabling businesses to tailor marketing campaigns that highlight flexibility and convenience. AI can also detect patterns in credit/debit card users who engage in hybrid shopping, offering personalized promotions to enhance their experience across both online and offline channels. Additionally, AI can optimize payment options, suggesting the most suitable methods for each segment, improving checkout efficiency. These insights enable businesses to provide personalized, efficient shopping experiences that align with consumers' preferences, boosting satisfaction and loyalty.

Table 10. Chi-Square Analysis of Payment Preference (Cash) and Preferred Shopping Type (N = 435)

Do you prefer to pay with cash?			
Preferred Type of Shopping	**Yes**	**No**	**Chi-Square Test Results**
E-commerce	12 4.0%	8 5.9%	$\chi^2(2) = 20.937$, $p < .001$
Traditional method	199 66.3%	13 9.6%	
Both methods	89 29.7%	114 84.4%	

0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.21.

Table 11. Chi-Square Analysis of Payment Preference (Credit/Debit Card) and Preferred Shopping Method (N = 435)

Do you prefer to pay with a debit or credit card?			
Preferred Type of Shopping	**Yes**	**No**	**Chi-Square Test Results**
E-commerce	13 5.3%	7 3.7%	$\chi^2(2) = 30.511$, $p < .001$
Traditional method	33 13.5%	69 36.1%	
Both methods	198 81.1%	115 60.2%	

0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.78.

Discussion

The findings of this study provide valuable insights into the factors influencing online shopping behaviors, payment preferences, and the role of demographic variables such as gender, age, and region, while also shedding light on the broader trends in consumer behavior. These results align with existing research in e-commerce, highlighting the interplay between demographic factors and the decision-making process related to shopping preferences and payment methods, with a particular emphasis on how these elements can be shaped by artificial intelligence (AI). The first objective of this study sought to explore how satisfaction with online purchases influences the likelihood of shopping exclusively online. The results demonstrate that satisfaction with the online shopping experience, particularly regarding convenience, time savings, and discounts, is strongly correlated with the decision to shop exclusively online. Consumers who expressed high satisfaction with these aspects were more inclined to prioritize online shopping over traditional methods. This finding supports the notion that enhancing the online shopping experience can encourage consumers to make online shopping their

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primary method of purchase. It also suggests that businesses can increase customer retention and loyalty by offering targeted promotions and time-saving benefits. These insights are particularly relevant when considering how AI can be leveraged to personalize and improve customer interactions, tailoring promotions and offerings based on individual preferences to drive further online shopping engagement, as noted by Hamli and Sobaih (2023).

The second objective focused on understanding gender-based differences in online shopping behaviors, with particular attention to payment preferences and the intention to increase online shopping. The results revealed distinct gender-based preferences, especially in payment choices, with women tending to favor debit or credit cards for online purchases, while men were more likely to opt for alternative payment methods. These findings are consistent with prior research indicating that gender plays a role in shaping consumer behavior, including the selection of payment methods (Piersiala & Kabus, 2023; Lin et al. 2019). This knowledge is valuable for businesses aiming to customize marketing strategies and payment systems that cater to the distinct preferences of male and female consumers. AI technologies, for instance, could be employed to analyze gender-specific shopping patterns and optimize the payment experience accordingly, providing more personalized payment options to enhance consumer satisfaction.

The third objective explored how age influences payment preferences for online shopping. The study identified a significant age-related distinction, with younger consumers (18-34 years) showing a strong preference for digital payment methods, such as mobile wallets and bank transfers. In contrast, older consumers demonstrated a preference for traditional payment methods, including cash and debit cards. This divergence suggests that businesses must recognize the digital fluency of younger consumers and the more traditional preferences of older consumers when designing payment systems. The findings underscore the importance of offering a wide range of payment options to accommodate the varying preferences across age groups. AI could play a pivotal role in this context by analyzing consumer demographics and automating the presentation of suitable payment options for each consumer, ensuring a seamless and personalized payment experience, as highlighted by Mari Selvam and Gomathi (2021).

The fourth objective examined regional differences in payment preferences, revealing that urban consumers were more likely to use digital payment methods, such as credit and debit cards, and mobile wallets, while rural consumers favored cash payments. These regional disparities can be attributed to varying levels of access to digital infrastructure, financial services, and consumer trust in digital payment systems. In areas with limited technological access or less confidence in online payment security, cash remains the preferred method of payment. Understanding these regional differences is important for businesses, as it enables them to tailor their payment options and infrastructure to the specific needs and preferences of different geographic locations (Cano-Leiva, et al. 2024). AI-driven platforms can assist in identifying these regional patterns, allowing businesses to optimize payment offerings and enhance customer experience by aligning with local consumer behaviors. This is in line with the findings of Sajid et al. (2022) and Santos et al. (2024), who suggest that regional variations in infrastructure and consumer trust are essential factors influencing payment preferences.

In conclusion, the findings of this study provide a comprehensive understanding of the multifaceted factors that influence online shopping behaviors and payment preferences. Satisfaction with online purchases, gender, age, and regional differences all play a significant role in shaping consumer decisions. By leveraging AI to analyze demographic data and consumer preferences, businesses can craft more targeted strategies, such as personalized promotions, optimal payment methods, and region-specific payment systems, all of which can contribute to increased customer satisfaction, loyalty, and engagement. These insights highlight the growing importance of AI in refining e-commerce strategies and navigating the complexities of consumer behavior in the evolving online shopping landscape. The integration of AI into these strategies can help businesses better understand the diverse needs of their customers, offering more tailored, secure, and efficient payment solutions that are aligned with consumer expectations.

Practical Implications: Integrating Results on Consumer Satisfaction, Payment Preferences, and AI with the Integrated Theoretical Framework

By integrating these findings with the Integrated Theoretical Framework, a comprehensive approach emerges that elucidates how AI can optimize the e-commerce experience, enhance payment systems, and account for demographic and regional differences in consumer behavior. The effective application of this integrated framework necessitates businesses to begin by collecting and analyzing comprehensive consumer data, with particular attention to key demographic factors such as age, gender, income, and regional characteristics (Shaw, Eschenbrenner, & Baier, 2022). This data can be gathered through various digital touchpoints, providing insights into consumer interactions and preferences. By leveraging AI-powered analytics, businesses can segment their consumer base into distinct groups, based not only on demographic details but also on specific behaviors, payment preferences, shopping habits, and regional inclinations. Such segmentation enables businesses to apply machine learning algorithms to detect behavioral patterns, such as the preferred payment methods of consumers and their navigational choices during the online shopping journey.

Once distinct consumer segments have been identified, AI can be employed to personalize the shopping experience for each group. For instance, recommendation engines powered by AI can suggest tailored products and services based on individual consumer preferences, while dynamic pricing models can facilitate personalized discounts and promotional offers. Furthermore, AI-driven customer support tools, such as chatbots, can offer real-time assistance to consumers, guiding them through the payment process and addressing any security-related queries. By analyzing historical consumer behaviors, AI can predict product preferences, allowing businesses to streamline the shopping experience and optimize the checkout process. This predictive capability further enables businesses to offer promotions that align with individual shopping behaviors, thereby enhancing the overall customer experience. In the realm of payment preferences, AI can be instrumental in optimizing payment systems by forecasting the most appropriate payment methods based on a consumer's transaction history, demographic profile, and regional factors. Consumers from different regions may exhibit varying preferences, such as cash-on-delivery in rural areas versus credit/debit card payments in urban settings. These preferences can be inferred from past transaction data, allowing AI to dynamically suggest the most suitable payment method during the checkout process, thus ensuring a seamless and frictionless transaction experience. By aligning payment options with consumer preferences, businesses can significantly improve user satisfaction and reduce cart abandonment rates, as consumers are more likely to complete transactions when the payment method corresponds to their individual preferences.

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To address security concerns—a common barrier to the adoption of digital payments—businesses should integrate AI-driven security measures, including real-time fraud detection, biometric authentication, and secure encryption protocols. These advanced security features help to build consumer trust, ensuring that consumers feel secure when making online purchases. AI-powered transaction monitoring allows businesses to detect and mitigate fraudulent activity in real-time, reducing the risk of security breaches. Additionally, biometric verification systems, such as fingerprint or facial recognition, can be employed to provide an extra layer of security, particularly for high-value transactions. The incorporation of these advanced security features reassures consumers, mitigating concerns about online fraud and privacy violations, and fostering greater confidence in digital payment systems. Given the time-sensitive nature of many online shoppers, businesses must also focus on optimizing the speed and efficiency of the online shopping experience. Time-constrained consumers are often drawn to the convenience that e-commerce offers, making it essential for businesses to streamline the purchasing process. AI can assist in this regard by providing tailored promotions or discounts designed to incentivize quick decision-making and purchases. Additionally, AI can predict consumer preferences and display the most relevant products, thereby reducing the time consumers spend searching for desired items. AI-driven features such as one-click payments and automated form filling further enhance the convenience for time-conscious consumers, improving overall satisfaction by catering to those who prioritize speed and efficiency.

The implementation of this framework also requires businesses to customize the shopping experience based on both regional and gender-specific preferences. For instance, if data reveals that women are more inclined to trust digital payment methods, such as debit/credit cards, businesses should tailor their payment systems and marketing strategies accordingly. Similarly, regional differences should be taken into account, particularly in areas where access to digital payment infrastructure is limited. AI plays a significant role in identifying these regional behaviors and can enable businesses to offer customized payment solutions that align with the available infrastructure in each region. Whether consumers are in areas with advanced digital payment systems or regions where cash-on-delivery remains prevalent, AI ensures that the payment experience is aligned with regional realities. Finally, businesses must remain agile and responsive, continuously monitoring the effectiveness of their AI-driven personalization and payment strategies. AI allows for the real-time tracking of consumer behavior, enabling businesses to adjust product offerings, payment methods, and marketing strategies in response to evolving preferences. The use of AI-powered analytics ensures that businesses can remain proactive, refining their approaches based on ongoing consumer feedback, which helps maintain an optimized and adaptive shopping experience. This approach enables businesses to stay ahead of market trends, swiftly implementing new solutions to enhance customer satisfaction, increase conversion rates, and drive retention. By integrating AI with deep insights into consumer behavior, payment systems, and security protocols, businesses can create a highly personalized and secure e-commerce environment that caters to the diverse needs of global consumers. This integrated approach not only enhances consumer satisfaction but also fosters long-term loyalty, driving repeat business and ensuring sustained success in a competitive digital marketplace.

Conclusion

This study offers valuable insights into the factors influencing online shopping behaviors, payment preferences, and the role of demographic variables like gender, age, and region. It highlights that consumer satisfaction, particularly regarding convenience and discounts, significantly impacts the likelihood of exclusive online shopping. Gender and age also influence payment preferences, with women favoring debit/credit cards and younger consumers preferring digital payments. Regional differences further shape payment choices, with urban areas leaning toward digital methods and rural areas favoring cash. The study also emphasizes the potential of artificial intelligence (AI) in enhancing e-commerce experiences by personalizing shopping journeys, optimizing payment systems, and improving security. AI can segment consumers more effectively, offer tailored recommendations, and strengthen consumer trust through features like fraud detection and biometric authentication. These findings suggest that businesses integrating AI with an understanding of demographic factors can better meet consumer needs and maintain a competitive edge in the marketplace.

However, several limitations must be noted. The sample was skewed towards younger adults and women, which may limit the generalizability of the results. The study's regional focus in Thessaly may not fully represent Greece or other countries with different e-commerce dynamics. The cross-sectional design also restricts the ability to establish causal relationships or track changes in behavior over time. Moreover, self-reported data may introduce biases, and the limited range of payment methods examined might exclude emerging trends. Finally, technological accessibility issues and recall bias could affect the accuracy of the findings, while the focus on specific product categories might not reflect broader online shopping behaviors.

Future research could build upon this study by addressing its limitations and exploring new dimensions of online shopping behavior. A more diverse and representative sample, including a broader age range and gender balance, would enhance the generalizability of the findings. Additionally, expanding the study to other regions or countries with varying e-commerce infrastructure and digital literacy could provide a more comprehensive understanding of global online shopping trends. Longitudinal studies could also offer insights into how consumer preferences and payment behaviors evolve over time, particularly in response to technological advancements or economic shifts. Future studies might explore emerging payment methods, such as cryptocurrency or buy-now-pay-later services, and examine how they influence shopping habits. Furthermore, examining the impact of factors like trust, privacy concerns, and user experience on online shopping satisfaction could provide deeper insights into consumer decision-making in the digital marketplace.

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