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The Effect of Artificial Intelligence on Pink Marketing for Generation Z: The Mediating Role of Online Purchasing Behavior

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Abstract

The study aims to examine the effect of artificial intelligence (AI) on how consumers of Generation Z respond to the presence of pink-themed marketing treatments in online shopping platforms and the effect these have on their final buying behavior in the area of Sulaymaniyah province.

The study used a cross-sectional survey to investigate online shopping behavior and the impact of pink product marketing among 306 Generation Z female respondents aged 17 to 27. The online platform (Google Forms) and the paper-based distribution of questionnaires were used, thus providing a varied sample from large e-commerce sites. For the data analysis, Statistical Package for the Social Sciences (SPSS) software (version 27) was used. The results of the multiple regression analyses indicated that online shopping behavior among Generation Z is strongly influenced by pink product marketing, explaining a large percentage of the variance, as indicated by a high coefficient of determination. The interaction effect is insignificant, but statistical significance is attained. Based on the research recommendations, companies should focus on marketing pink products using artificial intelligence to build individual, gender-neutral brand images while maintaining service quality. Therefore, future research should expand to other areas of Iraq with diverse demographics to study additional mediating factors, such as social media, brand trust, and the degree of AI personalization.

Keywords: Artificial Intelligence, Pink Marketing, Generation Z, online shopping behaviors

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کاریگەری زیرەکی دەستکرد لەسەر بەبازاڕکردنی پەمەیی نەوەی Z: ڕۆڵی نێوەندگیری ڕەفتاری کڕینی ئۆنلاین.

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پوختە

ئامانج: ئەم توێژینەویە لێکۆلینەوە دەکات کە چۆن زیرەکی دەستکرد کاریگەری لەسەر وەڵامەکانی بەکارهێنەرانی Gen Z هەیە بۆ ستراتیژییەکانی بازارکردنی پەمەیی لە ژینگەی بازارکردنی ئۆنلاین و پرۆسەی بڕیاردانی کڕینیان شێوازەکان دیزاینی ڕاپرسی بربڕەیی بەکارهێنرا بۆ پشکنینی ڕەفتارەکانی کڕینی ئۆنلاین و بەبازاڕکردنی پەمەیی لە نێوان ٣٠٦ بەکارهێنەری نەوەی Z(تەمەنی ١٧-٢٧). داتاکان بەبەکارهێنانی پرسیارنامەی پێکهاتەدار کۆکرانەوە کە لە ڕێگەی پلاتفۆرمەکانی دیجیتاڵ (فۆرمی گۆگڵ) وە فۆرماتەکان بنەمای کاغەزبوو بۆ دڵنیابوون لەهەمەجۆری نمونەیی لەسەرنسەری پلاتفۆرمەسەرەکییەکانی بازرگانی ئەلیکترۆنیدا. شیکاری داتاو ئەنجامەکان: شیکاری پاشەکشەی فرەیی نیشانیدا کە بەبازاڕکردنی پەمەیی و ڕەفتاری کڕین بەشێوەیەکی بەرچاو پێشبینی ڕەفتاری کڕینی ئونلاین نەوەی Z دەکات. لەگەڵ مۆدێلەکە کە ڕێکی زۆر باش جیاوازیەکە بەڕێژەی دیاریکردن ڕوون دەکاتەوە، وە کارلێکێکی کاریگەری بچووک بەرچاوە.پێشنیارەکان: پێویستە کۆمپانیاکان ئەولەویەت بدەن بەهێزکراوی AI بەبازارکردنی پەمەیی. لەهەمان کاتدا، براندی کەسی وڕەگەزی گشتگیردروست دەکەن. لەگەڵ هاوسەنگکردنی کوالیتی خزمەتگوزاریەکان. پێویستە توێژینەوەکانی داهاتوو فراوانتر بن بۆ ناوچەکانی تری عێراق کە دیموگرافیای جۆراوجۆری هەیە بۆ لێکۆلینەوە لەهۆکارە نێوەندگیرەکانی زیاتر وەک کاریگەری سۆشیاڵ میدیا، متمانەی براند، وئاستی کەسایەتیکردنیAI.

وشەی سەرەکی: زیرەکی دەستکرد، بەبازارکردنی پەمەیی، نەوەیZ، ڕەفتارەکانی بازاڕکردنی ئۆنلاین.

1. Introduction

Artificial intelligence (AI) is one of the most significant shifts in the global commercial landscape, chiefly in the realm of "pink marketing," which involves participation from Gen Z. This generation has grown up in a sophisticated digital world and interacts with AI technologies in ways that are dramatically altering their expectations and buyer behavior. One of the growing trends is the embedding of AI into marketing strategies, which is key to understanding and adapting to the dynamics of online buyer behavior. Additionally, the Iraqi Kurdistan Region, specifically Sulaimani province, has not been exempt from the effects of the artificial intelligence revolution on marketing, especially pink marketing, which targets Generation Z and online shopping. (C. R. Guerra-Tamez, Kraul Flores, Serna-Mendiburu, Chavelas Robles, & Ibarra Cortés, 2024). This study aims to explore the effect of AI on pink marketing among Gen Z, focusing on online shopping behavior in Sulaymaniyah province.

Nowadays, the marketing process widely uses artificial intelligence to increase efficiency, an advancement and development trend that is slowly becoming an e-commerce best practice in the modern business and marketing landscape (H Beyari, Hashem, & Alrusaini, 2024; Nagy & Hajdú, 2021). Artificial intelligence (AI) is defined as the ability to process and transform information and data into informed, goal-directed purchasing behavior (Karacop & Ozdemir, 2020). More recently, with the use of artificial intelligence technologies, the retail market has changed significantly, becoming a key driver of innovation in the market and beyond. Also, artificial Intelligence (AI) is a technology that can imitate human intelligence and perform a variety of cognitively demanding jobs.

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By providing chatbots, virtual assistants, customized recommendations, and other services, it can, however, improve customers' online purchasing experiences (Bunea, Corboș, Mișu, Triculescu, & Trifu, 2024).

Although marketing is a key process for strategic competition and keeping pace with constant market improvements and changes, it can be achieved by using modern marketing methods and tools grounded in research into the needs of current and prospective market segments. However, pink marketing is a modern trend in marketing science, showing a new marketing philosophy that corresponds with women's psychology and needs (Shehata & Fayyad, 2020). Also, “pink marketing" is the colloquial term for marketing to women. Women strongly associate pink with themselves, to the point of favoring it. "Pink Globalization" suggests that pink is a common language to attract women, a technique that collects information about women's attitudes and preferences to meet their needs and desires for goods and services (Hasan Beyari, 2024; Gabr, 2024). Therefore, pink marketing is the marketing effort that seeks to fulfill women's needs and desires for goods and services by strategically gathering marketing information that aligns with their attitudes and tastes to target women as consumers and implementing it with their consent (Obaidi & Aziz, 2017; Saeed & Sabriina, 2015). According to Saud, Hussein, and Saud (2020), "Pink marketing," or "women-oriented marketing," is a marketing approach that targets women through companies that manufacture or promote goods.

Generation Z is a young adult group born between 1997 and 2010 and is regarded as a key consumer group with distinct behaviors. They represent a generation of digital natives who highly esteem authenticity, variety, and individualized experiences. Therefore, in Kurdistan, Iraq, Generation Z will benefit from higher expectations for artificial intelligence products and services through online shopping (Priporas, Stylos, & Fotiadis, 2017). Bunea et al. (2024) define Generation Z as people clustered within a certain age range who have been formed by similar conditions, technologies, and life events experienced at pivotal developmental stages. Generation Z is significant since they were raised in the information age. They are therefore also known as "digital natives". With the online revolution of the 1990s, they have been exposed to unprecedented levels of technology during childhood and adolescence. Additionally, because of their initial exposure to large amounts of data and colorful graphics on the Web, they are very comfortable navigating varied digital environments and engaging in new online shopping (Kahawandala, Peter, & Niwunhella, 2020). Nevertheless, online customers are seeking open experiences, especially to support interaction with marketing messages. Also, there is a motivational reward that prefigures competence-related experiential tasks, such as pre-purchase inspections of goods, products, and services, in which competence-relevant considerations are framed in terms of price, quality, and functionality relevant to the purchasing role (Prashar, Sai Vijay, & Parsad, 2017). Online shopping is a critical method consumers use to purchase goods and services, increasingly relying on the Internet for their purchasing needs (Bunea et al., 2024).

Consumer purchasing behavior includes the desires, intentions, and attitudes that influence how people buy goods or services. After learning about a product and considering their options, consumers decide whether to buy. Trust and positive feelings toward a product also affect their choices. Sometimes, people intend to buy but do not complete the purchase (Gabr, 2024). Marketers

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need to help consumers follow through on their intentions. Businesses can use effective strategies to influence online shopping behavior (Azami, 2019).

In recent years, artificial intelligence (AI) has become an effective tool for formulating marketing strategies, especially for online shopping worldwide. At the same time, in the Kurdistan Region, Sulaimani province, artificial intelligence has become an effective tool for the new generation. Therefore, Pink marketing focuses on emotional appeal, aesthetics, inclusivity, and identity-based campaigns. Generation Z, a major group of technology users and key online consumers, exhibits distinct online shopping behaviors. This is a marketing strategy that targets women and girls, making it one of the strategic marketing techniques. Despite the growing reliance on AI and the popularity of pink marketing, there is a limited understanding of how these two elements work together to influence Gen Z's online shopping behavior. Does artificial intelligence enhance or diminish the effectiveness of pink marketing strategies for Gen Z women in their online shopping in the province? This gap poses a challenge for marketers: How can they effectively integrate AI tools with pink marketing to match Gen Z's expectations, values, and online shopping habits? Without a clear understanding, firms risk miscommunication, decreased customer engagement, and forgone opportunities in one of the fastest-growing consumer segments. With the rise of AI in marketing, there is a growing need to understand how these technologies affect consumer actions, particularly among Gen Z. Pink marketing, traditionally aimed at female consumers, is evolving with AI integration. However, the specific effects of AI on Gen Z's responses to pink marketing strategies in online shopping contexts remain underexplored. This study aims to explore and determine the level of AI's effect on Pink Marketing among Gen Z - Case of Purchasing Behavior Shopping Online in the Sulaimani province area.

H1: *Artificial intelligence has a significant positive effect on pink marketing strategies among Generation Z consumers.*

H2: *Artificial intelligence significantly influences the purchasing decisions of Generation Z consumers.*

H3: *Pink marketing strategies have a significant positive effect on Generation Z consumers' Online purchasing behavior*

H4: *Online purchasing behavior mediates the relationship between artificial intelligence and pink marketing among Generation Z consumers.*

H5: *The relationship between artificial intelligence and purchasing behavior varies significantly across different levels of online shopping engagement.*

2. Literature Review:

Introduction

The changing marketing landscape is determined by the convergence of gender-based marketing strategies, generational variations in consumer behavior, and advances in artificial intelligence. This literature review analyzes three key themes:

1. The evolution of pink marketing from gender stereotypes to sophisticated interaction strategies.
2. The distinctive buying behaviors of Generation Z, with a concentration on sustainability.
3. The transformative impact of artificial intelligence on e-commerce.

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The importance of bringing these three research areas together lies in their combined impact on consumer behavior and marketing success. As digital commerce becomes increasingly complex, understanding these trends is critical to formulating strategies that meet developing consumer expectations and capitalize on technological advances.

2.1 Artificial intelligence (AI)

Artificial intelligence has become a major force in marketing, widening the horizons of research, strategy, operations, customer relations, and the customer experience. The field of marketing is vast, including everything from analytics-based decisions to personalized buyer interactions (Hermann, 2022). Systems and applications are now widespread across all industries and sectors, providing numerous opportunities for marketing, strategic projects, and operations (Campbell, Sands, Ferraro, Tsao, & Mavrommatis, 2020). Predictive analytics is a key application of artificial intelligence in e-commerce, where machine learning algorithms predict customer behavior, demand trends, and business outcomes (Jakkula, 2023). Artificial intelligence is achieving extraordinary efficiency by enabling automated, interconnected business processes across numerous functions, including marketing. As a result, marketing managers need to revise their capabilities, strategies, and customer interactions. Simultaneously, some companies are seeking to rely entirely on AI for decision-making (Gao, Wang, Xie, Hu, & Hu, 2023). Artificial intelligence has moved beyond science fiction, fundamentally transforming business operations and buyer interactions with online stores. It enables a personalized shopping experience through intelligent product recommendations, dynamic pricing, and interactive chatbots, improving the customer experience and fostering stronger relationships. This ultimately leads to greater sales and greater customer loyalty (Anand, 2024). AI algorithms analyze a user's browsing, purchase, and search histories to produce personalized product and content suggestions. This creates an engaging, relevant shopping experience that meets Gen Z's demand for customized interactions (Peter et al., 2025).

2.2 Pink Marketing:

Pink marketing is a modern marketing term that began at the beginning of the twenty-first century, when many organizations around the world adopted the pink marketing strategy and applied it to women by formulating the four elements of the marketing mix (product, pricing, promotion, and distribution) in a manner consistent with the dimensions of a woman's life(Hanna Massoudi, 2020). Some believe Pink marketing stems from wider gender marketing strategies that target female consumers through color psychology and product gender differentiation. This marketing has changed considerably in recent years. Contemporary academic studies define pink marketing as gender marketing that uses gender research to maximize profits by offering two gendered versions of the same product (Bideaux, 2022). They focus on its effects on female consumer buying behavior, particularly by analyzing the psychological and historical relevance of pink and its economic effects for marketing strategies (Ma & Wang, 2024) and by exploring women's relationship with pink brand marketing within their feminine identity construction (Atkinson, Meadows, & Sumnall, 2024). This research reveals the complexity of contemporary consumer responses to gendered marketing strategies and the requirement for more sophisticated approaches (Freihat M, 2021). This approach is fundamentally based on the assumption that color preferences, particularly pink, are inherently

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racial and can affect purchasing decisions. In pink marketing, the focus is on promotional activities to inform, persuade, and attract a female customer base (Hasan Beyari, 2024). This term is often marketed to women, and its benefits are similar to or equal to those of men. This is apparent in personal care products, toys, clothing, home healthcare products, haircuts, and dry cleaning services (Chua, Hidalgo, Joshua, & Santos, 2022). Therefore, based on the previous definitions, we conclude that pink marketing is a female-oriented marketing strategy designed to influence women's attitudes, behaviors, and purchasing decisions through a combination of marketing mix elements.

2.3 Generation Z

Contemporary research identifies Generation Z as a significant consumer group born between the mid-1990s and the early 2010s, whose influence has made marketing strategies increasingly intricate in the digital landscape, because understanding of their unique preferences and behaviors shaped by their digital upbringing, distinguishing them from previous generations in fundamental ways that impact marketing strategy development (Salam, Singkeruang, Husni, Baharuddin, & AR, 2024). It is emerging as a powerful force in shaping global consumer behavior, particularly in the market of digital and technological products (Matsa Prasanna, 2024). Generation Z emphasizes sustainable consumption (Theocharis & Tsekouropoulos, 2025). Understanding the factors that drive Generation Z's purchasing decisions is critical for companies seeking to develop effective marketing strategies and products and services to meet their expectations (Pitanatri, Witarsana, Kartini, Swandewi, & Pitanatri, 2024). This points to a fundamental shift in consumer priorities that companies must address to remain competitive (Gomes, Lopes, & Nogueira, 2023). Generation Z shows greater online engagement than previous generations, and their purchasing behavior is influenced by a preference for personal experiences and a strong commitment to sustainability (Salam et al., 2024). Theocharis, Tsekouropoulos, Chatzigeorgiou, and Kokkinis (2025) believe that research on Gen Z's online consumer behavior has become a key factor in determining whether a product succeeds or fails in today's fast-changing market.

2.4 Theoretical Framework:

This paper discusses two theoretical frameworks. The first examines how artificial intelligence (AI) serves as a mediator in pink marketing, enhancing its effectiveness by aligning with the unique values and behaviors of Generation Z. This framework posits a complementary relationship in which AI capabilities bolster pink marketing's strategic objectives. The second axis critically examines the inherent tension between AI's mechanistic nature, which prioritizes efficiency, and Generation Z's need for authentic, human-centered experiences. This leads to a fundamental paradox of trust, which the paper explains through the theoretical concepts of the "value-tool" dichotomy and the "flow experience" as a psychological mediator. The study argues that the successful integration of AI into pink marketing for this age group hinges on a nuanced understanding of these two opposing forces.

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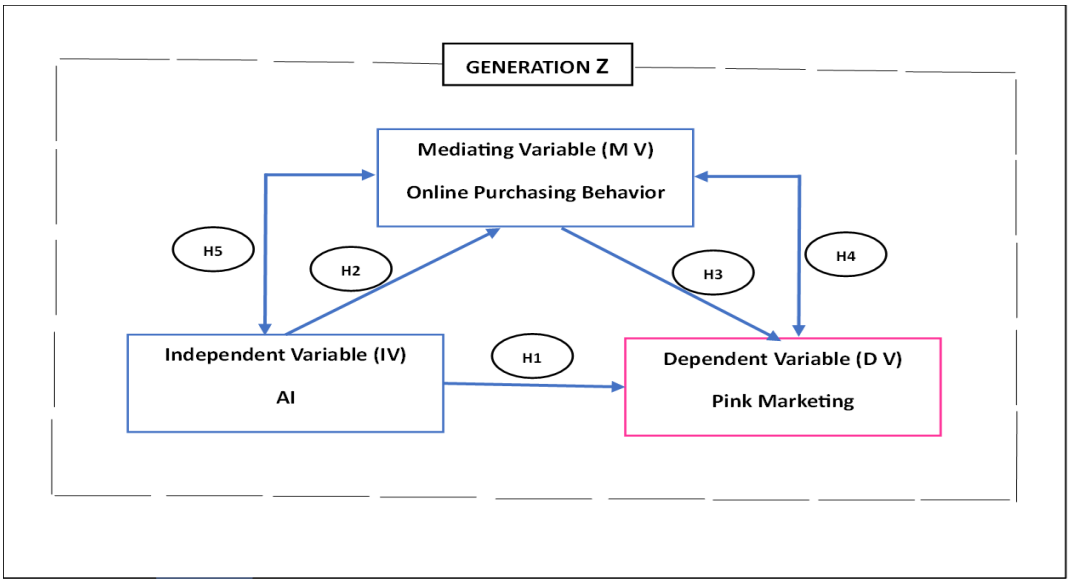


Diagram 1: Proposed conceptual framework for research

The conceptual framework of this research defines the causal relationships between artificial intelligence as the independent variable, online purchasing behavior as the mediating variable, and pink marketing as the dependent variable. This model aims to reveal how artificial intelligence tools influence Gen Z's decision-making processes and, consequently, how they affect the outcomes of pink marketing strategies.

2.5 Pink Marketing and Gen Z's Values

Pink marketing and Gen Z's purchasing behavior are being significantly influenced (Matsa Prasanna, 2024). AI is influencing online shopping, creating a new e-commerce environment. AI enables companies to move beyond blanket marketing campaigns to highly personalized, data-driven strategies that align with Gen Z's values and preferences (Le et al., 2024). For this digital native, AI's ability to deliver authentic, transparent, and convenient shopping experiences is a key factor in their purchasing decisions (C. R. Guerra-Tamez et al., 2024). For example, an AI system could recommend fashion brands to a Gen Z shopper who has previously viewed products from women-owned companies, or suggest products from women-owned companies that align with the consumer's values. This generation is very adept at identifying inauthentic messages and expects brands to align with their core values.

2.5 The Role of Artificial Intelligence in Personalization and Trust

Artificial intelligence is a key driver of this evolution in digital marketing. Rather than relying on superficial demographic data, AI delves deeper into users' online behavior and preferences to personalize the e-commerce experience. AI algorithms analyze users' search and purchase histories, as well as their search queries, to tailor product and content recommendations in online marketplaces (Hermann, 2022). Brand credibility and creative authenticity. Gen Z consumers tend to trust a brand's AI when they perceive it as accurate and reliable. This frequent, trusted interaction helps build a stronger brand connection, positively influencing purchasing decisions (Ang, 2024).

2.6 The Impact of Purchasing Behavior

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The theoretical framework indicates that artificial intelligence's role in pink marketing influences Generation Z's purchasing decisions through two primary factors.

1. The motivations of happiness and utility: Generation Z is characterized by a desire to enjoy shopping and easily find what it needs. Therefore, artificial intelligence caters to both motivations by creating enjoyable, personalized experiences, making the process convenient, and saving time (Bulante, Catalan, Miranda, Torres, & Sabaulan, 2025).
2. Emotional connection and product loyalty: AI's ability to align with Gen Z values and deliver an authentic experience can increase product loyalty and the likelihood of repeat purchases. Even if there isn't a significant direct impact on product loyalty, there will be an indirect effect through product imagery (El Fawal et al., 2024).). While artificial intelligence offers powerful tools, its effectiveness depends on its ability to go beyond mere automation and to understand and adapt to its target audience's values. Marketers should use AI not only to sell products but also to build meaningful, values-based relationships that resonate with today's consumer generation (Gen Z) (Hermann, 2022).

2.7 Strategic Implications and Synergistic Relationships: The Convergence of Pink Marketing, Gen Z Preferences, and AI Technologies

The convergence of pink marketing, Generation Z preferences, and artificial intelligence technologies creates complex relationships that shape the success of contemporary e-commerce. Research specifically examining the effects of AI on pink marketing illustrates how AI enhances the relationship between gender-based marketing strategies and consumer buying behavior, particularly through mobile apps, social media, and personalized experiences (Hasan Beyari, 2024). Generation Z's emphasis on authenticity and sustainability challenges conventional optimistic pink marketing strategies, necessitating a deeper understanding of individual preferences rather than reliance on broad gender-based assumptions (Theocharis & Tsekouropoulos, 2025). AI technologies enable this evolution by providing data-driven insights into personal preferences and enabling broader pattern discrimination (Anand, 2024).

3. Research methodology

3.1 Research approach

The study used a quantitative approach and an analytical-descriptive method. A simple random sampling technique was used to select the sample. To explore the effect of AI on pink marketing by Gen Z—the case of purchasing behavior and shopping online. The ability to analyze and determine the level of variables using the SPSS program (version 27) was used for general statistical analyses and data manipulation. Such techniques create a thorough analysis, delivering reliable results for strategic decision-making and policy formulation in artificial intelligence (AI) to pink marketing towards women in the Sulaymaniyah province area.

3.2 Item measurement

The research used a structured method to measure constructs related to women’s purchase behavior in online shopping, influenced by pink marketing and AI elements. The research used an online questionnaire consisting of 30 questions distributed across five constructs, as shown in Appendix A. This research was conducted by (Hasan Beyari, 2024; Bunea et al., 2024; C. Guerra-Tamez, Flores,

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Serna-Mendiburu, Robles, & Cortés, 2024). These questions were aimed at evaluating AI in pink marketing by Gen Z - the case of purchasing behavior shopping online. Moreover, they were scored on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This type of scale format allowed us to measure, in numerical terms, how strongly high-level viewers would agree or disagree with the offered statements and respond to them systematically. Question allocation varied across the constructs: the minimum was three, and the maximum was five.

3.3 Population, sampling, and data collection

The study focused on a specific group to ensure results were relevant and valid. It included women in Sulaymaniyah province aged 17 and older who had experience with online shopping. The main target was women aged 17 to 28, as their feedback reflects the impact of AI-driven pink marketing on Gen Z's online shopping behavior. The study selected frequent online shoppers to match the research topic. Socioeconomic backgrounds were considered, since responses to pink marketing and AI can vary. Out of about 350 participants, 306 completed the questionnaire and were included in the analysis after data screening. All participants gave informed consent.

3.4 Sample Size Determination

To ensure the sample size is representative of the Intended group, we used Cochran's (1977) formula. This statistical approach is Critical for determining the minimum number of respondents required to achieve a 95% confidence level with a 5% margin of error.

$$n_0 = \frac{z^2.\ p\ .q}{e^2}$$

Although the standard sample size for a large population is 384, our final count of 306 valid responses is statistically significant(Memon et al., 2020). This is supported by the specialized nature of our target group (Gen Z women in Sulaymaniyah). The sample size is sufficient and consistent with academic standards for conducting mediation analysis in the social sciences (Hair et al., 2019).

4. Data Analysis:

Table (1): Descriptive Statistics of Data

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Age	17	12	3.9	3.9	3.9
Age	18	20	6.5	6.5	10.5
Age	19	17	5.6	5.6	16.0
Age	20	39	12.7	12.7	28.8
Age	21	54	17.6	17.6	46.4
Age	22	39	12.7	12.7	59.2

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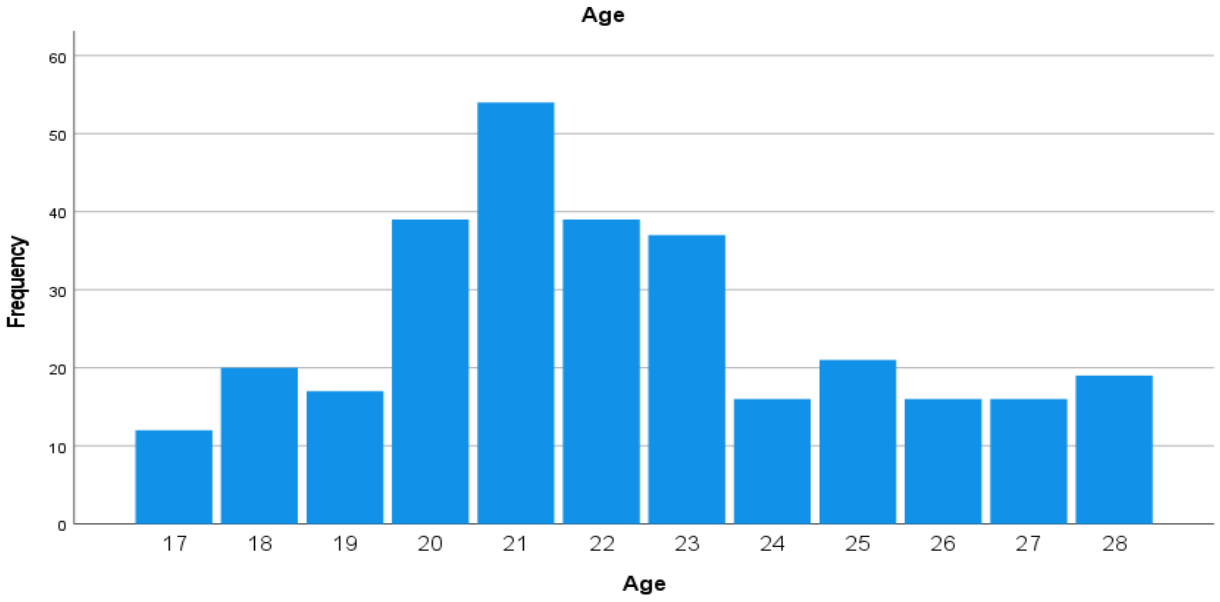
Age	23	37	12.1	12.1	71.2
Age	24	16	5.2	5.2	76.5
Age	25	21	6.9	6.9	83.3
Age	26	16	5.2	5.2	88.6
Age	27	16	5.2	5.2	93.8
Age	28	19	6.2	6.2	100.0
Online Shopping Frequency	Daily	3	1.0	1.0	1.0
Online Shopping Frequency	Weekly	6	2.0	2.0	2.9
Online Shopping Frequency	Bi-weekly	100	32.7	32.7	35.6
Online Shopping Frequency	Monthly	197	64.4	64.4	100.0
Average Online Spending (Iraqi Dinar)	Less than 50000	117	38.2	38.2	38.2
Average Online Spending (Iraqi Dinar)	51000 - 100000	100	32.7	32.7	70.9
Average Online Spending (Iraqi Dinar)	101000 - 200000	42	13.7	13.7	84.6
Average Online Spending (Iraqi Dinar)	201000 - 300000	29	9.5	9.5	94.1
Average Online Spending (Iraqi Dinar)	Over 300000	18	5.9	5.9	100.0
Average Online Spending (Iraqi Dinar)	Total	306	100.0	100.0	

'Prepared by the researcher,' 'From SPSS output

Table 1: The results of a survey with 306 respondents are presented in this report. The age distribution, frequency of online shopping, and average online spending are the three primary areas

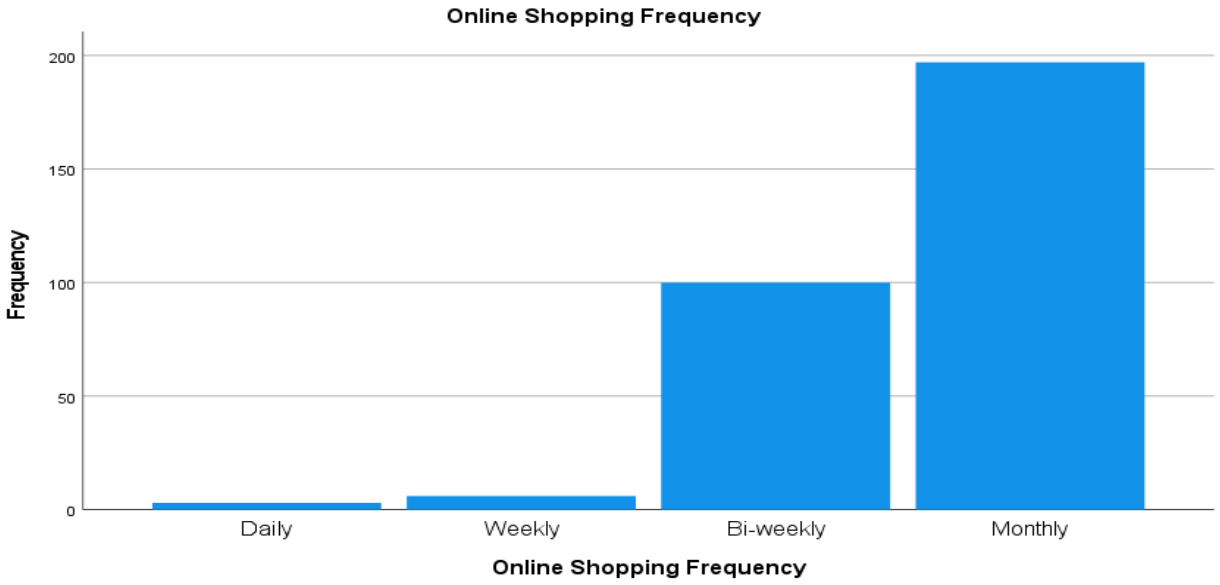
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of focus for this analysis. Age Distribution: More than half of the respondents are young adults aged 20-23. - 21-year-olds make up the largest group (17.3%). Frequency of Online Shopping: The majority of respondents shop online either every month (64.4%) or every two weeks (32.7%). Only 1% or 2% of people shop daily or weekly. Average Online Spending: Most people spend between 51,000 and 100,000 IQD (32.7%) or less than 50,000 IQD (38.2%). - Just 5.9% of people spend more than 300,000 IQD.



'Prepared by the researcher,' 'From SPSS output

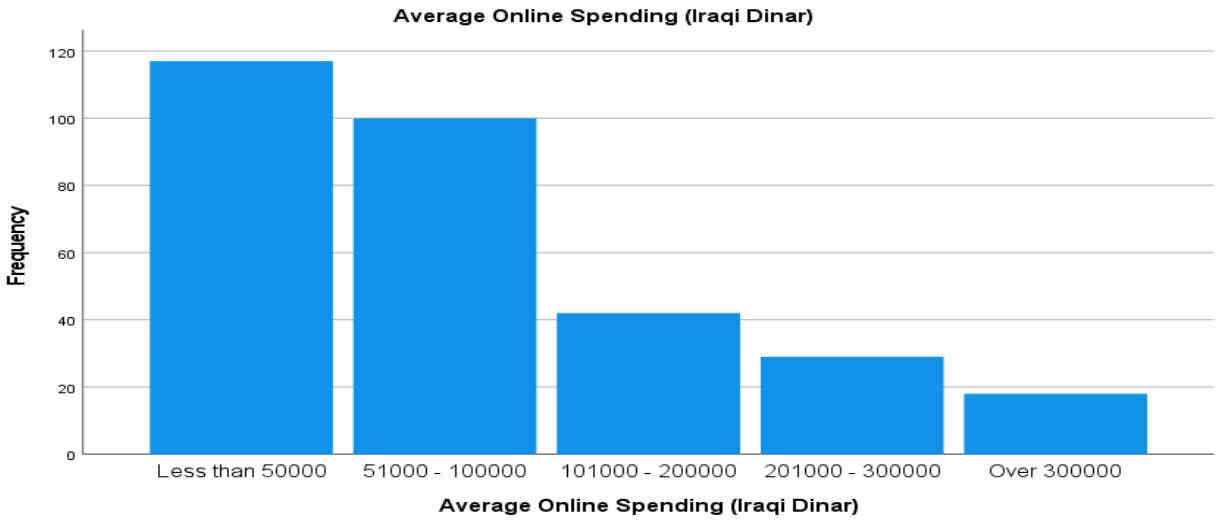
Figure 1: age frequency the bar chart illustrates that the majority of responders are in the 20–23 age range.



'Prepared by the researcher,' 'From SPSS output

Figure 2: Online Shopping Frequency, the bar chart illustrates that Most people shop once a month, then twice a week. 'Prepared by the researcher,' 'From SPSS output

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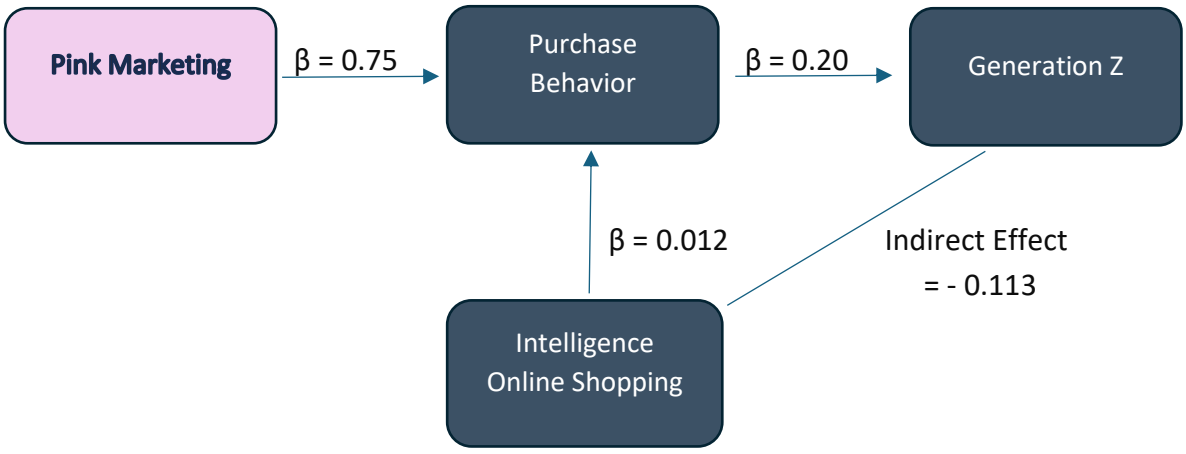
Figure 3: Average Online Spending. The bar chart illustrates that only a small percentage spend more than 200,000 IQD, while the majority spend less than 100,000 IQD.

Table (2) Reliability measurement through the alpha-Cronbach approach

Variables	Reliability Value	Strength of association
Pink Marketing	0.8	Very Good
Generation Z	0.9	Excellent
Purchasing Behavior	0.8	Very Good
Intelligent Online Shopping	0.8	Very good

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Table 2 shows that the prior findings indicate that the current study's questionnaire is suitable for field data collection, as it demonstrates sufficient reliability and validity across all its variables and dimensions**.**

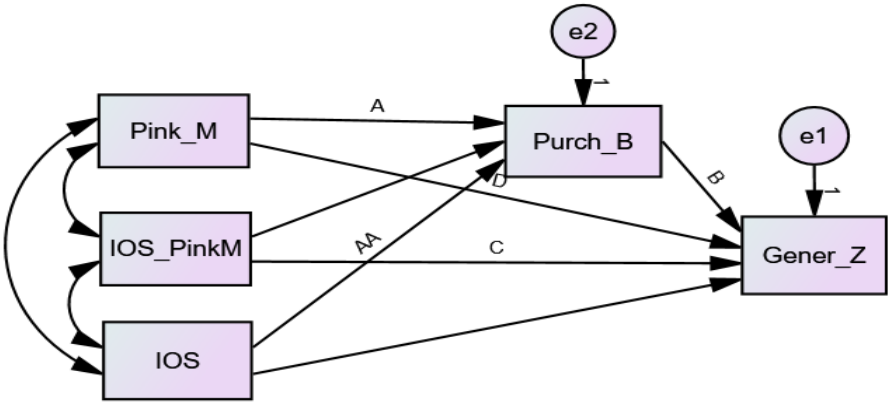


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Diagram2: illustrates that marketing strategies that emphasize pink elements effectively drive purchases and strengthen Generation Z, with intelligent online shopping serving as a partial pathway

Diagram 2: Impact of Pink Marketing and Purchase Behavior and Generation Z



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Diagram 3. Shows that, in essence, this model combines direct effects and mediation:

Purchasing Behavior and Gen_Z are both impacted by exogenous variables (pink Marketing, IOS_ pink Marketing, IOS). pink Marketing / IOS_ pink Marketing / IOS and Gen_Z are mediated by Purchasing Behavior. The three exogenous variables' direct effects on Gen_Z are also modeled, indicating partial rather than complete mediation. To explain results pertinent to Generation Z, the model examines how pink marketing and self-related constructs influence consumer behavior.

Diagram 2: The relationships among variables

Table (3) Outcome of Purchasing Behavior (Mediating Variable)

R	R^2	MSE	F	df 1	df 2	P
0.538	0.289	0.327	40.88	3	302	0.000

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In Table 3, the overall model explained approximately 28.9% of the variance in the outcome variable ($R^2 = 0.289$) and was statistically significant ($F(3, 302) = 40.88$, $p < 0.001$). A reasonable model fit was indicated by a mean squared error of 0.327 and a moderate correlation ($R = 0.538$) between the predictors and the dependent variable.

Table (4) Model for Purchasing Behavior (Mediating Variable)

	Coeff	SE	T	p	LLCI	ULCI
constant	3.73	0.033	112.22	0.000	3.66	3.79
pink Marketing	0.40	0.047	8.55	0.000	0.31	0.49
IOS	0.26	0.060	4.31	0.000	0.14	0.37
Int_1	0.001	0.076	0.014	0.988	- 0.14	0.14

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In Table 4, according to the coefficients, IOS (B = 0.26, SE = 0.060, t = 4.31, p <.001, 95% CI [0.14, 0.37]) and pink Marketing (B = 0.40, SE = 0.047, t = 8.55, p <0.001, 95% CI [0.31, 0.49]) were both statistically significant positive predictors. Nevertheless, the dependent variable was not significantly predicted by Int_1 (B = 0.001, SE = 0.076, t = 0.014, p =0.988, 95% CI [–0.14, 0.14]). Significant results were obtained for the constant (B = 3.73, SE = 0.033, t = 112.22, p <.001, 95% CI [3.66, 3.79]).

Table (5) Tests of the highest order unconditional interactions

	R^2 - change	F	df 1	df 2	P
AI * Online Purchasing Behavior	0.000	0.0002	1	302	0.988

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In Table 5, an R^2 change test was used to determine whether the interaction term (Artificial Intelligence × Online Purchasing Behavior) contributed to the explanation of extra variance in the dependent variable. With changeR^2 = 0.000, F (1, 302) = 0.0002, and p = 0.988, the interaction had no discernible impact on the model. This suggests that there is no significant additional variance in the outcome variable attributable to the interaction between Artificial Intelligence and Online Purchasing Behavior.

Table (6) Outcome of Gen_Z (Dependent Variable)

R	R^2	MSE	F	df 1	df 2	P
0.88	0.77	0.145	250.31	4	301	0.000

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In Table 6, with predictors accounting for roughly 77% of the variance in the dependent variable (R^2 = 0.77), the regression model was statistically significant (F (4, 301) = 250.31, p < 0.001). The mean squared error (MSE = 0.145) indicated a good model fit, and the correlation between the predictors and the outcome was very strong (R = 0.88).

Table (7) Model for Gen_Z (Dependent Variable)

	Coeff	SE	T	p	LLCI	ULCI
Constant	3.05	0.14	21.12	0.000	2.77	3.33
Pink Marketing	0.75	0.035	21.43	0.000	0.68	0.81
Purchasing Behavior	0.20	0.038	5.24	0.000	0.13	0.28
Online Purchasing Behavior	0.12	0.041	2.99	0.003	0.04	0.20
Int_1	- 0.113	0.048	- 2.37	0.018	- 0.21	- 0.02

Prepared by the researcher from SPSS output

In Table 7, 77% of the variation in the results can be explained by this model. The best predictor is Pink Marketing, which is followed by Purchasing Behavior and Online Purchasing Behavior. When the interacting factors come together, they marginally reduce the expected result, yielding a small but significant negative interaction effect (Int_1).

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Table (8) tests of the highest order unconditional interactions

	R^2 – change	F	df 1	df 2	P
AI * Online Purchasing Behavior	0.0043	5.63	1	301	0.018

Prepared by the researcher, from SPSS output

In Table 8, the regression model's explained variance increased slightly but significantly when the interaction term AI × Online Purchasing Behavior was added (change in $R^2 = 0.0043$, $F(1, 301) = 5.63$, $p = 0.018$). This suggests that, in addition to the main effects of the predictors, the interaction between AI and Online Purchasing Behavior accounts for 0.43% of the variance in the dependent variable.

Table (9): Conditional effects of the focal predictor at values of the moderator(s)

Internet online shopping	Effect	SE	T	p	LLCI	ULCI
- 0.56	0.81	0.036	22.37	0.000	0.74	0.88
0.000	0.75	0.035	21.44	0.000	0.68	0.815
0.56	0.68	0.050	13.58	0.000	0.58	0.78

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In Table 9, at every level of online shopping, the predictor significantly improves performance. As the moderator rises (from 0.8095 at low internet online shopping to 0.6832 at high internet online shopping), the effect becomes less pronounced. This implies that internet online shopping moderates the relationship, and that as internet online shopping increases, the predictor's effect is reduced.

Table (10): Conditional direct effects of AI on Pink Marketing

Internet online shopping	Effect	SE	T	p	LLCI	ULCI
- 0.56	0.81	0.036	22.37	0.000	0.74	0.88
0.000	0.75	0.035	21.44	0.000	0.68	0.815
0.56	0.68	0.050	13.58	0.000	0.58	0.78

Prepared by the researcher from SPSS output

In Table 10, as the moderator rises, AI's impact on Pink Marketing diminishes. This implies that the moderator weakens the bond between AI and Pink Marketing. The p-values are 0.000, and the t-values range from 13.58 to 22.37. This indicates that at all moderator levels, the conditional effect of AI on Pink Marketing is statistically significant. Zero is not included in the 95% CIs at any internet online shopping level:

Low: 0.74 to 0.88, Average: 0.68 to 0.815, High: 0.58 to 0.78. This provides more evidence that the effect is substantial and favorable at all moderator levels. In summary, Pink Marketing benefits from AI. As the moderator (internet online shopping) rises, the effect's strength falls. Every effect has statistical significance. With the moderator reducing the AI-to-Pink Marketing relationship, this pattern points to moderation.

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Table 11: Conditional indirect effects of AI on Pink Marketing:

internet online shopping	Effect	BOOT SE	t	P	BOOT LLCI	BOOT ULCI
- 0.56	0.81	0.019			0.047	0.12
0.000	0.75	0.019			0.046	0.12
0.56	0.68	0.024			0.039	0.13

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Table 11 shows the indirect impact at various moderator levels. internet online shopping = - 0.56; indirect effect = 0.81, IOS = 0.00: 0.75 is the indirect effect, internet online shopping = 0.56; indirect effect = 0.68. As the moderator rises, AI's indirect impact on Pink Marketing falls. When the moderator is higher, the mediator transmits less of AI's effect on Pink Marketing. Bootstrap confidence intervals are used to determine significance. The following are the bootstrap confidence intervals: Internet online shopping low: 0.047 to 0.12, Average IOS: 0.046 to 0.12, High internet online shopping: 0.13 to 0.039. At every moderator level, the indirect effect is statistically significant since none of the intervals contain zero. In summary, at every level of internet online shopping, AI has a considerable indirect impact on Pink Marketing through the mediator. As online shopping rises, this indirect effect's strength declines, suggesting that the moderator attenuates the mediated effect. This pattern favors moderated mediation, in which the moderator determines the mediation effect.

Table (12) Index of moderated Mediating

	Index	BOOT SE	BOOT LLCI	BOOT ULCI
Internet online shopping	0.0002	0.019	- 0.037	0.037

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In Table 12, since the confidence interval for the index of moderated mediation includes zero, the analysis shows that although the indirect effect of AI on Pink Marketing through the mediator varies slightly across levels of internet online shopping, the overall moderation of the mediation is not statistically significant.

5. Result and Discussions

Multiple regression analysis demonstrated that pink marketing strategies significantly predict purchasing behavior among Gen Z customers in online shopping contexts within Sulaymaniyah province. The initial model ($F(3,302) = 40.88$, $p < 0.001$, $R^2 = 0.289$) identified pink marketing ($B = 0.40$, $p < 0.001$) and online shopping ($B = 0.26$, $p < 0.001$) as significant predictors, while the interaction term remained non-significant ($B = 0.001$, $p = 0.988$). The extended model incorporating purchasing behavior as an additional predictor yielded substantially improved explanatory power ($F(4,301)=250.31$, $p<0.001$, $R^2=0.770$), with pink marketing ($B=0.75$, $p<0.001$) and purchasing behavior ($B=0.20$, $p<0.001$) emerging as the strongest positive predictors, whereas the interaction term exhibited a small but significant negative effect ($B=-0.113$, $p=0.018$, $\Delta R^2=0.0043$). Moderated mediation analysis revealed that while conditional direct effects of pink marketing on purchasing behavior decreased progressively across online shopping levels (low internet online shopping: 0.81; mean internet online shopping: 0.75; high internet online shopping: 0.68, all 95% CIs excluding zero), and conditional indirect effects through the mediator demonstrated similar patterns, the moderated

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mediation index was non-significant (index=0.0002, 95% CI[-0.037, 0.037]), indicating that online shopping does not significantly moderate the indirect pathway between pink marketing and purchasing behavior among the target demographic. A previous study demonstrated that AI has an important role for consumer participants in the digital market, providing useful input for marketers who intend to target women in Saudi Arabia. Also, AI has a significant positive effect on Generation Z consumers' decision-making(Hasan Beyari, 2024; Shiddieqy & Widarmanti, 2025). According to Ruiz-Viñals, Pretel-Jiménez, Del Olmo Arriaga, and Miró Pérez (2024), AI perceived usefulness has a positive influence on purchase intention. However, this research focuses on changes in consumer perception of women by examining how Gen Z and future generations view pink marketing, especially as discussions about gender roles and equality evolve. Brand trust: Research should focus on the brands that consumers, particularly Generation Z consumers accustomed to online shopping, find most trustworthy. Brand Loyalty: Investigate how pink marketing affects consumer loyalty and trust over the long run, beyond short-term sales. The pink marketing concept: most women are unaware of this concept. As a result, more attention must be paid to the pink marketing concept. Pink marketing mix: the need to increase shopping malls' interest in the pink marketing mix (pink products, pink prices, pink places, and pink promotions) to increase female customers' demand for their goods. Consumer of AI: Studying the role of consumer trust in AI, particularly how trust is established and maintained through transparent AI systems, may provide additional insights into how AI affects purchasing behavior.

6. Recommendations:

Based on the findings, several strategic recommendations are proposed for marketers and e-commerce platforms targeting Generation Z consumers in Sulaymaniyah Governorate. First, companies should prioritize AI-powered pink marketing strategies as a key driver of purchasing behavior (B=0.75, p<0.001), while incorporating personalized content and gender-inclusive branding across digital platforms. Second, organizations should improve online service quality (online shopping) while considering its moderating effect on marketing effectiveness. A balanced approach between service improvement and marketing intensity is recommended to maximize consumer engagement. Third, firms should focus on strengthening the direct link between pink marketing and purchase behavior rather than relying solely on indirect mechanisms, given the insignificant moderating effect. Finally, future research should extend this work to other Iraqi governors and diverse demographics to enhance generalizability and examine additional moderating factors, such as social media influence, brand trust, and the level of AI personalization, to provide a more comprehensive understanding of Generation Z online shopping behavior in the Iraqi Kurdistan Region.

7. Conclusion

All things considered, Pink Marketing was consistently the best predictor of the dependent variable. Internet online shopping and Purchasing Behavior both had a positive impact on the result, though internet online shopping was less pronounced. When included, interaction effects had a negligible negative impact. These findings imply that the dependent variable is primarily driven by the main predictors, especially Pink Marketing and Purchasing Behavior, with interactions between AI and online shopping behavior having negligible effects.

In conclusion, both directly and indirectly through the mediator, AI significantly benefits Pink Marketing. The moderation of the mediation itself was not significant, even though the strength of both direct and indirect effects diminishes with increasing online shopping. As a result, online shopping somewhat reduces the impact of AI on Pink Marketing, but the entire mediated pathway remains strong at all moderator levels.

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Appendix

Questionnaire

The Effect of Artificial Intelligence on Pink Marketing for Generation Z: The Mediating Role of Online Purchasing Behavior.

کاریگەری زیرەکی دەستکرد (AI) لەسەر بەبازاڕکردنی پەمەیی لەلایەن - Gen Z کەیسی هەڵسوکەوتی کڕین بازاڕکردن بە ئۆنلاین.

A- Demographic Information زانیاری دیمۆگرافی

1- Age: _____ تەمەن

2- Online Shopping Frequency: دووبارەکردنەوەی بازاڕکردنی ئۆنلاین

A. Daily ڕۆژانە

B. Weekly هەفتانە

C. Bi-weekly دوو هەفتە جارێك

D. Monthly مانگانە

E. Every few months چەند مانگ جارێک

3- Average Online Spending (Iraqi Dinar): (----------) تێکڕای خەرجییەکانی ئۆنلاین (دیناری عێراق):

- Under 50 کەمتر لە ٥٠ هەزار دینار
- ١٠٠-٥٠ ٥١٠٠٠ بۆ ١٠٠٠٠٠
- ٢٠٠-١٠١ ١٠١٠٠٠ بۆ ٢٠٠٠٠٠
- ٣٠٠- ٢٠١ ٢٠١٠٠٠ بۆ ٣٠٠٠٠٠
- Over 300 ٣٠٠هەزار زیاتر

4. Primary Online Shopping Categories: (Select all that apply)

پۆلە سەرەتاییەکانی کڕینی ئۆنلاین: (هەموو ئەوانەی کە دەیانکریت بە ئۆنلاین هەڵبژێرە)

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- Electronics پێداویستی ئەلیکترۆنی
- Home & Living پێدایستی ماڵ
- Health & Wellness پێداویستی تەندروستی
- Food & Beverages خواردن و خواردنەوە

B- Research Questions

Section 1: Artificial Intelligence (AI) بەشی یەکەم: زیرەکی دەستکرد (AI)

Artificial Intelligence	Strongly disagree **1**	Disagree **2**	Natural **3**	Agree **4**	Strongly agree **5**
1. I am familiar with how artificial intelligence (AI) works in online shopping platforms. ئاشنام بە چۆنیەتی کارکردنی زیرەکی دەستکرد (AI) لە پلاتفۆرمەکانی کڕین بە ئۆنلاین.					
2. AI-based recommendations influence my product choices. پێشنیارەکانی بنەمای زیرەکی دەستکرد، کاریگەریان لەسەر هەڵبژاردنی بەرهەمەکانم هەیە.					
3. AI technology has become an integral part of my online shopping routine. تەکنەلۆژیای زیرەکی دەستکرد بووەتە بەشێکی دانەبڕاو لە ڕۆتینی بازاڕکردنی ئۆنلاینم.					
4. Artificial intelligence chatbots offer genuine service to customers throughout the shopping experience. چاتبۆتەکانی(بۆتی گفتوگۆ) زیرەکی دەستکرد (AI) خزمەتگوزاری ڕاستەقینە پێشکەش بە کڕیاران دەکەن بە درێژایی ئەزموونی کڕین.					
5. I am comfortable with AI collecting and analyzing my data to improve my shopping experience. من ئاسوودەم لەگەڵ زیرەکی دەستکرد (AI) لە کۆکردنەوی داتا و شیکردنەوەی بۆ باشترکردنی ئەزموونی کڕینەکەم.					
6. I often purchase products suggested by AI recommendation systems. AIزۆرجار ئەو بەرهەمانە دەکڕم کە لەلایەن سیستەمی زیرەکی دەستکرد پێشنیار کراون.					

Section 2: Pink Marketing

Pink Marketing	Strongly disagree **1**	Disagree **2**	Natural **3**	Agree 4	Strongly agree **5**

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7. Pink marketing (gender-targeted marketing) influences my product choices and preferences. بەبڕڕکردنی پەمەیی (بەرهەمی جوانکاری و پێداویستی ئافرەتان – ڕەگەزی مێ) کاریگەری لەسەر هەڵبژاردن و ئارەزووەکانی بەرهەمەکانم هەیە					
8. I believe brands use pink marketing to target female customers. من باوەڕم وایە بڕاندەکانی دروستکردنی بەرهەمی بەبڕڕکردنی پەمەیی (بەرهەمی جوانکاری و پێداویستی ئافرەتان – ڕەگەزی مێ) بەکاردەهێنن بۆ ئەوەی کریارە مێ یەکان بکەنە ئامانج.					
9. I trust brands more when their designs reflect gender diversity. من زیاتر متمانەم بە بڕاندەکان هەیە کاتێک دیزاینەکانیان ڕەنگدانەوەی جۆراوجۆری ڕەگەزییە.					
10. Pink branding affects my willingness to try a product. بڕاندکردنی پەمەیی (بەرهەمی جوانکاری و پێداویستی ئافرەتان –ڕەگەزی مێ) کاریگەری لەسەر ئامادەیی من هەیە بۆ تاقیکردنەوەی بەرهەمێك.					
11. Pink marketing influences my perception of product quality and desirability. بەبڕڕکردنی پەمەیی (بەرهەمی جوانکاری و پێداویستی ئافرەتان – ڕەگەزی مێ) کاریگەری لەسەر تێڕوانینم هەیە بۆ کوالیتی بە باشتر زانینی بەرهەم.					

Section 3: Generation Z (Gen Z) Z (Gen Z) بەشی سێیەم: نەوەی

Generation Z (Gen Z)	Strongly disagree **1**	Disagree **2**	Natural **3**	Agree 4	Strongly agree **5**
12. I consider myself a digital-native shopper. خۆم بە کڕیارێکی ڕەسەن دیجیتاڵی دەزانم.					
13. I prefer brands that align with my social values and demonstrate social responsibility. من ئەو بڕاندانەم پێ باشترە کە لەگەڵ بەها کۆمەڵایەتییەکانمدا دەگونجێن و بەرپرسیارێتی کۆمەڵایەتی هەڵدەگرن.					
14. I rely heavily on social media and digital platforms for discovering new products and brands. من زۆر پشت بە سۆشیال میدیا و پلاتفۆرمە دیجیتاڵییەکان دەبەستم بۆ دۆزینەوەی بەرهەم و بڕاندە نوێیەکان.					
15. I expect personalized and customized experiences when interacting with brands online. لەکاتی کارلێککردن لەگەڵ بڕاندەکان بە شێوەی ئۆنلاین، چاوەڕوانی ئەزموونی کەسی و تایبەتمەند دەکەم.					
16. I prefer shopping on apps or websites over physical stores. من بڕڕکردنم لە ئەپ (بەرنامەکانی کڕینی کاڵا و خزمەتگوزاری بە ئۆنلاین) یان ماڵپەڕەکاندا پێ باشترە وەك لە فرۆشگا فیزیکییەکان (ئەو					

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فۆشگایانەی ڕاستەوخۆ کاڵا و خزمەت گوزارییەکە دەفرۆشن بە کەسەکان).					
17. I prefer to research products thoroughly online before making purchasing decisions. من پێم باشە پێش ئەوەی بڕیاری کڕین بدەم بە شێوەی ئۆنلاین، لێکۆڵینەوە بکەم (زانیاری کۆبکەمەوە) لەسەر بەرهەمەکان.					

Section 4: Purchasing Behavior **بەشی چوارەم: هەڵسوکەوتی کڕین**

Purchasing Behavior	Strongly disagree **1**	Disagree **2**	Natural **3**	Agree **4**	Strongly agree **5**
18. I compare multiple options before making a purchase. من پێش ئەوەی بڕیار بدەم، چەندین بژاردە بەراورد دەکەم					
19. I often purchase based on the look and feel of a product online. زۆرجار بە پشتبەستن بە دیمەن و وێنەی بەرهەمێك بە شێوەی ئۆنلاین دەیکرم.					
20. Discounts and promotions heavily influence my buying decisions. داشکاندن و بانگەشە (ریکلام) کاریگەرییەکی زۆری هەیە لەسەر بڕیارەکانی کڕینم .					
21. I rely on product ratings and reviews before buying. من پێش کڕین (بڕیار) پشت بە هەڵسەنگاندن و پێداچوونەوەی بەرهەمەکان دەبەستم.					
22. I compare prices across multiple platforms before making a purchase decision. من پێش ئەوەی بڕیاری کڕین بدەم نرخەکان لە چەندین پلاتفۆرمدا بەراورد دەکەم.					
23. I tend to make quick purchasing decisions when I find something visually appealing. من مەیلی ئەوەم هەیە بڕیاری کڕینی خێرا بدەم کاتێك بەرهەمێك لە ڕووی بینینەوە سەرنجم ڕادەکێشێت.					

Section 5: Online shopping **بەشی پێنجەم: بازاڕکردنی ئۆنلاین**

Online shopping	Strongly disagree **1**	Disagree **2**	Natural **3**	Agree **4**	Strongly agree **5**
24. I feel comfortable sharing personal information while shopping online. هەست بە ئاسوودەیی دەکەم لە هاوبەشکردنی زانیاری کەسی لەکاتی بازاڕکردن بە شێوەی ئۆنلاین					
25. I prefer online shopping because it saves time. من بازاڕکردنی ئۆنلاینم پێ باشترە چونکە کاتی تەواوم بۆ دەگێڕێتەوە.					
26. I shop online more due to social media influence.					

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من زیاتر بڕۆکردن لە ڕێگای ئۆنلاینەوە دەکەم بەهۆی کاریگەری زۆر بەکارهێنانی سۆشیال میدیا.					
27. I believe online stores offer more variety than physical ones. من پێم وایە فرۆشگا ئۆنلاینەکان جۆراوجۆری زیاتری بەرهەم پێشکەش دەکەن لە چاو فرۆشگا فیزیکیەکان (ئەو فۆشگایانەی ڕاستەوخۆ کاڵا و خزمەت گوزاریەکە دەفرۆشن بە کەسەکان).					
28. Fast and free shipping options are crucial factors in my online shopping decisions. بژاردەی خێرای گەیاندنی بێبەرامبەر هۆکارێکی گرنگە بۆ بڕیاردانم لە کڕینی ئۆنلایندا.					
29. I trust the security of major online shopping platforms. متمانەم بە (security) ئاسایشی پلاتفۆرمە سەرەکییەکانی کڕینی ئۆنلاین هەیە.					