

The Effectiveness of ChatAI on Influencing Customer's Compulsive Buying Behaviors: Application of ChatGPT

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Abstract

ChatGPT-a language model created and released by OpenAI in 2022. ChatGPT's natural language processing capabilities, including question answering and idea generation, make it an effective tool for commercial applications and revolutionize the way people interact with technology. This study aims to assess the influence of marketing campaigns generated by ChatGPT in comparison to campaigns created by experienced marketing managers (human managers) on consumers' compulsive buying behaviors. Structural equation modelling was employed to test the hypotheses after collecting data via questionnaire. Drawing on a sample of consumers, the findings reveal that traditional marketing managers have a greater influence on customer compulsive buying behaviors than ChatGPT. Additionally, the research assesses the significant impact of ChatGPT-generated promotional strategies on various consumer demographics, including age, gender, and income. The study employed two scenarios to investigate the vulnerability of customers of different age, gender, and income levels to AI-driven marketing interventions. These insights offer valuable implications for business managers who are considering incorporating ChatGPT into their marketing strategies. This integration can help optimize their marketing strategies and customize their approaches for different age, gender and income groups. Ultimately, this can enhance their overall market performance and provide a competitive advantage.

Keywords: OpenAI, ChatGPT, Compulsive Buying Behavior, Marketing Campaign, Marketing Mix, Consumer demographics

Introduction

Artificial Intelligence (AI) has experienced significant growth in recent years, and it has a profound influence on corporations, communities, and individuals (Dwivedi et al., 2023). AI, including the recently developed ChatGPT model by OpenAI, has been widely adopted and applied. ChatGPT is constructed using the foundational GPT models created by OpenAI, but it undergoes further training and customization specifically for conversational purposes (Fraivan and Khasawneh, 2023). ChatGPT's ability to receive instructions and generate detailed conversational responses has generated global interest. There is an increasing demand to gain a deeper understanding of how it will influence the field of business research and practices (Dwivedi et al., 2023). Some scholars pointed out that ChatGPT can provide better interaction with consumers, enhance customer service, personalize shopping experiences (Paul et al., 2023). From customer service and support to marketing and sales, ChatGPT offers a unique proposition for organizations to interact with their target audience in a more natural and engaging manner. By integrating ChatGPT into their business processes, companies can unlock opportunities for automation, efficiency, and improved decision-making (George et al., 2023a).

The field of marketing is undergoing a significant transformation due to the influence of artificial intelligence. One way in which this technology is making an impact is through the automation of various tasks, as noted by (Dholakia and Firat, 2019). Elhajjar (2023) summarized that a range of technical and interpersonal skills are essential for marketing managers. Marketing managers need to have a strong understanding of marketing principles, be creative, adept in online marketing, innovative, and skilled in team management. Takwim et al., (2023) suggest that effective marketing campaigns exert a significant influence on consumers' purchase decisions. Sands et al., (2022), discover that AI is often linked to an increased propensity to generate word-of-mouth intentions among consumers of different ages. Age, as an important demographic characteristic, plays a significant role in shaping consumers' purchasing decisions. Pratap (2017) highlights that the spending behavior of young individuals tends to prioritize entertainment, socializing, lifestyle choices, fashion, and movies. Pal & Shukla (2020) highlight a notable difference in purchase behavior of young individuals compared to older age groups in different marketing scenarios. However, as customers get mature, their priorities change, leading to a shift in their expenditure patterns. They begin to prioritize health and financial investments, while reducing spending on recreational activities. In contrast, elderly individuals typically spend more on pharmaceutical expenses due to their increased healthcare needs, despite being more home-bound. Furthermore, the role of gender can be considered a significant factor in shaping customer responses to advertisements

(Keshari and Jain, 2016). Although ChatGPT represents a major advance in natural language processing the existing research on ChatGPT applications has been dedicated to academic and communication aspects, while its application in business especially in marketing is still limited (Frieder et al., 2023). ChatGPT's integration in digital marketing enhances efficiency through automation, boosts customer engagement and offers scalability without the need for additional human resources when expanding operations (George et al., 2023a). Marinchak et al., (2018) discuss the initial manifestations of AI's influence on marketing management, highlighting that AI is reshaping the fundamental principles, responsibilities, and tools within the field of marketing.

However, limited research addresses segmented influences, such as impact of demographic factors of consumers' age, gender, and income level on marketing ideas generated by ChatGPT. In the era in which artificial intelligence-AI becomes increasingly powerful, few scholars have conducted research on whether artificial intelligence can replace the role of expert marketing managers. The need for further research in this area is also highlighted by the Marketing Science Institute (MSI), which has identified AI in marketing as a significant research priority. The significance and substitution of the emerging field of AI in marketing is insufficiently explored. Therefore, to gain a deeper understanding of the characteristics of the marketing campaigns generated by ChatGPT and which consumer populations these campaigns will impact, it is essential to conduct comprehensive marketing research and analysis. If ChatGPT generates campaigns that are biased towards a specific demographic, marketing managers should make adjustments to the marketing campaigns based on the specific demographic and consumer market. This study is an endeavor to fill this gap by using two different scenarios to examine and compare the impact of marketing campaign generated by ChatGPT and marketing managers on consumer impulsive buying behavior based on demographic factors such consumers age, gender and income level.

Literature Review

In recent years, the widespread popularity of artificial intelligence (AI) in business models has been driven by its efficiency and creativity. In their research Chintalapati & Pandey (2022), Kardon (2019), and Ng (2016) found that incorporating AI technology into marketing functions within organizations holds considerable promise for yielding strategic competitiveness and above average returns. Businesses aim to derive superior value through the development and application of intelligent technologies. Among them, ChatGPT is a newborn in the AI industry, while its potential value for development and future exploitation in business is immeasurable.

Verma et al., (2021) discuss the role of recent disruptive technologies, mainly AI, in

business operations. Sestino & De Mauro (2022) published a classification system that categorizes the application of machine learning and artificial intelligence in the field of marketing. Zaremba and Demir (2023) have pointed out that ChatGPT has the potential to enhance NLP-based financial applications, but it also raises ethical and regulatory issues that need to be addressed. In the area of scientific research, Grimaldi & Ehrler (2023) adopt a comprehensive view on the emerging role of AI in scientific research production. This technology offers valuable insights into every step of the customer journey, enabling marketers to better understand the factors that drive consumer behavior. Chen & Eger (2022) investigate the application of ChatGPT in the field of finance, as well as title and abstract generation. George et al., (2023) indicated that the application of ChatGPT in business has a positive effect on digital marketing and e-commerce since ChatGPT offers the benefits of quickly processing messages and providing timely suggestions to the potential customers. Previous scholarly research on the topic of ChatGPT in business is still relatively broad, and few academic studies have been able to explore the effectiveness of ChatGPT in marketing applications (as compared to human designed marketing programs/campaigns).

ChatGPT

ChatGPT is a large language model developed by OpenAI that has rapidly become popular in the field of natural language processing and artificial intelligence (Jin and Kruppa, 2023). It can be applied to various marketing tasks, such as content creation, lead generation and marketing research and sales, which makes it a powerful tool. The utilization of big data is also seen as an opportunity to gain a deeper understanding of consumer behavior (Filieri and Mariani, 2021). Davenport et al. (2020) propose that AI will have a profound impact on business models, sales procedures, customer service, and consumer behavior.

Loureiro et al. (2021) discuss the future where, like other industries, AI will have a huge impact on business. Claudé & Combe (2018) emphasize current perceptions of AI focus primarily on its role as a facilitator of important business decisions, rather than viewing it as the primary decision-maker. In business applications, marketers use ChatGPT to create content and marketing campaigns, manage customer relationships, and transform the brand advertising landscape (V. Jain et al., 2023).

Kose and Sert, (2016) stated that customers prefer to view advertisements that are relevant to their interests or meet their specific needs. By formulating targeted advertising strategies that target the right consumer segments, AI can ensure they reach the most receptive audiences who are likely to respond positively to the ads shown to them. When

combined with AI-driven smart notifications, these advanced technologies can deliver real-time discount offers and personalized messages to each visitor, thereby elevating the level of customized user experience. Marketing activities generated by AI include segmentation and analysis of consumer market groups closely related to marketing strategy. Additionally, artificial intelligence is highly sought after for its applications in messaging, customization, and predicting consumer behavior (Columbus, 2018). Carvalho and Ivanov (2023) note that in addition to assisting with customer surveys, ChatGPT and similar models have the capability to examine customer feedback, such as online reviews, comments, surveys, and social media posts.

ChatGPT vs Traditional Roles of Marketing Managers

The ongoing disruption caused by the fourth industrial revolution is leading to a shift in the responsibilities of marketing managers (Wedel and Kannan, 2016, and Whitler et al., 2017). AI is currently unable to replicate these human capabilities (Jarrahi, 2018). However, given the rapid emergence of tools to automate and enhance marketing decisions, as well as the demand-side impact of emerging technologies, the precise nature of the transformation occurring in the marketing manager's role remains unclear (Dawar and Bendle, 2018). The impact of AI goes beyond transforming the role of marketing managers within organizations. The marketing landscape will undergo a transformation where the primary competition will be for the attention of AI assistants (Dawar and Bendle, 2018). Despite having sufficient resources many companies encounter difficulties in producing new products that match customer preferences and current market trends (Ali et al., 2020). These challenges stem from limitations in marketing capabilities, a lack of skilled marketers, and experienced marketing managers. Liu-Thompkins et al., (2022) found that AI's current imitation of human empathy represents a significant advance in the development of AI and will create value for businesses in the future.

Marketing managers can communicate about company products, manage relationships, disseminate market knowledge, develop strategies and evaluate marketing performance, embodying a communication-and-relationship-oriented, knowledge-based, fluid marketing function that transcends departmental boundaries.

ChatGPT and Demographic Factors of Customers

Luo et al., (2019) examine data from a field experiment to investigate the impact of revealing an AI-powered financial chatbot on customer purchase choices. Ma and Sun, (2020) conclude that the adoption of AI in business varies based on consumer demographics. They demonstrate that the purchasing behaviors of younger consumers (under 25 years old) and those between 25 and 45 years old were most likely to be influenced. Santini et al., (2019) indicate a negative correlation between age and compulsive buying behavior. According to Ene et al., (2019) people under 40 show greater

openness and willingness to accept new AI technologies, while people over 40 show more suspicion and distrust. Older consumers may be less inclined to recognize the benefits of AI due to a lack of curiosity and reluctance to try new technologies. Hultén and Vanyushyn, (2014) found that both gender and age influence shoppers' compulsive buying tendencies. Specifically, they found that younger women made compulsive purchases more frequently than older men. Blut et al., (2021) found that there were differences between the gender of consumers in terms of correlations between the use of AI robots. Kacen, (2000) points out that consumer behavior is influenced by gender norms and expectations due to their unique perspectives and preferences on fashion and lifestyle, leading to differences in their purchasing behavior. Research shows that gender plays an important role in shaping individuals' online consumption preferences (Haq and Abbasi, 2016).

Consumers' compulsive buying behavior is not only influenced by gender, but also by income level. Santini et al., (2019) concluded that there is a significant positive relationship between consumers' income and compulsive buying behavior. Tifferet and Herstein, (2012) noted that higher income levels tend to lead to an increase in compulsive buying due to greater purchasing power and ability to afford such purchases when engaging in marketing campaigns. Consumers with higher incomes tend to be less sensitive to price changes and more likely to make compulsive purchases. Khatri, (2021) concluded that in artificial intelligence and consumer relations, there is a significant difference between a customer's purchasing behavior and their monthly income. Zhang and Qi, (2019) found that both educational level and income level have a significant impact on the use of artificial intelligence robots.

Compulsive buying behavior

Compulsive buying refers to the sudden, unplanned, compelling purchasing behavior (Pahlevan Sharif et al., 2022). Consumer purchasing involves the decision-making process aimed at fulfilling all the necessary requirements (Jalal, 2022). Purchasing decisions can be influenced by various external factors such as advertising, marketing campaigns, word-of-mouth recommendations and reviews. As a result, businesses often invest heavily in marketing and advertising campaigns to ensure their products or services are at top-of-the mind when consumers make purchasing decisions. Compulsive buying is influenced by multiple factors such as purchaser resources (financial and/or time availability), motivations (hedonic or utilitarian), individual characteristics (tendencies towards compulsive buying and sensation-seeking), and marketing cues (Olsen et al., 2022). Lv et al., (2021) point out that price attributes, visual appeal, and outside influence can lead to compulsive buying behaviors. In the wake of global economy and digital information age, firms are developing and using big data analytics capability to infer consumer preferences.

Compulsive buying arises from the urge of consumers' mood, which is an unplanned emotion. Identifying customer preferences is among the frequently observed applications of AI (Mishra and Mishra, 2023). AI plays a crucial role in converting data into valuable consumer insights (Paschen et al., 2020). Suresh and Biswas, (2019) examined the notable influence of demographic factors such as gender, income, age, and education level on compulsive buying. They found that gender emerged as the most dependable predictor of compulsive buying. Yinuo et al., (2022) discovered that young individuals exhibit a greater inclination towards compulsive buying compared to middle-aged individuals, and this inclination has a more significant influence on brand-related factors. Ye et al., (2021) found that age plays a critical role in the propensity for compulsive buying behaviors especially younger individuals are more prone to developing such behaviors compared to other age groups.

ChatGPT and Marketing Strategies

The main objective of marketing campaigns/strategies is to fulfill customers' needs and wants and to achieve the business objectives of the organization (Sutrisno et al., 2023). Using AI-generated marketing campaigns, marketers can gain comprehensive consumer insights and enhance their understanding of how to classify and guide customers to the next marketing stage (Peyravi et al., 2020). To run effective marketing campaigns, marketers often segment the market based on consumer demographics such as age, gender, and income level (Naim, 2023). Huang et al., (2019) discuss the growing importance of AI in marketing due to enhanced computing power and reduced costs, the availability of extensive market data, and the utilization of sophisticated machine learning models and algorithms. For instance, Haji and Stock, (2021) found that gender differences can be observed in responses to marketing advertisements. Research shows that older consumers are less willing to proactively seek out new information. When consumers encounter diverse marketing campaigns, differences in household income levels affect their purchase decisions (Naim, 2023). Therefore, AI has the ability to develop different marketing strategies based on consumers' demographic characteristics to further segment the consumer market.

AI has revolutionized marketing by enabling personalized experiences in various ways. Many companies have already started using artificial intelligence to personalize/customize their websites, emails, social media posts, videos and other marketing materials to more effectively target different age groups, income levels, gender differences and other influencing factors. One of the main goals of AI is to automate tasks that previously relied on human intelligence. Reducing the need for human resources to execute projects or

perform daily tasks not only improves efficiency, but also saves time for customers. Therefore, organizations can gain significant efficiency advantages by implementing AI technology to successfully formulate and execute marketing strategies.

Marketing Mix

Huang et al., (2019) designed a cyclic framework to incorporate or optimize AI into each stage of marketing work, which the authors divided into "marketing research", "marketing strategy" and "marketing action". In "marketing research", AI can be used for data collection, market and customer data analysis. In addition, AI can assist marketers in the "marketing strategy" stage by identifying patterns in customer data and recommending segmentation and positioning strategies. During the "marketing action" phase, AI can be advantageously used to streamline processes through standardization and personalization. Furthermore, Huang and Rust, (2020) use the marketing mix to more clearly illustrate the application of AI. Marketing plays a key role in determining whether a company can successfully achieve its goals (Deepak and Jeyakumar, 2019). The integration of AI and marketing has become a rapidly growing trend, ensuring competitive advantage in the competitive landscape. Companies are redefining their marketing mix by integrating artificial intelligence into marketing strategies. Therefore, companies that understand the importance and value of a competent marketing manager will consider finding the right candidate for the position. AI plays a vital role in analyzing customer segments, predicting customer expectations, and delivering customized promotions and advertising to each segment (Farrell et al., 2022). In order to implement AI in marketing strategies, companies adjust their marketing mix by integrating AI technology (Li, 2019).

AI and Product Mix

AI integration in product strategy offers various opportunities as outlined by (Campbell et al., 2020). These include identifying areas for new product development and enhancement, creating personalized products based on consumer preferences, streamlining product delivery and logistics, and leveraging AI to predict future product demand. Additionally, AI-powered audience insights platforms enable product marketing by extracting valuable customer insights from social media (Campbell et al., 2020). By implementing automated product recommender systems, AI contributes to improved customer loyalty and cross-selling, leading to increased customer satisfaction (Rodrigues, 2021). Furthermore, AI facilitates collaborative design processes that prioritize customer insights in product development (Wamba, 2022).

AI and Price Mix

AI technology offers various contributions to pricing strategies, including estimating price elasticity, identifying pricing patterns, and facilitating dynamic pricing (Campbell et al., 2020). AI can monitor consumer buying trends enabling competitive pricing solutions (De Jesus, 2019). AI collects pricing information on discounted prices offered by competitors and assess customers' willingness to pay discounted prices. AI has the ability to build a competitive pricing index by taking into account competitor prices, providing a benchmark for brands aiming to ensure competitive pricing (Jarek and Mazurek, 2019). AI enhances pricing strategies by customizing prices for customized products and adjusting pricing decisions based on various revenue management methods (De Jesus, 2019).

AI and Place Mix

AI is set to have a positive impact on distribution across three crucial areas: point of sale, supply chain, and internal processes (Meyer et al., 2020). It has opened new avenues for marketing channels like e-commerce and online platforms, leading to significant cost reductions for organizations (Stone et al., 2020). AI can automate online merchandising, increasing revenue and value o (Brandon, 2017). With the convenience of online shopping, consumers have the freedom to shop anytime, anywhere, providing businesses with new opportunities to engage with customers outside of their traditional locations. Furthermore, AI enables channel optimization and simplifies the identification of untapped channels. Integration of AI in distribution improves transaction times and expedites the overall transaction process (Rodríguez-Espíndola et al., 2020).

AI and Promotion Mix

AI has revolutionized marketing communications by offering a wide range of platforms and tools for effective implementation, such as A/B ad testing, contextual ad targeting, AI-optimized ad retargeting, keyword bidding, and automated content personalization (Kaput, 2016). AI plays a vital role in customizing advertising content, such as text, images, and videos, to suit different market segments across various marketing channels. In addition, AI expands and enhances direct marketing by selecting the right formats, channels and content types for different target groups (Brandon, 2017). In addition, AI contributes to marketing communications by creating unique experiences, eliminating the learning curve associated with product categories, and minimizing consumer disappointments, thereby fostering a positive brand image (Jarek and Mazurek, 2019).

In order to achieve maximum sales, it is crucial to effectively and optimally integrate various marketing activities such as product development, pricing, distribution and promotion. This harmonious mixture is often called the marketing mix (Takwim et al., 2023). Marketers employ a diverse range of strategies and techniques to shape the supply

and demand of their products and services. The alignment of market demand and supply is an ongoing process, and the objective of the marketing mix is to influence consumer buying behavior (Aloysius, 2015).

ChatGPT and Marketing Mix

At present, ChatGPT stands out as the leading GenAI platform. Its popularity has grown significantly in conjunction with content marketing due to its remarkable ability to produce human-like text. This groundbreaking feature sets it apart from earlier auto-generating models since it can grasp contextual elements and intent (George et al., 2023b). Dwivedi et al., (2023) offer a comprehensive analysis of ChatGPT's potential applications in diverse marketing strategies. These strategies encompass building marketing campaigns, content marketing developments, content picture and art design, service marketing, customer experience, keyword suggestions, marketing research, and brand comparison. It assists in generating content for various platforms, such as social media updates, blog entries, and other forms of content. The chatbot can suggest headlines, opening words, and even entire paragraphs for marketing materials based on specific subjects or keywords. Furthermore, potential customers can train it to respond to frequently asked queries, provide customer service, and suggest products. Furthermore, ChatGPT's data analysis capabilities allow it to categorize customer reviews and unstructured data into groups based on product features and customer service, thereby improving the understanding of consumer needs and preferences. These strategies provide insights into marketing from product, price, promotion, and place.

Conceptual Framework and Hypothesis Development

We used a blind test in our experiment to eliminate the effect of social learning or observation on the customers' preferences because we think that the interviewees would be influenced (positively or negatively) by the public's implicit impression of ChatGPT. By not providing any information about ChatGPT during the experiment, the interviewees will only perceive it as a marketing strategy experiment.

The four Ps of Product, Price, Placement, and Promotion (Borden, 1964) are the foundation upon which we built our experiment. We use this framework to evaluate and determine the interviewees' preferences toward various marketing strategies crafted by the human manager or ChatGPT under each Ps.

Scenario:

The purpose of the study is to evaluate how well the two strategies affect customers' compulsive behaviors. In this study, a number of marketing campaigns will be created by skilled marketing managers and ChatGPT, a powerful AI-powered platform. These

advertisements will be expertly designed to appeal to particular customer demographics. Subsequently, the research will scrutinize and contrast the reactions and conduct of the intended audience towards each advertisement.

Based on findings this study aims to provide insight on the potential benefits of employing AI-generated advertisements rather than those made by experienced marketing managers in order to influence consumers' impulsive behaviors. This research demonstrates on how effective AI technology is in creating engaging and convincing marketing content. Businesses using AI-powered campaigns may see an increase in compulsive purchases, higher conversion rates, and maybe more income if ChatGPT's marketing campaigns are more successful in eliciting compulsive behaviors in their target audience. Marketers may be better able to recognize and take advantage of compulsive buying patterns if they comprehend the precise components and methods used by AI to produce attractive advertisements.

Therefore, we put forth Hypothesis 1:

H1: Marketing campaigns generated by ChatGPT are more attractive than those produced by experienced managers in influencing customers' compulsive behaviors.

In the scenario we examine the impact of marketing campaigns produced by ChatGPT on the compulsive behaviors exhibited by customers across various age groups. This study evaluates the potential impact of AI-generated advertising on the compulsive behaviors exhibited by the younger customer group. Hence, this study prioritizes the targeting of younger demographics by employing ChatGPT in the development of marketing campaigns.

Simultaneously, ads produced by seasoned marketing managers are also used as a point of comparison. The research subsequently examines and evaluates the reactions and behaviors of the targeted younger consumers towards each marketing campaign. The objective of this study is to provide insight into the potential influence of AI-generated campaigns on the compulsive behaviors of the younger consumer segment, as proposed by Hypothesis H2.

The significance of AI technology in effectively reaching and interacting with the younger audience can be underscored if the marketing campaigns produced by ChatGPT demonstrate notable efficacy in influencing the compulsive behaviors of younger customers. Firms can leverage this knowledge to design marketing strategies that align with the compulsive buying tendencies of younger customers and thus capture compulsive buying tendencies of younger generation.

Therefore, we propose the following Hypothesis:

H2: Marketing campaigns generated by ChatGPT have a significant effect on influencing younger customers' compulsive behaviors.

This study also aims to investigate the impact of marketing campaigns generated by ChatGPT on the compulsive behaviors of customers of different genders and posit whether AI-generated campaigns positively affect the compulsive actions of female consumers. In order to establish a benchmark, marketing campaigns meticulously designed by seasoned marketing managers will also be created. reactions and actions exhibited by the specific female customers in relation to each campaign. The study subsequently conducts a thorough examination and analysis of the behaviors and responses of the female consumers targeted by each campaign. This study offers valuable insights into the potential effectiveness of AI-driven marketing strategies in effectively attracting and captivating female consumers at a compulsive level.

Should AI-generated campaigns demonstrate a favorable impact on the compulsive behaviors of female consumers, it indicates a potential avenue for enhancing comprehension and accommodation of the distinct preferences and stimuli that female consumers possess. Businesses can utilize this knowledge to create marketing content that resonates with female customers and encourages compulsive purchases this can contribute to increased customer satisfaction, brand loyalty, and overall sales performance among the female target audience. We propose the Hypothesis 3:

H3: Marketing campaigns generated by ChatGPT have a positive effect on influencing female customers' compulsive behaviors.

Finally, this research examines the influence of ChatGPT-generated marketing campaigns on the compulsive behaviors exhibited by consumers belonging to different income brackets. The study seeks to determine whether AI-generated campaigns have a significant effect on shaping the compulsive actions of customers with higher income. The study places particular emphasis on customers with varying income levels by employing marketing strategies created by ChatGPT. This study rigorously examines and evaluates the reactions and behaviours of customers across various income brackets in relation to each marketing campaign.

The objective of this study is to offer significant insights into the possible efficacy of AI-driven marketing strategies in attracting and influencing affluent clients on a compulsive level. If it is determined that AI-generated advertising have a substantial impact on influencing the compulsive behaviors of customers with higher incomes,

it indicates a potential opportunity for capturing a greater portion of their disposable income.

Firms can leverage this knowledge to design marketing strategies that align with the compulsive buying tendencies of customers with higher income levels. This can lead to improved customer engagement, brand loyalty, and overall sales performance within target market segment. Furthermore, it can contribute to increased profitability and strategic competitiveness of the businesses. Customers with higher incomes are more likely to engage in compulsive buying, leading to larger transaction sizes and the possibility of repeat business. Hence, we put forth the Hypothesis 4:

H4: Marketing campaigns generated by ChatGPT have a significant effect on influencing customers' compulsive behaviors of higher income.

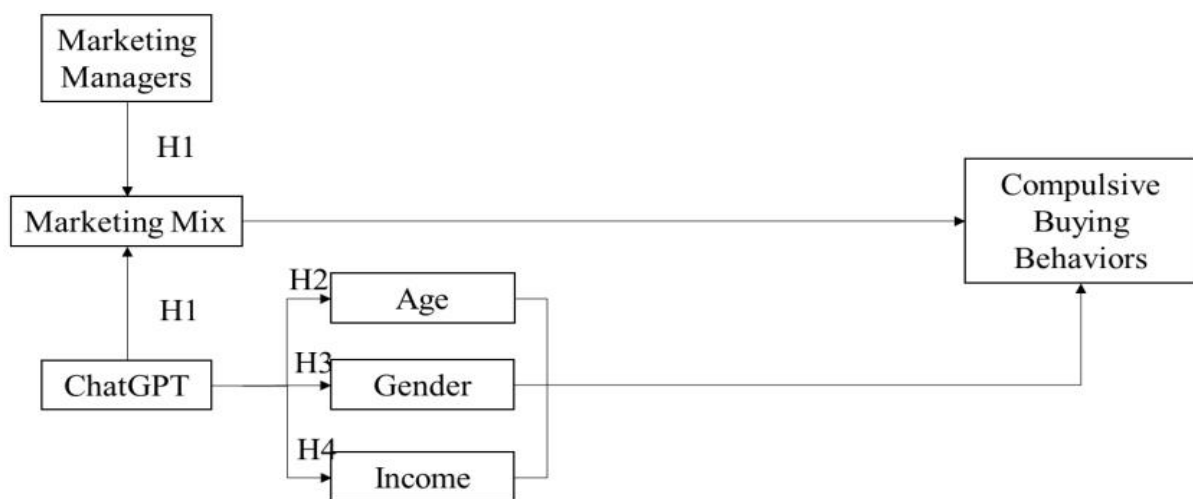


Figure.1 Conceptual Framework

Methods

The main purpose of this study is to examine the impact of marketing strategies generated by ChatGPT and formulated by experienced marketing managers on consumers' compulsive buying behavior. We examined two scenarios, firstly generated by ChatGPT and the marketing strategies related to marketing mix (four Ps). For this purpose, we designed a self-administered questionnaire to collect data from consumers. The respondents were unaware of the questions related to marketing mix (i.e., product, price, place and promotion) generated by ChatGPT and drafted by the marketing manager. The questionnaires were randomly distributed among different customers to seek how they respond to the marketing strategies generated by ChatGPT and marketing manager. During the data collection phase, questionnaires are designed from the managers' perspective. In order to address

marketing challenges and assess customers' compulsive purchasing behaviors across various scenarios, the questionnaires include two randomly selected solutions, developed either by ChatGPT or human managers. Respondents, assuming the role of customers, are required to select their preferred solution without being aware of the solution provider.

We published the questionnaire under the title "Research on how different marketing strategies affect purchasing behavior as a consumer" to ensure that the title would not influence respondents. As a result, no information pertaining to the term "ChatGPT" was disclosed throughout the questionnaire. In this particular scenario, the participants formed their own assessments solely on the basis of their personal preferences, thereby eliminating any potential bias introduced by machine-generated suggestions into the study. The English version of the questionnaire was subsequently translated into Mandarin for our participants. The seven-point Likert scale, ranging from "1=Strongly Disagree" to "7=Strongly Agree," was used to measure variable items. After completing the questionnaire design, six target subjects were first invited to fill out the questionnaire. Based on their semantic understanding of the questionnaire, we revised the contents to better readability. After modifying the semantic context of the questionnaire, another ten target subjects were invited to complete the questionnaire to confirm the questionnaire quality. In the end, the example verification was finished. After the questionnaire adopted the Wenjuanxing questionnaire platform and conducted the questionnaire survey on Wechat. We used purposive sampling. The respondents include consumers of different gender, age, area and income level. Data were obtained from 572 customers from various provinces of China. Of these, 286 (50%) were male, and 286 (50%) were female. Table 1 shows the descriptive statistics.

Table 1. Descriptive information of participants

Demographic Variable	category	Frequency	Percent
Age	<18	48	8.39%
	18-25	271	47.38%
	26-44	133	23.25%
	45-60	68	11.89%
	>60	52	9.89%
Gender	Male	286	50%
	Female	286	50%
Income level/ year	0-60000 RMB	302	52.8%
	600001-360000RMB	185	32.34%
	>3600000RMB	85	14.86%

Results

The study employed validated English and Mandarin versions of various self-rating instruments. Compulsive buying behavior (CB) was assessed using the 7-item Compulsive Buying Scale (CBS; Faber & O'Guinn, 1992). The CB scale demonstrated high internal consistency, with a Cronbach's alpha coefficient of 0.901, exceeding the recommended threshold of 0.7. Additionally, Cronbach's alpha (CA) and composite reliability (CR) were used to confirm internal consistency, both of which yielded values above 0.70. Convergent validity (CV) was confirmed through the examination of the average variance extracted (AVE) values, with each construct's value surpassing the necessary 0.50 threshold, validating the correlation of the indicators (Fornell & Larcker, 1981). All items demonstrated reliability and alignment with their corresponding constructs. Furthermore, discriminant validity (DV) was confirmed, highlighting the high loadings of the measurement items onto theoretically positioned factors (Ryu et al., 2014). Table 2 displays the DV values, indicating that the square root of AVE exceeded the correlations across constructs.

Table 2. Items' reliability and validity

Constructs and Items	Loadings	AVE	CR	CA
GTPPRODUCT		0.573	0.871	0.72
GTPPRODUCT1	0.753			
GTPPRODUCT2	0.790			
GTPPRODUCT3	0.755			
GTPPRODUCT4	0.739			
GTPPRODUCT5	0.750			
GTPPRICE		0.627	0.627	0.715
GTPPRICE1	0.792			
GTPPRICE2	0.778			
GTPPRICE2	0.781			
GTPPROMOTION		0.576	0.576	0.711
GTPPROMOTION1	0.759			
GTPPROMOTION2	0.801			
GTPPLACE		0.711	0.711	0.702
GTPPLACE1	0.843			
GTPPLACE2	0.782			

MPRODUCT		0.613	0.613	0.850
MPRODUCT1	0.783			
MPRODUCT2	0.839			
MPRODUCT3	0.694			
MPRODUCT4	0.701			
MPRODUCT5	0.732			
MPRICE		0.681	0.681	0.739
MPRICE1	0.825			
MPRICE2	0.752			
MPROMOTION		0.664	0.664	0.733
MPROMOTION1	0.815			
MPROMOTION2	0.673			
MPLACE		0.626	0.626	0.711
MPLACE1	0.791			
MPLACE2	0.762			

Table 3. Discriminant validity

Constructs	1	2	3	4	5	6	7	8
1 GTPPRODUCT	1.0							
2 GTPPRICE	0.357	1.0						
2 GTPROMOTION	0.361	0.350	1.0					
4 GTPPLACE	0.388	0.286	0.360	1.0				
5 MPRODUCT	0.323	0.288	0.332	0.292	1.0			
6 MPROMOTION	0.290	0.283	0.322	0.324	0.554	1.0		
7 MPLACE	0.294	0.278	0.310	0.323	0.555	0.576	1.0	
8 MPLACE	0.277	0.282	0.308	0.342	0.552	0.570	0.525	1.0

No missing values were observed in the study. To mitigate common method bias (CMB), the questionnaires were carefully designed following the guidelines outlined by Podsakoff et al. (2003). Variance inflation factor (VIF) values demonstrated the absence of multi collinearity and CMB issues, with each independent variable's VIF value remaining below 2, well below the proposed threshold of 3.3, indicating the absence of common method bias (Petter et al., 2007).

In the first stage of determining the preference of groups based on particular types of

distinguishing characteristics, an analysis of variance (ANOVA) was performed (Table 4) to establish the significance of the difference between each group of distinct demographic characteristics.

Table 4. ANOVA result of comparison ChatGPT and marketing managers.

	Df	F-value	P-value	variables
	572	121.99100	0.000***	PRODUCT
	572	130.571	0.000***	PRICE
	572	86.9128	0.000***	PROMOTION
	572	484.28972	0.000***	PLACE

*p<0.10; **p<0.05; ***<0.01

In each scenario under marketing mix, the p-value is very close to 0, indicating significant differences of compulsive buying tendencies in product, price, promotion, and place performance between ChatGPT and human managers. In the product dimension, the F-value is 121.99100, and the P-value is 0.000. This indicates a significant difference in marketing strategies between ChatGPT and human managers in terms of products. In the price dimension, the F-value is 130.571 and the P-value is 0.000. This shows that there is a significant difference in pricing strategies between ChatGPT and human managers. In the promotion sub context, the F-value is 86.9128 and the P-value is 0.000. It demonstrates that there is a significant difference in promotional strategies between ChatGPT and human managers. This may involve differences in different promotional methods, marketing activities, or promotional strategies. Regarding location, the F-value of 484.28972 and the P-value of 0.000 suggest a notable disparity in the choice of location between ChatGPT and human managers. This divergence might entail discrepancies in market positioning, the selection of sales channels, or strategies related to geographical distribution. These results indicate that ChatGPT's performance in these areas differs significantly from that of human managers.

Table 5. ANOVA results- dependent variable: compulsive buying

Main effect	Df	F-value	P-value	
Age	4.0	9.4011224	0.0001***	CPRODUCT
	4.0	12.00216	0.000***	CPRICE
	4.0	17.559689	0.000***	CPROMOTION
	4.0	5.92232	0.002**	CPLACE
	4.0	9.4011224	0.000***	MPRODUCT
	4.0	1.2270920	0.029	MPRICE
	4.0	2.51397	0.000	MPROMOTION
	4.0	6.743347	0.051	MPLACE
Gender	1.0	139.017	0.000	CPRODUCT

	1.0	106.37570	0.000	CPRICE
	1.0	76.84565	0.000	CPROMOTION
	1.0	45.55463	0.000	CPLACE
	1.0	132.77	0.078	MPRODUCT
	1.0	22.13006	0.000	MPRICE
	1.0	4.69356	0.000	MPROMOTION
	1.0	2.065	0.085	MPLACE
Income	2.0	1.9378	0.014	CPRODUCT
	2.0	0.067181	0.935	CPRICE
	2.0	0.42334	0.655	CPROMOTION
	2.0	1.672760	0.000	CPLACE
	2.0	.132726	0.072	MPRODUCT
	2.0	16.2954	0.000	MPRICE
	2.0	0.068527	0.018	MPROMOTION
	2.0	0.4423926	0.064	MPLACE

*p<0.10; **p<0.05; ***<0.01

The ANOVA analysis indicates that both human managers and ChatGPT generate distinct promotional strategies impacting compulsive buying behaviors across different age groups. The significant F-value and the near-zero P-value for all product categories (PRODUCT, PRICE, PROMOTION, PLACE) underscore the pivotal role of age in shaping compulsive buying patterns from diverse marketing standpoints. The ANOVA results suggest that the ideas formulated by human managers and ChatGPT vary in their impact on different genders, particularly concerning the influences on compulsive buying behavior. This indicates that there exist significant differences in the promotional strategies tailored for distinct sexes, emphasizing the need for nuanced marketing approaches based on the specific characteristics and preferences of male and female consumers.

In step 2, we examine the mean value of compulsive buying behaviors (CB) under PRODUCT, PRICE, PROMOTION, PLACE scenario (Table 6). The F-value for compulsive buying behavior (CB) is highly significant, indicating that there are significant differences between ChatGPT and Human Managers in their influence on CB. The total sample's mean score for CB falls between ChatGPT and Human Managers, suggesting that both human managers and ChatGPT have an impact, but the effect of Human Managers is more pronounced.

The data presented demonstrates the mean values (M) and standard deviations (SD) for various variables across the total sample, ChatGPT, and Human Managers. For the variable CB (Compulsive Buying), the mean value for Human Managers (M=5.0957) surpasses that of ChatGPT (M=4.227564) and the overall sample (M=4.5748). This

suggests that Human Managers exert a more significant influence on Compulsive Buying behavior compared to ChatGPT. Similarly, in the case of the PRODUCT scenario, Human Managers (M=4.9671) exhibit a notably higher mean value compared to ChatGPT (M=4.094) and the overall sample (M=4.4026), indicating their stronger impact on product-related decisions. Concerning the PRICE variable, Human Managers (M=5.104) again demonstrate a higher mean value compared to ChatGPT (M=4.054) and the overall sample (M=4.6480), signifying their more substantial influence on pricing strategies. Likewise, for the PLACE variable, Human Managers (M=5.1643) exhibit a higher mean value compared to ChatGPT (M=4.2343) and the overall sample (M=4.9570), indicating their stronger influence on decisions related to product placement and distribution. Finally, regarding the PROMOTION variable, Human Managers (M=5.0428) once again demonstrate a higher mean value compared to ChatGPT (M=4.1949) and the overall sample (M=4.8128), suggesting their more pronounced impact on promotional strategies. These findings highlight the prominent role of Human Managers in shaping various marketing aspects, as evidenced by their consistently higher mean values across the analyzed variables.

Table 6. Mean value comparison test

Variable	N	Total sample		ChatGPT		Human Managers		
		M	SD	M	SD	M	SD	F
CB	572	4.575	1.867	4.228	1.861	5.096	1.750	41.774**
PRODUCT	572	4.403	1.874	4.094	1.906	4.967	1.737	32.2423*
PRICE	572	4.649	1.835	4.054	1.864	5.104	1.745	124.99***
PLACE	572	4.958	1.764	4.234	1.813	5.164	1.743	78.15**
PROMOTION	572	4.813	1.800	4.195	1.842	5.043	1.7501	42.5240*

*p<0.10; **p<0.05; ***<0.01

In the next step, we examine the relationship between the independent variables, namely Age, Gender, and Income, and the dependent variable, Compulsive Buying Behaviors, to ascertain the extent to which these demographic factors contribute to the variance in compulsive buying tendencies (Table 7). By assessing the influence of Age, Gender, and Income on Compulsive Buying Behaviors, we aim to elucidate the specific role played by these demographic characteristics in shaping consumer preferences and purchasing habits.

Table 7. Regression analysis

Main effect	Coefficient	Std err	P value	VARIABLES
Age	-0.1779	0.050	0.000***	CPRODUCT
	-0.1434	0.060	0.017**	CPRICE
	-0.1093	0.059	0.062*	CPROMOTION
	-0.0852	0.070	0.0223**	CPLACE
	0.62	0.053	0.0906*	MPRODUCT
	-0.375	0.060	0.0532*	MPRICE
	0.1320	0.060	0.0827*	MPROMOTION
	0.447	0.067	0.0507*	MPLACE
Gender	1.1601	0.098	0.000***	CPRODUCT
	1.2308	0.119	0.000***	CPRICE
	1.0472	0.110	0.000***	CPROMOTION
	0.9860	0.146	0.000***	CPLACE
	0.308	0.114	0.000***	MPRODUCT
	0.612	0.013	0.065*	MPRICE
	0.892	0.130	0.049**	MPROMOTION
	0.211	0.0146	0.089*	MPLACE
Income	0.1057	0.075	0.159	CPRODUCT
	-0.254	0.089	0.776	CPRICE
	-0.335	0.087	0.701	CPROMOTION
	0.1504	0.104	0.150	CPLACE
	0.567	0.078	0.046**	MPRODUCT
	0.363	0.089	0.046**	MPRICE
	-0.89	0.089	0.092*	MPROMOTION
	0.941	0.1	0.035**	MPLACE

*p<0.10; **p<0.05; ***<0.01

The results of the regression analysis reveal substantial insights into the relationship between demographic factors (Age, Gender, and Income) and various marketing variables (product, price, promotion, and place) in the context of compulsive buying behaviors. Notably, Age emerges as a key determinant, showcasing a negative association with marketing variables across product, price, promotion, and place under the marketing campaigns generated by ChatGPT. The negative coefficients for Age across all marketing variables suggest that as individuals' age increases, their engagement with marketing strategies diminishes. Notably, this trend is consistent for both ChatGPT and human managers, albeit with varying degrees of impact.

Conversely, Gender exhibits a noteworthy influence, displaying a positive association with the marketing variables, indicating that specific genders are more susceptible to marketing efforts in the areas of product, price, promotion, and place under the marketing ideas generated by ChatGPT. While both ChatGPT and human managers showcase this trend, the differences in the coefficients highlight varying degrees of influence exerted by each group.

However, the analysis indicates that Income does not significantly impact the marketing

variables. This implies that variations in income levels do not notably influence responses to marketing efforts concerning product, price, promotion, and place under ChatGPT scenario since the p - value is not significant.

Discussion and Conclusion:

The result analysis highlights the distinct approaches employed by human managers and ChatGPT in shaping marketing strategies targeting compulsive buying behavior across various demographic groups, further insights into the comparative influence of human managers and ChatGPT on various marketing aspects, such as product decisions, pricing strategies, promotional activities, and placement choices.

The significant influence of age on different marketing variables emphasizes the need for tailored marketing campaigns that effectively resonate with consumers of different age demographics. Additionally, the observed gender-based differences in the impact of promotional strategies underscore the significance of gender-sensitive marketing approaches for enhancing consumer engagement and satisfaction. The consistently higher mean values for human managers across different marketing variables suggest their pivotal role in shaping consumer preferences and decision-making processes. The findings underscore the importance of leveraging human insights and expertise to craft effective marketing campaigns that resonate with target consumers and drive positive purchasing behaviors. ChatGPT may have made different decisions regarding marketing mix positioning compared to human managers based on the data and algorithmic logic it has learned. This may include different positioning strategies targeting different target markets, such as differences in positioning strategies targeting different age groups, gender, geographical location, etc. ChatGPT may have made different decisions regarding marketing mix positioning compared to human managers based on the data and algorithmic logic it has learned. This may include different positioning strategies targeting different target markets, such as differences in positioning strategies targeting different age groups, gender, geographical location, etc. To be more specific, younger individuals, based on the negative coefficients associated with age across various marketing variables, are more influenced by the marketing strategies suggested by ChatGPT. This suggests that younger consumers are more responsive to the marketing campaigns tailored by ChatGPT compared to other age groups. In the gender context, the results suggest that female groups, are more influenced by the marketing strategies developed by ChatGPT, signifying a greater susceptibility to the marketing efforts of ChatGPT among female respondents. Therefore, it can be concluded that females are more responsive to the marketing campaigns generated by ChatGPT compared to male respondents under the context. However, the results do not show a significant influence of income on the marketing

variables under the context of ChatGPT-generated campaigns. Therefore, it can be inferred that income levels do not play a prominent role in influencing the effectiveness of marketing strategies developed by ChatGPT.

The analysis of gender differences in the marketing strategies formulated by human managers indicates that females exhibit a heightened susceptibility to various marketing initiatives, consistent with the findings of (Tarka et al., 2022) research outcomes. This tendency can be attributed to the psychological composition of females, which is characterized by a reduced capacity to effectively manage stress and anxiety, as evidenced in R. Zhang & Fu's study from (Zhang and Fu, 2020). Consequently, females tend to engage in shopping activities primarily for the purpose of seeking enjoyment and alleviating negative emotions, in contrast to their male counterparts. On the other hand, males, with their relatively stronger psychological resilience and cognitive abilities, tend to derive enjoyment from shopping experiences geared towards exploration, such as discovering new information and ideas, as elaborated by (Muscanell and Guadagno, 2012). The analysis of the influence of age within the context of human managers reveals a discernible trend. Specifically, the research indicates that as individuals' age increases, their engagement with marketing strategies diminishes, which are consistent with those found by (Japutra et al., 2022), (Melancon and Dalakas, 2018), (Lee et al., 2022). They emphasized that compared to older consumers, younger individuals are more prone to compulsive buying as they are more likely to be passionate and anxious. One explanation is that older individuals often endure a decline in information processing abilities, limiting their responses (Homburg and Giering, 2001). They may also be more self-assured and have more experience, which constrains their anxiety. This is exemplified by the negative coefficients observed across various marketing variables, such as product, price, promotion, and place, under the management of human managers. The findings suggest that older individuals tend to exhibit a reduced responsiveness to marketing campaigns developed by human managers, signifying a potential decline in their inclination towards consumer engagement and purchasing activities. Understanding this age-related dynamic is crucial for developing targeted marketing strategies that effectively cater to the preferences and behaviors of different age groups, thereby optimizing marketing efforts and enhancing consumer outreach and engagement.

The results show the crucial role of the lower income group would be more influenced by various marketing aspects, particularly in the domains of pricing, product, and placement decisions. This highlights the importance of tailoring marketing strategies to effectively target and accommodate the preferences and behaviors of consumers belonging to the lower income group, thus ensuring the successful implementation of marketing initiatives that resonate with their specific needs and demands, which is also tested by (Wasim et al.,

2023) as well as (Ahamed, 2022).

In conclusion. The findings of the study indicate that marketing campaigns devised by seasoned human managers hold a greater appeal than those generated by ChatGPT in shaping customers' compulsive buying behaviors. This underscores the pivotal role of human insight, experience, and understanding in crafting effective marketing strategies that resonate with consumer preferences. Furthermore, the analysis reveals that marketing campaigns formulated by ChatGPT wield a substantial influence on the compulsive buying tendencies of younger customers, suggesting a stronger receptivity among this demographic group to AI-generated marketing initiatives. Additionally, the results emphasize the significance of gender in the context of marketing strategies, highlighting the positive impact of ChatGPT-generated campaigns on the compulsive buying behaviors of female customers. Conversely, the study reveals that marketing campaigns orchestrated by ChatGPT do not significantly impact the compulsive buying behaviors of different income level customers, underscoring the need for tailored marketing approaches that effectively target specific income segments. These findings collectively underscore the nuanced interplay between AI-generated and human-driven marketing strategies, emphasizing the necessity for a balanced and informed approach that leverages the strengths of both human insights and AI-driven innovations to effectively cater to diverse consumer segments.

VI Limitations and future research

Although the present study offers useful insights into the comparative examination of marketing campaigns conducted by human managers and ChatGPT, it is essential to acknowledge certain inherent limitations. The primary limitations of this study stem from the methodology used to design the marketing questions, which were derived from the input of a limited number of human managers. While efforts were made to ensure diversity in the selection of these managers, the reliance on a relatively small sample size may have constrained the variability and comprehensiveness of the marketing ideas presented. Furthermore, the research context was primarily focused on the dynamics of the Chinese market, thereby potentially limiting the transferability of the study's outcomes to other global marketplaces. Although attempts were made to account for regional and cultural nuances, the overarching emphasis on the Chinese market context may restrict the generalizability of the research findings.

Given the acknowledged limitations, there are several potential avenues for future research to address these constraints effectively. Expanding the pool of human managers and soliciting input from a more diverse group of industry professionals could lead to a more comprehensive and robust set of marketing questions. Additionally, conducting comparative studies across multiple global markets and incorporating a diverse range of

cultural and socio-economic contexts may offer valuable insights into the cross-cultural variations and preferences influencing marketing strategies. Moreover, employing advanced analytical tools and artificial intelligence techniques could enhance the scope and depth of the marketing questions, facilitating a more comprehensive understanding of consumer behavior and preferences. Future studies could also explore the potential impacts of various contextual factors, such as technological advancements, economic trends, on the design and implementation of effective marketing strategies across diverse markets. Longitudinal studies focusing on the evolution of marketing trends and consumer behavior could provide valuable insights into the sustainability and adaptability of marketing strategies in response to dynamic market conditions and evolving consumer preferences.

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