STUDY OF THE FACTORS INFLUENCING CONSUMER PURCHASING BEHAVIOR IN THE UNMANNED RETAIL INDUSTRY- THE MEDIATING ROLE OF BRAND TRUST

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This article discusses the rapid development of the unmanned retail industry, which is driven by the continuous advancement of artificial intelligence and big data technology, the push from the COVID-19 pandemic, and the increasing acceptance by consumers. While unmanned retail provides contactless services, ensuring consumer safety and enriching user experiences, its rapid growth also brings new challenges. How to ensure the prosperity of the unmanned retail industry and meet the needs of consumers are issues that unmanned retail enterprises need to consider.

Using empirical research methods, this study examined the factors influencing consumer purchasing behavior in the unmanned retail industry. We collected data by distributing surveys and analyzed the results to draw conclusions. The study found that product features, geographical location, service quality, intelligent technology, and brand trust have significant positive effects on consumer purchasing behavior, with brand trust mediating consumer purchasing behavior. The research findings provide practical evidence for the decision-making process of unmanned retail enterprises. These enterprises can meet consumer needs and promote industry development by optimizing product features, geographical location strategies, improving service quality, employing intelligent technology, and establishing brand trust.

Keywords: unmanned retailing; consumer purchase behavior; brand trust

Introduction

Compared with developed countries such as the United States and the United Kingdom, China's commodity circulation system is significantly lagging behind in development.
Specifically, the retail industry's development, derivation, and growth primarily took place in the three decades following reform and opening up.

Due to the influence of regional, economic, and seasonal factors, the development of the retail industry has always been accompanied by unstable factors. However, in 2016, the General Office of the State Council of China issued the "Opinions on Promoting the Innovation and Transformation of Physical Retail", which further promoted the innovative transformation of physical retail companies and provided government support for their development.

In 2017, the report of the 19th National Congress of the Communist Party of China proposed the goal of promoting the deep integration of the Internet, big data, artificial intelligence, and the real economy and clarified the direction of industry upgrading and transformation for China's future development. With the rapid development of science and technology, such as artificial intelligence and big data, traditional retail methods are unable to meet existing social needs, and new retail models have developed rapidly. In 2017, the unmanned retail industry reached a certain climax in China.

However, due to issues such as technical level, operating costs, and personal information security, some unmanned retail companies have declined. However, after the COVID-19 epidemic broke out in 2020, the unmanned retail industry grew against the trend, and companies launched "contactless" delivery and meal pickup services, once again driving the rise of the unmanned retail model.

The commercial application of artificial intelligence, the Internet of Things, computer vision, and other technologies, the popularization of mobile payment methods, and the standardization of electronic credit systems have brought new development opportunities to the unmanned retail model. Consumers' understanding and purchasing behavior in unmanned retail are also constantly changing. However, there are currently few studies on the influencing factors of consumer purchasing behavior, and most of them focus on supply and demand, marketing strategies, and other aspects.

This paper aims to put forward the influencing factors that affect consumer purchasing behavior in the unmanned retail industry from the perspective of consumers through the SOR model in order to provide an important reference for the stable development of the unmanned retail industry and the improvement of consumer purchasing power.

**Objectives**

This study uses a combination of theoretical analysis and empirical research, combined with scholars' research on unmanned retail and consumer purchasing behavior, to establish a SOR model to solve the following research questions:

1) Based on the current development environment and problems of the unmanned retail industry, what are the factors that affect consumer purchasing behavior?

2) Will consumer brand trust have a mediating effect on consumer purchasing behavior in the unmanned retail industry?

**Literature review**

*Definition of the concept of unmanned retail and collection of relevant literature*

According to the definition of "China's Unmanned Retail Industry Research Report", unmanned retail refers to the situation where consumers can enter the store, select, purchase,
pay, etc. by themselves without the presence of salespersons, cashiers, and other staff. retail form of shopping activities. Xu (2022) classified unmanned retail and divided it into different forms and scenarios, mainly including four categories: open shelves, vending machines, unmanned convenience stores, and unmanned supermarkets.

Feng (2018) pointed out that open shelves emerged in 2015 as "energy gas stations" for offices, mainly providing packaged food, soft drinks, and other commodities with low operating costs but limited usage scenarios. Song et al. (2018) believe that unmanned retail is a supplement to traditional retail, reducing labor and rental costs through mobile payments, artificial intelligence, and other technologies and providing more convenient and efficient shopping services.

Research by Liu (2021) shows that the sustainable development of unmanned retail requires government support, mobile payments, and other external factors combined with smart technology to provide a personalized and high-quality consumer experience. Liu (2011) believes that the user experience of unmanned retail is the overall impression and feeling of consumers on the entire shopping process, and a good experience will increase user loyalty. Research by Zhang et al. (2019) shows that in an unmanned retail environment, the self-service consumption experience will affect consumers' trust in merchants and purchase intentions.

Although the unmanned retail industry is developing rapidly, it still faces problems such as product prices and product replenishment. Some scholars have put forward suggestions for improvement. For example, Xu (2022) emphasized that operators need to accurately adjust and optimize categories to ensure key indicators. Yu (2017) pointed out that the operation of unmanned retail stores requires early labor replenishment and payment. However, with the advent of the post-epidemic era and the resurgence of the unmanned retail industry, companies need to focus on how to retain consumers, attract consumers, and promote purchasing behavior.

To sum up, scholars mainly study the unmanned retail industry from aspects such as business development, business operations, information technology development, consumer experience, and purchase intention and put forward relevant improvement suggestions. However, the rapid development of the unmanned retail industry is not only affected by factors such as consumers and enterprises but also mutually restricted by various factors. There are still certain gaps in relevant research. Therefore, this article chooses the unmanned retail industry as the research background and conducts in-depth research based on corporate marketing strategies and consumer purchasing behavior.

**Conceptual definition of consumer purchasing behavior and review of related literature**

Chinese and foreign scholars have defined consumer purchasing behavior from different perspectives. Scheff & Kotler (1996) defined consumer behavior as a series of subjective psychological activities and objective material activities that people conduct to satisfy their needs and desires. The process activities involve finding, selecting, purchasing, using, evaluating, and disposing of products and services. Sun & Yang (2006) believes that purchasing behavior is a specific behavior, mainly through generating consumer expenditures to purchase goods. Cao & Yang (2016) defined purchasing behavior as the actual purchasing choice, Zhang (2016) believes that purchasing behavior is the final purchasing result.
In their research on the unmanned retail industry, some scholars define both retail and unmanned retail when defining unmanned retail. Liang et al. (2018) proposed that retail is a process where producers or operators use certain channels to sell goods or services to final consumers.

As a new model of retail, Du & Jiang (2017) believe that it is a deeply integrated retail model that relies on the Internet to upgrade products, circulation, and sales processes, integrating online services and offline services. Integrate experience and logistics. Zhu (2019) put forward constructive opinions on the future development of unmanned retail, believing that unmanned retail has played a very important role in the transformation of new retail and that in the future, online and offline integration can be adopted to replace manual labor with intelligent technology. Xu (2022) posited that unmanned retail refers to consumer-performed sales behavior in an unmanned environment. Intelligent technology enables this type of unattended service. Feng (2018) pointed out that unmanned retail is a new retail service that uses intelligent technology to replace the roles of shopping guides and cashiers to achieve intelligent shopping.

In the context of new retail, numerous researchers have conducted extensive research on consumers' purchasing behavior and intentions, drawing from a variety of industry backgrounds. In the beauty industry, Gui & Hong (2020) conducted research on VR marketing and proposed that factors affecting consumers’ purchase intentions include interest level, awareness, technology maturity, and externally related technologies. Zhang (2015), in a study of consumer behavior in the book retail market, found that convenience factors have the greatest impact on book consumers when making purchase decisions. Feng (2022) conducted a quantitative analysis of brand influence and consumer purchasing behavior from the perspective of new retail and concluded that brand influence in the apparel industry has an important impact on consumer purchasing behavior.

In the field of consumer purchasing behavior research, scholars have conducted in-depth analysis of the factors that affect consumer purchasing behavior and repurchase behavior through different research theories and approaches. For example, in a study based on perceived value theory, Zheng & Yao (2023) found that social value, quality mechanism, emotional value, and price value are the main influencing factors for the clothing industry. Song et al. (2023) found in the study of consumer repurchase behavior that when consumers are satisfied with goods and services, especially trust or even loyalty, they are more willing and likely to repurchase.

In the research on the unmanned retail industry, no scholars have yet studied the relationship between factors affecting consumer purchasing behavior, brand trust, and consumer purchasing behavior. However, some scholars have elaborated on the impact of factors affecting consumer purchasing behavior in different industries on consumer purchasing behavior based on different research objects, as well as the intermediary role of trust and brand trust in their research. Xia & Li (2011) conducted a study on consumer behavior in the food industry. The analysis shows that consumers trust brand products to a high degree. The higher the trust, the higher the proportion of consumers who make purchases. Wang et al. (2017) elaborated on the mediating role of trust between service scenarios and customer behavior, and Long & Wu (2018) concluded from research that customer trust has a complete mediating effect between electronic service quality and transaction behavior (continuous purchase).
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In order to fill the research gap, this article will focus on the unmanned retail industry and explore the relationship between unmanned consumer purchasing behavior, related influencing factors, and brand trust.

**Conceptual framework**

This article is based on a literature review of background research on the unmanned retail industry, consumer purchasing behavior, and brand trust. Research on the unmanned retail industry continues to concentrate on the fundamental stages of technology and development. The research is in the initial stages, and there are few studies. The selection of factors focuses on price, store location, product type, payment method, time cost, and consumer characteristics. However, based on the outbreak of the new crown epidemic, iiMedia Consulting's expected data on the development of the unmanned retail industry shows that its sales scale will reach 2 trillion yuan in 2025, and the number of people covered may reach 250 million.

The rapid development of the unmanned retail industry and the continuous expansion of consumer groups have also posed new challenges to the unmanned retail industry. Wang & Yang (2022) in the development of unmanned supermarkets in China, under the background of new retail, there are market audiences, technical levels, and issues such as cost and insufficient consumer experience. In their research on unmanned stores in communities, Zou & Bao (2019) found that what consumers buy in unmanned stores is no longer just goods but services and experiences driven by technology. In his research on unmanned convenience stores, Biff (2018) proposed that unmanned convenience stores need to break through many bottlenecks, such as new cost constraints, insufficient technology supply, and imperfect supporting services.

This article is based on the characteristics of unmanned retail, the problems faced by its development, and scholars’ research on factors affecting consumer purchasing behavior. On the basis of the SOR model, this article comprehensively selects product characteristics, geographical location, service quality, and intelligent technology from external stimuli. We select consumer brand trust as the independent variable for further research.

**Research hypothesis:**

H1a: The product characteristics of unmanned retail stores positively affect consumer purchasing behavior.
H1b: The location of unmanned retail stores positively affects consumer purchasing behavior.
H1c: The service quality of unmanned retail stores positively affects consumer purchasing behavior.
H1d: Smart technology in unmanned retail stores positively affects consumer purchasing behavior.

H2a: Product characteristics of unmanned retail stores positively affect brand trust.
H2b: The location of unmanned retail stores positively affects brand trust.
H2c: The service quality of unmanned retail stores positively affects brand trust.
H2d: Smart technology in unmanned retail stores positively affects brand trust.

H3: Brand trust positively affects consumer purchasing behavior.
H4a: Brand trust plays a mediating role between the product characteristics of unmanned retail stores and consumer purchasing behavior.
H4b: Brand trust plays a mediating role between the location of unmanned retail stores and consumer purchasing behavior.
H4c: Brand trust plays a mediating role between the service quality of unmanned retail stores and consumer purchasing behavior.
H4d: Brand trust plays a mediating role between smart technology in unmanned retail stores and consumer purchasing behavior.

Methodology

**Document analysis method**
During the writing process of this article, a large number of searches and consultations were conducted on a large number of Chinese industry research news, materials, and foreign-related research. The main literature sources include the China National Knowledge Infrastructure, the Wanfang Database, Google Scholar, Baidu Scholar, and other websites, and a large number of There is literature on unmanned retail, purchasing behavior, brand trust, etc., and since this article is to study the development of the survey objects in the current period, it uses previous research as the background to focus on analyzing the previous research and the relevant conclusions drawn, providing a theoretical and methodological foundation for this study.

**Questionnaire-survey method**
This paper collects sample data needed for research through the questionnaire survey method, takes consumers as the research object, focuses on the factors that affect consumer purchasing behavior, and designs an unmanned The questionnaire on factors influencing consumer purchasing behavior in the retail industry has gone through two stages of pre-testing and a formal questionnaire to obtain the final sample data to prepare for subsequent statistical analysis.

**Empirical research methodology**
This article uses SPSS and Excel software to analyze effective questionnaire data on factors influencing consumer purchasing behavior in the unmanned retail industry. We first conducted a descriptive statistical analysis of the demographic variables and research variables of the sample data, followed by reliability, validity, correlation, and mediation effect analyses. Finally, we verified the research hypotheses proposed in this article.

**Results**
This study verified the previous hypothesis through the data analysis of the collected samples. The verification results are as follows:

This study verified the previous hypothesis through the data analysis of the collected samples. The verification results are as follows:

H1a: The product characteristics of unmanned retail stores positively affect consumer purchasing behavior. established
H1b: The location of unmanned retail stores positively affects consumer purchasing behavior. established

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H1c: The service quality of unmanned retail stores positively affects consumer purchasing behavior. established
H1d: Smart technology in unmanned retail stores positively affects consumer purchasing behavior. established

H2a: Product characteristics of unmanned retail stores positively affect brand trust, established
H2b: The location of unmanned retail stores positively affects brand trust. established
H2c: The service quality of unmanned retail stores positively affects brand trust. established
H2d: Smart technology in unmanned retail stores positively affects brand trust. established

H3: Brand trust positively affects consumer purchasing behavior. established
H4a: Brand trust plays a mediating role between the product characteristics of unmanned retail stores and consumer purchasing behavior. Some intermediaries
H4b: Brand trust plays a mediating role between the location of unmanned retail stores and consumer purchasing behavior. Some intermediaries
H4c: Brand trust plays a mediating role between the service quality of unmanned retail stores and consumer purchasing behavior. Some intermediaries
H4d: Brand trust plays a mediating role between smart technology in unmanned retail stores and consumer purchasing behavior. Some intermediaries

The study’s research data reveals that factors such as product characteristics, geographical location, service quality, intelligent technology, and brand trust significantly influence consumer purchasing behavior. Brand trust has a significant positive impact on consumer purchasing behavior in the unmanned retail industry, produce some intermediary effects.

The research results of this article fully verify the impact of service and equipment problems in unmanned retail stores on consumer purchasing behavior proposed by Wang et al. (2017) and Zhang et al. (2021) and supplement and verify Jiang Xun and Xu Yan’s views on unmanned retail. The research on the influencing factors of in-store consumer shopping behavior also discovered three new influencing factors: intelligent technology, service quality, and brand trust.

Conclusion

This study conducted data analysis on 316 valid questionnaires, with the primary focus on the influencing factors of consumer purchasing behavior in the unmanned retail industry. During the research process, it focused on product characteristics, geographical location, service quality, intelligent technology, brand trust, and purchasing behavior. We conducted discussions and data analysis to ultimately arrive at the research conclusion. In general, based on the rapid development of the unmanned retail industry and the increasing frequency of use of unmanned retail stores by consumers, this article studies the impact of product characteristics, geographical location, service quality, intelligent technology, and brand trust on consumer purchases. Behavior has a significant positive impact, and consumers’ brand trust has a partial mediating effect on their purchasing behavior.

1 The impact of product characteristics, geographical location, service quality, and intelligent technology on purchasing behavior Product characteristics, geographical location,
service quality, and intelligent technology all have a significant positive impact on consumer purchasing behavior. The more obvious the product features are, the more consumers will make purchases; the more convenient the location, the more consumers will make purchases; the higher the service quality of unmanned retail stores, the more consumers will make purchases; the intelligence of unmanned retail stores. The higher the level of technology, the more likely consumers will be to purchase it. Consumer purchasing behavior will drive the continuous development of unmanned retail behavior. Unmanned retail companies should always pay attention to consumer purchasing behavior and make continuous strategic adjustments based on the factors that affect it.

The impact of product characteristics, geographical location, service quality, and intelligent technology on brand trust. Product characteristics, geographical location, service quality, and intelligent technology all have a significant positive impact on brand trust. The more obvious the product features are, the higher consumers’ brand trust; the more convenient the location, the higher consumers’ brand trust; the higher the service quality of unmanned retail stores, the higher consumers’ brand trust; the intelligence of unmanned retail stores. The higher the technical level, the higher consumers’ brand trust.

According to the research results of this article, from a consumer perspective, consumers are more concerned about the products provided by unmanned retail stores, the convenience of using unmanned retail locations, service quality, and smart technology level. Therefore, the unmanned retail industry should start from a consumer perspective. Starting from the beginning, pay attention to consumer needs and concerns, and fully build consumer brand trust.

3: The impact of brand trust on consumer purchasing behavior

Brand trust has a significant positive impact on consumers' purchasing behavior. The higher the consumer's trust in the brand, the easier it is for them to make a purchase. According to the research results of this article, companies should pay attention to brand building, pay attention to the brands of goods sold by the company, pay attention to the establishment of consumers' brand trust, and help consumers build long-term brand trust.

4: The intermediary role of brand trust

Product characteristics, geographical location, service quality, and smart technology have a significant positive impact on consumer purchasing behavior. After adding brand trust as an intermediary variable, the impact of product characteristics, geographical location, service quality, and smart technology is still significant but less significant than before. The effect is small when considering brand trust, so brand trust produces a partial mediating effect.

Product features, geographical location, service quality, and smart technology not only directly affect consumer purchasing behavior but can also further affect consumer purchasing behavior through brand trust. Therefore, it is necessary to pay attention to consumers’ trust in brands and better promote consumer purchasing behavior.

**Recommendation**

Given the shortcomings of this study, future scholars should consider adjusting the following aspects of their research on the unmanned retail industry to ensure the science and integrity of their findings:
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Researching relevant topics can lead to the following improvements:

1) Increase the amount of sample data, expand the scope of research objects, use large samples as much as possible to make the survey research results more general and representative, and strengthen the universality of the data and conclusions.

2) In terms of data analysis, structural equation modeling can also be used to conduct multiple verifications of the research model, hypotheses, and data.

3) Improved control variables. This study mainly controlled variables for gender, age, education, and monthly income. However, since the development level of the unmanned retail industry in different regions is different, the research should collect the situation in different regions and conduct separate and combined analyses to enrich the applicable areas of the model and increase its general practicality.

4) Pay attention to the influencing factors of consumer purchasing behavior in different unmanned retail formats, conduct targeted research on open shelves, vending machines, unmanned convenience stores, and unmanned supermarkets in different unmanned retail formats, and find consumers based on their different characteristics. Select different unmanned retail formats and influence factors on purchasing behavior.

5) For research on consumer purchasing behavior in the unmanned retail industry, research can also be conducted on aspects of consumer psychological perception, corporate culture, etc. Simultaneously, the study's variables can undergo refinement. For instance, the variables related to store location could be further refined. Continue to study the distance between unmanned retail stores and consumers and the extent to which consumers are more likely to choose unmanned retail models. The research will be more specific and quantitative.

References


