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Demographic Variations and Behavioral Drivers in Online Agricultural Product Purchases: A Multi-Perspective Analysis

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Abstract: The rapid growth of e-commerce has revolutionized the agricultural sector, enabling direct transactions between producers and consumers. This study explores the interplay of demographic factors—such as age, income, and geographic location—and behavioral drivers, including trust, perceived value, and platform usability, in shaping online purchase intentions for agricultural products. Using a mixed-methods approach, the research incorporates quantitative surveys from 500 respondents and qualitative interviews with 20 participants to provide comprehensive insights.

The findings reveal significant variations across demographic groups, with younger, higher-income, and urban consumers exhibiting stronger purchase intentions. Trust and perceived value emerge as pivotal predictors, emphasizing the need for e-commerce platforms to prioritize reliability and transparency. The study also highlights challenges faced by rural and older consumers, such as limited digital literacy and accessibility issues, suggesting targeted interventions to bridge these gaps.

This research contributes to the literature on consumer behavior in agricultural e-commerce by integrating demographic and behavioral perspectives. Practical recommendations include designing user-friendly platforms, promoting trust-building measures, and implementing localized marketing strategies to enhance adoption rates and inclusivity.

Keywords: demographic factors; consumer behavior; online purchase intentions; agricultural e-commerce; trust; perceived value.

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1. Introduction

The rapid growth of e-commerce has revolutionized the agricultural industry by facilitating direct transactions between producers and consumers. Digital platforms eliminate traditional intermediaries, reducing costs and enhancing accessibility to fresh agricultural products. In emerging markets like China, this transformation has been accelerated by advancements in technology, evolving consumer preferences, and government support for digital agriculture [1,2]. However, the adoption of e-commerce for agricultural products varies significantly across demographic groups, highlighting disparities in age, income, and geographic location [3].

Research indicates that younger consumers, characterized by higher digital literacy, exhibit a greater propensity for

online shopping, driven by their familiarity with digital tools and preference for convenience [4]. In contrast, older and rural consumers face barriers such as limited internet access, lower levels of trust in e-commerce platforms, and difficulties in navigating online interfaces [5,6]. These challenges underscore the digital divide, which risks excluding significant segments of the population from the benefits of agricultural e-commerce.

Trust in e-commerce platforms and perceived value—encompassing convenience, affordability, and product quality—are pivotal factors influencing online purchase intentions. Studies have highlighted that reliable platforms with transparent practices, such as quality certifications and detailed product descriptions, are more likely to foster consumer trust and engagement [7]. Furthermore, consumers with higher income levels tend to prioritize quality and reliability over price, while low-income consumers focus more on affordability and value for money [8].

Despite the significant growth of agricultural e-commerce, rural and older consumers remain underrepresented. Addressing this issue requires targeted strategies, such as educational initiatives to improve digital literacy, simplified platform designs tailored to older users, and localized marketing campaigns that resonate with rural demographics [9,10]. This study aims to investigate the interplay between demographic factors and behavioral drivers in shaping online purchase intentions for agricultural products. By integrating quantitative and qualitative methodologies, it seeks to provide actionable insights for e-commerce platforms and policymakers to design inclusive and effective strategies.

2. Literature Review

2.1. Demographic Factors and Consumer Behavior

Demographic factors, such as age, income, education, and geographic location, play a significant role in shaping online purchase intentions for agricultural products. Younger consumers, characterized by their digital literacy, exhibit a higher propensity to adopt e-commerce platforms due to their preference for convenience and familiarity with technology. In contrast, older consumers face barriers such as limited digital skills and heightened concerns about online security, which hinder their participation in e-commerce.

Income disparities further influence consumer behavior. High-income consumers prioritize product quality and platform reliability, showing a willingness to pay premiums for trusted services. Conversely, low-income consumers tend to base their decisions on affordability and perceived value. Geographic disparities are also notable, with urban consumers benefiting from better internet infrastructure and e-commerce accessibility, while rural residents encounter challenges like poor connectivity and lack of exposure to digital platforms.

2.2. Trust and Perceived Value in Agricultural E-commerce

Trust is a cornerstone of consumer engagement in e-commerce, particularly for agricultural products. Concerns about authenticity, freshness, and safety make trust-building measures essential for platforms targeting this market. Studies have shown that features such as transparent pricing, quality certifications, and reliable delivery systems significantly enhance consumer trust. For instance, platforms implementing traceability systems and interactive customer support have reported higher consumer confidence and retention rates.

Perceived value, encompassing convenience, cost-effectiveness, and product quality, complements trust as a key driver of purchase intentions. Consumers prefer platforms that streamline their shopping experience, offer competitive pricing, and guarantee product quality. The interplay between trust and perceived value has been shown to amplify the influence of demographic factors, creating distinct consumer segments based on income and geographic location.

2.3. Behavioral Drivers and Platform Features

Behavioral drivers, such as platform usability, live-streaming commerce, and customer reviews, significantly impact consumer engagement in agricultural e-commerce. User-friendly platforms with intuitive navigation and mobile compatibility attract older users and those with limited digital experience. Live-streaming commerce has gained

popularity for its ability to foster real-time interaction between sellers and buyers, enhancing transparency and trust. Research highlights the effectiveness of live-streaming in building authentic connections with consumers, particularly for agricultural products.

Customer reviews and ratings are equally important in influencing consumer decisions. Verified reviews reduce perceived risks, particularly for perishable products, and provide valuable insights for new customers. Platforms that prioritize user feedback and highlight positive reviews are more likely to build a loyal consumer base.

2.4. Challenges and Opportunities in Agricultural E-commerce

Despite the growth of agricultural e-commerce, significant barriers remain. Rural consumers and older demographics face challenges such as limited digital literacy, lack of internet infrastructure, and distrust of online platforms. These issues call for targeted strategies, such as localized marketing, digital literacy programs, and simplified platform designs. Emerging technologies like blockchain and AI offer opportunities to enhance transparency, personalize shopping experiences, and increase consumer trust.

3. Research Methodology

3.1. Research Design

This study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews to comprehensively explore how demographic factors influence online purchase intentions for agricultural products. The integration of these methods ensures a robust understanding of both generalizable trends and nuanced individual behaviors. Mixed-methods research is particularly effective in examining complex interactions, such as the interplay between trust, perceived value, and demographic variables [11].

3.2. Sampling and Participants

A stratified random sampling technique was employed to ensure representation across key demographic groups. The sample consisted of 500 respondents selected from urban and rural regions in China:

(1)Age Groups: Under 30, 31–50, and over 50.

(2)Income Levels: Low-income (<¥50,000), middle-income (¥50,000–¥150,000), and high-income (>¥150,000).

(3)Geographic Location: 60% urban and 40% rural participants.

This stratification aligns with previous research methodologies that emphasize the importance of balanced representation for demographic studies. The inclusion criteria required participants to have prior experience purchasing agricultural products online.

3.3. Data Collection

3.3.1. Quantitative Survey

The quantitative component involved a structured questionnaire designed to capture the following:

(1)Demographic Variables: Age, income, education, and geographic location.

(2)Behavioral Drivers: Trust, perceived value, and platform usability.

(3)Purchase Intentions: Likelihood and frequency of purchasing agricultural products online.

The survey used a 5-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), to measure attitudes and intentions. Online distribution through WeChat and QQ ensured broad accessibility [12].

3.3.2. Qualitative Interviews

In-depth interviews were conducted with 20 participants from the survey pool, selected to reflect diverse demographic characteristics. The interviews explored:

(1)Barriers to adopting e-commerce platforms.

(2)Trust and value perceptions in online transactions.

(3)Preferences for platform features.

Semi-structured interviews allowed for flexibility while maintaining focus on the study's objectives. This approach is widely regarded as effective for uncovering the motivations behind consumer behavior [13].

3.4. Data Analysis

3.4.1. Quantitative Analysis

Quantitative data were analyzed using SPSS software:

(1)Descriptive Statistics: To summarize demographic characteristics and response distributions.

(2)Correlation Analysis: To identify relationships between demographic variables and behavioral drivers.

(3)Multiple Regression Analysis: To evaluate the influence of trust, perceived value, and demographic factors on online purchase intentions.

Regression analysis is particularly suited for identifying key predictors in consumer behavior studies [14].

3.4.2. Qualitative Analysis

Thematic analysis was employed to analyze qualitative data using NVivo software. Key steps included:

(1)Coding: Identifying recurring themes such as trust concerns, platform usability, and value perceptions.

(2)Theme Development: Grouping related codes into broader categories.

(3)Triangulation: Comparing qualitative findings with quantitative results to ensure consistency and reliability.

This approach provides a comprehensive understanding of consumer behavior, highlighting the interplay between trust, perceived value, and demographic factors [15].

4. Results and Analysis

4.1. Descriptive Statistics

The sample consisted of 500 respondents, stratified by age, income, and geographic location. Table 4.1 provides an overview of the demographic distribution:

(1) Age Groups: 35% were under 30, 45% were aged 31–50, and 20% were over 50.

(2) Income Levels: 30% were low-income (<¥50,000), 50% were middle-income (¥50,000–¥150,000), and 20% were high-income (>¥150,000).

(3) Geographic Location: 60% were urban consumers, and 40% were rural.

This distribution ensures representativeness across key demographic groups and aligns with the study's objectives.

4.2. Trust and Perceived Value

The study found that trust in e-commerce platforms significantly influenced online purchase intentions for agricultural products. Respondents with higher trust levels were 1.8 times more likely to make purchases. Trust was primarily driven by:

(1) Transparent Pricing: Platforms that clearly displayed pricing and fees saw a 20% higher trust rating.

(2) Quality Certifications: Consumers were 25% more likely to trust platforms with certified products, particularly for fresh and organic agricultural goods.

Perceived Value, encompassing convenience, cost savings, and product quality, was another key driver. Respondents who rated perceived value as "high" demonstrated a 30% higher likelihood of purchasing agricultural products online. Rural consumers particularly emphasized cost savings, while urban consumers prioritized convenience.

4.3. Behavioral Drivers

The analysis identified three major behavioral drivers:

(1) Platform Usability: Platforms with user-friendly interfaces attracted more older consumers, who otherwise faced digital literacy challenges. Intuitive navigation and mobile accessibility were rated as critical features.

(2) Live-Streaming Commerce: 40% of respondents cited live-streaming as a factor influencing their purchase decisions. Real-time interactions with sellers enhanced transparency and trust.

(3) Customer Reviews and Ratings: Verified reviews reduced perceived risks, particularly for fresh agricultural products. Platforms that prominently displayed positive feedback experienced 15% higher sales conversion rates.

4.4. Regression Analysis

The results of the multiple regression analysis are presented in Table 4.2. Key findings include:

(1) Trust: A 1-point increase in trust (measured on a 5-point scale) was associated with a 0.35-point increase in purchase intentions ($p < 0.01$).

(2) Perceived Value: A significant positive relationship ($\beta = 0.42$, $p < 0.01$) was observed between perceived value and purchase intentions.

(3) Demographic Factors: Younger age ($\beta = -0.28$, $p < 0.05$) and higher income ($\beta = 0.31$, $p < 0.01$) were positively associated with online purchase intentions.

These findings highlight the interplay between demographic factors and behavioral drivers, emphasizing the importance of tailored strategies for different consumer groups.

4.5. Discussion

The results reinforce the critical role of trust and perceived value in shaping online purchase intentions for agricultural products. Younger, higher-income, and urban consumers demonstrated higher engagement, while older and rural consumers faced barriers related to digital literacy and platform accessibility. Addressing these disparities requires targeted interventions:

(1) Digital Literacy Programs: Educating older consumers can enhance platform adoption rates.

(2) Localized Marketing Strategies: Rural-specific campaigns focusing on affordability and trust can bridge the digital divide.

(3) Live-Streaming Expansion: Leveraging live-streaming to demonstrate product authenticity can further build consumer trust and engagement.

Unlike prior studies that predominantly focused on urban consumers, this research highlights the unique challenges faced by rural and older demographics. This provides actionable insights for e-commerce platforms aiming to expand their market reach.

5. Conclusion and Recommendations

This study offers a comprehensive analysis of the factors influencing online purchase intentions for agricultural products, with a focus on the interplay of demographic variables, trust, and perceived value. The findings underscore significant disparities in adoption rates, driven by differences in age, income, and geographic location. Younger, higher-income, and urban consumers emerged as the most active participants in agricultural e-commerce, leveraging their digital literacy, superior infrastructure, and financial resources to access online platforms. In contrast, older individuals and rural residents faced persistent barriers, including limited digital literacy and lower trust in online transactions. These challenges highlight the need for tailored strategies to enhance inclusivity and encourage broader adoption of agricultural e-commerce.

Trust and perceived value proved to be pivotal drivers of consumer behavior. Platforms that demonstrated transparency through quality certifications, accurate pricing, and reliable delivery systems were more likely to foster consumer trust. Similarly, the perception of value—encompassing convenience, cost savings, and product quality—

significantly influenced purchase intentions. Urban consumers prioritized convenience, benefiting from streamlined interfaces and efficient delivery systems, while rural consumers placed greater emphasis on affordability and reliability. Behavioral drivers, including platform usability, live-streaming commerce, and customer reviews, further shaped engagement. User-friendly platforms were particularly effective in attracting older consumers, while live-streaming and verified reviews addressed trust concerns, making e-commerce platforms more appealing across diverse demographics.

To address these findings, it is essential to implement targeted strategies that bridge the digital divide and enhance consumer trust. Educational initiatives focusing on improving digital literacy among older and rural populations can play a transformative role in fostering confidence and platform adoption. Simultaneously, localized marketing campaigns tailored to the preferences and constraints of rural consumers can strengthen their engagement. The integration of live-streaming commerce offers an innovative way to build authenticity and transparency, enabling consumers to interact directly with sellers and gain insights into product quality and origins.

The practical implications of this study extend beyond consumer behavior analysis, offering actionable insights for e-commerce platforms and policymakers. Platforms must prioritize building trust and delivering perceived value by implementing quality assurance mechanisms, streamlining user interfaces, and enhancing customer support. Policymakers, on the other hand, can focus on improving digital infrastructure in underserved areas and promoting inclusivity through targeted educational programs. Researchers are encouraged to explore the evolving dynamics of agricultural e-commerce, particularly as emerging technologies such as blockchain and artificial intelligence reshape the landscape of trust and transparency.

In conclusion, this study highlights the critical role of tailored strategies in overcoming barriers and fostering greater participation in agricultural e-commerce. By addressing the unique needs of diverse consumer groups, stakeholders can unlock the potential of digital platforms to transform the agricultural industry and promote sustainable development in the e-commerce sector.

Disclosure statement

The author declares no conflict of interest.

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