International Journal of Advanced Research in Islamic Studies and Education (ARISE)
e-ISSN 2785-9088

BEYOND USABILITY: HOW ANXIETY AND STRESS SHAPE VR ADOPTION AMONG OLDER ADULTS IN A MAJOR DIGITAL MARKET

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Received: 24 September 2025 *Accepted: 26 November 2025* *Published: 22 December 2025*

Abstract: As global population aging accelerates and digital technologies rapidly evolve, understanding older consumers' acceptance of emerging technologies like virtual reality (VR) shopping becomes increasingly critical. China, with the world's largest and fastest-growing older consumer market, represents a pioneering case for examining how older adults navigate digital retail innovations in the context of its thriving "silver economy." Based on the Unified Theory of Acceptance and Use of Technology (UTAUT) framework, this study examines factors influencing older Chinese consumers' VR shopping adoption. Using structural equation modeling (SEM) with data from 428 older adults (aged 60+) with online shopping experience, we tested an extended UTAUT model incorporating computer anxiety and perceived stress as key psychological factors. Effort expectancy and facilitating conditions emerged as primary determinants of VR shopping adoption intention, with performance expectancy showing moderate influence. Notably, social influence showed no significant effect. Computer anxiety negatively affected both effort expectancy and facilitating conditions perceptions. However, when anxiety transformed into perceived stress, it paradoxically enhanced positive expectations toward VR shopping technology. These findings challenge prevailing assumptions about older adults' technology resistance and reveal nuanced psychological mechanisms underlying their digital adoption. The study demonstrates that embracing new technologies is becoming normative among Chinese older consumers, suggesting significant opportunities for leveraging VR technology characteristics to expand the silver economy and unlock new economic growth potential.

Keywords: older consumers, UTAUT model, VR shopping, silver economy, technology acceptance, computer anxiety, China.

Cite This Article:
Hu Mingyue. (2025). Beyond Usability: How Anxiety And Stress Shape Vr Adoption Among Older Adults In A Major Digital Market. *International Journal of Advanced Research in Islamic Studies and Education (ARISE),* 5(1), 171-185.

INTRODUCTION

Global population aging has become one of the most important socio-demographic trends of the 21st century. China, as the country with the largest and fastest-growing elderly population in the world, is undergoing an unprecedented demographic transformation. According to the latest data from the 56th Statistical Report on Internet Development in China, as of June 2025, my country had 116 million internet users aged 60 and above, accounting for 14.3% of the total number of internet users nationwide, with an internet penetration rate among the elderly exceeding 52% (CNNIC, 2025). Notably, more than half of elderly internet users frequently

use the internet for shopping, with interaction and emotional needs being their primary motivations.

In the context of global digital transformation, the technology adoption behavior of older consumers has become a key issue in understanding digital inclusion and the development of the silver economy. Virtual reality (VR) technology, as a representative of emerging immersive technologies, possesses characteristics such as high interactivity, experiential nature, and contextualization, providing an innovative solution to the problem of insufficient product perception in traditional e-commerce. For older consumers with limited mobility but strong shopping needs, VR shopping technology may become an important bridge connecting their consumption demands with market supply.

However, existing research mainly focuses on the acceptance of VR technology among younger groups, with insufficient attention paid to the special group of elderly consumers. Especially against the backdrop of the rapid development of the "silver economy" in China, there is still a lack of systematic research on the acceptance mechanisms, influencing factors, and psychological characteristics of elderly consumers towards emerging technologies such as VR shopping. As the world's largest and fastest-growing digital consumer market for the elderly, China provides a forward-looking and representative research scenario for exploring the technology adoption behavior of the elderly.

This study aims to fill this research gap by constructing an extended model based on the Integrated Technology Adoption and Use Theory (UTAUT) framework, incorporating psychological factors such as computer anxiety and perceived stress. It systematically explores the key factors influencing the acceptance of VR shopping among older Chinese consumers and their mechanisms of action. This research not only contributes theoretically to understanding digital inclusion in the context of global population aging but also provides practical insights for VR/AR hardware manufacturers, software developers, global marketers, and governments and non-profit organizations promoting digital inclusion.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

VR Shopping Technology and Older Consumers

The application of VR technology in the retail sector has attracted widespread attention from academia and industry in recent years. Compared with the traditional Web 2.0 shopping model, VR shopping provides a richer product perception experience through an immersive environment (Li et al., 2002; Verhagen et al., 2014). Existing literature mainly focuses on three dimensions: technical characteristics, user experience, and purchasing behavior.

From a technical perspective, researchers focus on the core attributes of VR systems, such as interactivity, vividness, and immersion. Jiang and Benbasat (2007) found through experimental research that the vividness and interactivity of product displays significantly affect consumers' willingness to return to the website and their purchasing behavior. Kim and Forsythe (2008) further pointed out that 3D product display technology can effectively reduce consumers' perceived risk and enhance their purchasing confidence.

Research on user experience dimensions emphasizes the importance of immersion, pleasure, and flow experience. Verhagen et al. (2014) showed that the sense of presence and enjoyment in VR shopping environments positively influence consumers' purchase intentions. However, Madathil et al. (2017), through usability testing, found that although virtual environments provide a stronger immersive experience, there was no significant difference in user ratings compared to traditional interfaces, suggesting that technology acceptance is influenced by multiple factors.

While existing research on older consumers is relatively limited, it is on the rise. Due to the unique physiological, cognitive, and social adaptability characteristics of older adults, their technology adoption behavior exhibits a different pattern compared to younger groups (Mitzner et al., 2010; Neves et al., 2013). Physiologically, factors such as declining vision and reduced finger dexterity affect their ability to operate technological interfaces; cognitively, reduced working memory capacity and slower information processing speed increase the difficulty of learning new technologies; and psychosocially, "technology anxiety" and concerns about privacy and security are significant psychological barriers (Braun, 2013).

UTAUT Framework and Technology Acceptance

Technology acceptance research has evolved from the Technology Acceptance Model (TAM) to integrated theory. Venkatesh et al. (2003) proposed the UTAUT model based on the integration of eight major technology acceptance theories. This model explains users' intentions and behaviors in using technology through four core constructs: performance expectancy, effort expectancy, social influence, and convenience conditions. The model has an explanatory power of 70% and has become the most influential theoretical framework for technology acceptance.

The UTAUT model has been widely used and validated in research on technology adoption among older adults. Kijsanayotin et al. (2009) found in a study at a community health center in Thailand that performance expectations and accessibility were key factors influencing the adoption of health information technology by older adults. Cimperman et al. (2013), in a study on home telemedicine services, indicated that effort expectations had a significant positive impact on performance expectations, and that the importance of effort expectations was more pronounced in older adults.

Of particular note are the fact that multiple studies have shown that older adults exhibit characteristics in technology adoption that do not entirely conform to theoretical expectations. Braun (2013) found that perceived ease of use and social pressure, traditionally considered important, are not decisive factors in older adults' use of social networking services; self-efficacy plays a more crucial role. This finding suggests that researchers need to appropriately extend the UTAUT model according to specific technological contexts and cultural backgrounds.

Psychological Factors: Anxiety and Stress

Computer anxiety, a typical manifestation of technology anxiety, refers to the negative emotional response an individual experiences when using or anticipating the use of computers

and related technologies (Venkatesh, 2003). It is particularly prevalent and far-reaching among older adults. Research by Or et al. (2011) shows that computer anxiety not only directly reduces older adults' willingness to use technology but also indirectly affects their technology adoption behavior by weakening their self-efficacy.

Yoon et al. (2009) explained the causes of computer anxiety in older adults from a cognitive psychology perspective: older adults tend to rely on long-accumulated behavioral patterns and decision-making procedures, and the introduction of new technologies disrupts this cognitive balance, triggering a defensive anxiety response. This anxiety is characterized by persistence and generalization; even when faced with simple technical operations, older adults may experience excessive fear of difficulty.

Perceived stress refers to the psychological burden experienced by older adults when learning and using new technologies due to declining cognitive abilities and insufficient knowledge base (Hamarat et al., 2001). Tomczyk et al. (2020) pointed out that perceived stress may prompt older adults to actively avoid new technologies and digital social activities, and in some cases become the root cause of the digital divide.

Interestingly, recent research has revealed a complex transformation mechanism between anxiety and stress. When older adults realize that learning new technologies is a general challenge rather than a personal deficiency, anxiety may transform into a positive "challenging stress," thereby motivating them to overcome difficulties (Leni et al., 2013). This finding provides a new perspective on understanding the psychodynamic mechanisms of technology adoption in older adults.

RESEARCH HYPOTHESES

Based on the UTAUT theoretical framework and the above literature review, this study proposes the following research hypotheses:

H1: Performance expectations positively influence older consumers' willingness to use VR shopping. Performance expectations reflect users' perception of the benefits of using technology. Multiple studies have confirmed that older adults' willingness to adopt new technologies is significantly increased when they believe that these technologies can improve their shopping efficiency and provide them with better product information (Arning & Ziefle, 2009; Kijsanayotin et al., 2009).

H2a: Efforts are being made to positively influence older consumers' willingness to use VR shopping.

H2b: Effort expectations positively influence performance expectations. Effort expectation reflects the perceived ease of use of technology. Studies by Cimperman et al. (2013) and Kijsanayotin et al. (2009) have shown that effort expectation plays a more significant role than performance expectation in technology adoption among older adults, and that effort expectation is a precursor to performance expectation.

H3: Social impact positively influences elderly consumers' willingness to use VR shopping. Although the role of social influence varies across different technological contexts, most studies support its importance in older adults' technology adoption (Kim & Park, 2012).

Particularly in collectivist cultural contexts, the opinions of family and friends have a significant impact on older adults' decision-making.

H4: Convenience positively influences older consumers' willingness to use VR shopping. Favorable conditions represent the availability of external resources and technical support. Studies by Heinz et al. (2013) and Rho et al. (2014) have shown that adequate technical support and resource guarantees can significantly increase older adults' willingness to adopt technology.

H5a: Computer anxiety negatively impacts the perception of convenience conditions.

H5b: Computer anxiety negatively impacts effort expectations.

H5c: Computer anxiety is positively correlated with perceived stress. Computer anxiety, as a negative psychological state, can reduce older adults' confidence in their own technical abilities and external support (Or et al., 2011) and may translate into perceived stress.

H6a: Perceived stress positively influences performance expectations.

H6b: Perceived stress positively influences effort expectations.

Based on the theory of challenging stress, when anxiety is transformed into a manageable perception of stress, it may motivate older adults to overcome difficulties and enhance their positive expectations of the utility and learnability of technology.

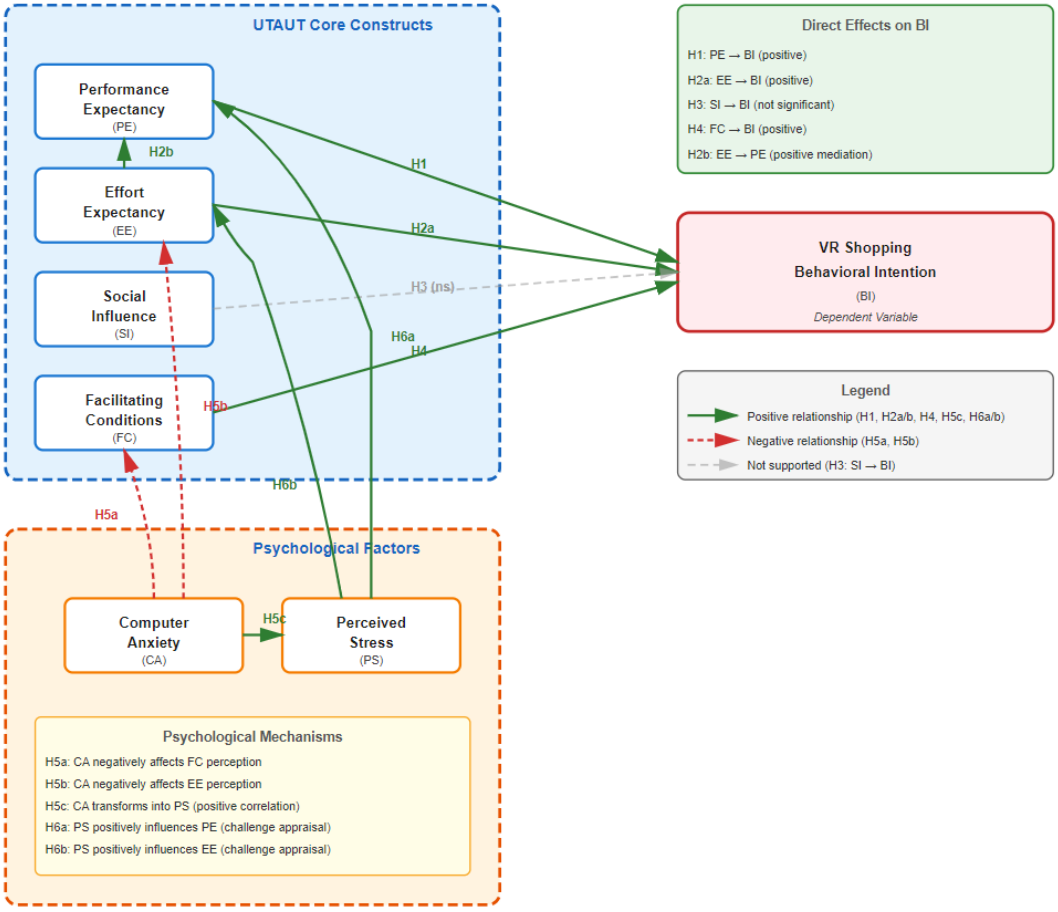

Figure 1: Research Conceptual Model Methodology Measurement Development

This study is based on the established UTAUT scale and appropriately adjusted to incorporate VR shopping and the characteristics of elderly Chinese consumers. All measurement items were derived from validated English literature, and cross-cultural validity was ensured through a translation-back-translation process. The final measurement scale contains 25 observed variables, covering six latent variables: performance expectation (4 items), effort expectation (4 items), social influence (3 items), convenience conditions (4 items), computer anxiety (5 items), and perceived stress (5 items).

All items were measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). A pre-survey involving 30 elderly participants was conducted prior to the formal survey. Based on feedback, some item wording was adjusted to ensure the questionnaire was concise, clear, and suitable for the reading habits of older adults. The pre-survey results showed that the internal consistency coefficient (Cronbach's α) of the scale was greater than 0.70, indicating good reliability of the measurement tool.

SAMPLE AND DATA COLLECTION

Based on my country's Law on the Protection of the Rights and Interests of the Elderly and WHO standards, this study defines Chinese citizens aged 60 and above with online shopping experience as the target group. Considering the large number of elderly people in China with online shopping experience, this group is highly representative for exploring digital consumption behavior in the context of global aging.

Data collection employed a hybrid approach combining online and offline methods. Online channels involved distributing electronic questionnaires through WeChat shopping groups for seniors, and using snowball sampling to broaden sample coverage. To ensure respondents understood the VR shopping concept, the questionnaire included a link to a VR shopping demonstration video, which respondents were required to watch before completing the questionnaire. Offline channels involved selecting four communities with a large elderly population, and distributing paper questionnaires using convenience sampling with the assistance of community workers. Researchers then played and explained the VR shopping demonstration video on-site to ensure respondents fully understood before filling out the questionnaire.

Data collection took place from July 1st to 15th, 2025, lasting two weeks. 202 questionnaires were distributed offline, and 178 were returned; 305 questionnaires were collected online through 12 WeChat groups, for a total of 483 questionnaires returned. After data cleaning, removing obviously arbitrary and logically contradictory questionnaires, 428 valid samples were obtained, resulting in an effective return rate of 88.6%.

The sample characteristics are reasonably distributed: in terms of gender, males account for 46.7% and females account for 53.3%; the age distribution is 60-65 years old (42.3%), 66-70 years old (35.7%), and 71 years and above (22.0%); the education level is mainly junior high school (38.1%) and high school/technical secondary school (35.5%); the monthly income is concentrated in the range of 3,000-5,000 yuan (41.8%) and 5,000-8,000 yuan (31.5%); in terms of online shopping experience, 77.3% of respondents have more than 2 years of online shopping

experience. The sample characteristics are basically consistent with the demographic distribution of elderly Chinese internet users and are highly representative.

DATA ANALYSIS

This study employed structural equation modeling (SEM) for data analysis, implemented using AMOS 24.0 software. SEM is suitable for handling theoretical models containing multiple latent variables and complex path relationships, and it effectively handles non-normally distributed data. The analysis consisted of two phases: first, confirmatory factor analysis (CFA) was used to assess the reliability and validity of the measurement model; second, path analysis was used to test the structural model and research hypotheses.

The evaluation of the measurement model followed the criteria proposed by Hair et al. (2010): for internal consistency reliability, both Cronbach's α and combined reliability (CR) were required to be greater than 0.70; for convergent validity, the mean variance extraction (AVE) was required to be greater than 0.50 and the factor loadings of each item were required to be greater than 0.70; for discriminant validity, the Fornell and Larcker (1981) criteria were adopted, requiring the square root of AVE of each construct to be greater than its correlation coefficient with other constructs.

The structural model was evaluated using multiple fit indices: absolute fit indices included χ^2/df (less than 3), RMSEA (less than 0.08), and SRMR (less than 0.08); relative fit indices included CFI, TLI, and IFI (all greater than 0.90). The significance of path coefficients was tested using the Bootstrap method (5000 repeated samplings), with a confidence interval set at 95%.

RESULTS

Measurement Model Assessment

Confirmatory factor analysis showed that the measurement model had good reliability and validity. The Cronbach's α coefficients for all latent variables ranged from 0.847 to 0.912, and the combined reliability (CR) ranged from 0.851 to 0.915, both exceeding the critical value of 0.70, indicating good internal consistency of the scale. Regarding convergent validity, the AVE values for each latent variable ranged from 0.587 to 0.728, all greater than the standard of 0.50; the standardized factor loadings for all measurement items ranged from 0.712 to 0.891, all exceeding the recommended value of 0.70 and significant at the $p < 0.001$ level, indicating good convergent validity of the measurement model.

Discriminant validity was tested using the Fornell-Larcker criterion. The results showed that the square root (diagonal value) of the AVE for each construct was greater than the correlation coefficient between that construct and other constructs, indicating good discriminant validity among the latent variables. Furthermore, the correlation coefficients between all constructs were less than 0.85, further confirming the discriminant validity of the measurement model.

The overall fit of the measurement model is good: $\chi^2/df = 2.314$ (less than 3), RMSEA = 0.056 (less than 0.08), SRMR = 0.048 (less than 0.08), CFI = 0.947, TLI = 0.941, IFI = 0.948 (all greater than 0.90). These indicators all meet the recommended standards, indicating that the measurement model fits the data well.

Table 1. Reliability and Validity Analysis Results

Constructs	Items	Factor Loading	Cronbach's α	CR	AVE
Performance Expectancy (PE)	PE1	0.823	0.893	0.895	0.681
	PE2	0.856			
	PE3	0.812			
	PE4	0.807			
Effort Expectancy (EE)	EE1	0.847	0.912	0.915	0.728
	EE2	0.891			
	EE3	0.863			
	EE4	0.809			
Social Influence (SI)	SI1	0.782	0.847	0.851	0.656
	SI2	0.825			
	SI3	0.819			
Facilitating Conditions (FC)	FC1	0.753	0.868	0.871	0.628
	FC2	0.819			
	FC3	0.801			
	FC4	0.794			
Computer Anxiety (CA)	CA1	0.768	0.884	0.887	0.612
	CA2	0.793			
	CA3	0.812			
	CA4	0.786			
	CA5	0.775			
Perceived Stress (PS)	PS1	0.712	0.856	0.859	0.587
	PS2	0.749			
	PS3	0.801			
	PS4	0.768			
	PS5	0.743			

Note: CR = Composite Reliability; AVE = Average Variance Extracted. All factor loadings are significant at $p < 0.001$. Bold values indicate summary statistics for each construct.

Structural Model and Hypothesis Testing

Structural model analysis results show good model fit indices: $\chi^2/df=2.428$, RMSEA=0.058, SRMR=0.051, CFI=0.942, TLI=0.936, IFI=0.943. Path analysis results and hypothesis testing are as follows:

Regarding the core constructs of UTAUT, effort expectation has the most significant impact on willingness to use ($\beta=0.412$, $p<0.001$), supporting H2a. Performance expectation also shows a significant positive impact on willingness to use ($\beta=0.267$, $p<0.001$), supporting H1. Convenience conditions also have a significant impact on willingness to use ($\beta=0.338$, $p<0.001$), supporting H4. Notably, social influence has no significant impact on willingness to use ($\beta=0.063$, $p=0.187$), and H3 is not supported. Furthermore, effort expectation has a significant positive impact on performance expectation ($\beta=0.524$, $p<0.001$), supporting H2b.
Regarding psychological factors, computer anxiety had a significant negative impact on convenience ($\beta=-0.286$, $p<0.001$) and effort expectation ($\beta=-0.318$, $p<0.001$), supporting H5a and H5b. A significant positive correlation existed between computer anxiety and perceived stress ($\beta=0.447$, $p<0.001$), supporting H5c. Perceived stress had a significant positive impact on performance expectation ($\beta=0.176$, $p=0.002$) and effort expectation ($\beta=0.192$, $p=0.001$), supporting H6a and H6b.

Regarding the explanatory power of the model, the R^2 values of each endogenous variable indicate that: willingness to use explains 56.8%, performance expectation explains 42.3%, effort expectation explains 37.6%, and convenience condition explains 8.2%. These results suggest that the extended UTAUT model has strong explanatory power for the VR shopping adoption behavior of older consumers.

Analysis of controlled variables showed that gender, education level, income level, and duration of online shopping experience had no significant impact on willingness to use ($p>0.05$), indicating that the core findings of this study are robust across groups.

Table 2. Path Coefficients and Hypothesis Testing Results

Hypothesis	Path	Coefficient (β)	p-value	Result
H1	PE → Behavioral Intention	0.267***	<0.001	Supported
H2a	EE → Behavioral Intention	0.412***	<0.001	Supported
H2b	EE → PE	0.524***	<0.001	Supported
H3	SI → Behavioral Intention	*0.063*	*0.187*	*Not Supported*
H4	FC → Behavioral Intention	0.338***	<0.001	Supported
H5a	CA → FC	-0.286***	<0.001	Supported
H5b	CA → EE	-0.318***	<0.001	Supported
H5c	CA → PS	0.447***	<0.001	Supported
H6a	PS → PE	0.176**	0.002	Supported
H6b	PS → EE	0.192**	0.001	Supported

Note: PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence; FC = Facilitating Conditions; CA = Computer Anxiety; 0.942, TLI = 0.936, IFI = 0.943. R^2 values: Behavioral Intention = 56.8%, PE = 42.3%, EE = 37.6%, FC = 8.2%.

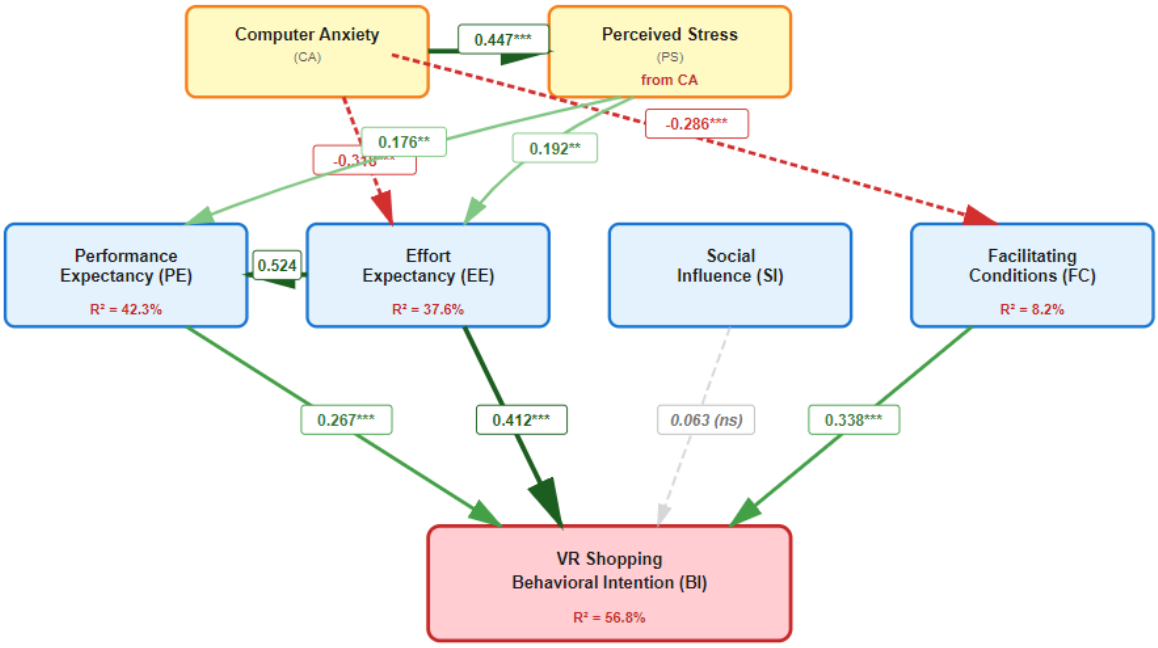

Figure 2: Structural Equation Model Path Diagram

DISCUSSION

Key Findings Summary

The core findings of this study challenge traditional assumptions about older adults' resistance to technology, revealing a unique pattern in the adoption of VR shopping technology by older

Chinese consumers. First, effort expectation and convenience emerged as the most critical determinants, a finding consistent with the findings of Kijsanayotin et al. (2009) in the field of healthcare information technology, but their importance is even more pronounced in the consumption context. This indicates that for older consumers, ease of use and availability of external support are the primary considerations for accepting new technologies, even surpassing the functional benefits brought by the technology itself.

Secondly, the insignificance of social impact is a finding worthy of further exploration. This result partially aligns with Kim and Park's (2012) research on the adoption of professional skills, but it appears particularly unique within the context of China's collectivist culture. A possible explanation is that as older adults accumulate online shopping experience, they exhibit greater autonomy and personal judgment in their consumption decisions; VR shopping, as a personalized experience technology, is valued more based on individual direct feelings than on social references. This finding has significant theoretical implications for understanding the consumption autonomy of older adults in the digital age.

Theoretical Contributions

This study makes a significant contribution to the expansion of the UTAUT theory. By introducing two psychological constructs, "computer anxiety" and "perceived stress," this research deepens the understanding of the psychological mechanisms of technology adoption in older adults. The study found that computer anxiety does not simply inhibit technology adoption, but rather influences behavioral intentions through a complex cognitive transformation process. When anxiety is transformed into perceived and coping stress, it actually stimulates older adults' motivation to engage in challenging technology learning. This finding echoes Lazarus and Folkman's (1984) cognitive appraisal theory of stress, providing a new theoretical perspective for understanding the technological adaptability of older adults.

Furthermore, this study confirms the strong antecedent effect of effort expectation on performance expectation (β=0.524), a finding that deepens our understanding of the dynamic relationship between technology acceptance constructs. For older consumers, the functional value of technology can only be fully recognized and appreciated when it is perceived as easy to learn and use. This finding has important implications for designing age-oriented technological innovations.

Practical Implications

The research findings provide actionable practical recommendations for multiple stakeholders: For VR/AR hardware manufacturers and software developers: Prioritize optimizing the simplicity and intuitiveness of the user interface to reduce the learning curve. Specific recommendations include: adopting natural interaction methods such as voice navigation and gesture recognition to reduce complex button operations; providing step-by-step interactive tutorials to support repeated practice; and designing a fault-tolerant operating system to avoid frustration caused by misoperation. Simultaneously, emphasize emotional design, enhancing the self-efficacy of older users through positive feedback mechanisms.

For global marketers looking to enter the senior consumer market: A rethinking of communication strategies for the target audience is crucial. Instead of emphasizing advanced features and social attributes, the focus should be on ease of use and comprehensive customer support. Marketing content should include detailed user guides and real-time technical support information, showcasing the accessibility of the technology through real-world user testimonials to lower the psychological barrier for potential customers.

For governments and non-profit organizations committed to promoting digital inclusion: Research findings indicate that providing adequate technology training and ongoing support is key to facilitating the digital integration of older adults. Recommendations include establishing community-level digital literacy training centers offering personalized, progressive technology learning courses; training young volunteers as "digital assistants" to provide one-on-one guidance to older adults in the early stages of their technology learning journey; and establishing age-friendly technology support hotlines to reduce psychological barriers to seeking help. In particular, policymakers should recognize that older adults are not only the service recipients of a digital society but also potential market contributors, and should design relevant policies from a consumer empowerment perspective.

LIMITATIONS AND FUTURE RESEARCH

This study has the following limitations, which point the way for future research. First, the study used a cross-sectional design, which cannot capture the dynamic evolution of technology adoption behavior among older consumers. Future research could employ a longitudinal tracking design to examine the complete learning curve of older adults from initial exposure to VR technology to proficient use, as well as the time-dependent changes in various influencing factors.

Secondly, the sample primarily comes from urban areas of China and may not be representative of elderly populations in rural or underdeveloped regions. Given China's vast territory and significant urban-rural digital divide, future research should expand the sample coverage, paying particular attention to the technology adoption characteristics of elderly people in areas with relatively scarce digital resources. Furthermore, cross-cultural comparative studies will help identify the moderating role of cultural factors in elderly technology adoption and test the cross-cultural universality of the findings in this study.

Third, this study is based on self-reported data and may be subject to social expectation bias. Some older respondents may tend to report more positive technology attitudes to conform to social expectations. Future research could combine experimental methods with data on actual usage behavior to more objectively assess the technology adoption behavior of older adults.

Finally, this study focuses on the specific technological context of VR shopping, and the applicability of its findings to other types of immersive technologies (such as VR education and VR healthcare) needs further verification. Future research can be extended to the broader technology ecosystem for the elderly, exploring the similarities and differences in adoption mechanisms across different technology application scenarios.

CONCLUSION

Against the backdrop of a global aging population, this study focuses on China, the largest digital consumer market for the elderly, and systematically explores the acceptance mechanisms of VR shopping technology among older consumers. The study finds that effort expectation and accessibility are the most critical factors influencing VR shopping adoption among the elderly, revealing the central role of ease of use and external support in technology adoption. By introducing two psychological constructs—computer anxiety and perceived stress—the study deepens the understanding of the psychological mechanisms of technology adoption among the elderly, discovering a positive pathway for the transformation of anxiety into challenging stress.

The most important finding of the study is that "embracing new technologies" is becoming the new normal for elderly consumers in China. This finding challenges the stereotype of older people being resistant to technology, demonstrating that with appropriate technological design and support, the elderly population is fully capable and willing to live and consume digitally. This not only provides Chinese experience for understanding the issue of digital inclusion in global aging societies, but also provides a scientific basis for unleashing the potential of the "silver economy" and exploring new economic growth points.

Looking ahead, with the continuous maturation of immersive technologies such as VR and the ongoing improvement of digital literacy among the elderly, age-friendly consumption models based on new technologies will become an important engine for promoting the development of the silver economy. This requires joint efforts from technology developers, marketers, and policymakers to design user-friendly, accessible, and valuable digital products and services based on the real needs and capabilities of the elderly, truly achieving a virtuous cycle where technology empowers the elderly and the elderly contribute to the socio-economic development.

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