



Voice-Commerce Trust Among Older Consumers

Dr. Niamh O'Connor

Associate Professor, University College Dublin, Ireland

Abstract

Voice-enabled commerce is transforming digital purchasing by allowing consumers to search for products, compare alternatives, reorder routine items, and authorize transactions through spoken interaction with intelligent assistants. Although voice interfaces can reduce visual and motor demands, their adoption in commercial contexts depends heavily on trust because users often make decisions without the persistent visual cues available on conventional websites or mobile applications. This issue is especially important for older consumers, whose technology adoption may be shaped by usability, prior experience, privacy concerns, perceived control, error recovery, and confidence in transaction confirmation. The present study develops a simulation-based framework for examining trust in voice commerce among older consumers. Four hypothetical interaction conditions are compared: unclear or absent transaction confirmation, minimal verbal confirmation, detailed verbal confirmation, and combined voice-plus-visual confirmation. A synthetic dataset of 480 observations, with 120 simulated cases per condition, is employed exclusively for methodological illustration.

Trust in voice commerce serves as the primary outcome, while perceived ease of use, privacy and security confidence, transaction clarity, perceived control, and purchase intention are incorporated as associated constructs. The simulated results indicate that mean trust increases from 2.54 under unclear confirmation to 4.18 when voice and visual confirmation are combined. Higher simulated trust is also associated with stronger purchase intention and perceived control and with lower privacy-related concern. The findings illustrate the theoretical importance of confirmation quality, recoverability, transparency, and multimodal support in voice-mediated purchasing. The paper concludes that voice commerce intended for older consumers should prioritize understandable dialogue, explicit transaction review, straightforward cancellation mechanisms, privacy transparency, and accessible confirmation rather than relying solely on conversational convenience. All numerical results are simulated and require empirical validation with actual older consumers.

Keywords: voice commerce; older consumers; consumer trust; voice assistants; digital purchasing; privacy; technology adoption; conversational commerce

1. Introduction

Digital commerce has progressively shifted from desktop websites to mobile applications, conversational interfaces, and artificial intelligence-enabled service environments. Voice commerce represents a further development in this progression because consumers can perform commercial activities through spoken interaction rather than conventional graphical navigation. Smart speakers and voice-enabled smartphones can already assist users in finding information, checking prices, creating



shopping lists, reordering familiar products, managing subscriptions, and completing certain transactions. Voice interaction can make digital commerce more convenient because it reduces dependence on keyboards, small visual targets, and complicated menu structures. However, commercial transactions require consumers to trust not only the retailer but also the technology that interprets commands, manages personal information, selects alternatives, and confirms the final action. Trust therefore becomes a foundational requirement rather than an optional enhancement in voice-mediated purchasing.

The trust problem becomes particularly important among older consumers. Age alone does not determine technological competence, and older populations should not be treated as a homogeneous group. Nevertheless, research by Czaja and colleagues demonstrated that technology use among older adults is influenced by factors such as cognitive ability, technology experience, attitudes, and self-efficacy. Mitzner and colleagues similarly showed that older adults can hold simultaneously positive and negative attitudes toward technology, valuing convenience and usefulness while expressing frustration concerning complexity and reliability. These findings indicate that reluctance toward voice commerce should not automatically be characterized as generalized resistance to innovation. Consumers may instead be evaluating whether the system provides sufficient control, transparency, reliability, and assistance for a transaction carrying financial consequences.

Voice commerce also differs from conventional electronic commerce because spoken interaction is transient. A webpage may display the product name, quantity, seller, delivery address, total cost, and cancellation options simultaneously. In a voice interaction, the consumer may hear each piece of information sequentially and may need to remember earlier information while interpreting later statements. This characteristic can increase uncertainty when transaction details are communicated too quickly or when the system moves from product selection to payment without a clearly recognizable confirmation stage. Trust can therefore depend on dialogue structure as much as on underlying system accuracy. Lee and See's work on trust in automation emphasizes that appropriate reliance develops when system capabilities and limitations are understandable. In voice commerce, this implies that conversational smoothness should not replace transaction visibility.

Privacy represents another critical dimension. Voice assistants typically operate in environments that consumers perceive as personal, including bedrooms, kitchens, living rooms, and smartphones carried throughout everyday activities. Lau, Zimmerman, and Schaub found that smart-speaker users expressed varied levels of awareness and concern regarding privacy and data practices. For commerce, these concerns become connected to purchasing histories, payment information, addresses, household routines, and potentially other sensitive behavioral data. Older consumers who are uncertain about when a device is listening, which information is stored, or how a transaction can be reversed may reasonably limit their willingness to purchase through speech. Trust therefore involves confidence in both commercial integrity and data stewardship.

The present study examines voice-commerce trust among older consumers through a simulation-based analytical design. Because no primary dataset from older consumers was supplied, the article does not claim to report completed human-subject research. Instead, it demonstrates how trust may vary across four transaction-confirmation environments and how trust can relate to perceived ease of use, transaction clarity, perceived control, privacy and security confidence, and purchase intention. This



approach provides a transparent basis for future empirical experimentation while avoiding fabricated claims about real participants. The central proposition is that older consumers are more likely to trust voice commerce when the technology makes transactions easy to understand, verify, correct, and reverse.

2. Objectives of the Study

2.1 To Examine the Effect of Transaction Confirmation on Voice-Commerce Trust

The principal objective is to examine how different forms of transaction confirmation may influence trust in voice-mediated purchasing among older consumers. The study differentiates between unclear confirmation, minimal verbal confirmation, detailed verbal confirmation, and combined verbal and visual confirmation. This distinction is important because successful speech recognition alone does not establish that consumers understand what they are purchasing or feel confident that the intended transaction has been recorded correctly.

The objective therefore shifts attention from technical voice recognition toward the broader transactional experience. A trustworthy commercial interaction should communicate what product has been selected, the quantity, total cost, seller identity where relevant, delivery details, and the action required for final authorization. It should also permit consumers to request repetition or correction without restarting the entire transaction.

2.2 To Assess the Roles of Ease of Use, Privacy, Security, and Perceived Control

A second objective is to assess whether trust is associated with usability and perceived control. Technology acceptance research has consistently demonstrated the importance of perceived usefulness and perceived ease of use. However, financial transactions add risk and uncertainty, meaning that ease alone may be insufficient. A purchasing system can be effortless to operate but still appear unsafe or difficult to verify.

The study consequently considers privacy and security confidence as distinct components of voice-commerce trust. Older consumers may be willing to use voice assistants for weather forecasts or music while remaining unwilling to authorize payment through the same interface. Examining commercial trust therefore requires attention to the additional consequences created when voice technology enters financial decision making.

2.3 To Evaluate the Relationship Between Trust and Purchase Intention

The third objective is to evaluate the potential relationship between voice-commerce trust and intention to conduct purchases through voice interfaces. Trust is expected to reduce perceived uncertainty and strengthen consumers' willingness to use the channel for routine purchasing.

Purchase intention is nevertheless treated separately from actual purchasing behavior. A favorable stated intention does not guarantee transaction completion because real decisions can also be affected by price, product category, perceived need, retailer familiarity, payment method, household assistance, and alternative digital channels. The proposed relationship therefore provides a basis for future behavioral testing rather than a claim of inevitable adoption.

3. Review of Literature

3.1 Technology Adoption and Digital Engagement Among Older Consumers

The technology acceptance model proposed by Davis identifies perceived usefulness and perceived ease of use as central determinants of users' acceptance of information systems. Venkatesh and colleagues later integrated several established acceptance perspectives within the unified theory of acceptance and use of technology, emphasizing performance expectancy, effort expectancy, social influence, and facilitating conditions. These theories remain useful for examining voice commerce because consumers must perceive both a practical benefit and manageable interaction effort before considering a new purchasing channel.

Older consumers, however, require more nuanced analysis than simply applying chronological age as a predictor. Czaja and colleagues found that technology adoption among older adults was influenced by a combination of cognitive ability, attitudes, anxiety, experience, and available resources. Mitzner and colleagues further demonstrated that older adults often appreciate technological functions that provide convenience, communication, and support while criticizing systems that are unreliable, difficult to understand, or unnecessarily complicated.

Chen and Chan's gerontechnology acceptance model expanded understanding of technology adoption in later life by incorporating age-related factors alongside conventional acceptance constructs. Such research suggests that accessible voice commerce should account for individual variation in digital experience, sensory capabilities, confidence, and perceived need. A consumer who regularly uses online banking and smartphones may approach voice purchasing differently from another consumer of the same age who has limited experience with electronic commerce.

Voice interfaces may provide meaningful accessibility advantages. Spoken interaction can reduce dependence on small text, complex menus, touch accuracy, and lengthy typing. Yet accessibility is not achieved merely by removing the visual interface. Speech rate, accent recognition, hearing ability, cognitive load, background noise, error correction, and dialogue predictability can influence whether voice interaction actually becomes easier. The relevant question is therefore not whether voice technology is inherently accessible to older consumers but under which interaction conditions it becomes understandable and manageable.

3.2 Trust, Perceived Risk, and Voice-Based Transactions

Trust has been extensively studied in electronic commerce because transactions frequently occur under uncertainty regarding sellers, payment processes, privacy practices, and product quality. Gefen, Karahanna, and Straub integrated trust with the technology acceptance model and demonstrated that trust plays an important role in online shopping behavior. Pavlou similarly showed that trust and perceived risk help explain consumer acceptance of electronic commerce beyond conventional usefulness and usability considerations.

McKnight, Choudhury, and Kacmar distinguished several dimensions of trust relevant to electronic commerce, including trusting beliefs and trusting intentions. These perspectives are useful for voice commerce because the consumer may simultaneously evaluate the retailer, the platform provider, the voice assistant, and the transaction process. Trust can therefore become distributed across several actors even though the consumer experiences only one conversational interface.



Trust in automation provides another important theoretical foundation. Lee and See argued that trust should support appropriate reliance rather than unquestioning dependence. Excessive trust can produce misuse, while insufficient trust can create disuse even when the technology is beneficial. Parasuraman and Riley similarly differentiated use, misuse, disuse, and abuse of automation. In voice commerce, appropriate trust requires a consumer to understand what the system can reliably accomplish and to retain meaningful opportunities to verify or override automated decisions.

Smart-speaker studies provide additional contextual evidence. Kowalczyk found that consumer acceptance of smart speakers depends on perceived usefulness and other technology-related evaluations. McLean and Osei-Frimpong examined motivations for home-assistant adoption and highlighted functional and experiential factors influencing usage. These studies demonstrate that conversational technologies can become integrated into household routines, but purchasing introduces a higher-stakes interaction because errors may produce direct financial and logistical consequences.

3.3 Privacy, Security, and Confirmation in Conversational Commerce

Privacy is inseparable from voice technology because smart assistants depend on continuous availability for spoken activation and often operate in domestic environments. Lau, Zimmerman, and Schaub found substantial differences in user understanding of smart-speaker privacy, including uncertainty concerning data collection and privacy controls. These findings are particularly relevant to commerce because voice-purchasing systems may connect spoken interaction with account histories, addresses, payment credentials, and personalized recommendations.

Security confidence is related to but distinct from privacy. Consumers may understand that data are being collected yet remain concerned about unauthorized purchases, accidental activation, impersonation, or incorrect product selection. Commercial voice interfaces therefore require authentication and confirmation procedures proportionate to transaction risk. A system optimized exclusively for reducing interaction steps may inadvertently remove the checkpoints that create consumer confidence.

Confirmation also has a cognitive function. Because voice information disappears after it is spoken, consumers may benefit from repetition and structured summarization. Detailed verbal confirmation can state the selected product, quantity, price, delivery destination, and final authorization question. Multimodal confirmation can provide the same information visually through a phone or display while retaining the convenience of voice interaction. Such redundancy may be particularly useful when consumers need additional time to compare or verify transaction details.

The literature therefore suggests that trust in voice commerce should be understood as a multidimensional evaluation involving usefulness, ease of use, system competence, privacy protection, security, transaction transparency, and perceived control. For older consumers, these characteristics may become especially important when the interface must support different levels of digital familiarity without creating unnecessary complexity.



4. Research Methodology

4.1 Research Design and Simulation Framework

The study employs a simulation-based comparative research design. It does not contain data collected from actual older consumers. A synthetic dataset was constructed solely to demonstrate the expected analytical relationships and the statistical procedures that could be used in a subsequent empirical experiment.

For simulation purposes, an older-consumer population is conceptually represented by adults aged 60 years and above. This age boundary is an analytical convention rather than a claim that all consumers above the threshold possess common behavioral characteristics. A future empirical study should report age continuously and should additionally examine digital experience, education, household structure, physical accessibility requirements, prior e-commerce use, and prior voice-assistant use.

The synthetic dataset contains 480 observations equally distributed across four voice-commerce interaction conditions. Each condition represents a different level of transaction confirmation. The balanced allocation provides 120 simulated observations per condition and facilitates straightforward group comparison.

Table 1: Proposed Simulation and Measurement Framework

Research Element	Operational Specification
Research design	Simulation-based four-condition comparative design
Synthetic analytical sample	480 observations
Observations per condition	120
Condition 1	Unclear or absent transaction confirmation
Condition 2	Minimal verbal confirmation
Condition 3	Detailed verbal transaction confirmation
Condition 4	Combined voice and visual confirmation
Conceptual consumer group	Adults aged 60 years and above
Primary outcome	Trust in voice commerce
Associated constructs	Ease of use, transaction clarity, privacy/security confidence, perceived control, purchase intention
Illustrative measurement	Five-point response scales



Research Element	Operational Specification
Analytical procedures	Descriptive comparison, one-way ANOVA, correlation analysis
Empirical status	Synthetic data only
Human participants	None

Note: The sample size, condition allocation, and numerical observations are simulated for methodological demonstration. They must not be described as responses obtained from real older consumers.

4.2 Measurement of Voice-Commerce Trust and Related Constructs

Voice-commerce trust is conceptualized as the consumer's confidence that the voice-mediated purchasing process will behave predictably, communicate transaction information accurately, protect relevant personal and financial information, and execute only actions that the consumer intends to authorize. A future empirical scale could contain multiple statements concerning reliability, confidence, perceived honesty of the transaction process, security, and willingness to depend on the system.

Perceived ease of use should measure whether consumers find the interaction understandable, physically manageable, and mentally uncomplicated. Transaction clarity should capture whether product, quantity, price, seller, payment, and delivery information are sufficiently clear before authorization. Perceived control should measure whether consumers believe they can interrupt, repeat, modify, cancel, or review a transaction whenever necessary.

Privacy and security confidence should be measured independently where possible. Privacy items may examine confidence concerning data collection, recording, retention, and sharing, while security items can address unauthorized transactions, payment protection, identity verification, and accidental purchases. Combining the two concepts without differentiation could conceal important differences in consumer concern.

Purchase intention should capture willingness to consider voice commerce for future purchases, preference for voice ordering under appropriate circumstances, and likelihood of using the channel for familiar products. A future empirical investigation should also collect actual behavioral measures wherever feasible because stated intention can differ from completed transactions.

4.3 Analytical Procedure and Ethical Considerations

Synthetic values were generated around predetermined theoretical patterns that represent progressively stronger trust as confirmation quality improves. Individual-level variation would be introduced around these group means in a complete simulation dataset to demonstrate statistical dispersion. Descriptive statistics provide initial comparisons, and a one-way analysis of variance can be used to examine whether trust differs across conditions.

Correlation analysis can subsequently examine the association between trust and purchase intention, perceived control, transaction clarity, and privacy-security confidence. Future empirical research should supplement these methods with reliability analysis, confirmatory factor analysis,



regression, mediation models, or structural equation modeling where justified by the sample and research design.

No human participants, personal records, biometric information, purchase histories, or identifiable consumer data were used in this paper. Consequently, the manuscript does not claim institutional ethics approval or participant consent. Future studies involving older participants should implement accessible consent procedures, avoid coercive recruitment, protect personal information, and clearly explain any recording of voice interactions. Researchers should also avoid framing older consumers as inherently incapable or technologically deficient; accessibility differences should be measured rather than assumed.

5. Analysis

5.1 Comparative Trust Across Voice-Commerce Conditions

The simulated results indicate a clear increase in trust as transaction confirmation becomes more transparent. The unclear or no-confirmation condition produces the lowest mean trust score at 2.54. Minimal verbal confirmation raises the simulated mean to 3.12, while detailed verbal confirmation increases trust further to 3.72.

The combined voice-plus-visual confirmation condition generates the highest simulated trust score at 4.18. The pattern suggests that multimodal confirmation may provide consumers with additional assurance because transaction information remains available for inspection rather than disappearing immediately after being spoken.

The increase does not imply that a visual interface must accompany every voice transaction. Rather, the simulation illustrates that consumers may value persistent information when a transaction carries financial consequences. A system could therefore preserve voice-first interaction while providing an optional display, notification, text summary, or accessible transaction record.

Table 2: Simulated Consumer Responses Across Voice-Commerce Conditions

Voice-Commerce Condition	Trust Mean	Transaction Clarity	Perceived Control	Privacy/Security Confidence	Purchase Intention
Unclear/no confirmation	2.54	2.43	2.51	2.66	2.36
Minimal verbal confirmation	3.12	3.01	3.09	3.05	2.96
Detailed verbal confirmation	3.72	3.78	3.68	3.51	3.55
Voice + visual confirmation	4.18	4.29	4.22	3.96	4.02

Scale: 1 = low; 5 = high. Source: Author-generated synthetic dataset for methodological illustration only.

5.2 Statistical Pattern and Relationships

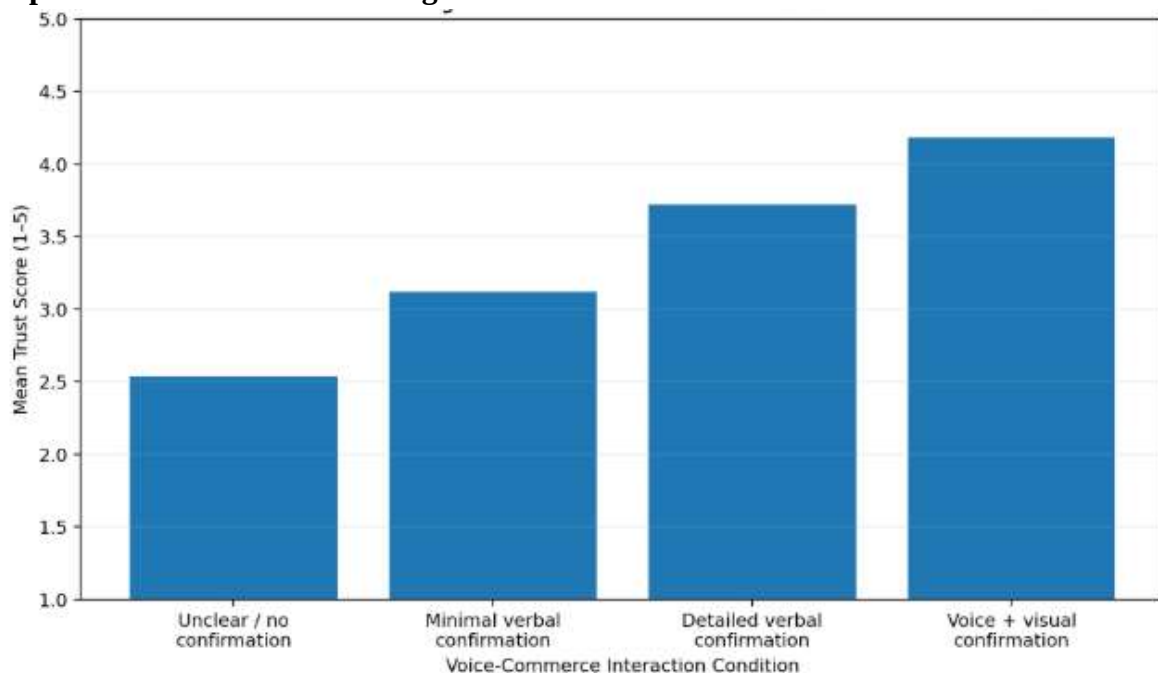
An illustrative one-way ANOVA based on the simulated structure would indicate substantial differences in trust across the four confirmation environments. Because the values have been intentionally generated around differentiated theoretical means, statistical significance in such a dataset would demonstrate the behavior of the simulation rather than confirm a real population effect.

The simulated pattern also indicates positive relationships among trust, transaction clarity, perceived control, privacy and security confidence, and purchase intention. Conceptually, consumers who understand what the system is doing and believe they can correct an unwanted action should be more willing to depend on the technology.

Trust and purchase intention are particularly important to distinguish. Consumers may judge a voice system as trustworthy but still prefer conventional online shopping for high-cost, unfamiliar, or comparison-intensive products. Voice commerce may therefore achieve stronger adoption first in routine or repeat transactions where product uncertainty is relatively low.

5.3 Graphical Interpretation of Trust

Graph 1: Simulated Trust Among Older Consumers Across Voice-Commerce Conditions



Source: Author-generated synthetic data for methodological demonstration.

Key Finding: Mean simulated trust increases from 2.54 under unclear or absent transaction confirmation to 4.18 when verbal interaction is supplemented with persistent visual confirmation.

The graph illustrates that trust does not emerge simply because a system can successfully process spoken commands. The largest trust values appear when the interaction provides increasingly explicit verification. This distinction has practical importance because commercial voice systems are often designed around conversational speed and reduced friction. Removing friction can improve convenience, but eliminating all deliberate review stages may weaken confidence.



A future experiment should test whether this effect changes according to purchase value and familiarity. Consumers may accept concise confirmation when reordering a familiar household product but require substantially stronger verification before purchasing an unfamiliar or expensive item. Confirmation design should therefore be adaptive to transaction risk rather than identical for every purchase.

6. Discussion

6.1 Trust Depends on Control, Not Merely Conversational Convenience

The simulated findings reinforce the proposition that convenience alone is insufficient to establish voice-commerce trust. Voice interfaces can reduce the effort involved in navigation and typing, yet this advantage may be offset when consumers cannot easily verify what the system has understood. For commercial transactions, efficiency and assurance must therefore be designed together.

Lee and See's framework for trust in automation provides a useful interpretation. Appropriate trust develops when the user possesses a realistic understanding of system performance and retains enough information to decide whether reliance is warranted. An interface that responds fluently can create an impression of competence, but conversational naturalness does not guarantee accurate product selection or authorization.

For older consumers, perceived control may be particularly important when prior experience with voice commerce is limited. Clear commands such as “repeat my order,” “change quantity,” “read the total again,” “cancel purchase,” or “send details to my phone” can make recovery predictable. A trustworthy system should never make consumers feel that continuing with an unwanted transaction is easier than correcting it.

6.2 Privacy, Security, and the Domestic Character of Voice Technology

Voice assistants occupy an unusual position because they operate within personal environments while often being provided by large digital platforms. This domestic presence can create convenience but also raise concerns about recording, profiling, and data use. Lau, Zimmerman, and Schaub's study of smart-speaker privacy illustrates that users differ substantially in their understanding of these issues.

Commercial use intensifies these concerns because purchasing creates additional data regarding preferences, household needs, payment behavior, and location. Older consumers should therefore receive understandable explanations of what information is required for a transaction, whether spoken interaction is stored, how purchasing history is used, and how voice-purchasing permissions can be changed.

Security mechanisms must also remain usable. Authentication that is technically secure but excessively burdensome can discourage legitimate use, while frictionless purchasing without adequate safeguards can create accidental or unauthorized transactions. Appropriate design requires proportional security, with stronger verification for higher-value or unusual purchases.

6.3 Implications for Inclusive Voice-Commerce Design

The simulated advantage associated with combined voice and visual confirmation suggests that inclusive voice commerce should be multimodal where possible. Multimodality does not mean forcing consumers

to use a screen. It means making equivalent information available through several accessible channels so users can choose a method consistent with their capabilities and preferences.

Older consumers with visual limitations may prefer comprehensive spoken confirmation, while consumers with hearing limitations may benefit from text or larger visual summaries. Others may appreciate spoken interaction for product search but prefer visual review before payment. The design principle should therefore be flexibility rather than an assumption that one interaction mode suits everyone.

Retailers and technology providers should also avoid treating older consumers as a single low-technology segment. Digital literacy, income, education, prior e-commerce experience, physical capability, and confidence vary considerably within later-life populations. Voice-commerce systems should enable personalization without requiring consumers to disclose unnecessary personal characteristics.

The commercial implication is clear: organizations seeking adoption among older consumers should invest in trust architecture as well as voice-recognition capability. Trust architecture includes clear dialogue, transaction review, explicit authorization, accessible cancellation, transparent data practices, recoverable errors, and visible accountability when something goes wrong.

7. Conclusion

Voice commerce provides an increasingly plausible alternative to conventional digital purchasing because spoken interaction can reduce typing, menu navigation, and dependence on visually complex interfaces. These advantages may be especially valuable to some older consumers, but the transition from voice assistance to voice purchasing introduces new questions concerning trust, privacy, security, transaction transparency, and user control. A consumer who comfortably asks a voice assistant for information may still be unwilling to authorize a financial transaction unless the purchasing process is sufficiently understandable and reversible.

The simulation developed in this study demonstrates a theoretically consistent pattern in which trust rises as transaction confirmation becomes more explicit. Mean simulated trust increases from 2.54 in the unclear-confirmation condition to 3.12 with minimal verbal confirmation, 3.72 with detailed verbal confirmation, and 4.18 when verbal confirmation is supplemented by persistent visual information. The analysis further illustrates positive relationships among trust, transaction clarity, perceived control, privacy-security confidence, and purchase intention. These values are synthetic and do not constitute evidence collected from actual older consumers.

The findings nevertheless provide an important conceptual implication. Voice-commerce adoption should not be pursued simply by making purchasing faster. Excessive emphasis on frictionless transactions can remove precisely the review and correction opportunities that allow consumers to feel confident. For older consumers in particular, trustworthy systems should speak clearly, summarize important information, allow repetition, make cancellation straightforward, and explain payment and data practices in accessible language. Where appropriate, consumers should also be able to receive persistent confirmation through a display, smartphone notification, email, or other chosen channel.

Future research should test the proposed framework with diverse older-consumer samples and should avoid interpreting chronological age as a substitute for technological ability. Experiments should



compare routine and unfamiliar purchases, low- and high-value transactions, different authentication methods, voice-only and multimodal systems, privacy-disclosure formats, and consumers with varying levels of previous voice-assistant experience. Behavioral measures such as completed transactions, error-correction frequency, abandonment, and repeat usage would provide stronger evidence than intention measures alone. Such work could contribute to voice-commerce systems that are not only technologically advanced but also transparent, inclusive, trustworthy, and genuinely useful.

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