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The Formation Mechanism of Channel Choice in Preventive Health Consumption among Older Adults from a Value Co-Creation Perspective on Health Literacy, Digital Trust, and Health Agency

Yuan-Shuh Lii and Shan-Ni Cheng

Abstract

With the accelerating trend of global population aging, the paradigm of health consumption has shifted from traditional passive treatment models toward proactive preventive healthcare. Despite the information transparency and convenience offered by digital technologies, the choice behavior of older adults between online digital platforms and offline physical channels remains complex, characterized by intricate psychological trade-offs and resource integration needs. This study aims to delineate the decision-making mechanism of older adults in the context of preventive health consumption. By integrating service-dominant logic, social cognitive theory, and health literacy models, this research constructs a comprehensive theoretical framework encompassing health literacy, digital trust, and health agency, emphasizing the psychological agency of older adults as active agents of value co-creation. Adopting a cross-sectional research design, this study empirically investigates over 300 individuals aged 65 and above with experience in preventive health consumption, utilizing structural equation modeling (SEM) for hypothesis testing. The results are expected to show that health agency serves as a critical mediator between information reception and channel choice, while digital trust acts as a moderator between information empowerment and behavioral decision-making. This study not only elucidates the underlying psychological drivers of omnichannel choice behavior among older adults, thereby transcending the technological determinism of traditional technology acceptance models, but also offers novel theoretical insights and practical paradigms for future smart aging policies and digital transformation strategies in the retail sector, ultimately affirming the central role of older adults in a smart aging society.

Keywords: Older adults, Preventive health consumption, Digital trust, Health literacy, Value co-creation, Omnichannel choice.

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1.Introductrion

1.1 Research Background and Motivation

The global aging population is not only a major shift in social structure but also fundamentally reshapes the demand paradigms and consumption landscapes for health services. Traditional health management systems have long been dominated by medical-centrism, favoring a treatment-oriented approach to disease management. However, with the proliferation of successful aging and the concept of autonomous living, the health consumption paradigm is undergoing a shift from passive medical treatment to proactive preventive care. Preventive health consumption, including high-quality nutritional supplements, smart health monitoring devices, remote consultation services, and personalized fitness programs, has become a core resource for older adults to maintain physiological functions and mitigate frailty.

Nevertheless, existing marketing literature remains limited in its interpretation of the consumption behavior of older adults. Most studies, constrained by a technological determinism perspective, tend to depict older consumers as having poor adaptability to digital technologies or as mere passive recipients of digital dividends. This simplified narrative often focuses excessively on the single usage rates of specific channels, while overlooking the psychological agency demonstrated by older adults during value co-creation within the digital health ecosystem.

1.2 Research Gap

There exists a critical theoretical gap in our understanding of this demographic. Although academia has extensively documented the barriers faced by older adults in technology adoption, research into the psychological motivations driving their channel selection remains scarce. Specifically, current literature fails to effectively bridge the focus on health literacy within public health with the investigation of digital trust in marketing. We currently lack a systematic framework to explain how these two distinct resources interact and subsequently influence consumers' perceptions of their own capacity to manage complex health decisions. Traditional technology acceptance models appear inadequate in this context, as they often reduce channel selection to a static function of ease of use, rather than a dynamic manifestation of health agency.

1.3 Research Objectives

Based on the aforementioned research background and gaps, this study aims to achieve the following three specific objectives:

1. To investigate how health literacy and digital trust collectively shape the health agency of older adults and influence their decision-making behavior in preventive health consumption.
2. To clarify the psychological mechanisms of channel selection among older adults in digital environments, shifting the focus of their technology adoption behavior from mere ease-of-use judgments to value co-creation as an agentic practice.
3. To construct an integrated service-dominant logic framework that provides empirically grounded strategic guidance for industry practitioners and policymakers in promoting digital smart-aging services, thereby optimizing the digital health well-being of older adults.

1.4 Academic Contributions

The study seeks to bridge the aforementioned theoretical gap by treating preventive health consumption as a service-dominant interactive process. This study argues that the channel selection behavior of older adults is not merely a transactional exchange based on cost-benefit calculations, but a dynamic equilibrium among personal health literacy, digital trust perception, and the construction of health agency. By integrating these constructs, this study makes three primary contributions: First, it introduces health agency as a core psychological mechanism, shifting the research focus from technology deficiency to agentic empowerment. Second, it provides a comprehensive theoretical framework that integrates public health objectives with e-commerce marketing strategies. Finally, it offers actionable insights for digital transformation and the construction of smart health ecosystems, affirming the central role of older adults as value co-creators in a smart aging society.

2. Literature Review and Theoretical Foundations

2.1 From Passive Object to Agentic Integrator: The Service-Dominant Logic Turn

Research on the consumption behavior of older adults has long been constrained by negative societal stereotypes, often reducing them to a vulnerable group characterized by technological exclusion, or analyzing the digital divide

solely through the lens of functional impairment[1,2]. Over the past two decades, however, the field has undergone a profound paradigm shift led by Service-Dominant (S-D) Logic. This shift has redefined the consumer's role from a passive recipient of value, as viewed in traditional marketing, to a dominant participant in the value co-creation process. The theoretical foundation established by Vargo and Lusch[3,4] reveals that value is not created at the moment of product exchange, but rather through dynamic, continuous engagement in resource integration and service experience within specific service ecosystems.

Beyond this repositioning, S-D logic rests on a set of foundational premises with specific implications for aging consumers. Its axiomatic core holds that service, the application of competences for the benefit of another, is the fundamental basis of exchange; that value is always co-created by multiple actors, including the beneficiary; that all economic and social actors are resource-integrating actors; and that value is uniquely and phenomenologically determined by the beneficiary[5]. For older adults, this implies that the value of a preventive-health channel is not embedded in the product or the interface, but is realized experientially through the integration of operant resources, namely the knowledge and skills each individual brings to the encounter[6,7]. When older adults make preventive-health decisions, they are thus engaged in complex sense-making and resource recombination rather than simple procurement[8]. Health literacy and digital trust are therefore best understood not as antecedents external to consumption, but as operant resources that older adults mobilize within a service ecosystem, and whose asymmetric distribution helps explain divergent channel trajectories, consistent with a service-logic reading of value co-creation [9].

2.2 Health Literacy as a Cognitive Operant Resource

In the theoretical discourse of health communication, the evolution of the health literacy concept reflects a deepening understanding of individual capabilities. Early research tended to narrow its scope to basic reading and comprehension skills. However, the comprehensive model proposed by Sorensen et al precisely positions it as a dynamic system of competencies encompassing the acquisition, understanding, appraisal, and application of health information.[10]. This integrative empowerment mechanism demonstrates that health literacy is not merely a manifestation of physiological or cognitive function; rather, it serves as a core psychological driver that regulates decision quality and self-efficacy in an environment saturated with medical information[11].

Nutbeam's influential typology further differentiates three progressive levels: functional literacy (the basic skills to read and act on health information),

interactive literacy (the social and cognitive skills to extract information and derive meaning from communication), and critical literacy (the advanced ability to critically appraise information and exert greater control over health decisions)[12,13]. It is the higher, critical tier that operates as a protective cognitive barrier for preventive-health consumption: older adults with strong critical literacy can discern value across competing information channels and interpret it autonomously. As digital and physical channels become deeply integrated, an individual's literacy level directly dictates their control over information interpretation, influencing not only processing efficiency but also their bargaining power and subject positioning within complex care networks[14,15]. In digitally mediated settings this capacity extends to eHealth literacy, the combined ability to locate, evaluate, and apply electronic health information[16].

2.3 Digital Trust as a Situational Resource

In the digital economy, digital trust is viewed as a structural cornerstone and psychological safety net for consumer behavior. Gefen et al. successfully integrated trust variables into the Technology Acceptance Model (TAM), confirming that consumer perceptions of a digital platform's ability, integrity, and benevolence are key predictors of transaction intention[17]. The structural assurance and situational interaction mechanisms proposed by McKnight, Choudhury, and Kacmar[18], grounded in the integrative model of trust of Mayer, Davis, and Schoorman, further refined the dimensions of digital trust, which are decisive for evaluating how older adults judge the professional credibility of digital health ecosystems[19].

However, existing literature largely focuses on the functional reliability of information systems, rarely addressing the connection between real-world professional expertise and virtual trust in digital platforms during omnichannel consumption. When conceptualized as a regulatory mechanism, digital trust is better understood in terms of how it lowers cognitive load and mitigates perceived risk, factors crucial for the psychological stability of older adults facing high-stakes health consumption decisions[20]. This risk-buffering function positions trust not merely as an antecedent of adoption but as a boundary condition that governs whether psychological agency is converted into concrete channel behavior.

2.4 Health Agency: The Integrative Psychological Mechanism

To integrate these disparate dimensions, this study adopts Bandura's[21,22]

social cognitive theory and agency theory, defining health agency as the psychological capacity of an individual to actively adapt resources to maintain physical and mental well-being in an uncertain environment. Human functioning is explained through triadic reciprocal determinism, in which behavior, personal (cognitive-affective) factors, and the environment operate as interacting determinants rather than one-directional causes.

Within this system, human agency is characterized by four core properties: intentionality (forming action plans), forethought (anticipatory goal setting), self-reactiveness (self-regulation of conduct), and self-reflectiveness (metacognitive appraisal of one's own efficacy). Health agency, as operationalized here, foregrounds forethought and self-reflectiveness, which are closely tied to perceived self-efficacy[23] and to autonomous, self-determined motivation[24]. The older adult who believes she can orchestrate supplements, monitoring devices, and professional advice into a coherent preventive routine engages the omnichannel ecosystem as a designer rather than a recipient. This reframes part of the digital divide as an agency gap rather than merely a skills gap: research consistently observes marked heterogeneity in channel preference even among older adults of comparable digital skill, implicating the sense of control over health decisions as the operative variable[25].

2.5 Aging, Technology, and the Limits of Acceptance Models

Two life-span theories further specify why chronological age is a poor proxy for channel behavior. Socioemotional selectivity theory[26] holds that as future time horizons shorten, older adults prioritize emotionally meaningful goals and trusted relationships over information-acquisition goals; this predicts a systematic preference for channels, including physical pharmacies and known professionals, that offer relational assurance, and helps explain why digital trust rather than digital access is often the operative constraint. The model of selective optimization with compensation[27] describes how aging individuals maintain functioning by selecting valued domains, optimizing resources within them, and compensating for losses; on this reading, omnichannel behavior is a compensatory-optimizing strategy in which digital and physical channels are combined to preserve autonomy.

Together, these perspectives reposition traditional technology-acceptance accounts, namely the Technology Acceptance Model[28], the diffusion of innovations framework[29], and the unified theory of acceptance and use of technology and its consumer extension[30,31], as necessary but insufficient. Such models capture perceived ease of use and usefulness, yet remain comparatively silent on the motivational and relational logic through which older adults convert

perceptions into value-creating action[32,33]. Empirical work on older adults' attitudes toward technology likewise shows that adoption hinges on perceived benefit, relevance, and support rather than age per se[34~36]. Within an omnichannel retail environment [37], the theoretically decisive question therefore shifts from whether older adults can use a channel to why and how they orchestrate multiple channels to create value.

2.6 Theoretical Integration and the Research Gap

In summary, this study contends that health literacy as a cognitive resource and digital trust as a situational resource are not independent constructs; rather, they jointly constitute a dynamic driving force behind the health agency of older adults. This integrative framework moves beyond the limitations of previous studies that focused solely on behavioral outcomes, elevating the level of analysis to the psychological configuration of agency. It provides a deep-seated explanation for why some older adults successfully achieve value co-creation in digital spaces while others prefer to retreat to physical channels.

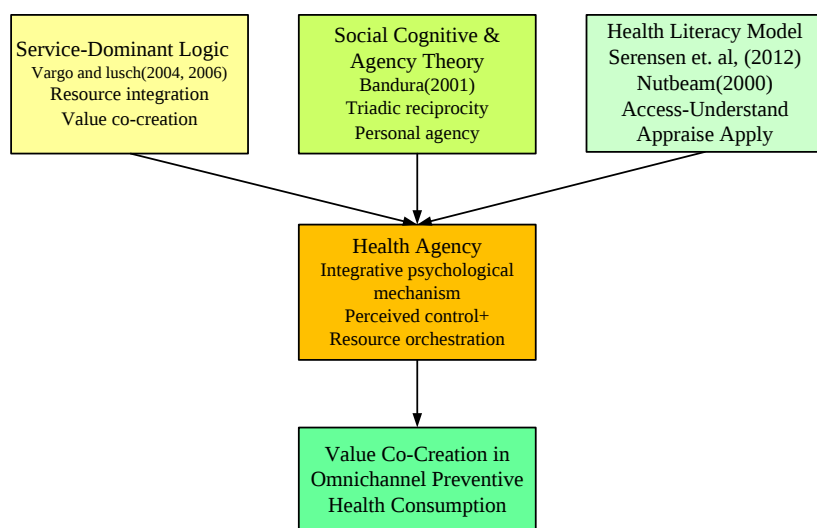


Fig. 1 Theoretical integration framework: three lenses converging on health agency

Fig.1 depicts how the three theoretical lenses converge on health agency as the integrative mechanism that drives value co-creation in omnichannel preventive health consumption. Table 1 summarizes the foundational theories, their key proponents, and their role in the present study, while Table 2 contrasts the

technology-acceptance and value-co-creation perspectives that motivate this reframing. This theoretical space offers analytical depth for explaining the omnichannel behavior of older adults, while providing a rigorous basis for enterprises and policymakers to facilitate precise resource empowerment for individuals across varying levels of agency in the construction of a smart aging society.

Table 1 Summary of theoretical foundations

Theoretical lens	Key proponents	Core premise	Role in this study
Service-Dominant Logic	Vargo & Lusch [3~5]	Value is co-created by resource-integrating actors within service ecosystems	Frames older adults as agentic co-creators; channels as value-in-use platforms
Social cognitive & agency theory	Bandura [21~23]	Behavior arises from triadic reciprocity; agency via forethought and self-reflection	Defines health agency as the core psychological mechanism
Health literacy model	Nutbeam [12,13]; Sorensen et al. [10]	Multi-level competence: functional / interactive / critical	Health literacy as a cognitive operant resource and antecedent of agency
Trust in e-commerce	Gefen et al. [17]; McKnight et al. [18]	Trust as perceived ability, integrity, benevolence plus structural assurance	Digital trust as a situational resource and moderator
Socioemotional selectivity theory	Carstensen et al. [26]	Shortened time horizons prioritize emotionally meaningful, trusted ties	Explains relational pull toward offline channels; centrality of trust
Selective optimization with compensation	Baltes & Baltes [27]	Successful aging via selection, optimization, and compensation	Omnichannel use as a compensatory-optimizing strategy

Note. Constructed by the authors to summarize the theoretical basis of the integrated model

Table 2 Paradigmatic contrast: technology-acceptance versus value-co-creation lenses

Dimension	Technology-acceptance lens (TAM / UTAUT)	Value-co-creation lens (this study)
View of the older adult	Passive adopter; at risk of the digital divide	Agentic resource-integrator and co-creator
Core driver	Perceived ease of use and usefulness	Health agency (perceived control and orchestration)
Role of trust	Antecedent of adoption	Situational resource and moderator of conversion
Channel logic	Single-channel adoption and usage	Omnichannel value-in-use configuration
Locus of value	Embedded in the technology	Phenomenologically realized by the beneficiary
Policy implication	Improve interface and access	Cultivate literacy, trust, and agency

Note. TAM = Technology Acceptance Model; UTAUT = Unified Theory of Acceptance and Use of Technology.

3. Research Framework and Hypothesis Development

The study constructs an integrated decision-making model in which health literacy and digital trust serve as exogenous variables, jointly exerting a direct path influence on the endogenous mediator, health agency. The full model, including all nine hypothesized paths, is presented in Fig. 2.

Theoretically, health literacy functions as the foundation for information processing, empowering older adults with a sense of perception and control over their own health status. Individuals with higher health literacy possess greater decision-making confidence.

Thus, the paper proposes

H1: Health literacy has a positive impact on the health agency of older adults.

Furthermore, digital trust mitigates the perceived risks that older adults face in digital environments, strengthening their belief that they can effectively manage their health through digital channels.

Consequently, we propose.

H2: Digital trust has a positive impact on the health agency of older adults.

Regarding direct pathways, information-empowerment theory suggests that individuals with high health literacy tend to be active information seekers, viewing digital platforms as sites for self-directed learning.

Thus, the paper proposes

H3: Health literacy positively influences digital channel preference.

Similarly, digital trust directly alleviates the anxiety associated with online transactions, so we propose.

H4: Digital trust positively influences digital channel preference.

Concerning the mediating role, once older adults establish a robust sense of health agency, they are more inclined to integrate digital and physical channels, proactively planning health pathways aligned with their individual needs.

Accordingly, the paper proposes

H5: Health agency positively influences digital channel preference.

H6: Health agency positively influences offline channel preference.

To delineate the transmission process, this study posits that health agency serves as a bridge between information processing and behavioral decision-making.

Thus, the paper proposes

H7: Health agency mediates the relationship between health literacy and digital channel preference.

H8: Health agency mediates the relationship between digital trust and digital channel preference.

Finally, considering that varying levels of digital trust may alter the intensity with which agency is translated into consumption intentions, the paper proposes

H9: Digital trust moderates the relationship between health agency and digital channel preference; specifically, higher levels of trust strengthen the transformation of agency into digital consumption intentions.

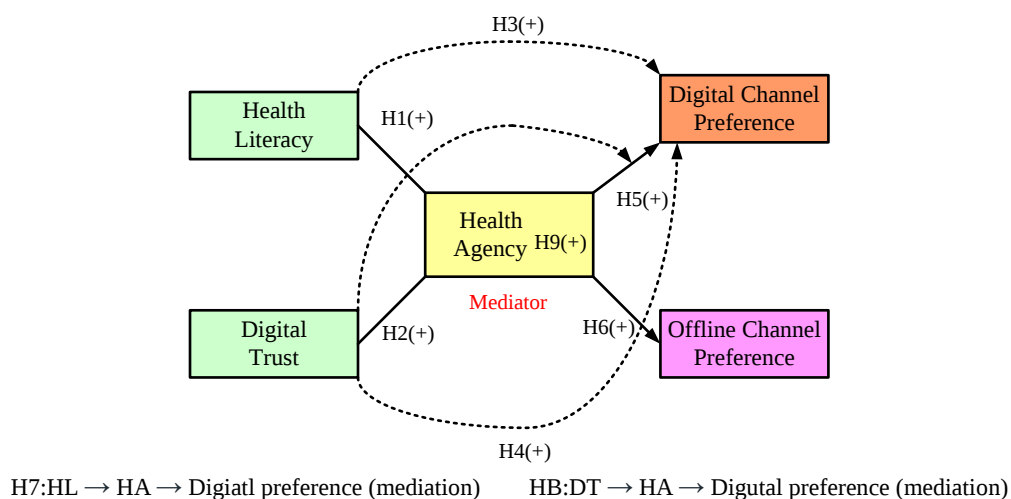


Fig. 2 Conceptual research model with hypothesized paths (H1-H9)

Table 3 summarizes the nine hypotheses, their paths, theoretical bases, and expected signs.

Table 3 Summary of research hypotheses.

Hypothesis	Path	Type	Theoretical basis	Expected sign
H1	Health literacy → Health agency	Direct	Social cognitive theory; information empowerment	+
H2	Digital trust → Health agency	Direct	Trust-TAM; perceived-risk reduction	+
H3	Health literacy → Digital channel preference	Direct	Active information seeking	+
H4	Digital trust → Digital channel preference	Direct	Reduced online transaction anxiety	+
H5	Health agency → Digital channel preference	Direct	Agentic orchestration	+
H6	Health agency → Offline channel preference	Direct	Agentic complementarity	+
H7	Health literacy → Health agency → Digital pref.	Mediation	Agency as bridge	+ (indirect)
H8	Digital trust → Health agency → Digital pref.	Mediation	Agency as bridge	+ (indirect)
H9	Digital trust × (Health agency → Digital pref.)	Moderation	Trust strengthens conversion	+ (interaction)

Note. Digital pref. = digital channel preference. Signs denote hypothesized direction of effect.

4. Methodology

The study adopts a positivist research paradigm and employs rigorous quantitative methods to test the proposed hypothesis framework. To precisely capture the psychological dynamics of older consumers in an omnichannel context, we utilize a cross-sectional survey design. The research population is defined as individuals aged 65 and above who had actively participated in purchase decisions for preventive health products, such as nutritional supplements, wearable health monitoring devices, or subscription-based health consulting services, within the past twelve months. This criterion ensures that the sample possesses sufficient

behavioral engagement, thereby enhancing the reliability of their cognitive responses to the survey items. Given the significant variance in digital participation among older adults, a multi-stage purposive sampling method is employed, with questionnaires distributed through community care centers, wellness centers in major hospitals, and digital learning centers to ensure heterogeneity in health literacy and digital reliance, strengthening external validity.

Regarding variable measurement and construct operationalization, this study strictly adheres to psychometric development standards. All scales are adapted from established literature and subjected to expert-validity assessments and pilot testing to ensure that item phrasing aligns with the cognitive patterns of older adults. Table 4 presents the conceptual definition, dimensions, source scales, and an illustrative item for each construct.

Table 4 Construct operationalization.

Construct	Conceptual definition	Dimensions	Source scale (adapted)	Illustrative item
Health literacy	Capacity to access, understand, appraise, and apply health information	Functional; interactive; critical	Nutbeam [12]; Sorensen et al. [10]	I can judge whether health information from different sources is trustworthy.
Digital trust	Belief in a digital platform's ability, integrity, and benevolence	Ability; integrity; benevolence	Gefen et al. [17]; McKnight et al. [18]	I believe reputable health platforms act in my best interest.
Health agency	Perceived capacity to orchestrate resources to sustain well-being	Forethought; self-reflective ness; resource orchestration	Bandura [22]	I can plan a preventive-health routine that fits my own needs.
Digital channel preference	Propensity to select online platforms for preventive-health consumption	—	Author developed	I prefer to obtain health products through online platforms.
Offline channel preference	Propensity to select physical outlets and in-person professionals	—	Author developed	I prefer to consult in-person professionals before purchasing.

Note. Illustrative items are representative wordings; full instruments were refined through expert review and pilot testing.

Each construct undergoes confirmatory factor analysis (CFA) to confirm that convergent and discriminant validity meet statistical thresholds. To eliminate error

arising from cultural or educational background, a measurement-invariance test is conducted to ensure that subgroups interpret item meaning consistently. For data analysis, this study employs structural equation modeling (SEM) for path testing. Because the relationships among psychological constructs may be non-normally distributed, bootstrapping with 5,000 resamples is used to estimate confidence intervals for path coefficients and to test the mediating effect of health agency. To analyze how digital trust moderates the translation of agency into decision intention, multi-group analysis and path-difference tests are conducted by grouping respondents according to their level of digital trust. This strategy captures complex interaction effects and helps address endogeneity concerns common in behavioral research, maintaining statistical discriminant power in the face of the high heterogeneity of the older-adult sample.

5. Expected Contributions

At the theoretical level, this study opens new conceptual space across disciplinary boundaries, bridging the paradigmatic gap between gerontology and marketing in digital-transformation research. Whereas traditional consumer research reduces age to a demographic variable or casts older adults as passive audiences of the digital divide, this study advances health agency as the bridge connecting public-health literacy with digital decision behavior, positioning it as a necessary condition for value co-creation under service-dominant logic. By introducing digital trust as a moderating mechanism, the study also responds to calls for closer examination of the interaction between digital-risk perception and individual choice.

At the managerial level, the insights encourage retailers and healthcare providers to abandon a one-size-fits-all digital-marketing logic in favor of a value-co-creation-centered omnichannel segmentation strategy. For groups with high health literacy but nascent digital trust, firms should adopt a physical-to-digital bridge strategy, treating in-store pharmacists, dietitians, and nurses as co-creation anchors whose face-to-face endorsement offsets the cognitive dissonance and selection risk of digital environments. Conversely, for older adults with strong health agency, firms should adopt a data-empowerment model that returns decision authority to the consumer through personalized, self-monitoring, and analytic tools. Segmenting by psychological profile rather than age helps build durable customer lifetime value.

At the policy level, the findings inform the construction of a smart aging society. Current digital-health policy often over-emphasizes hardware deployment and interface optimization while neglecting the cultivation of psychological agency and digital trust. This study argues that only by raising national

digital-health literacy and improving the transparency of public-health information to consolidate digital-governance trust can the social isolation and information deprivation caused by the digital divide be effectively alleviated. It is recommended that authorities incorporate digital-health-literacy education into long-term senior-care planning and encourage trust-guaranteed digital-health standards and certification. As older adults acquire greater health agency, their engagement in prevention becomes more proactive, reducing the incidence of chronic disease and the marginal costs of care, and easing the long-run fiscal burden on the national health-insurance system.

6. Conclusion and Future Research Directions

The study systematically analyzes the channel-choice mechanism of older adults in preventive health consumption, revealing how individual psychological agency integrates with platform service resources during digital transformation. The channel-choice behavior of older adults is conceptualized not as a functional decision based on ease of use, but as the result of an evolving interaction among health literacy, digital trust, and health agency within a complex dynamic system. Health agency is positioned as a central mediator connecting informational cognitive resources with value-co-creation practices, carrying greater weight than the ease of use or expected benefits emphasized by technology-acceptance models. This challenges the technological determinism pervasive in prior gerontological research and establishes a perspective centered on the construction of individual agency. The moderating role of digital trust further underscores the necessity of governance in digital ecosystems: without adequate support for the psychological vulnerabilities of older consumers, the efficacy of technological empowerment remains limited.

Looking ahead, as artificial intelligence and ambient intelligence continue to penetrate daily life, the boundary between digital technology and the lived experience of older adults becomes increasingly blurred. First, future studies should move beyond cross-sectional frameworks toward longitudinal designs, tracking how health agency is adjusted and reconstructed across the life course as older adults navigate transitions in physiological status and health context. Second, the research focus should shift from technology usage to co-evolution with technology; in particular, how generative AI, acting as a digital health agent, influences the psychological agency of older adults represents a compelling area for inquiry, raising questions of cognitive autonomy and decision transparency under algorithmic recommendation.

Finally, in terms of methodology, future research should integrate neuro-physiological indicators, such as stress indices or cognitive-load responses

detected by wearable devices, with behavioral data to capture the real-time experience value of older adults during digital-channel interactions. Through such multidimensional triangulation, we can better understand how value co-creation unfolds in micro-moments of interaction. In sum, this study provides an explanatory theoretical framework for digital health marketing and outlines a human-centered, technology-enabled blueprint for policymakers, encouraging the academic community to continuously re-examine the definition of aging agency within an ever-changing digital landscape.

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4. References
 - [1]F. C. Chuang, C. M. Hu, and M. H. Chang, The discussion on innovative early warning fatigue driving system, International Journal of Uncertainty and Innovation Research, vol. 5, no. 2, pp. 81-94, 2023.
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 - [4]Taiwan Tobacco and Liquor Corporation, The product of wine and Tabaco, <http://www.ttl.com.tw/>, Taipei, 2024.
5. Appendix(if necessary)

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