Filial Piety and AI: Consumer Choices in Elderly Smart Robots

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Abstract: This study is based on the Dual Filial Piety Model and Social Support Theory to examine Beijing consumers' perceptions, purchase intentions, and influencing factors regarding elderly-oriented intelligent robots. Using qualitative methods and grounded theory coding, in-depth interviews were systematically analyzed. The findings demonstrate that filial piety beliefs fundamentally shape consumers' support strategies and purchasing preferences. Consumers with authoritarian filial piety tend to fulfill obligations through economic means and exhibit no clear preference for robot types. In contrast, those with reciprocal filial piety prefer to provide emotional support personally and are inclined to select task-oriented robots to outsource instrumental care. Positioned within the broader discourse of technological filial piety, this study incorporates cultural values into the understanding of aging-related consumption and provides practical implications for the development and market adoption of age-friendly intelligent technologies.

***Keywords*:** Elderly-oriented smart robots, social support, dual filial piety, technological filial piety

1. Introduction

As aging accelerates, China's policies promote elderly-oriented smart products. This study explores how filial piety influences consumer preferences for labor- vs. emotion-oriented robots, addressing concerns over outsourced support and identity threats. Using qualitative methods, it develops the Elderly-Oriented Smart Product Selection Model, providing insights for product design and marketing.

2. Literature Review

2.1 Social Support and Intergenerational Gifting

Intergenerational support is crucial for elderly well-being, but societal shifts like urbanization and changing family structures have increased reliance on financial support and market-based elderly care [6] [3]. While caregiving has traditionally included labor, financial, and emotional support [2], it is now more focused on financial aid and smart technologies as co-residence declines [4]. This study explores consumer preferences for labor- vs. emotion-oriented smart robots, refining support classifications and contributing to intergenerational support theory and elderly care marketing.

2.2 Elderly-Oriented Smart Products

The aging population is driving the integration of intelligent technologies in elderly care, with China's "14th Five-Year Plan" promoting elderly-friendly innovations . Research highlights that aligning product design with user needs improves adoption and quality of life [5]. Elderly-oriented smart robots are categorized into Labor-Oriented Robots for tasks and health monitoring and Emotion-Oriented Robots for companionship . However, challenges like complex interactions and mismatched emotional features remain, requiring optimized functionality for better adoption.

2.3 Identity Role Threat

Identity, shaped by social interactions, is threatened when caregiving roles are replaced. In elderly care, parents outsourcing support prefer caregivers similar to themselves [1]. Smart robots, especially as gifts, impact this dynamic—labor-oriented robots complement caregiving with minimal threat, while emotion-oriented robots may weaken parent-child bonds Based on Social Identity Theory (Tajfel & Turner, 1979), children's filial identity influences gift choices, prioritizing products that aid caregiving without undermining their role, shaping support outsourcing through functionality and identity preservation.

3. Research Methodology and Data Analysis

3.1 Design and Process of In-Depth Interviews

This study conducted 21 in-depth interviews in Beijing to examine how filial piety shapes consumer preferences for

elderly-oriented smart robots. Using a refined semi-structured guide, interviews in July 2024 lasted 18 to 52 minutes, totaling 602 minutes and 70,100 words, reaching theoretical saturation.

3.2 Data Analysis and Research Findings

This study applies grounded theory to analyze interview data through open, axial, and selective coding. Open coding identified 38 themes from 18 transcripts, focusing on consumer concerns like product value. Axial coding refined these into 14 core themes, linking filial piety beliefs to smart robot preferences. Selective coding developed the "Elderly-Oriented Smart Product Selection Model", showing that reciprocal filial piety favors labor-oriented robots, while authoritative filial piety leans toward financial support. The study introduces "technological filial piety" to guide elderly care design.

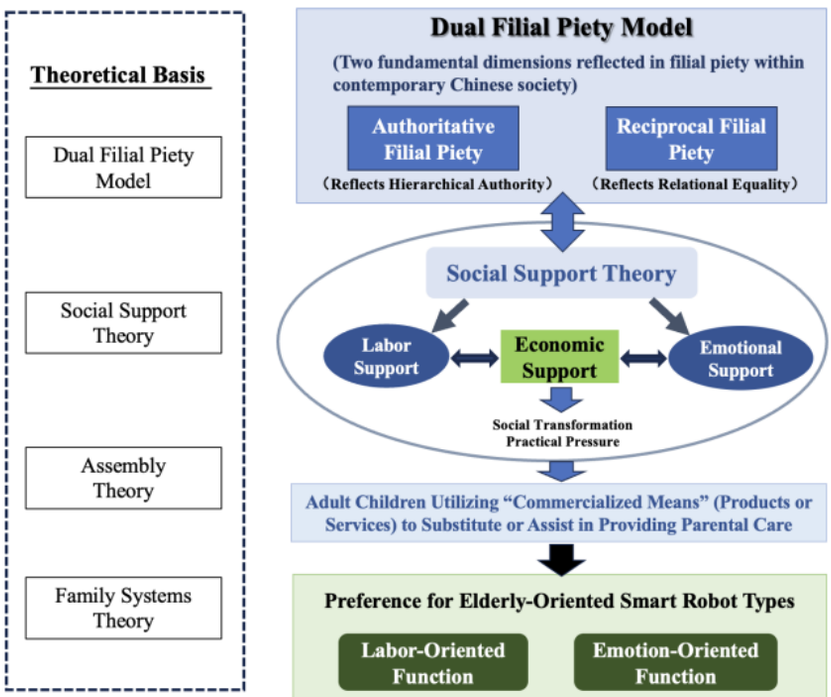

Figure 1. The Selection Model for Elderly-Friendly Smart Products

3.2.1 Differentiation of Filial Piety Concepts

Filial piety has evolved into a Dual Filial Piety Model, balancing authoritarian obedience and reciprocal emotional bonds. This study, using adapted items from Hu (2017), explores how individuals navigate personal choices and parental expectations. Responses show F1 emphasizes duty, reflecting authoritarian values, while F5 and F6 prioritize autonomy and emotional connection, aligning with reciprocal filial piety. These findings confirm the model's relevance in shaping elderly care preferences.

3.2.2 The Impact of Filial Piety Concepts on Support Types and the Selection of Elderly-Friendly Intelligent Robots

Research shows authoritarian filial piety encourages financial support, while reciprocal filial piety focuses on emotional care, but neither boosts labor support (Hu, 2017). This study uses the Dual Filial Piety Model alongside social support and family system theories to explore how Beijing consumers select commercial or intelligent solutions for supporting their parents.

(1) Consumers with reciprocal filial piety concepts tend to provide labor support and purchase labor-oriented intelligent robots.

Reciprocal filial piety prioritizes emotional support, fostering close parent-child relationships through frequent communication. Respondents view smart devices as practical tools for labor assistance but reject them as emotional substitutes. For instance, F15 regularly checks on their parents, while F18 engages in meaningful conversations. As F11 stated, "A robot can't replace a real child." Instead, they use video calls to maintain emotional bonds, emphasizing personal interaction over technology.

(2) Consumers with authoritarian filial piety concepts do not show significant differences in their preference for support types or intelligent robot categories.

Authoritarian filial piety emphasizes obligation over direct interaction, often expressed through financial support or

commercial proxies. Respondents provide economic assistance, purchase gifts, and use technology for caregiving. For instance, F8 chose an emotionally interactive robot for their distant father, illustrating how this filial style relies on external tools rather than personal engagement.

4. Research Conclusions and Implications

4.1 Research Conclusions

This study examines how filial piety shapes consumer preferences for elderly-oriented smart robots in Beijing. Authoritarian filial consumers favor financial support and technological delegation, while reciprocal filial consumers emphasize emotional engagement, preferring labor- over emotion-oriented robots to avoid "emotional replacement." Both groups rely on market-based caregiving over direct labor support.

4.2 Theoretical Contributions

This study advances research by: (1) Expanding the dual filial piety model to show how authoritarian filial piety promotes financial support through technology, while reciprocal filial piety resists outsourcing emotional care. (2) Linking technology delegation with family role conflict, highlighting that emotion-oriented robots raise role concerns, while labor-oriented robots facilitate caregiving. (3) Integrating social support theory with technology acceptance, offering a cross-disciplinary framework for digital intergenerational support.

4.3 Marketing Implications

For authoritative filial piety consumers, position high-end products as symbols of devotion, while for reciprocal consumers, emphasize smart products as caregiving assistants. Prioritize labor-oriented robots with simplified interfaces and frame emotion-oriented robots as communication aids rather than emotional replacements.

4.4 Limitations and Future Research Directions

This study focuses on Beijing consumers, limiting regional comparisons. Future research should explore technology outsourcing in various living arrangements. The cross-sectional approach lacks insights into evolving filial piety beliefs, and ethical concerns like emotional dependence and privacy in emotion-oriented robots need further exploration within a "filial piety-aligned" design framework.

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