

Exploring the Impact of VR Nostalgic Sandbag Game Experience on the Happiness of the Elderly

Yu-Chi Chen, National Yunlin University of Science and Technology, Taiwan
Chang-Franw Lee, National Yunlin University of Science and Technology, Taiwan

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Abstract

With the trend of aging population in China, the well-being of the elderly has become the focus of social concern, and the rapid development of digital technology has provided a new way of life for the elderly, and Barsasella et al. (2021) showed that Virtual Reality (VR) has a positive effect on the well-being of the elderly. The purpose of this study was to investigate the effect of elderly people's participation in VR nostalgic sandbag game experience on their well-being. Through the VR nostalgic sandbag game (ForeVR Cornhole), elderly people can revisit their childhood memories and understand the effect of nostalgic games on their well-being. In this study, we used questionnaires to collect the happiness level of the participants, and recorded the behaviors and reactions of the elderly during the experience of the VR nostalgic sandbag game through observation, and finally conducted semi-structured interviews to understand the subjective feelings and experiences of the participants on the VR nostalgic sandbag game. As a result of this study, it was found that (1) to understand the subjective feelings of the elderly when using VR and their acceptance of new technology; (2) to record the behaviors of the elderly in the VR nostalgic sandbag game through the observation method, which can enhance and satisfy the quality of life and sense of well-being of the individuals.

Keywords: Virtual Reality (VR), Nostalgia, Gaming Experience, Elderly, Happiness

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1. Introduction

1.1 Background and Motivation

According to the National Development Council, Taiwan will enter a super-aged society by 2025 due to the aging population (National Development Council, 2023).

As the population ages, the happiness of the elderly becomes a major concern because it affects their quality of life and health. (Veenhoven, 2008).

Recent advancements in digital technology offer new ways of living for the elderly. Most older adults have a positive attitude towards new technologies, believing that technological progress will improve their quality of life and society as a whole (Li & Perkins, 2007).

A study by Barsasella et al. (2021) found that just 15 minutes of VR sessions per week over six weeks improved the happiness of elderly participants. The immersive experience of VR can boost mood and concentration and can also be used as a tool for nostalgia therapy. Nostalgia therapy helps improve the emotions and cognitive functions of the elderly by recalling childhood and past experiences, thus enhancing their happiness (Chaze et al., 2022).

1.2 Purpose

This study explores the impact of elderly participation in VR nostalgic sandbag game experiences on their happiness. Through the ForeVR Cornhole virtual reality nostalgic sandbag game, older adults can relive and enjoy childhood memories in a virtual environment. This helps understand their acceptance and feelings toward new technology, ultimately enhancing their happiness and quality of life. There is two point in the main purposes of this study:

1. Exploring how VR nostalgia sandbag games impact the happiness of older adults.
2. Understand the technology acceptance and personal feelings of older adults towards VR sandbag games.

2. Literature Review

This study focuses on how experiencing VR nostalgic sandbag games affects the happiness of elderly people. By playing these nostalgic games, seniors can relive their childhood memories, which brings them joy and happiness. The study also aims to understand how willing elderly people are to accept new technology, which could encourage them to try more tech-based activities. This could lead to more entertainment and learning opportunities, ultimately improving their quality of life and happiness. The research will explore three main areas:

2.1 Virtual Reality (VR)

Virtual environments, first proposed by Jaron Lanier in 1987, can create realistic settings that feel like the real world. Users can interact with these environments through sound, sight, and other senses, offering a fully immersive experience. Initially used mostly in the entertainment industry, VR technology has advanced and is now widely applied in various fields, such as medical treatment, travel, cuisine, and films.

Recently, due to an aging population, this technology has also been applied to senior care. A 2019 study by Tsinghua University in Beijing found that among six activities normal situations, watching TV, playing cards, interacting with pets, using VR, and visits from children, using VR had the highest emotional scores. The immersive VR experience provides sensory stimulation that helps seniors relax and feel happier.

2.2 Nostalgia Games

Nostalgia originally referred to the feeling of longing for one's homeland but now means longing for the good things from the past. The nostalgic effect of games, like nostalgia in other areas, has been theorized and proven by academics to positively impact an individual's subjective and psychological well-being. This includes self-assessment of life satisfaction and psychological flourishing (Wulf et al., 2018).

Here are some key points about how nostalgia affects happiness:

1. Nostalgia has a direct impact on entertainment outcomes, such as enjoyment and appreciation.
2. Nostalgia directly affects happiness through self-direction, existential, and social functions.
3. Nostalgia also has indirect effects on happiness, which are results of its impact on entertainment.

2.3 Happiness

It refers to feeling happy and satisfied emotionally, and experiencing things that stimulate happiness through our senses. Other studies have found that getting into the "Flow state" and being fully in activities can boost happiness and quality of life (Csikszentmihalyi, 1975).

International Society of Gerontechnology: "Gerontechnology is an interdisciplinary research that enables technology to provide more opportunities for the elderly. Its purpose is to provide the elderly with a healthier life and fuller social participation through product development, design and services to improve the quality of life of the elderly."

2.4 Literature Review Summary

With the aging population, there's growing interest in using VR tech for older adults. VR can affect older adults emotions and mental happiness, and nostalgic games can bring back childhood memories. We hope these games and VR can offer older adults folks fun immersive experiences, boost connections with family and community, enhance their happiness, willingness to use tech, and improve their quality of life and mental health.

3. Research Method

3.1 Method

This study used surveys, observation, and semi-structured interviews to understand the impact of VR nostalgic sandbag games on the well-being of elderly people. We focused on the behaviors and reactions during the experience. The final interviews aimed to understand the elderly's acceptance of technology and their personal feelings.

1. *Questionnaire Survey*

The Chinese Happiness Inventory (CHI) evaluates the differences before and after experiencing the VR nostalgic sandbag game.

Flow experience to measure whether seniors are immersed in the nostalgic state of the VR sandbag game, we use a 5-point Likert scale for evaluation.

2. *Observation Method*

In the experiment, observe and record the behaviors and reactions of the elderly during their VR experience.

3. *Semi-structured Interviews*

To further understand the subjective feelings of six elderly people and their acceptance of new technology, the interview content is divided into five main aspects, as follows:

- (1) Personal Information, Life and Activities
- (2) Reminiscence game to recall childhood (Entity and VR)
- (3) Experiencing VR after the heart flow experience feelings
- (4) Experience of VR operation feelings
- (5) Feelings towards new technology

3.2 Objects & Tools

This study was conducted at a community center in Yunlin, Taiwan, where 25 elderly participants experienced a VR nostalgia group activity game. From these, 6 elderly participants, aged between 74 and 88, who were more skilled in the game, were selected for further one-on-one experiments.

In this research using Meta Quest Pro VR for experimental tools (Figure 1) and ForeVR Cornhole for experimental games (Figure 2).



Figure 1: Meta Quest Pro VR.



Figure 2: ForeVR Cornhole.

3.3 Research Process

Our research is a one-on-one experiment, the process is about 30-40 mins. In the research we used before and after test of CHI, to know about their happiness, 6 of the older adults had completed their Pre-test two months before the VR game. After experiencing the VR sandbag game course, they will finish their Post-test.

Process Step following (Figure 3):

1. Introduction content & operations
2. Experience ForeVR Cornhole, record the behavior and reactions during the VR experience
3. Flow experience
4. Semi-structured Interviews
5. Give a gift

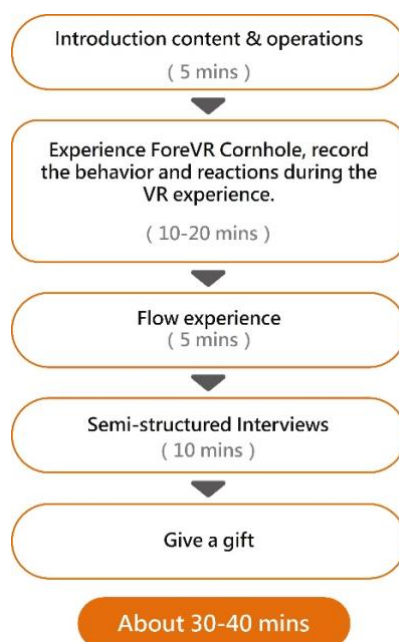


Figure 3: Research Process

4. Result

4.1 The Chinese Happiness Inventory (CHI)

In the result of CHI test before and after experiencing VR nostalgic gaming, we choose 6 older adults who were more skilled at operating the game for a happiness survey.

The paired samples t-test analysis in SPSS shows that there is a significant difference between the pre-test and post-test scores on the happiness scale ($t=-3.64$, $p=0.015<0.05$).

		(n)	(M)	(Sd)	<i>t</i>	<i>p</i>
CHI	Pre-tests	6	13.17	2.23	-3.64	.015*
	Post-tests	6	18.00	3.63		

Note: * $p < 0.05$, there is a significant difference

Table 1: CHI Pre- and Post-tests Paired Sample t test

4.2 Flow Experience

The average score for flow experience is 4.32, and which hitting 4 means ($M=4.32$, $SD=0.23$) the participants were really immerse into the VR experience. The average experience time was 912 seconds (15.2 minutes).

	Time	Flow experience	
(n)	(s)	(M)	(Sd)
P1	970	4.38	0.23
P2	803	4.25	
P3	1076	4.50	
P4	952	4.38	
P5	1053	4.50	
P6	618	3.88	
Total	912	4.32	

Table 2: Flow experience & Time

4.3 Observation Method

Here are some observed behaviors of elderly people recorded through observation methods:

1. They explore the virtual environment and interact with virtual objects because they find it novel.
2. They express enjoyment and interest in the virtual experience, wanting to keep playing. With more playtime, they find it easier and smoother (Figure 4). They show excitement and curiosity when using VR, feeling amazed by the scenes and games in the virtual environment.
3. If they miss the target while throwing the beanbag, most elderly people feel disappointed.
4. Some participants actively teach others how to use the controllers and play the game, which promotes social interaction and helps each other learn (Figure 5).



Figure 4: Elderly people playing a nostalgic VR beanbag game.



Figure 5: Actively teaching other elderly how to use controllers.

4.4 Semi-structured Interviews

(1) Personal Information, Life and Activities

From interviews and surveys, we found that six elderly women, aged 74 to 88, participated. Two did not use technology, while four used their phones daily for socializing, entertainment, and learning. They were active in community activities like volunteering and cleaning, interacted with neighbors and family, and often played board games. Most believed that learning new things helps keep them feeling active.

Based on the analysis, we understand that the elderly participants have different experiences with technology. However, they are all active in community activities, maintain a lively attitude through interaction and learning, value their community and social connections, and continuously seek learning and growth.

(2) Nostalgic Game to Recall Childhood (Entity and VR)

Through the interviews, we found that most people had played the traditional sandbag game. P6 mentioned that they often had to take care of children when they were young, so they had very little playtime. As a result, P6's flow experience average was lower compared to other participants.

Participants found the VR nostalgic sandbag game interesting. P4 mentioned that playing with technology and family helps keep the mind active and improves hand-eye coordination.

Some recalled tough times or childhood fun, but some felt the VR environment didn't match their childhood, so they couldn't fully recall their past.

From the analysis, we found that participants had different past gaming experiences and childhood memories, but they all felt satisfied and happy experiencing the VR nostalgic sandbag game. Some recalled memories from nostalgic games, while others felt the VR environment was different from their childhood. However, everyone was open to the new technology experience and enjoyed the fun and challenges it brought.

(3) Experiencing VR After the Flow Experience Feelings

Through interviews, we found that older adults get so into playing games that they lose track of time. Older adults enjoy experiencing VR and find playing nostalgic sandbags games in VR fun and satisfying.

(4) Experience of VR Operation Feelings

Participants did not experience any physical discomfort during the game. They found it easy to use and watch the VR scenes. Some felt nervous at first, but it got easier with practice. A few mentioned having difficulty throwing the sandbag and wished for simpler controls, but overall, they did not find the process difficult.

(5) Feelings Towards New Technology

Participants felt that playing nostalgic games improved their quality of life and mental health, making them happy and helping them forget their worries. It was especially beneficial for keeping older adults' minds active. Most older adults believe that continuing to use technology or taking experience courses would increase their happiness because these activities not only teach new knowledge but also bring more joy and challenges.

5. Conclusion

This study found that older adults felt significantly happier after participating in VR games. The games had a positive impact on their happiness. Despite differences in their past gaming experiences and childhood memories, they enjoyed the VR nostalgic beanbag game. They felt it helped keep their minds active, slowed cognitive decline, and improved their quality of life.

Elderly individuals show a positive attitude towards new technology during gaming, which not only offers them a new form of entertainment but also enhances their physical and mental health, as well as social engagement. The study observed that seniors interacted socially, helping each other with game skills and enjoying the experience together. Most found no difficulty in operating the games and believed this experience positively impacts their mental well-being and happiness. They are willing to continue participating in similar technological activities or experiences to maintain an active lifestyle.

References

- Barsasella, D., Liu, Megan, Malwade, S., Galvin, C. J., Dhar, E., Chang, C., Li, Y. J., & Syed-abdul, S. (2021). Effects of Virtual Reality Sessions on the Quality of Life, Happiness, and Functional Fitness among the Older People: A Randomized Controlled Trial from Taiwan. *Computer Methods and Programs in Biomedicine, Volume 200*, 449-469.
- Chaze, F., Hayden, L., Azevedo, A., Kamath, A., Bucko, D., Kashlan, Y., Dube, M., De, J. P., Jackson, Alexandra, Reyna, C., Dupuis, K., & Tsotsos, L. (2022). Virtual Reality and Well-Being in Older Adults: Results from a Pilot Implementation of Virtual Reality in Long-Term Care. *J Rehabil Assist Technol Eng., Volume 200*.
- Csikszentmihalyi M. (1975). *Beyond Boredom and Anxiety*. San Francisco, CA: Jossey-Bass Publishers.
- Li, S. Y., & Perkins, A. (2007). The Impact of Technological Developments on the Daily Life of the Elderly. *Technology in Society, Volume 29*, (Issue 3), 361-368.
- Veenhoven, R. (2008). Healthy happiness: Effects of happiness on physical health and the consequences for preventive health care. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being, 9*(3), 449-469.
- Wulf, T., David Bowman, N., Anthony Velez, J., & Breuer, J. (2018). Once Upon a Game: Exploring Video Game Nostalgia and Its Impact on Well-Being. *Psychology of Popular Media Culture, 9*(1).

Contact email: a0928815259@gmail.com