Socioemotional Benefits of Digital Games for Older Adults

David Kaufman(✉)

Faculty of Education, Simon Fraser University, Burnaby, BC, Canada
dkaufman@sfu.ca

Abstract. Older adults are the fastest growing population in the world, with the number of those over sixty years old expected to grow to more than two billion by 2050. In recent years, discussions have focused on programs aimed at fostering socioemotional factors, such as social connections, subjective wellbeing, life satisfaction, and levels of loneliness of older adults, to maintain their quality of life. This paper reviews the literature on socioemotional benefits and the impacts of digital games on this factor. Three examples are given from recent studies carried out in Canada that demonstrate the impacts of digital games on social connectedness.

Keywords: Older adults · Seniors · Digital games · Socioemotional benefits · Social connectedness

1 Introduction

Older adults are the fastest growing population in the world, with the over sixty years age group projected to grow to more than two billion by 2050 [1]. Canada is following this global trend. Today, approximately three in 10 Canadians are members of the baby boomer generation, those born between 1946 and 1961 [2]. The average life expectancies for those born in 2012 were 84 years for Canadian women and 80 years old for Canadian men, up from 81 and 74 years, respectively, in 1990 [3]. These increases will require greater resources to support individuals' aging process.

Aging older adults face challenging conditions as they experience declines in physical and cognitive abilities, changed living arrangements, loss of lifelong friends and partners, and increasing likelihood of chronic and debilitating illness [4]. Recent evidence shows that the quantity and/or quality of social relationships in western societies are decreasing. For instance, the data shows fewer cases of intergenerational living, greater social mobility, dual-career families that decrease the time available for the elderly, more single-residence households, and increased age-related disabilities [5, 6].

In recent years, discussions have focused on programs aimed at fostering socioemotional factors for older adults, such as social connections, subjective wellbeing, life satisfaction, and reduced loneliness, to maintain their quality of life [7]. Social engagement (also referred to as social connectedness) has been shown to be an essential component of successful aging [8]. For overall wellbeing, social engagement may be more important than physical health [9], as it has been shown to be associated with a variety of health indicators [10]. Social engagement is an important component of

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positive aging [8, 11]. Earlier epidemiological, cross-sectional, and longitudinal research has shown that older adults with greater levels of social interaction report more positive wellbeing. Glei et al. [12] examined how changes in cognition over time are related to social participation and the extent of social networks. Data drawn from this population-based, longitudinal study revealed that respondents who engaged in one or two social activities failed 13% fewer cognitive tasks than those with no social activities, and those who participated in three or more activities failed 33% fewer cognitive tasks. Glei et al. also assert that social interaction outside the family may have a bigger impact on cognitive function than social contacts with family. Social engagement also provides opportunities for older adults to deal with stress and receive social support and connect with friends.

Rowe and Kahn [13] included social engagement as one of the three major elements of successful aging. Rowe and Kahn [7] defined social engagement as being involved "in activities that are meaningful and purposeful" and "maintaining close relationships." On the opposite side, social isolation and cognitive decline are two potential negative effects of the aging process and have consistently been identified by older adults as some of their main concerns about aging [11, 14–18]. Previous studies have shown that a lack of communication and social connection to others can contribute to isolation and loneliness [19–21], which in turn can result in problems such as depression and cognitive decline for older adults. Furthermore, loneliness may lead to many other negative health effects, such as feelings of not belonging, elevated systolic blood pressure, less restorative sleep, and diminished immunity [22–24]. A number of lifestyle factors associated with the aging process have been shown to be associated with feelings of loneliness, such as spouses dying [25] and declines in physical health [26, 27]. In addition to the complexity of social wellbeing and cognitive functioning in older adults, research has found these two factors to be associated with one another.

1.1 Older Adults and Digital Games

Digital games have the potential to support seniors in creating meaningful and enjoyable ways to enjoy life and the company of others [28]. Researchers have identified older adults as prominent digital game players and have been evaluating the benefits they receive from engaging in digital games as a leisure activity. Thirty-four percent of older adults over 55 years old in Canada played digital games in 2014 [29], and as younger generations who grew up with digital games grow older, this number is expected to increase. Research in this area is in its early stages, but studies are uncovering evidence to support various benefits associated with playing digital games [30, 31].

Older adults play games to satisfy diverse needs [32–34]. The ability to interact socially with other players is one affordance that draws older players to engage in gameplay is [35, 36]. Research has shown that digital games have the potential to enhance the social life of older adults [37] and to exert a positive influence on an individual's sense of wellbeing [38]. Playing digital games with others has been found to increase older adults' social connectedness, defined as a person's feelings of belonging and being able to relate to others, and to decrease feelings of loneliness [36, 39, 40]. When played with one or more other people, games have a social element that can enhance wellbeing.

Playing digital games offer a venue for meeting people, staying connected and coping with loneliness [39].

The social context surrounding older adult players has been largely neglected by researchers until recently [42]. Modern digital gameplay can be carried out in many different social contexts, locations, and modes of play, including online co-playing with other players and with virtual game agents. Social events during gameplay directly affect players' enjoyment in a social gameplay session [42].

Research investigating the impact of digital games on older adults' social wellbeing is showing promising results. Researchers have suggested that digital games hold great promise for enhancing older adults' quality of life by improving their subjective well-being, enhancing their social connectedness, and offering an enjoyable way of spending time [43, 44]. Increasingly, digital game playing involves social interaction [45]. However, while these findings are encouraging, they are found under special circumstances. Researchers have set up programs in retirement communities, assisted living facilities, and community centres. They have provided the equipment and trained participants to use the game, thereby creating a social environment in which the older adults can engage. Without the support of researchers and other assistants, the older adults in those studies may have not obtained these positive benefits.

1.2 Online Games and Social Connectedness

Massively Multiplayer Online Role-Playing Games (MMORPGs) such as *World of Warcraft* (*WoW*) offer immersive worlds that are based on social interaction with other players in persistent, online virtual worlds. In an online survey study of older adult *WoW* players, Zhang and Kaufman [46] found a connection between enjoyment of relationships with the game and the development of online bridging and bonding social capital that they used to build and sustain their social networks. The researchers also reported that playing MMORPGs offered older adults ways to nurture off-line relationships with family and real-life friends and to create new meaningful and supportive relationships with friends in the game [47]. These results show that it is important to provide opportunities in which older adults can share their experiences and build relationships with their peers in a supportive social environment.

Online games offer a venue for interacting with other people and enjoying leisure activities; this can have positive impact on wellbeing and successful aging. Nimrod's analysis of 50,000 posts, collected from online social games, showed that participants reported that online games offer meaningful play, an opportunity for practice, a venue to demonstrate their abilities, and a means for coping with ageing [48]. Nimrod noted that "regulars" "knew" one another and had interpersonal dialogues, mostly relating to the game. Nimrod also found play and active entertainment were important goals for those who participated in social online games. Also, those who played digital social games frequently were often involved in sociable conversations. Players identified each other, exchanged personal information and experiences and had their own "group humor." The main categories of subjects in the postings —funny stories, jokes or other comments— fostered connectedness among players and provided enjoyable interaction, and to a certain extent, a sense of belonging.

Studies have shown that social interaction that takes place when playing digital games is important to older players [41, 49, 50]. Playing digital videogames promotes positive health outcomes associated with alleviating depression, and reducing feelings of loneliness, and isolation [50]. Digital gaming also provides a venue for developing social capital that strengthens strong social ties both online and offline [51].

More recently, older adults have begun to experience online communities as a medium for enjoyable social interactions. In a study of one online community, Nimrod found that the majority of posts were part of online social games, including cognitive, associative, and creative games [52]. In another study [48], Nimrod concluded that because online communities offer both leisure activity and an expanded social network, participation in these settings could contribute to the wellbeing of older adults.

Recent research suggests that training in technology use can enhance older adults' cognitive functions as well as facilitate their social interaction and support [53]. Astell [54] suggests that games and social/ interaction technologies offer both cognitive stimulation and social connection, particularly for older adults with dementia. Older adults are currently the fastest growing segment of society with regard to active technology use and should be able to readily learn and use digital games [55]. *ELDERGAMES* [56] and *HERMES* [57] showed promise for improving cognitive function. Regarding older adults' social interactions, Whitcomb [44] identified several early studies in which older adults had positive social experiences when playing computer games. In the *ELDERGAMES* project, participants identified social interaction, defined as the "opportunity to create and maintain new relationships," as that game's biggest benefit.

Kari [58] conducted a review of systematic reviews in this field and drew the following conclusion:

> "The results indicate that exergaming is generally enjoyed and can evoke some benefits for physical fitness and physical activity, but the current evidence does not support the ability of exergaming to increase physical fitness or physical activity levels sufficiently for significant health benefits. This systematic review also revealed several gaps in previous research. Additional high-quality research and systematic reviews concerning exergaming are needed" (p. 59).

Researchers agree that much additional work is needed to establish whether and in what forms digital games can best and most efficiently benefit older adults. This issue has been addressed by IJsselsteijn et al. [37], who identified four potential areas for games to contribute to improving the quality of life for older people: (1) relaxation and entertainment, (2) socializing, (3) sharpening the mind, and (4) more natural ways of interacting. Our current knowledge of older adults' needs suggests that many of today's commercial games pose usability challenges for older adults [32, 41, 57], although tablets and larger mobile phones offer great opportunities for improved ease of use.

2 Some Examples

2.1 Older Adult Game Player Survey

In a recent survey of 463 Canadian older adult digital game players aged from 55–89 years [4] recruited from shopping malls, community centres, long-term care centres, and assisted living facilities, there was a broad spread in number of years respondents had

played digital games, with almost one-third (31%) reporting that they had played for 10 years or more. Most (84%) had played in the past month and almost one-quarter (23%) had played every day in the past month. Most (88%) reported that they had played at least one day or more per week on average. Nearly all (93%) had played between 2 and 5 h per day on average when they played, and more than one-quarter (27%) had played social games with other players.

Table 1 shows participants' gameplay patterns. Most participants played digital games alone (81.2%) and a minority played either social games (27.5%) or role-playing games (9.5%) online with other players. A majority of older adults reported that they played digital games alone, but about a third played with family members and almost a quarter played with friends.

Table 1. Results of social gameplay patterns

Social gameplay patterns	% Respondents
Played social games online with other players	
Yes	15.3
No	84.7
Who do you play digital games with?	
Alone	81.2
Family members	34.3
Friends	22.5
Members of a club/association	5.2

Table 2 lists participants' opinions about the benefits and difficulties of playing digital games. Mental exercise was the most commonly selected benefit of digital game playing (83.0%), with the next most common selection being enjoyment (fun) (70.7%). More than 25% of respondents saw social interaction and a general escape from daily life as additional benefits.

Table 2. Benefits of playing digital games (n = 463)

Benefits	% Selecting
General benefits	
Mental exercise	83.0
Enjoyment (fun)	70.7
Social interaction	25.9
Escape from daily life	25.7
Reported increases in socioemotional areas	
Developing self-confidence	41.9
Dealing with loneliness	34.5
Connecting with family	32.5
Connecting with various age groups	28.1
Connecting with current friends	26.6
Developing new friendships	25.6

When asked to what extent they experienced playing digital games as leading to specific socio-emotional and/ or cognitive changes, no participants reported a decrease. They most frequently reported increases in the socio-emotional areas of developing self-confidence (41.9%), dealing with loneliness (34.5%), and connecting with family (32.5%). The lowest-rated benefit, dealing with depression, was still reported by 23.9% of participants.

These results show that a minority of older adults report playing with others and therefore these players report fewer socio-emotional benefits than cognitive benefits from playing digital games.

2.2 Wii Bowling Study

This study investigated the impact of playing digital games on the social life of both gamer and non-game older adults by implementing a citywide Wii Bowling tournament at a number of centers in the metropolitan area [59]. The primary research question was: Does playing a digital game, Wii Bowling, with peers in a tournament, decrease older adults' feelings of social isolation and loneliness?

This research focused on a digital game that many have played or are familiar with, Wii Bowling, published by Nintendo in 2006. The Wii remote device contains sensors that detect body movements that are mirrored within the game play itself. Through our mixed methods approach, data collected included quantitative survey results that included 73 players and recorded interviews with 17 participants.

During each Wii Bowling session, research assistants ensured that the teams of 3–4 participants played two full games of Wii Bowling. The research assistants recorded the scores and posted them on a tournament website and announced the next game date and time. They also encouraged practice during the week between sessions. The sites' social coordinators extended invitations encouraging others to attend as audience members at the weekly Wii Bowling sessions.

Of the 73 participants in the experimental group, there were 52 female (71.2%) and 21 male (28.8%) participants. A paired-samples t-test was conducted to compare loneliness before and after game playing. There was a significant decrease in the score of loneliness ($M = 2.21$, $SD = 0.53$) before game playing and ($M = 2.04$, $SD = 0.54$) after game playing; $t(70) = 3.52$, $p = 0.001$. The effect size was .42, which suggests that the loneliness score of older adults decreased moderately after two months of game playing. A paired-samples t-test was conducted to compare social connectedness before and after game playing. There was a significant increase in the scores for social connectedness ($M = 3.41$, $SD = 0.53$) before and ($M = 3.53$, $SD = 0.49$) after game playing; $t(72) = -2.18$, $p = 0.033$. The effect size was .25. The results show that the social connectedness score of older adults increased significantly, with a low to moderate effect size, after two months of game playing.

The primary theme uncovered through the qualitative analysis coding process was social connectedness. The main codes were: team experience, interaction with others because of playing Wii Bowling, better social connections, and conversations with family and friends about playing Wii Bowling. For example, one participant commented:

> "Getting to know your teammates, right. Then, you know, when you see them, you sort of well, you feel part of them Right? So it brings the camaraderie between you, you know."

A number of older people are often lonely [60, 61]. Those who are at the greatest risk of loneliness include widows and widowers, the oldest of the old, those living in institutions, and those with problems with hearing and vision. Older adults who are single or widowed made up 75.3% of participants in the quantitative study and all participants in the qualitative sample. Eight of the 17 in the qualitative study were 75 to 84 years old. Participants' comments indicated that they found playing in the tournament with others whom they may have known or been acquainted with before had social benefits for them.

Playing Wii Bowling appeared to have expanded their social network, and although these contacts involved fairly casual relationships, they were thought to be enjoyable and satisfactory encounters. The results of this study have contributed to a deeper understanding of the role that digital games could play in helping older adults who are dealing with feeling of loneliness and a diminished sense of social connectedness.

This quantitative study included a larger sample than some earlier studies and included an older demographic group not studied to the same extent as younger age groups. The larger sample size, combined with the rich descriptions of personal experience, uncovered insights into the social process related to digital game playing that reached beyond prior work that had primarily been focused on cognitive and physical advantages. The results suggest that playing Wii Bowling might extend relationships beyond the confines of the game playing activity itself to those who watch the game, play the game with them, or simply enjoy the conversations they have with others about the game.

2.3 Bingo Study

Marston [62] found that older adults identified a number of motivating benefits for digital games, including social enjoyment, competitiveness, feeling connected, and education for oneself and other players. She recommended integrating both player interaction and learning content into digital games, supported by multiple levels of game tasks and positive feedback to aid in learning and improving self-confidence.

To test this approach, a study investigated the embedding of learning content to better understand both gameplay outcomes and players' gameplay experiences with a multiplayer, educational digital game. Fifty older adults (aged 60+ years) in co-located groups played the customized online educational game "Bingo Nutrition and Health" [63] in assisted living homes and community centres. The quantitative results revealed that participants experienced statistically significant increases in social connectedness and in their knowledge about nutrition and health.

Qualitative results described players' social and learning experiences. Three of the themes generated from the coding of interview transcripts, together with their respective sub-categories, were used to provide a description of players' social experience: social co-playing, gameplay excitement, and making new friends. Two sample quotes are given below.

"… you're meeting new people. And if you don't know them in person, perhaps there's a connection where you form it."

"Yes, I like playing with the group, you are talking to them, playing and sitting with them, you feel comfortable."

This study provided a better understanding of the learning and social gameplay experience of older adults (60 years and above), when playing an educational game that embeds learning content into the game. A digital game that offers an objective that is relevant to what the older adults want (in this case, learning about nutrition and health in a social co-playing setting) has the capability to provide them with a good social and learning experience. When digital games present a combination of enjoyment, social interaction, and learning, they engage to older adults by offering them cognitive and social benefits.

3 Conclusions and Future Research

Several studies have demonstrated that the social interaction that takes place when playing digital games is very important to older players [41, 49, 50]. Playing digital games has the potential to promote positive health outcomes associated with alleviating depression, and reducing feelings of loneliness and isolation [50]. Digital gaming also provides a venue for developing social capital that strengthens strong social ties, both online and offline [51].

We are continuing our research on the socioemotional impact on the oldest old, i.e. those over 80 years of age, of playing digital games. Marston, Freeman, Bishop, and Beech [64] concluded in their scoping review that no studies focused directly on the oldest old population. Therefore, we are investigating various questions such as whether these oldest players experience a greater decrease in loneliness and a greater increase in social connectivity than their younger counterparts? We are also investigating the potential of intergenerational gameplay as a method for overcoming ageism and changing the stereotypes between youth and older adults.

This is a challenging area to investigate as there is so much variability in the group that we refer to as 'older adults' or 'seniors'. The differences between 60 year-old and 80 year-old adults can be enormous along several dimensions, e.g., cognitive abilities, physical health. Also, the life experiences of older adults vary and there can be huge variability among adults within the same age range, e.g., computer skills, educational background. Future research studies need to better describe the participants and should avoid placing everyone over the age of 55 years in the same category.

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