Attraction and Addiction Factors of Online Games on Older Adults: A Qualitative Study

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Abstract. With the development of technology and new devices, online games have attracted more and more older adults. Exploring chances and challenges of the elder players become an important issue in the game industry. First of all, older adults have a lot of accesses to reach a new game, but it is unclear which way is the most effective one. Secondly, although adequate game playing is good for elders' mental and physical conditions, game addiction is not. It is emergent to distinguish between the attractive and addictive factors of online games on older adults, and find a balance between them. A semi-structure interview is employed in this study. We analyze the qualitative data from four themes: older adults' access to online games, factors that attract older adults to play online games, factors that lead to older adults' addiction in online games, game design features that alleviate game addiction for older adults. This research is among the first to distinguish the attractive and addictive factors on elder game players, as well as provide practical implications for game company and designers.

Keywords: Game attraction · Game addiction · Older adults · Game design

1 Introduction

Online games have increasingly become an integral part of daily life for people of all ages and genders [1]. An official report from ESA and ARRP announced that there were over 41 million elder game players, constituting 36 percent of all the population with an age above 50 [2]. From the social benefit perspective, online games have been proved to enhance the quality of elders' lives, such as improving their mental and cognitive abilities, strengthening social connectedness, as well as offering a joyful way of spending time [3, 4]. From a commercial view, elder players are a potential user base due to large numbers and lots of free time. Therefore, it is of great importance to explore the chances and challenges of the elder players in the game industry.

To open this potential market, the first problem is game publicity and promotion. Different from the younger generation, older adults are usually with low technical literacy and have almost none information seeking techniques. Therefore, our first research question is: ***Where do the elders access game information? And which is the most effective one?***

Even if a game successfully reaches the aged population, it does not mean the older players will be willing to click in the game. Most games have not fully taken older adults' needs and interests into consideration, which build solid healthy, social and technical barriers that keep the elders away from playing online games [5, 6]. Fortunately, A few literatures have paid attention to the problem and proposed several game design features that might be attractive for older adults, such as font size, color brightness, theme relevance, goal simplicity, and necessary social functions [7–9]. These changes significantly increase the number of elder players but unintentionally lead to a negative consequence: game addition, which caused serious bodily impairments on older adults' eyes, necks, and waists. So, it is emergent for academicians and practitioners to distinguish between the attractive and addictive factors of online games on older adults, and find a balance between them. In other words, *which factors can attract elder players to play an online game? Which factors will lead to their addiction in games? And how can we motivate older adults to play games but not be addicted to it through game designs?*

To solve the above questions, this study adopts a semi-structured interview as the research method. 12 respondents with an average age of 66.7 who have played at least one kind of online game are recruited. We analyze the qualitative data from four themes: older adults' access to online games, factors that attract older adults to play online games, factors that lead to older adults' addiction in online games, game design features that alleviate game addiction for older adults. This research is among the first to distinguish the attractive and addictive factors on elder game players, as well as provides practical implications for game company and designers.

The rest of the paper is organized as follows. We first review relevant literatures. Then we propose our research design. After that, we report on the qualitative results. Finally, we discuss the implications, limitations and future directions of this study.

2 Literature Review

2.1 Barriers that Hinder Older Adults from Playing Online Games

Older adults are a homogeneous group facing similar age-related changes and impairments, which may hinder them from playing online games [1]. According to previous literatures, we categorize these factors into healthy, social and technical barriers.

First and foremost, older adults face serious health problems including sensory decrements in vision and hearing, decaying cognitive abilities, reduced physical skills, as well as chronic illnesses [6]. Secondly, the "old" is recognized as a group irrelevant to online games under current social norms [3], few seniors do play online, and therefore, few peers in games lead to few social benefits [4]. Thirdly, current generation of older adults have not experienced the same degree of computer and Internet technology as the younger ones do [5], who have significant difficulties in handling diverse game interfaces and operations.

Overall, these healthy, social and technical problems limit older adults' possibilities of participating in most online games and lead to special requirements in the process of game design and promotion [8].

2.2 Game Design Features for Older Adults in Online Games

In fact, older adults are a group of under-investigated users in online games with particular needs and interests [1]. Till now, a few researches have begun to understand the ageing population and attempt to incorporate specific design features into online games. We summarize these features from four aspects: interface, user-computer interaction, user-user interaction, and content.

First of all, the interface has to be adjusted to meet the needs of older adults in consideration of their healthy barriers, including basic settings of size, color and voice [8]. Secondly, according to Choi and Kim [10], user-computer interaction can be facilitated by providing appropriate goals, operators and feedback. Besides, devices with technology that are easy-to-operate are the mostly preferred [7]. Thirdly, user-user interaction is important in improving social capital and support for elders [9]. Last, appropriate themes and funny game contents play a significant role in attracting older adults [7, 11]. Details are illustrated in Table 1 below.

Table 1. Game design features for older adults in online games

Game design factors	Objects	Features	References
Interface	Size	Large font size and figures	[5, 8]
	Color	Bright and soft color	
	Voice	Low-frequency voice	
User-computer interaction	Goal	Easy and large targets	[5, 10]
	Operators	Minimize the number of operators, and help elder to get full control over the game	
	Feedback	Frequent tactile or vibration feedbacks	
	Device & technology	Prefer touch screen	[7]
User-user interaction	Social interaction	Effective communication places and tools	[9]
	Social recommendation	Sharing and ranking function in popular social media platforms	
Contents	Theme	Appropriate themes for elders	[7, 11, 12]
	Entertainment	Funny and attractive	

Although previous literatures proposed specific features of online game design for older adults, they have not distinguished them into short-term and long-term factors. In other words, the ageing population may be attracted to an online game with certain

features, but the reasons why they addict to an online game is different. It is important to identify and classify these features to better guide the game design for elders.

2.3 Impacts of Playing Online Games on Older Adults

Ample studies have demonstrated that online games can help older adults to improve their cognitive abilities, mental health, social networks, and technical literacy. First of all, games are proved to be efficient in improving elders' hand-eye coordination, recognition memory, attentional control, and processing speed [4]. Secondly, as an alternative to television, the initial purpose of online games is for relaxation and entertainment [5], which improves the elders' quality of life [3]. Thirdly, many older adults enjoy online game because it provides a place to communicate with others, thus improve their social capital and support social relationships [4]. Last, online games also generate positive attitudes towards technology and encourage their technological learning impetus [7].

However, every coin has two sides. A number of negative impacts of playing online games on older adults have been put forward recently. On one hand, it is widely known that playing online games too long will lead to cervical spondylosis, lumbar strain, and eye impairment, especially for older adults with a relatively bad healthy condition. On the other hand, although elders regard games as a means of escaping from daily routines [7], it will be troublesome if they put too much time on games, which eventually disturbs their daily life and offline social activities.

In this regard, playing online games adequately is good for the aged population, but the challenge is to avoid them from being too addictive to those games. Therefore, it is emergent and important to find the boundary between attractive and addictive factors, and alleviate the addiction phenomenon through specific game designs features.

3   Research Design

3.1   Research Method

This research adopts a semi-structured interview as the research method, which follows a general interview approach [13]. The reasons why I choose this method are twofold. Firstly, attractive and addictive factors are difficult to distinguish with simple survey questions when the sample group is elder people, so prior studies with quantitative data can only investigate all related factors but cannot tell the difference. Secondly, semi-structured interview can help respondents recall the memory, and report their detailed attitudes with multiple choices, which is widely recognized as an effective approach in social research.

3.2   Interviewees and Interview Process

We recruited 12 respondents with an average age of 66.7 who have played at least one kind of online game (i.e., QQ Chinese Poker, AniPop) during the year 2018. All interviews were conducted in China by the same researcher. Every interview started

with an open question: What is your favorite game? Then, participants were invited to talk freely about how they know the game, why and when they begin to play the game, their attitudes towards the game, and so on. Later on, they were asked about the average time they spend in playing this game every day, and following questions are based on their answers. Two hours were regarded as the boundary between normal and addictive game players. For addictive older adults, they recalled the reason why they keep playing this game so long, as well as the perceived negative effects of their addiction. The average interview duration was 40 min. Each participant was offered a small gift valued around 30 RMB after the interview. The demographic summary is shown in Table 2.

Table 2. Demographic Summary

Age	Gender	Education	Game playing experience (Years)	Game playing time (Hours/Day)
60	F	Bachelor	4	1
66	M	Senior secondary school	6	2.5
59	M	Junior college	5.5	1
62	M	Junior secondary school	2	3
58	F	Bachelor	3	6.5
64	F	Primary school	4.5	1
81	M	Bachelor	3	4.5
73	F	Junior secondary school	3	2
80	M	Senior secondary school	10	6
60	M	Senior secondary school	1	2
72	F	Primary school	9	1
65	M	Junior secondary school	5	2.5

4   Qualitative Results

The qualitative results are demonstrated under four themes that guided the interview: (1) where do you know online game information? (2) Which factors of the game that attract you to play it? (3) Which factors of the game that make you addict to it? (4) Are there any ways to alleviate the symptom of game addiction?

4.1   Older Adults' Access to Online Games

This qualitative results reveal that there are four approaches that take older adults to online games.

The first and most effective way is from peers' recommendation. In fact, respondents were usually introduced to games by their spouse, relatives or friends, because they share common interests and trust each other. Healthy, social and technical barriers can be easily broken when your peers play the same game. Interestingly, different from the younger generation, even if suggested by their friends, the elders are not necessarily playing together, they prefer play games alone and have a competition in the system-uploaded high scores.

> *"My elder sister has been playing AniPop for a couple of years, and taught me how to play the game in our family party last year. It seemed easy and I believed I could play well since she could…In most times, we don't play together, but we always check and compare our highest scores. Sometimes she won me and then I would try to surpass her as soon as possible."*

The second approach is an unintentional one. A few respondents played games which were originally prepared for their grandchildren. Under this circumstance, online games unexpectedly narrow the intergenerational distance, and become a new way for older adults to spend more time and have more interactions with the younger generations.

> *"My son downloaded the game 'Baby Crocodiles Love Baths' for my granddaughter. Sometimes she could not pass a barrier and asked me for help. Then I found the game interesting and began to play whenever I was free. Finally, this game became a shared activity with my granddaughter. It is incredible!"*

In addition, marketing messages are delivered everywhere by the game company. Due to unfamiliarity with most devices, older adults frequently click into pop-up windows unconsciously. They are so cautious that they feel afraid of the advertisements, because they think these are possibly virus. But when the game seems well developed, older adults' worry may be dispelled and even try to play it.

> *"Last time, when I opened the game 'Fruit Slice', another game appeared and I accidentally clicked in. This game seemed poorly developed thus I quickly quit in case it was a virus…If the game seemed better, it was likely that I may try it."*

The last way to access game information is from self-seeking. One advantage of playing online games is the improvement in older adults' technological literacy [7]. They are motivated to learn as long as they want to play more and better. Therefore, some of them have gradually acquired the ability to search for games that they are interested in.

> *"I like playing AniPop and have already cleared all the stages. Then I felt bored and my daughter taught me how to search and download new games from my tablet PC. I used the key word 'elimination' and found a few similar games. That's great!"*

4.2   Factors that Attract Older Adults to Play Online Games

Just as we summarized in Sect. 2.1, there are three barriers that hinder older adults from playing games. Except for social recommendation approach proposed in Sect. 4.1, game design features that are directed at breaking healthy, social and technical barriers can play a key role in attracting elders to play a new game.

First and foremost, interface design makes a first impression that directly impacts elders' willingness to try. For a game to attract older adults, the principle is a bit different because it has to consider their healthy conditions first. Due to the eye and ear impairments, older adults will only be interested in games that allow players to change the font, color and voice settings, as well as window resizing and figure zooming. With regard to their low cognitive ability, easy operation and basic instructions is necessary for older adults when they first enter the game.

> "Once I clicked in a game, I was scared by dense words and figures. You know, I have got presbyopia for a long time, I cannot see the words clearly if the font cannot be enlarged…Some games seem difficult to play with no instructions, I will be in a loss because I don't know what I should do. I will quickly quit the game with no hesitation."

Social barriers also keep elders away from certain games. For instance, massively multiplayer online games are mainly designed for young adults, where elders cannot find any peers in the game. Bloody, childish, and dating games are also not suitable for older adults under current social norms. Therefore, the best way to broke social barriers is to design games with relevant themes attractive to older adults. For instance, puzzle games like poker, mahjong, and chess is popular in the elders' life because it corresponds to their offline activity. Simple games such as AniPop and Fruit Slice may also attract older adults since their peers are playing it too.

> "I am interested in Chinese chess, which I am good at since I was a child. Online games help me to find matched rivals, and I don't need to go out early to occupy a seat. This technology really improves my recreational life."
> "AniPop is so interesting, many of my friends play it. And when I conquered my friend, I might even share the score in my friend cycle."

With a low technical literacy, older adults stated their worry about the ability to use a computer, but felt relieved after the prevalence of touch screen laptop. Besides, the mobility nature of tablet affords the possibility to play games everywhere at any time. Therefore, the development of new device breaks the longstanding technical barriers for elders. However, older adults are not followers of all new technology. WII somatic games and virtual reality games have not attracted the elders at all, because they are relatively complex even compared with PCs.

> "It is difficult to use a PC because I have to learn how to start up, how to find the game, how to use the mouse and keyboard. I never played any online games before my son gave me an iPad. It is an amazing technology and so easy to learn and use! My son also bought a VR glass last year, I really don't like it. I keep playing my iPad since there are countless new games."

In addition, money is also important in older adults' selection of online games. They seldom play any games that are not free because they don't know how to pay and are afraid of being cheated. The reasons seem totally different from the younger generation.

> "I don't want to spend any money in a game. It is just a game, and what if they stole my bank account information? The Internet is unsafe."

4.3   Factors that Lead to Older Adults' Addiction in Online Games

Game addiction is not a rare phenomenon nowadays. Among the interviewees in our study, two thirds of them spend 2 h or above in playing online games every day, who can be identified as game addiction users. Although they know this is a bad habit, it is difficult to change.

> *"I originally started playing online games just because I was bored…But now I am completely fascinated by QQ Chinese chess. I almost spend all my free time on it, I have to admit that I am totally addicted to it."*

In fact, older adults might be attracted to an online game with certain factors, but being addicted is another thing. Some game design factors can be experienced only when the elders play the game for a while. First of all, although easy goals and simple operations can attract older adults at first glance, these games cannot lead to user loyalty. In other words, a good game for elders should increase the level of difficulty progressively, and demands some challenges thus improves a sense of accomplishment and self-efficacy.

> *"The game should be very simple at the beginning, and as we are learning and progressing, it can become harder and more complicated gradually. It allures me to play again and again to achieve a higher level…It is a perfect way for us to learn new things, we can train our brains while having fun."*

Another important factor is frequent and exaggerated feedbacks for elder players. As they are lacking in technical literacy, it may take longer time for older adults to pass a new stage. If the feedback can only be achieved when players make a big progress, they will feel disappointed in most times. Therefore, respondents stated their requirements for more encouragements either with words or props, which can attract them to play longer.

> *"Actually, I played better and better each time although I failed to pass the level. Every time, the game continued to tell me that "you lose", which made me angry and abandon the game though it was a good one…Different with it, AniPop always gave me game props which helped me to pass a new stage more easily, so I felt my effort was worthy."*

In addition, social interaction is also proved to be important for the time that interviewees spent in online games. Most older adults regard games as an approach to build social contact with offline friends, relatives, and even grandchildren, and some of them also make new friends online with same age and common interests when playing. In other words, the social interaction functions attach more value than simple entertainment on playing games.

> *"I will be bored when I play QQ Landlords alone, but I feel satisfied when playing it with my friends. Maybe it is because we can chat online and have a close teamwork."*
>
> *"I am good as Chinese chess, and cannot find a rival in real life. Fortunately, the QQ game assigned one to me according to my level, who was two years older than me and lived in a neighboring province. We had so much to talk because we shared common interest and experiences. I really treasure this friend."*

Actually, the ultimate purpose of playing games is to get entertainment. Only when an older adult feels happy in a game, he or she will continue playing it, no matter the fun comes from challenging tasks, social interactions, or both.

> *"The only reason that I am addicted to the game is that I could get great fun from it."*

4.4 Game Design Features that Alleviate Game Addiction for Older Adults

We confirm previous findings that there are two negative impacts of online games if older adults put too much time on it: serious healthy problems and disturbance of normal daily life. The following quote describes how an old man aged 81 spend so much time in online games, even to the degree that he has to face wife's criticism and physical illness as a consequence.

> *"Three years ago, I began to play QQ Chinese Chess online. In the beginning, I didn't have any problems with it, but my wife complained from time to time. Because this game could not stop once I begun, otherwise my marks would be deducted. I even missed the meals and she had to eat alone…Besides, it was bad for my neck and eyes after I played it for a long time. I kept sitting in my desk and stared at the screen for at least four hours every day. I think I should change my addiction but I lack self-control, and I have made an appointment with my online friend."*

Therefore, it is urgent to find solutions to alleviate the above phenomenon. Fortunately, our respondents both pointed out several existing useful game design features and suggested a few potential changes of online games that might work in the future. Among them, time control function has already been adopted by a few games, while time warning and counting functions are rarely seen since the purpose of game designers is to make users play as long as possible.

> *"In all the games I played, only AniPop has a time control function. You have to rest for a period of time before starting a new round. Sometimes, because I did not want to wait idly, I would do some cleaning and washing instead. At first, I hated this function because it interrupted my desire to gain a higher score. But now, I thought it was good since I could not control myself without this specific function."*
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> *"Sometimes, I wanted to know how long I have been playing the game, but I could not see the clock in most game interfaces. I think it might work if the game reminds me every other hour. This function will definitely alert me."*

5   Discussion and Implications

5.1   Discussion of Findings

Based on the qualitative analysis, we not only answer all our research questions, but also have a few unexpected findings. First of all, older adults have four approaches to reach online game information: peers' recommendation, unintentionally attracted by grandchildren's games, advertisements in pop-up windows, self-seeking by keywords searching. Among them, peers' recommendation is the most effective one.

Secondly, just as we summarized in Sect. 2.2, a number of game design features are useful for older adults in online games, which can be separated into attractive and addictive factors. For instance, easy operations, interface design, social recommendation, theme, technology and device can conquer healthy, social and technical barriers for elder people, which is vital in attracting them to play a new game. Besides, free price is also found to be a basic requirement to attract elder players. Differently, because game is an experience product, additive factors can only be perceived after the older adults play the game, including progressive challenging goals and operations, frequent and exaggerated feedbacks, social interaction functions, and entertainment. We find that the most obvious distinction lies in the difficulty of games. At the beginning, older adults will be attracted by easy games due to low cognitive ability, but when they play more, only challenging games allure them to play longer.

Last, we also confirmed the bad healthy and social consequences caused by online games, and provide time control, time warning, and time counting functions to alleviate game addiction phenomenon for older adults.

5.2   Implications, Limitations and Future Research

This study has profound theoretical and practical implications. Theoretically, we are among the first to distinguish the attractive and addictive factors on elder game players. We also indicate a few neglected game design features. In practice, game company should adopt social recommendation approach in promotion because it is the most effective method. Game designers should find a balance between the proposed two groups of factors, and may incorporate time control features into their design especially for elder players.

As an exploratory research, this study contains a few limits which can be further explored. Firstly, with a small sample size, maybe we have missed some important clues. A focus group research with more respondents will be conducted in the future. Secondly, the qualitative research approach has relatively low external validity. Our next step is to confirm the relationship between certain factors and corresponding attractive and addictive behaviors by quantitative methods like survey and experiment.

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