The 6th International Conference on Computer Games; Challenges and Opportunities (CGCO2021)
February 2021 – University of Isfahan, Isfahan, Iran

Looking at Intergenerational Game Design through Lens of Game Genres

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***Abstract*— We live in an aging society, and in the future, we will face an increase in the need for meaningful interactions between young children and seniors. Intergenerational games as a means for providing such interactions will play a major role in upcoming decades, thus having a framework for designers to make such games is crucial. This paper acknowledges that individuals' preferences play a major role in the type of game they play, but it also discusses convergent factors that help in the creation of such a framework. Having this guide be based on a familiar classification, makes using it easier for game researchers and designers. Therefore, this paper uses genre categorization, which is commonly used by both the industry and the audience. A ranking is assigned to each genre based on how well it satisfies introduced criteria for a successful intergenerational game, in accordance with previous research in this area. Finally, this paper concludes that the best genres for this purpose are action, strategy, and puzzle; it also finds vehicle simulations to be the most inadequate. These findings suggest that using any of these genres or mixing several of them, as the foundation for building a game, results in a more appealing game for a broader range of audience.**

Keywords*— *Intergenerational gaming, game genres, game design guidelines

I. INTRODUCTION

According to the annual report of Population Division of the United Nations Department of Economic and Social Affairs [1], known as "World Population Ageing", in 2020, there were an estimated 727 million persons aged 65 or above worldwide, about 9.3 percent of the whole population, and it is estimated that this number will increase to 1.5 billion persons, about 16 percent of the whole population by the year 2050. This rapid aging of society demands careful planning in order to provide people with adequate social support, and that is where young people's role becomes quite important [2]; in the same report it was stated that co-residence of seniors with their children can provide them with mutual support as well, which likely leads to an increase in skip-generation households where parents leave their children in the care of grandparents.

Strong social bonds among family members ensures this interaction caused by the longer time spent between children and their grandparents happens without negative prejudgments regarding the intergenerational gap, and games can be one of the best solutions for improving these possible negative perceptions between them and additionally provide many other benefits to all the players. It is estimated that intergenerational games bring up to four generations together [3]. Furthermore, the Covid-19 pandemic showed the increased value of "digital gathering places" [3] for people, as they cannot be physically in touch, but they can still share experiences and make memories together.

Many people consider "playing" to be an act of children, and undervalue "gaming", whereas in reality, games are learning tools [4] that help the players gain a better understanding of each other, while also providing a joyful experience [5]; nevertheless, the dominant point of view is slowly changing. In regard to the "gamer" population in the United States, senior gamers have grown from 9 percent of all gamers in 1999 to 25 percent of all gamers in 2009 [6], and this is a rising trend as the people who grow up with games reach their elderhood and accessibility to the technology becomes more widespread. Some argue that this existing negative attitude might be due to the current public image of the gaming culture, for example looking at gaming as some form of addiction or total immersive experience, leads most the gamers to not identify themselves as such [7]. Regardless of age, the main motivations for playing a digital game are having fun, relaxing, escaping from reality, and socializing [7, 8].

An individual's preferences for games can be diverse, thus one of the main challenges of designing an intergenerational game is its varying target audience each with their own needs, limitations and taste in games. In spite of this, there still exist similarities that can be used to generate a rough guideline for designers. In order to increase the efficiency and the usability of the proposed guideline, in this paper, it is decided to use game genres as a familiar categorization, recognized by the industry, the academia, and the audience alike. Then, each genre is held against suggested criteria, extracted from previous research regarding intergenerational play, and scored. The final results reveal the genres found most suitable for designing intergenerational games, along with most inadequate ones.

The data of this paper comes from broad internet research using scientific and nonscientific search engines with the following subjects: elderlies' gaming habits and preferences, children's gaming habits and preferences, and intergenerational games.

In the background, the result of previous research related to gaming habits and preferences of seniors and children are discussed, in order to propose the criteria for a satisfactory intergenerational game. Then, game genres are held against these criteria, based on their most broad definition. Finally, the genres are sorted, and the paper suggests which one of them are the most suitable for the purpose of designing an intergenerational game.

II. BACKGROUND

To design a good game, the designer needs to know her/his audience well, their particular preferences, habits, needs, and limitations. Accordingly, to introduce criteria for designing an appealing intergenerational game, in this section, the paper discusses seniors' and children's playing characteristics, as the main target for such a game.

A. Seniors

1) Preferences and Motivations

The most noticeable trend seen among seniors' preferences for games, is their high opinion about puzzle games [9-13]. Along with that, one of the main features of games appealing to seniors discussed in the literature is their casualness [5, 6, 14-16]. There have been some hypotheses about why these types of games are more pleasant to the elderly audience. Birk, Friehs, et al. [13] suggested this observation can be explained by psychology theories that indicate by getting older, people tend to prefer familiar tasks; and since the current generation of elderly adults have been more exposed to puzzle and card games than genres that came into the light following the recent improvements in digital technology and computing power such as First-Person Shooters (FPS) or Massive Multiplayer Online games (MMOs). Drawing this conclusion seems reasonable, however due to the younger generation's more experience with new technologies, some speculate this predilection trend is going to change [11], and some even suggest this shift is already happening, for example, problem-solving particularly in the form found in strategy and action/adventure games, was the most cited skill in the research of Costa and Veloso [17].

"Being intellectually challenging" has been an important motivation for seniors to play a game [9, 15, 18] especially in the form of an adequate and adaptive challenge [19, 20]; furthermore the game needs to be easy to learn [5, 10, 11, 21]; puzzles and word-games are two of the best examples that follow these terms. However games that challenge age-related constraints are generally disliked by seniors [22].

Beside puzzle games, some of the most appealing types of games to seniors are strategy games [11] more specifically those that follow simple rules and can be played in short sessions [8, 17], which is believed to be the most consistent motivation for playing across generations [23], and adventure games, that are appealing to both gamer and non-gamer elderly audience [12].

Birk, Friehs, et al. [13] detected a pattern of behavior that with growing older, players' motives and preferences shift away from focusing on performance to completion, choice, and enjoyment. Tekofsky, Spronck, et al. [24] have confirmed a less achievement-oriented and more conscientious play style.

In terms of aesthetics, the preferred games are the ones with cartoony or historical/nostalgic arts over photorealistic visuals [18].

Social aspect of the games is the most important predictor of the time investment by elderly gamers [15]. Especially being able to not only play with peers but also with family members, satisfies seniors the most by giving them a sense of fulfilling their social obligations [25] as grandparents, which by some is perceived to be the most crucial use of their time [12]. Some seniors also see digital gaming as a bridge between generations to be crossed, and a way to be immersed in the culture of the younger generations [3]. Yet it can be inferred from the literature that collaborative and cooperative play rather than competitive one, becomes more important to players as they get older [5, 8, 11, 13, 26, 27]. Additionally, seniors prefer learning games from family members, which is usually caused by the fact that family members are the ones who introduce them to technology, the feeling of trust toward family, the use of less confusing terminology compared to user manuals or classes, and them being comfortable enough to ask questions [3]. Most of the time, what motivates seniors to engage in intergenerational games is the enjoyment and feeling of connectedness and the chance to strengthen their social support structure that comes with this kind of interaction that motivates seniors to engage in intergenerational games [21, 28].

2) Gaming Habits, Benefits, and Limitations

In terms of social behaviors linked to gaming, the most common observation was that current elderly gamers, play in solitude [9, 11]; but the younger end of the seniors spectrum seem to be getting more engaged in networked video games [17] which again can be explained by their increased familiarity with new gaming technology.

Regarding the most common platform, it seems Personal Computers (PCs) are still the mainstream platform among seniors [11, 18].

Contrary to the popular belief of seniors having a negative perception against games, Marston [12] stated that the most cited reason for not playing video games, was lack of spare time; for non-gamers the most important mentioned use of their time was

spending it with their grandchildren, whereas for gamers was spending it with their spouse. It is suggested that maybe through designing an intergenerational game [12], appealing to both seniors and children and ensuring that the audience can clearly perceive the benefits that come along with the game and understand its purpose [22, 28], this concern can be addressed. In contrast with these findings, some of the literature suggest that due to the greater available spare time to the younger end of the spectrum because their children require less and to the older end of the spectrum because they tend to work part-time jobs or be retired, and also more relative financial stability which leads to more intense usage of the games, seniors are a great audience for games [6, 18]. Regarding time investment of seniors into playing, Pearce [18] reports cases where seniors play 20-40 hours per week, which puts them into the hardcore-gamers category. Considering the smaller sample size of research [12], the second result appears to be broader.

As people get older, the priority of their attention changes from acquisition of new skills toward emotional regulation, which is probably why elderly people tend to seek familiar and social games [13]. In general findings of Mahmud, Alvina, et al. [29] showed that adults and seniors rely on past software experiences when facing new software which gives us an important design aspect, particularly regarding input methods and general User Interface (UI).

Unfortunately one of the common problems encountered by seniors is the lack of attention by the mainstream game industry [18]. Marston [12] stated that some of the ideas and suggestions made by seniors participating in a design workshop conducted by researchers, were novel enough that they couldn't categorize them in any particular genre or subgenre; implying that designers can develop new game contents and subsequently widen their audience through the use of these kind of ideas.

According to Pearce [18], one remarkable phenomenon regarding seniors' playing is the "leapfrog effect", in which they are more likely to play with their grandchildren than they used to play with their children, emphasizing on the importance of having well-designed intergenerational games in upcoming decades.

However, old age comes with some limiting factors, such as lower multi-tasking ability, poorer hand-eye coordination [30], more limited memory performance, and reduced motor skills. Age-related diseases may worsen these limitations [5]. This is why providing immediate feedback when interacting with digital devices is one of the important factors regarding the design of UI for seniors. These limitations may explain some changes to the taste of seniors in games where they seek slower paced games [11]. But some of these functional limitations, mainly cognitive and perceptual ones, can be improved through gaming [14, 31, 32]. And it is important to keep in mind that the decline of abilities is often compensated for through knowledge [13]. Birk, Friehs, et al. [13] argued that even if self-perceived performance declines overtime, and seniors cannot see themselves as real gamers due to the intergenerational cultural gap [33], other mechanisms like knowledge of the game, prevent huge reductions in actual performance.

Games are perceived as a place where seniors can reconstruct the past and live unattainable experiences [33], especially with recent advancements in Augmented Reality (AR) and Virtual Reality (VR). Seniors in general have shown aversion to violent content, but on the other hand, these games are the most beneficial for improving perceptual and cognitive disorders related to aging [9]. In spite of that, some contested that the designers shouldn't focus merely on improving cognitive functionality, and forget the fun aspect of games when they design for the purpose of aging intervention to improve age-related diseases [10]. Furthermore, Ferguson, Nielsen, et al. [34] concluded that negative attitudes toward video games are discarded when people come to direct contact with games, specifically violent ones.

B. Children

1) Preferences and Motivations

Most of the literature addressing children's preferences state that unlike seniors, the types of games played by children vary more when looking at different demographics, namely different age groups, different genders [35] and even individuals' psychosocial factors [36].

In general boys seem to hold a higher opinion of digital games, which is influenced by them having access to the internet [37], while girls prefer outdoor play; and comparing digital games preferences specifically, boys would rather play action/adventure games, strategy games, and sport games whereas girls tend to play less violent games such as simulation games, minigames, and puzzles [37, 38]. However the research of Homer, Hayward, et al. [35] on a smaller sample demonstrated that an equal percentage of girls favor fighting games and puzzles, and it appears that this leaning toward violent contents in girls comes from the desire for more thrilling or risky behavior, among people who have a higher self-esteem. This confirms previous findings by Brandtzæg and Heim [36], which showed that regardless of gender, low social acceptance among peers is moderately associated with preference for violent games. Sherry, Lucas, et al. [38] found a tendency for an "open play without clear rules and goals" among girls, and associated it with girls' preference toward simulation games. Asadzandi, Bigdeli, et al. [39] suggested that preferring open world games is a common tendency among teenagers. Furthermore, the interest in playing strategy games increases as children grow older [38] and it is the second most favorite genre regardless of gender, right after FPS games [40].

Being able to touch and feel actual objects is one of the keys for a joyful in-games experience especially for younger children [27].

In regard to aesthetics, realism and high-end graphics seem to be an important factor for younger people especially teenagers [39]; some even considered it more influential than gameplay and storytelling [37, 38]. Satisfying sound effects and music is another stated feature enhancing the game experience [39].

2) Gaming Habits, Benefits, and Limitations

Reports on the time spent playing video games reports vary a lot between different regions and demographics, on average ranging from an hour each day among American children aged 10 to 19 [41] and Australian children aged 10 to 13 [40], up to five hours each day among Iranian teenagers [39]. Boys tend to play more, and the time spent playing increases with age, regardless of gender [35].

In relation to the most commonly used platforms, PC is found to be the most popular one, followed by PlayStation, tablets and smartphones [37]. Considering higher computational power and better graphics of PCs, this finding is consistent with the fondness of children for better aesthetics.

Experiencing feelings of "excitement" is the most important motivation for teenagers [39]. Other stated factors for playing games were "entertainment and relaxation" among boys and "educational purposes" among girls [37]. Digital media usage seems to play a crucial role in the subjective well-being of children [42], while also providing them with autonomy. Newland, Mourlam, et al. [42] also pointed out that some children play games acts as a coping mechanism against negative emotions and experiences.

Looking at social features of a game, being able to play with one another is perceived to have a major influence in people's willingness to play it [39]. Competition seems to be one of the main characteristics of the boys' play [38], however as people age, regardless of gender, this need tends to slowly fade away [23]. Teaching other children [43] how to play seems to be another important aspect of outside game interactions, which is a positive and meaningful social experience [44]. Participating in children's gaming activities provides a means to strengthen family bonds, promote socially-valued behavior [42], and gain better mutual understanding [30].

Nevertheless, there are some limitations to children's play, especially younger children. Cognitive restraints include a hard time understanding abstract concepts and remembering instructions, which demands simple games with simple instructions; the children's impatience [5], which calls for immediate feedback, frequent rewards, and avoidance of creating situations where the child feels overwhelmed by better skills of her/his opponent, thus leading to tension [45]. Physical restraints include undeveloped motor-skills, especially hand-eye coordination, and difficulty using some game inputs [5]. After the age of 6, children tend to form a logical understanding of time and space, and start problem-solving efficiently [46]. Overall sense of immersion in the game is also higher among children compared to adults [5].

C. General Suggestions, Benefits, and Limitations

The most important factor to keep in mind when designing an intergenerational game is that "one size does not fit all" [16], especially considering diverse preferences among children; thus it is recommended to pay more attention to the preferences of the younger end of the audience [25]. Additionally, both of these age groups are experiencing rapid changes within relatively short time intervals [5].

Mahmud, Alvina, et al. [29]'s research conducted on different age groups regarding the different approaches toward learning a new application on different age groups, carries some insights to take into consideration when designing an intergenerational application; such as the struggle of children when using contextual menus, and the negative effect of preexisting knowledge about similar applications among seniors. It also suggests that in general, children rely on real-life experiences to explore the application environment, while seniors rely on past software experiences. Furthermore, younger people have a higher competency when playing video games due to their higher exposure to this type of games. One suggestion to overcome this problem is using a scoring system where players' score is determined based on her/his own past performance. Another suggestion could be using the asymmetrical game design principle, where players do not have similar starting conditions, and might even have different goals. Designing an asymmetrical game [47], though hard for developers, is one of the best ways to ensure that the game doesn't favor a particular player over the others because of her/his superior knowledge or more precise motor functions.

Children are overall more competitive compared to seniors who prefer collaboration [5, 25], so designers are advised to use dynamics and mechanics that allow both of these interactions while not letting any of them become a dominant factor in the game [48].

It is believed that a good proportion of teenagers play with their parents on a regular basis, but there are only a small proportion who play with their grandparents [30]; one reason might be that seniors are not living alongside their grandchildren and interactions between them are not so common, or it might be because there are few games that appeal to both generations. Thus, one of the most frequent recommendations for designing an intergenerational game in the literature is allowing short and quick game sessions, along with simple game rules is [2, 11, 16, 21, 47-49]. Another method is embedding online interactions within the game, such as voice or video messaging over the course of gameplay [49] which can be quite attractive, especially for seniors [26].

Furthermore, designers need to recognize the significance of the shift of traditional roles between engaged players in an

intergenerational game [21, 50], owing to the fact that seniors are usually considered to be the organizer, instructor, and caregiver; and many believe the same regular roles are present when thinking about an intergenerational interaction [16].

Since teaching a game to other people is one of the main social aspects of it; an intergenerational game provides a great opportunity, especially for younger generations, to share the knowledge through the doors of gaming in a fun way; nonetheless, one of the challenges is going to be explaining the rules and mechanics in a simple fashion understandable for seniors, which may reduce the fun aspect for younger people [30]. These games also help to create a common enriching experience for all the players, and give them better understanding of each other's capabilities and needs and reduce ageist attitudes [5, 14, 21, 51], while strengthening the family social bonds [14, 52] and having more substantial impact on families with poorer communication [53]. Another social benefit of intergenerational games can be their ability to enhance mutual understanding between generations in regards to their perception toward one another [21, 54], which is amplified by how joyful the game experience is for the players [55]; it also has positive effects on prosocial behaviors among younger people [56].

Considering the fact that seniors have a harder time using new input devices, and younger children prefer interacting with tangible items; it would be sensible to take advantage of mixed-reality games [54, 57].

One of the main differences between seniors and children, is the negative biased opinions about technology usage among seniors, the belief that due to their old age, they can no longer embrace new technology and especially, have fun with it; whereas children are much more flexible [5]. These stereotypes exist within the whole society, therefore it has a negative impact on intergenerational interaction of the players [58]. Consequently, this calls for a change in seniors' attitudes regarding digital games which demands extra effort from them [8], and a change in perception of the older generation in the minds of children; nevertheless, with the increase in age of the generations familiar with the technology, this problem appears to slowly fade away.

III. Introducing the Framework

A. *Final guidelines concerning intergenerational game design*

Based on preferences of seniors and children and their limitations and previous guidelines in the literature, this paper suggests following criteria for a fulfilling and enriching intergenerational experience:

1. Being easy to get in
2. Having specific goals
3. Requiring short and quick game sessions
4. Allowing a wide-range of challenges
5. Using both competitive and collaborative forms of interaction
6. Allowing direct social interactions among players
7. Having a simple and preferably familiar UI
8. Not Being heavily dependent on players' physical skills (especially when the target audience are younger children or older seniors)
9. Containing strategy, that can be described as "thinking ahead, and making decisions" which is the most age-stable motivation [23]

Furthermore, considering specific genre preferences and gaming habits of the players, this paper proposes following additional factors for a successful intergenerational game:

1. Publishing the game for PC platforms since they appear to be the most popular.
2. Containing constant feedback which is essential
3. Being challenging enough for all the players
4. Supporting formation of communities for the game

B. *Game Genres*

The current game genre classification commonly used throughout the industry, has been criticized by many for separating games with similar gameplays into different groups or grouping dissimilar games together [59]. Some researchers have tried to propose alternatives for the current categorizing system [60-63], however since there is no consensus on any of these proposals among scholars, this paper uses genre categories proposed by Adams [64] including 8 genres, in their broadest form of definition based on the mechanics and dynamics involved and will not delve too deep into the genre classifications.

Some genres intrinsically satisfy some of the criteria mentioned in the last section (marked with 'I' for "intrinsic" in TABLE I), or can be designed in a way to support some (marked with 'P' for "possible" in TABLE I), or it might be impossible to integrate the factor (marked with 'N' for "not possible" in TABLE I). In the following, this paper discusses based on what data, it came up with this table.

TABLE I Genres-Criteria Satisfaction

Criteria	Action	Adventure	CMS	Puzzle	RPG	Sport Simulation	Strategy	Vehicle Simulation
1	P	P	N	I	P	P	P	P
2	I	P	I	I	P	I	I	P
3	I	N	N	I	N	I	N	P
4	I	I	I	N	I	N	I	N
5	I	P	P	N	P	I	P	P
6	P	P	P	P	I	P	P	P
7	P	P	N	I	N	P	P	P
8	N	I	I	I	I	P	I	N
9	I	P	I	N	P	N	I	N

1) Action Games

Action games' initial learning curve can be gentle and the goal in these games is usually very clear, however not easily achievable. The game sessions, especially in shooter and fighting subgenres, tend to be short. It is believed that Action games can have more different kinds of challenges than about any other genre [64]. The games categorized under this genre can very well integrate both cooperation and competition. It is possible for designers to allow direct interaction among players through means of voice or video chat. Usually, the UI of action games does not need to be very complicated since there is not much information that the player would need to know. However, the few necessary data are crucial for the decision-making process during the game. Action games are all about testing the physical capabilities of the players and need high levels of hand-eye coordination and require quick reactions. Having strategic plans, for example tactical positioning in combats, can be beneficial for particular games in this genre.

2) Adventure Games

These games' core mechanics can be relatively uncomplicated. Although adventure games are one of the most used genres for interactive storytelling and the end of the story might not seem obvious at the beginning of the game, it is still possible to give the players achievable and reasonable goals. How the player overcomes a problem can affect how the story unfolds for her/him and change the outcome of the story in a meaningful way, which might ask for careful planning. Excluding very rare cases, these games tend to have quite long sessions; since the story being told by the game tends to be long. Lots of challenges can be put into these games such as puzzle-solving and conceptual challenges, and based on the nature of these kinds of challenges, there is no need for much physical skills. The possibility of a mutual goal for the players in the game allows both collaboration and competition to reach the target sooner, based on the design of the game. Some puzzles might be predetermined to be solved by several players to emphasize on collaboration. Social interaction can be a part of these games, especially if the players need to collaborate to access the rest of the story or gameplay. The UI elements do not have to be very complex because not much data has to necessarily be transferred to the player.

3) Construction and Management Simulations (CMSs)

Usually there are lots of mechanics involved in these games, and learning and remembering all of them might be hard for our target audience. The goal in this genre is rather clear and simple, to oversee the process of stabilizing the in-game economy. Usually, this process of stabilizing takes a long period of time. There can be lots of micro-systems that need to be stabilized to achieve the ultimate goal of the game, and each one of them can be a different challenge for the player. This genre is more about strategic planning and less about instant reactions, thus there is no need for sharp physical skills. If the resources are limited in the game, it gives rise to competitive behavior among players, while there also can be collaboration, for example by the players working together to build a specific structure or system. However, emphasizing on competition is discouraged in this genre since it threatens the creativity essence that comes along with the game. The decision to implement a direct social communication gateway depends on the designers and their decision on whether or not this interaction is meaningful. Since there is lots of information that the player needs to have access to, to perform actions and make decisions in the game, the UI might get confusing and it might become hard for the player to remember where each specific action could be performed.

4) Puzzle Games

The way that puzzles can be solved is usually pretty simple and easy to grasp. As simple as it sounds, the goal in these games is to solve as many puzzles as possible. Although, beside fast-paced puzzles that are a subgenre of action games, the game usually offers some sort of conceptual or spatial challenge, thus does not need much physical skill. Usually, the core mechanic of the puzzles is repeated between different levels, and there is not much variety to the challenges offered by these games, and due to the same reason, the game UI can be pretty simple as well. While there might be puzzles out there that are quite complicated and people might spend days trying to solve them, the majority of games categorized under this genre, are rather casual ones with short game sessions. There is not much multiplayer value intrinsically in these games, except competitions for the number of puzzles solved in the form of a leaderboard, although, the social interaction can occur when players try to help each other to overcome a certain level. Generally, because of the casual

nature of these games, there are no long-term effects or consequences based on the player's actions in the game, so there is no need for strategic planning.

5) Role-Playing Games (RPGs)

RPGs' main challenges can come in many forms such as fighting, economic growth, and puzzle-solving, but they are not necessarily complicated, nor have to come in the form of physical challenges. But in general, due to the vast range of challenges offered in these games, the UI of the game might get complicated. Just like adventure games, this genre is great for storytelling, and despite the fact that the end of the story might not be known to the player, the minor goals in each step are. The emergent gameplay of the games categorized in this genre is their most valuable asset, and it usually comes along with their long and enriching stories, which takes long sessions of gameplay. Using both forms of interaction, collaboration and competition, with other players is possible and the social interaction with other characters is an integral part of this genre. The way the player interacts with the game, can affect the outcome of the game, especially in the presence of story-trees, which shows the need for careful planning.

6) Sport simulations

Depending on the sport that the game is trying to simulate and the sport's actions and the simulation's accuracy, the learning curve of the game can be relatively gentle, and the complexity of the UI and the input devices depend on the same. The goal in sports is usually clear from the outset, even in fantasy sports that do not have counterparts in real life. These simulations in general tend to be short. Sports might offer lots of challenges, yet they are mostly in the form of physical challenges, and it is not possible to include different kinds of challenges in one game. Sports are the best genre for creating competition and collaboration among the players. The social aspect in them is rather important, and allowing such interactions can be quite beneficial in these simulations. Sport simulations normally take place in real-time, and long-term planning might not be very instrumental over the course of the game.

7) Strategy Games

Strategy games core mechanics can be both very simple (like chess) or be very complicated and include several sub systems. The goal in strategy games is normally obvious to the player from the beginning of the game, but the victory comes from careful planning for the future, and so the game sessions tend to be longer than most genres. The challenges included in this genre can come in lots of different forms, rarely in the form of physical challenges though. The amount of data that needs to be accessed by the player is usually large, and the game usually needs a more complex UI system. These games can support both collaboration and competition and it is possible to include means of voice or video communication to form meaningful social interactions.

8) Vehicle Simulations

Based on the accuracy level of the simulation, they can range from having very easy to very hard barriers of entry, and the same affects the complexity of the input device and UI system. Beside mastering how to control the simulated vehicle, some of these simulations don't offer any other goal, which some argue would exclude them from being games, thus having clear goals might not always be true for these games. Also, the only challenges usually offered in these games are physical ones. Based on the goal of the game and the complexity of the simulation, the game session might be short or long. Competition can be easily implemented in these games, just like sports, but integrating collaboration might not be as common as the former, and it is limited by the type of vehicle that is being simulated. Based on the type of interaction between players, voice and video communication can be supported. These games tend to happen in real-time and there is no need for planning.

IV. DISCUSSION

The TABLE I shows the suggested mapping between the genres and how they are affected by each factor. By scoring this table based on how it satisfies criteria, +1 for I, 0 for P, and -1 for N, TABLE II will be obtained.

Based upon TABLE II's data, this paper suggests the following genre rankings depending on how well they fit as the main theme for an intergenerational game:

TABLE II Genres-Criteria Satisfaction Scored

Criteria	Action	Adventure	CMS	Puzzle	RPG	Sport Simulation	Strategy	Vehicle Simulation
1	0	0	-1	1	0	0	0	0
2	1	0	1	1	0	1	1	0
3	1	-1	-1	1	-1	1	-1	0
4	1	1	1	-1	1	-1	1	-1
5	1	0	0	-1	0	1	0	0
6	0	0	0	0	1	0	0	0
7	0	0	-1	1	-1	0	0	0
8	-1	1	1	1	1	0	1	-1
9	1	0	1	-1	0	-1	1	-1
Total Score	**4**	**1**	**1**	**2**	**1**	**1**	**3**	**-3**

1. Action games
2. Strategy games
3. Puzzle games
4. Adventure games / CMSs / RPGs / Sport simulations
5. Vehicle simulations

Considering the above ranking, the best genre for a successful intergenerational game, is action, followed by strategy and puzzle games. Something important to note is the fact that this genre has several major sub-genres that this paper didn't take a detailed look into and treated them as a single genre. Definitely the general disapproval of certain subgenres such as shooters or fighting games, can limit the actual games developed in this genre.

Another key note here is that the low score of vehicle simulations shows that investing in such a game as an intergenerational game might not be the best approach.

Additionally, designers can produce hybrid genres out of the current proposed rankings, so the game can appeal to a wider range of audience.

V. Conclusion and Future Work

The most important factor when designing a game for such a broad audience is that their personal preferences play a huge role in whether they like the game or not, and as Rice, Cheong, et al. [16] put it, "one size doesn't fit all"; yet some similarities exist that can be used as general guidelines and frameworks for designing future games.

This paper tried to find a correlation between current industrialized game genres, and influential factors for designing a game that is appealing to both seniors and children considering their preferences, gaming habits, needs, and their physical or cognitive limitations.

The ideas introduced in this paper are based on current game genre classifications that might be subject to change in the future, thus more detailed research into more concrete categorizations acceptable to the industry, scholars and the audience becomes necessary.

I acknowledge that that the proposed results still require further research and even though the source material has been empirically validated in prior research, one limitation of this study was the lack of field work in the area and it being theory-driven. Future researchers are welcomed to analyze the results of this study in action.

Furthermore, advancement in technology can give rise to genres, or types of play that haven't been previously discussed, and they may allow much easier approaches for designing an intergenerational game.

Acknowledgment

The assistance provided by Mr. Ali Vahidi in editing this paper was greatly appreciated.

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