

# “It’s Easier to Play Alone”: A Survey Study of Gaming With Disabilities

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Within gamers, disabled people remain an understudied minority. While research indicates that they actively play single-player games, we lack an understanding of their experience with multiplayer games. This study aims to answer the following research questions: (a) What kind of games do disabled people play? and (b) Why do disabled people not play multiplayer games? The questions are answered using survey data focusing on playing digital games as a person with disabilities. In total, 92 answers were analyzed. The findings suggest that disabled people play both single-player and multiplayer games and they play games for the same commonly reported reasons as players without disabilities do, although demographics seem to be a key differentiating factor among them in their playing habits, rather than disability differences. However, disabled people reported that they play single-player games more often. We identified four themes from our data that explain why multiplayer games are played less, which are: playing games company and insecurity about one’s own skills, lack of relaxation while playing, lack of game accessibility, and lack of interest. Our results indicate that much more work is needed to ensure, especially the social, as well as the technical accessibility of multiplayer games.

**Keywords:** game accessibility, single-player games, multiplayer games, playing habits

There are over 3 billion gamers in the world according to recent statistics (Statista, 2021). At least a third of those gamers experience a disability that affects or fully hinders their use of games (Moss, 2014). This estimate of gamers with disabilities could, in fact, be higher depending on how disability is defined and on gamers’ willingness to disclose disability. Globally, over 1 billion people have a disability, and the number of disabled people is dramatically increasing due to congenital reasons, aging, wars, and natural disasters among many reasons (World Health Organization, 2020). Potentially, many of these individuals play games, more than we have accounted for in previously mentioned gamer estimates. According to the *accessibility in gaming report*, 66% of gamers with disabilities said that they face barriers or issues related to gaming (Scope UK, 2022). Furthermore, according to our survey of gamers with disabilities, 91% claimed that disability affects their gaming.

Work on game accessibility (making games more playable for everyone, especially disabled people) has accelerated in the last 20 years, as is also confirmed by the participants of our survey. Game developers are paying more attention to implementing

various accessibility options and some developers are making games that are purposely designed for disabled people, such as audio games. More accessibility settings (such as game speed and contrast modifications) are appearing in games, in fact, according to our survey, 65% played games with built-in accessibility settings. Still, it seems that some games are lacking knowledge of even the most basic accessibility features and existing accessibility settings should be added to every game to make the games more accessible (Baltzar et al., 2022). Our findings also confirm these observations as 49% of the participants agreed that games are currently not accessible to them. Furthermore, 71% agreed that they would play more if games were more accessible. This all indicates that much more work is needed in the game accessibility field.

Previous research has investigated the internet experiences of autistic people (including their experience with games; Gonçalves et al., 2020), others studied the experiences of disabled people with audio games through interviews (Urbanek & Gldenpfennig, 2019), investigated visually impaired people’s habits, opinions, and concerns focusing on digital games (Andrade et al., 2019) and practical maneuvers of young disabled people related to digital games (Wsterfors & Hansson, 2017). Most of this research has focused on single-player games, a single type of disability at a time, and was conducted with small sample sizes. However little (Porter & Kientz, 2013) to no research has explored the experience of disabled people with, especially, multiplayer games, nor compared multiplayer games with single-player games across disabilities. The aim of this study is to address this clear gap through a survey.


This study focuses on the following research questions: (a) What kind of games do disabled people play? and (b) Why do disabled people not play multiplayer games? The research was conducted as a survey at the beginning of 2022. The study focuses on multiple types of disability: vision, motor, hearing, cognitive, and neuropsychiatric.

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## Background

To better understand what this study refers to when discussing accessibility in games and players/gamers with disabilities (used interchangeably in this study), some basic concepts need to be defined. The coming sections shortly define disability, multiplayer game, single-player game, and game accessibility within the context of this study.

### Disability

Two different models are often used in defining disability (Shakespeare, 2005): the medical model and the social model. The medical model is linked to remedying or managing a diagnosis, and it supposes that disability negatively affects functioning in society. The social model understands disability more as a social construct, that it is society that decides what a disability is and what is not. These models differ from each other tremendously, although they may occasionally overlap or benefit each other. The medical model states that the person is faulty, and the social model sees the person as unique and society as faulty (Haegele & Hodge, 2016). In practice, the medical model focuses on individual and disability-specific solutions, for example, on providing people with magnifying glasses, hearing aids, adapted controllers, and many such assistive technologies, so that the person with a disability can have access to the game. The social model, while still welcoming of many solutions from the medical model, takes a step back and asks how games can be designed in more intuitively accessible and inclusive ways in the first place, whenever possible. It investigates why social access barriers are in place, for example, just because it has become the social norm that games have small fonts, low contrast, complex controls and so on, which can all be access barrier, not only to disabled people, but to universal design and to the design of games with better usability. In the social model, hence, the idea is to use assistive technologies and adapted solutions when needed, but to also change the society in such a way that disabled people can live in it equally without “special” accommodations. Furthermore, the aim is that everyone can play games more enjoyably, for example, with the use of various accessibility settings and adapted game controllers that can make a game more universally accessible.

Disabilities vary depending on the person, for instance, visually impaired people include legally blind people, people with colorblindness, and people with low vision. Disabilities could be seen more as a spectrum since there is no one common “disability experience” or way disability is manifested (Shakespeare, 2005). The most common types of disabilities are sensory (hearing and vision); physical (mobility); and cognitive (aging, learning, reading) disabilities (World Health Organization, 2020). In addition, in this research, neuropsychiatric disabilities (ADHD, autism) are considered. The disability can be temporal, permanent, dynamic, or situational, for example, a person with a broken hand, who can use only one hand for playing, is temporarily disabled. A person who has night blindness is situationally disabled. In this study, all disabilities are considered regardless of their severity and form.

### Multiplayer and Single-Player (Video) Game

Game researchers have not yet agreed on a definition of a game. However, games can be defined, for example, based on their rules, purpose and function, artifact or activity connected to it, social connection, a player’s meaning-making, a player’s role, competition and conflict experiences, goals and end conditions, or coherence

(Stenros, 2017). This study focuses on digital games; thus, board games are excluded. More specifically, the study focuses on multiplayer games as they most especially need accessibility research attention.

Multiplayer games, however, as a subcategory of games, are easier to define according to key characteristics. According to Zagal et al. (2000), multiplayer games have six different characteristics: (a) social interaction, the amount of interaction varies but it is significantly present; (b) experiences of competition and cooperation; (c) synchronicity: players take part simultaneously in the game; (d) coordination between the players; (e) prop and tool dependence without which the game rarely takes place; and (f) existence of meta-gaming, that is, communications about and defining information of gaming. On the contrary, according to Korhonen and Koivisto (2007), multiplayer games can have two or more players in the same game sessions, but players may play games asynchronously, bringing the synchronicity point at least of Zagal et al. (2000) under debate. Playing multiplayer games can happen online, or locally with multiple or single devices.

In this research, a multiplayer game is defined in the same way as it was defined in our survey: as a summative definition of the previously discussed two definitions. A multiplayer game is a video game, that more than one person can play at the same time, or in turns, in the same environment either locally or online with a game console or computer. In this study, single-player games are seen in comparison to multiplayer games as digital games that a person plays alone. In some games, there are both single-player and multiplayer modes available.

### Game Accessibility

According to Mangiron and Zhang (2016), game accessibility can be approached in two different ways. The first way is through design for all, in other words, all games should be made accessible to all people (Mangiron & Zhang, 2016). According to Westin et al. (2011), similarly, game accessibility is adapting a game’s hardware and software, for example, controllers, difficulty, or feedback modality, to individual needs, regardless of having a disability or not. According to Mangiron and Zhang (2016) and Archambault et al. (2007), game accessibility’s goal is to bring the idea of accessible games to the mainstream and provide different approaches to implement it.

The second approach to game accessibility is to target different user groups with specific games or modifications that suit them (Mangiron & Zhang, 2016). According to Westin et al. (2018), game accessibility is removing barriers faced by disabled people within the limitations of game rules. It depends on the disability, how the game should be made accessible (Westin et al., 2018). International Game Developers Association (IGDA) (2004) also had a similar approach to accessibility, seeing it through disabilities. Accordingly, “game accessibility can be defined as the ability to play a game even when functioning under limiting conditions. Limiting conditions can be functional limitations, or disabilities such as blindness, deafness, or mobility limitations” (IGDA, 2004).

Game accessibility could be also defined as offering different accessibility options in the game. Accessibility options can also be called accessibility settings or features. Accessibility settings can include, for example, modifying the game’s visual content (font size, colors, contrast, etc.) or the auditorial content (menu narration, volume levels, etc.). In addition, accessibility features can focus on adapting game controls (remapping buttons, toggles, etc.) or the gameplay (changing the game speed, ledge guard, different cues, etc.). Furthermore, audio descriptions in text or through visuals can enhance game accessibility (Mangiron & Zhang, 2016).

This article defines game accessibility according to Westin et al. (2011) and Archambault et al. (2007). Game accessibility does not need to be seen through disabilities. Further, there is no need to design games targeted at, for example, only visually impaired people, instead, every game should be as accessible as possible to everyone. Game accessibility benefits all players, not only the disabled, for example, in *Uncharted 4*, 9.5 million people played the game with an accessibility option and it is very likely that many of these people did not have disabilities (Gerblick, 2021).

Through such a lens, game accessibility comes akin to universal design, or design for all, where the aim is to produce products usable by everyone without any use barriers (Story, 2001). While the outcomes of game accessibility, as mentioned, are games that are more usable by everyone, it is important to still distinguish it from universal design as many definitions of game accessibility has disability at its core; focusing on mainly providing access to people with disabilities who have long been disregarded in games, and if accessible games end up universally accessible, that is a merry side outcome, rather than an intentional departing point in design (see Dolmage, 2017 for an extended treatise on accessibility and universal design).

## Methodology

The research was conducted as a survey. Surveys are often utilized to measure attitudes, perceptions, and experiences across a large number of people (Fransella, 1981). They allow access to the respondents' individualized perception of their reality, which is our purpose here in understanding gaming experiences of disabled people. While interviews could have allowed more room for probing, qualitative research rarely allows for a wide-scale investigation as is allowed by surveys (Mugenda & Mugenda, 1999). The next sections will briefly describe more of the conducted survey, participants, and analysis.

### Survey Items

The survey was conducted through Microsoft Forms, from February 25, 2022 to April 25, 2022. It was conducted in English and Finnish, and was made considering different disabilities and accessibility needs, for example, the survey worked with various screen readers. The survey was distributed to several disability organizations via email, on Twitter, and in different accessibility-related Facebook groups.

The survey questions ranged between multiple-choice questions and open-ended questions, which were created based on the research questions. The questions were mostly developed through iterative discussions between three experienced researchers with backgrounds in gaming and accessibility. Similar surveys by other researchers were consulted and two questions "What type of video games do you play?" and "I play video games for the (reasons for playing games) . . ." were taken from the Accessible Gaming Survey (RNIB, 2022). The estimated time to fill in the survey was 15–25 min. Most participants were spending more time with the survey, than we had initially anticipated, this was reflected in the quality of the open-ended answers we got. On average, people spent 26 min and 38 s filling out the survey.

A pilot study was conducted with two people with disabilities. Based on that, some questions and wordings were revised. The final utilized survey had 34 questions. First, the questions asked for background information, for example, age, country, and type of disability. After that, the questions focused on different accessibility settings and assistive products, asking

which do the respondents use. Next, the questions asked for playing hours per week, playing platforms, and overall playing habits. Lastly, the questions focused on the most accessible games that the respondents had found and their suggested changes to game accessibility in general, if any.

### Participants

The study was distributed to various disability organizations mostly in Finland (*Vammaisfoorumi ry; Heta—Henkilökohtaisten avustajien liitto ry; CP-liitto; Suomen Kuurosokeat ry; Lihastautiliitto ry; Kynnys ry, Akson ry, Näkövammaisten liitto ry, Neuroliitto ry, Aivovamma-liitto ry, Aivoliitto ry, Invalidiliitto ry, Kuuloliitto ry, Kuurojen liitto ry, Parkinsonin liitto ry, World Blind Union, World Blind Union Europe, European Disability Forum*) via email and they were asked to share the survey on their channels. In addition, the survey was distributed through the personal and university social accounts of the authors on Twitter and different accessibility-related Facebook Groups (*Accessibility Advocates; Disability Awareness and Advocacy; Game Accessibility [IGDA-GASIG]; Game Devs for Diversity*). After this, we used the snowball method for gathering answers, we trusted that participants and different disability organizations will share the survey with other potential participants. In total, 95 responses were collected from which three were excluded since the participants did not play multiplayer games or single-player games at all or they were not disabled.

### Analysis

The analysis was carried out using computer-assisted qualitative data analysis software *ATLAS.ti* (version 22; ATLAS.ti Scientific Software Development GmbH) and Microsoft Excel programs. The data analysis process started with collecting the data from both survey versions, English, and Finnish, and combining them. After that, the first close reading was made which resulted in excluding two participants since they did not play games at all, and the survey was targeted to disabled people who play games. Quantitative data were mainly analyzed using Excel. Next, the qualitative data were considered and analyzed in-depth.

The qualitative data analysis started with modifying the data to the right format for *ATLAS.ti*. While adding the survey data to the program, key demographic variables (e.g., gender, gaming experience, age) were used by *ATLAS.ti* to automatically create document groups that combined answers across similar demographic groups under one variable (e.g., combine answers from males, females, or nonbinary people, based on the variable "gender"). This way, we could compare, for example, gender differences. In addition, the program automatically created a document for each participant and automatically coded each survey question. Some of the document groups were combined across Finnish and English. The next step of the analysis process was close reading the material once again and conducting data-driven coding. The coding was made with different perspectives in mind: for example, in the question "If you don't play multiplayer games, what is the reason for it?" The perspective was to consider why the participants do not play multiplayer games. In the process, some interesting new perspectives arose, and more coding was done. Finally, the coding was analyzed with the help of tools provided by *ATLAS.ti*, and various code groups (themes) were created.

## Results

The study aims to address the following two research questions:

- a. What kind of games do disabled people play?
- b. Why do disabled people not play multiplayer games?

To answer the questions, first, some relevant background information on the participants and their disabilities and playing habits are presented. After that, the research questions are handled more in-depth. The first research question is answered using mostly quantitative data and the second question using qualitative data.

### Demographic Information

The most present age group was 25–34 years old ( $n = 30$ ); after that clearly present groups were 35–44 years old ( $n = 25$ ) and 18–24 years old ( $n = 16$ ). Some participants were also in groups under 18 years old ( $n = 8$ ), 45–54 years old ( $n = 8$ ), 55–65 years old ( $n = 4$ ), and over 65 years old ( $n = 1$ ). All age information can be seen from Table 1. Most participants were from Finland ( $n = 65$ ) as shown in Table 2. Other named countries were United States

**Table 1 Age**

Age ( $n = 92$ )	
Age (years)	Frequency
Under 18	8
18–24	16
25–34	30
35–44	25
45–54	8
55–65	4
Over 65	1

**Table 2 Country**

Country ( $n = 92$ )	
Country	Respondents
Finland	65
United States	9
United Kingdom	4
Germany	4
Canada	2
France	2
Sweden	2
Malaysia	1
The Netherlands	1
Spain	1
Austria	1

**Table 3 Gender**

Gender ( $n = 92$ )		
Gender	Frequency	%
Man	44	47
Woman	35	38
Nonbinary	10	11
Prefer not to say	3	3

( $n = 9$ ), United Kingdom ( $n = 4$ ), Germany ( $n = 4$ ), Canada ( $n = 2$ ), France ( $n = 2$ ), Sweden ( $n = 2$ ), Malaysia ( $n = 1$ ), Netherlands ( $n = 1$ ), Spain ( $n = 1$ ), and Australia ( $n = 1$ ).

Forty-eight percent ( $n = 44$ ) of the participants identified as men, 38% ( $n = 35$ ) as women, 11% ( $n = 10$ ) as nonbinary, and 3% ( $n = 3$ ) preferred not to answer the question as shown in Table 3. Of the respondents, 68% ( $n = 63$ ) had one disability, 20% ( $n = 19$ ) had two disabilities, and 11% ( $n = 10$ ) had more than two disabilities. The most common disability group was people with physical disabilities ( $n = 49$ ), and after that vision ( $n = 32$ ), neuropsychiatric ( $n = 26$ ), hearing ( $n = 13$ ), and cognitive ( $n = 7$ ) disabilities as seen in Table 4.

### Gaming Background

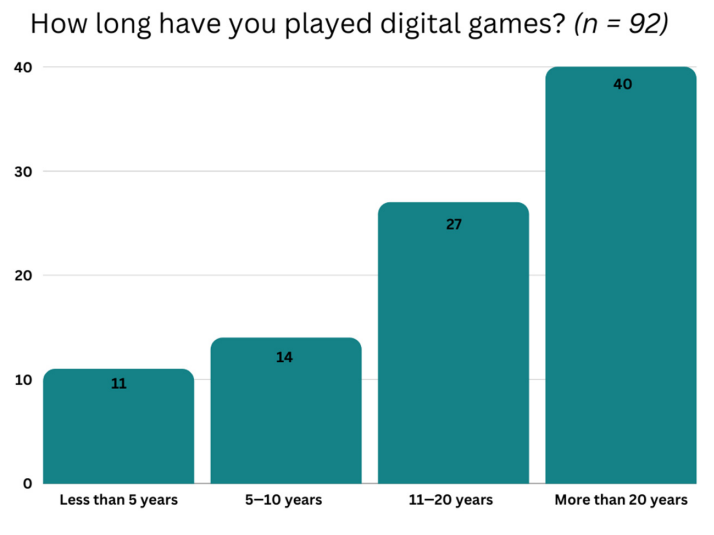
The participants were rather experienced gamers as we can see in Table 5 and Figure 1. 43.5% ( $n = 40$ ) of the respondents had been gaming for more than 20 years and 29.5% ( $n = 27$ ) for 11–20 years.

**Table 4 Disability**

Disability ( $n = 92$ )	
Disability	Frequency
Physical	49
Vision	32
Neuropsychiatric	26
Hearing	13
Cognitive	7

**Table 5 Playing Experience**

How long have you played digital games? ( $n = 92$ )		
Experience (years)	Frequency	%
Less than 5	11	12
5–10	14	15
11–20	27	29.5
More than 20	40	43.5



**Figure 1** — Playing experience.

The median gaming hours was 11–15 hr of playing digital games per week, all playing hours can be seen in Table 6 and Figure 2. There were no clear differences between the disability groups and the time used for playing digital games per week.

The results indicate that there is a clear difference between playing multiplayer and single-player games. Approximately 70% ( $n = 64$ ) of the respondents played single-player games several times per week and 4% ( $n = 4$ ) said that they never play single-player games, as can be seen from Table 7 and Figure 3. Half of the respondents who never play single-player games had a physical (motor) disability, and the other half had a vision disability. On the contrary, only 45% ( $n = 41$ ) played multiplayer games several times per week. Eighteen percent ( $n = 17$ ) of the participants claimed that they never play multiplayer games. Of the respondents who never play multiplayer games, 35% ( $n = 6$ ) had a physical disability, 18% ( $n = 3$ ) had a vision disability, 18% ( $n = 3$ ) had a neuropsychiatric disability, and 29% ( $n = 5$ ) had more than one disability.

Forty-one percent ( $n = 38$ ) of the respondents played multiplayer games online several times per week and 23% ( $n = 21$ ) of the participants never played multiplayer games online. Locally, only 4.5% ( $n = 4$ ) of the respondents played multiplayer games several times per week and on the contrary, 39% ( $n = 36$ ) never

played multiplayer games locally. Of the respondents, 82% ( $n = 76$ ) played multiplayer games at least sometimes and 76% ( $n = 70$ ) were communicating, being social, during playing. All information related to playing multiplayer games can be seen from Table 8 and Figure 4, Table 9 and Figure 5, and Table 10 and Figure 6.

According to the data, people with disabilities play mostly on PC, including Mac ( $n = 73$ ), and with a phone, including iPhones and Androids ( $n = 50$ ), as can be seen from Table 11 and Figure 7. The most popular console was Nintendo Switch ( $n = 27$ ). Of the respondents, most played on more than two platforms ( $n = 42$ ), and 19 participants only played on PC.

### What Kind of Games Do Disabled People Play?

According to the survey, the most popular game genres were adventure ( $n = 60$ ), strategy ( $n = 52$ ), role playing games ( $n = 45$ ), simulation ( $n = 45$ ), shooter ( $n = 44$ ), and racing ( $n = 41$ ). All offered types of games got at least nine answers as can be seen from Table 12 and Figure 8. Most people who played audio games had a vision disability, but otherwise there was no clear correlation between disability type and the played game genre. It is also noteworthy that many games can fall into many genre categories, such as shooter

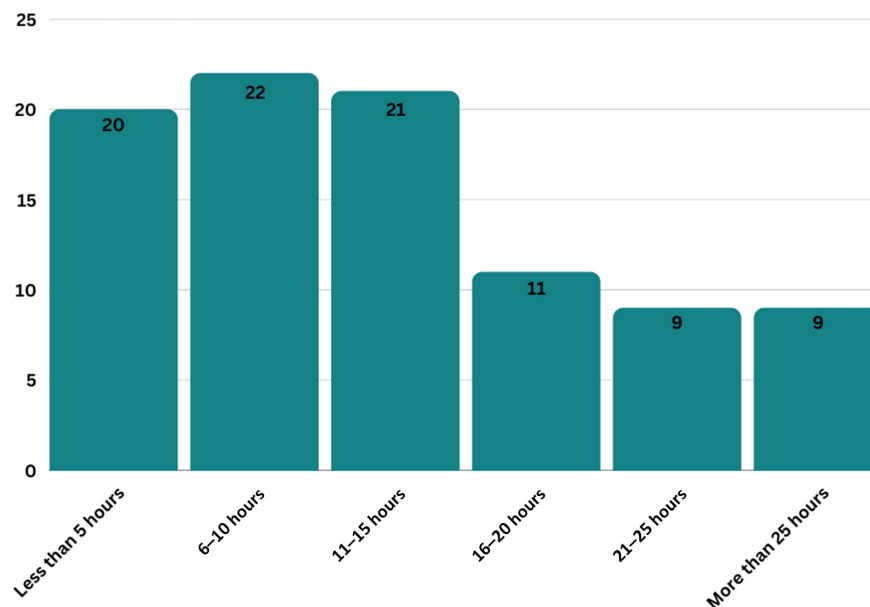
**Table 6** Playing Hours per Week

How many hours per week do you play digital games? ( $n = 92$ )		
Hours	Frequency	%
Less than 5	20	21.7
6–10	22	23.9
11–15	21	22.8
16–20	11	12
21–25	9	9.8
More than 25	9	9.8

**Table 7** Playing Single-Player Games

How often do you play single-player games ( $n = 92$ )		
Times per week	Frequency	%
Several times per week	64	70
Once per week	8	9
Once per 2 weeks	6	6.5
Once per month	4	4
Less frequently	6	6.5
Never	4	4

How many hours per week do you play digital games? ( $n = 92$ )



**Figure 2** — Playing hours per week.

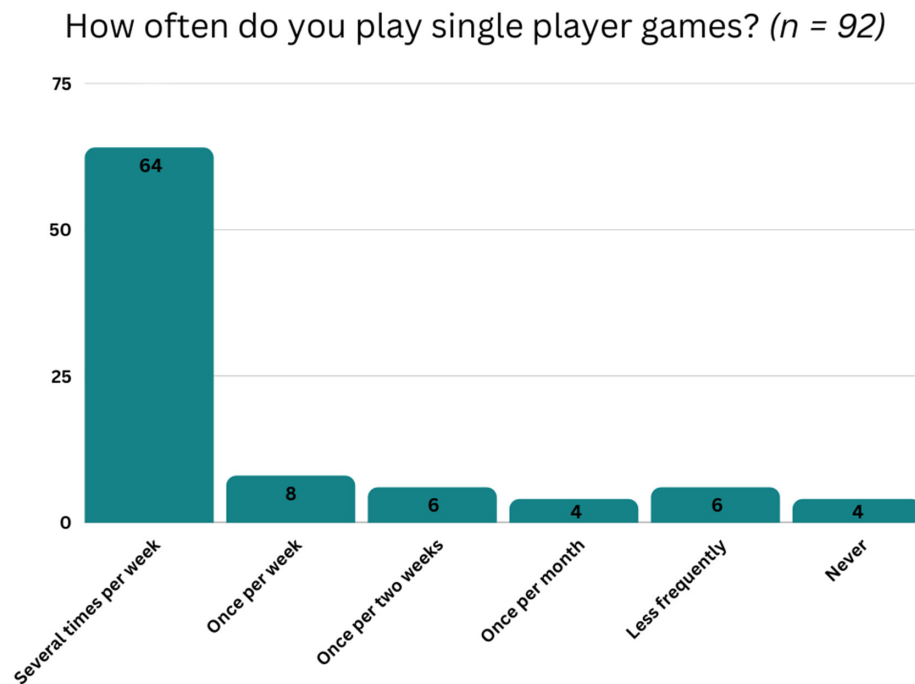


Figure 3 — Playing single-player games.

Table 8 Playing Multiplayer Games

How often do you play multiplayer games ( $n = 92$ )		
Times per week	Frequency	%
Several times per week	41	45
Once per week	5	5
Once per 2 weeks	6	7
Once per month	7	8
Less frequently	16	17
Never	17	18

massive multiplayer online games. We did not categorize any games ourselves but only asked the participants to report the genres they play the most.

Another aspect the survey investigated was finding out if there are some games that are commonly played among gamers with disabilities. Participants named in total over 180 different single-player games and over 110 different multiplayer games. The *Sims Series* (by Maxis and The Sims Studio) was named by 11 players (a combination of all named Sims games). Next, *Horizon Forbidden West* (by Guerilla Games) and *Minecraft* (by Mojang) were the most played individually named games with six players mentioning them. On the multiplayer side the most popular game, *Hearthstone* (by Blizzard Entertainment), was named by seven participants. The most popular games can be seen from Table 13 and Table 14.

In addition, the survey asked, “Which games you have played are the most accessible? Why?” In total, nine people mentioned *The Last of Us* (by Naughty Dog) to be the most accessible game they had played. In this question, noteworthy is that most participants said that they play *Hearthstone* with an accessibility mod, which is targeted at especially people with visual disabilities, otherwise the

game would not have been as accessible. The most accessible games can be seen from Table 15.

### Why Do Disabled People Not Play Multiplayer Games?

As presented in the previous sections, disabled people play less multiplayer games than single-player games. Multiplayer games are played mostly online, but some play them also locally. In total, 82% ( $n = 76$ ) of the respondents at least sometimes play multiplayer games online, or locally. One rather straightforward reason for not playing multiplayer games is that most participants played games to have fun, to relax, or for action as shown in Table 16 and Figure 9. Only 41 participants (44%) claimed that they play for socializing, which is also equal to the number of participants who played multiplayer games several times per week.

Qualitative survey data were analyzed from the perspective of why disabled people do not play multiplayer games, especially focusing on the question “If you don’t play multiplayer games, what is the reason for it?” The question was answered by the people ( $n = 33$ ) who never play multiplayer games and people who play less multiplayer games than single-player games. The reasons for not playing multiplayer games were identified and summarized under four themes: playing company and insecurity about one’s own skills, lack of relaxation while playing, lack of game accessibility, and lack of interest. Each of the themes will be presented in-depth next.

#### Playing Company and Insecurity About One’s Own Skills

“It’s easier to play alone because you don’t have to agree with others, or commit to playing at a certain time, but you can play when you feel like it.” (Participant 31, male; neuropsychiatric disabilities) [Translated from Finnish]

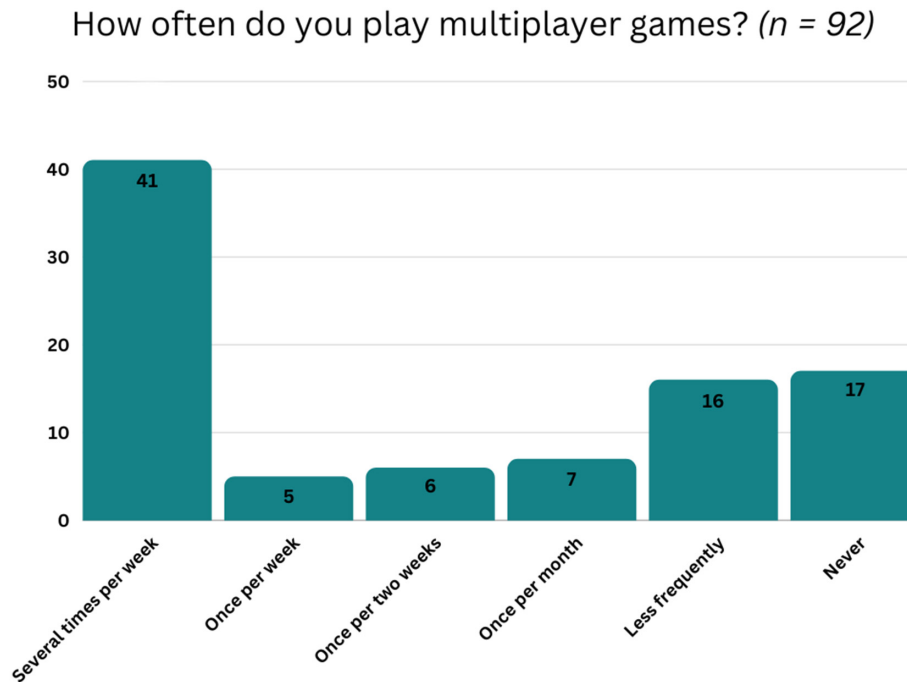


Figure 4 — Playing multiplayer games.

Table 9 Playing Multiplayer Games Online

How often do you play multiplayer games online ( $n = 92$ )		
Times per week	Frequency	%
Several times per week	38	41
Once per week	3	3
Once per 2 weeks	7	8
Once per month	5	5
Less frequently	18	20
Never	21	23

This explanation summarizes a key reason why disabled people do not play multiplayer games: time constraints and the need to negotiate gameplay time with friends. Respondents thought that it is easier to play alone whenever one has the time, and without a need to schedule a certain time to play with friends. Interestingly, respondents who named time constraints as a reason not to play multiplayer games stated that they do play with strangers. Perhaps, it is easier to play with a stranger who happens to be online, and the time constraints mainly exist as a reason why they do not play as much with their friends as they would like to. This remains relatively surprising; however, as most negative social experiences reported by the participants took place when playing with strangers, as we discuss next, yet the majority of the participants still play mostly with strangers.

“It’s hard for me to enjoy them [multiplayer games] alone, but I don’t have the courage/can’t ask friends to join me.” (Participant 66, nonbinary; neuropsychiatric disabilities) [Translated from Finnish]

In addition, some participants mentioned that they avoid playing multiplayer games or at least communicating in the games since they

do not want to face any inappropriate behavior due to being disabled, and specifically in some cases, due to being a female gamer with disabilities. This was a sentiment also expressed by many participants, regardless of nationality. Overall, playing with friends was seen as a positive experience, since the friends knew about the disability, and were highly supportive. On the other hand, more negative experiences rose when playing with strangers, as other players were often rude when the participants did not succeed in the game at the level that the strangers were expecting. Participants also highlighted this as a reason not to play multiplayer games altogether: they did not feel that they were good enough for these games.

Some participants also mentioned that they would rather play single-player games rather than multiplayer games so that they do not need to be worried about someone blaming them for cheating, for example, if they use aim bots. Perceiving accessibility as cheating is a larger topic under intense debate in the gaming community. We cannot be sure if the negative experiences faced by the participants were due to ableism and negative attitudes toward disability from players without disabilities, or due to the previously mentioned experiences of players with disabilities not being able to play at the same level as other players and generally, simply having difficulties with the game itself. However, many participants avoided telling strangers that they were disabled due to these negative experiences, implying that their disabled identity has an influence on the game as can be seen from the following quote:

“However, in my early teens, I learned the hard way that it is not a good idea to tell about your disability in gaming communities, which mainly consist of strangers. Therefore, the people, with whom I spent a considerable amount of my free time as a youngster while playing multiplayer games, do not know about my disability even today, and our friendships never extended beyond the game world. I believe that, with some of them, I might have become friends outside of the game, and still be in contact with them, if I was not

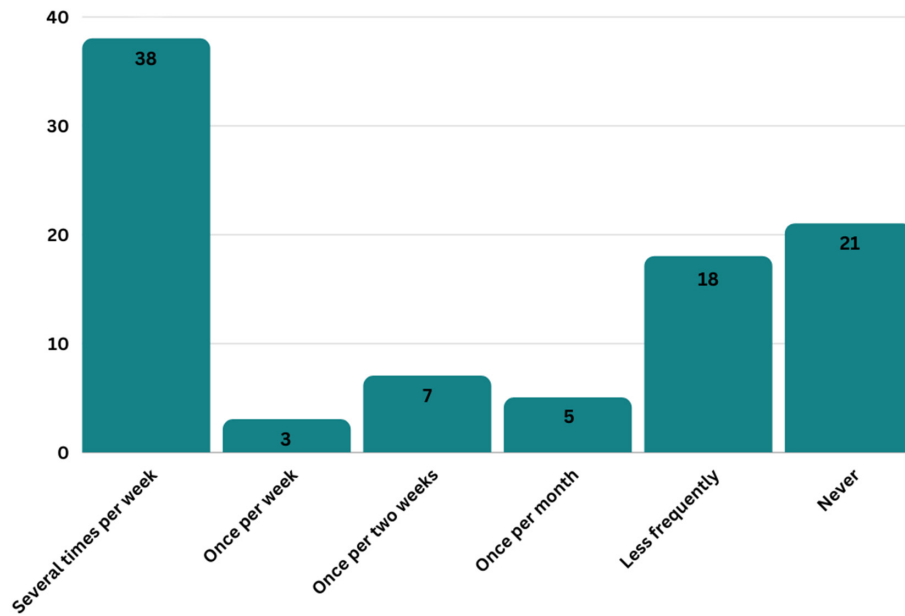
How often do you play multiplayer games online? ( $n = 92$ )

Figure 5 — Playing multiplayer games online.

Table 10 Playing Multiplayer Games Locally

How often do you play multiplayer games locally ( $n = 92$ )		
Times per week	Frequency	%
Several times per week	4	4.5
Once per week	5	5
Once per 2 weeks	4	4.5
Once per month	11	12
Less frequently	32	35
Never	36	39

disabled.” (Participant 32, male; physical disability) [Translated from Finnish]

Disability appears to be connected with feelings of fear of rejection and the need for masking (i.e., trying to act based on mainstream expectations or common behaviors, so as not to stand out from others). As is discussed in the coming sections, these form an emotional labor for gamers with disabilities, leading them to potentially feel tense during and avoidant of social gaming.

#### Lack of Relaxation While Playing

“Gaming is also then [when you play alone] your own time, and you can carefully think about what you are doing in the game, and there is no social pressure to act quickly or in a certain way. There is no social situation as a ‘burden’.” (Participant 31, male; neuropsychiatric disabilities) [Translated from Finnish]

Eighty-three percent ( $n = 76$ ) of the participants claimed that they play for relaxation, so one clear reason for not playing multiplayer games was a lack of relaxation, as seen in the translated

quote. Some participants stated that playing is for themselves and allows them to focus on their own things and recover from the day’s (social) burden. Such relaxation appears to be at odds, for many participants, with the emotional labor of socializing, of masking their disability, or of apologizing for it and the disruption it can cause to others’ gameplay.

In addition, the participants stated that it is easier to focus alone on the game when you can decide on your own and at your own pace what to do next in the game. In addition, there is no pressure to communicate and be social while playing alone.

#### Lack of Game Accessibility

“Because I play at a slower pace due to my poor eyesight, it makes it difficult to play with others.” (Participant 18, female; vision disability)

Thirty-three percent ( $n = 11$ ) of the respondents stated that they do not play multiplayer games due to their disability. For example, participants shared that they are too slow in pushing buttons or that they are worried that their skills are not enough, or that their disability would be in the way of playing. However, no one stated that they would not play multiplayer games due to poor game accessibility, although the point of game accessibility is to eliminate these disability-related participation barriers.

“I don’t think as a blind person I can play multiplayer games as I don’t want to annoy someone by being too slow or not good enough.” (Participant 19, female; vision, physical, and hearing disabilities)

The participants seemed to think throughout the survey that they are the problem and not the game. As we see it, the problems in playing multiplayer games that have something to do with players’ disabilities could, at least to a certain extent, be solved with better



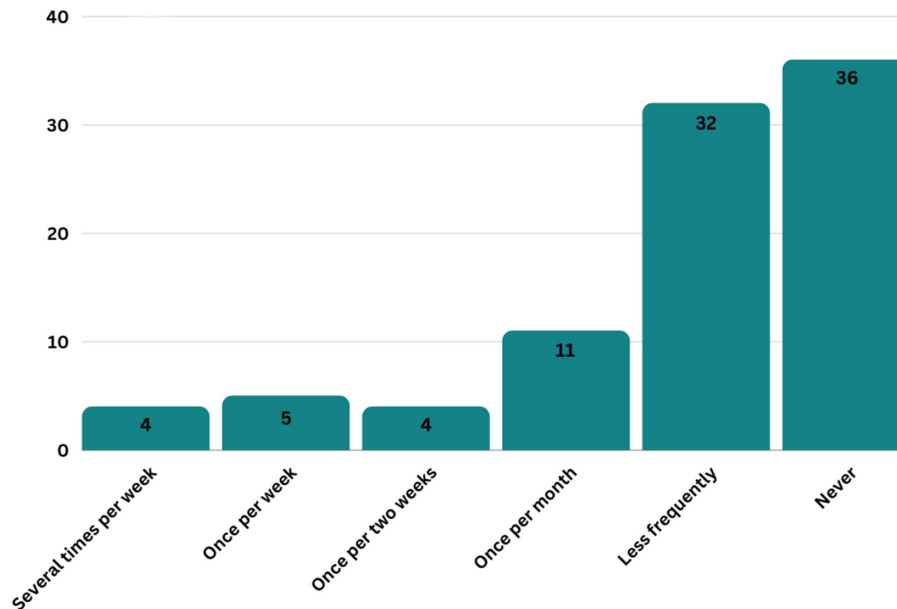
How often do you play multiplayer games locally? ( $n = 92$ )

Figure 6 — Playing multiplayer games locally.

Table 11 Playing Platform

On which platform do you play? ( $n = 92$ )		
Platform	Frequency	%
PC	73	79
Phone	50	54
Nintendo Switch	27	29
PlayStation 4	21	23
Xbox One	14	15
PlayStation 5	13	14
Nintendo Wii/WiiU	10	11
Xbox series x	7	8
Tablet	5	5
PlayStation 3	4	4
PlayStation 2	2	2
NES	2	2

game accessibility. For example, making it possible to slow game speed in a specific server could solve some of the problems of “being too slow.”

#### Lack of Interest

One reason for not playing multiplayer games was purely a lack of interest in the specific games. Participants stated that they do not like competitive action games, so they do not see multiplayer games fit for them.

Some participants played multiplayer games alone and did not see that as playing multiplayer games as they did not interact with other players. Likewise, some participants played multiplayer game’s single-player mode rather than the multiplayer version. In addition, the participants named their disability as at least a

partial reason for not being interested in multiplayer games. Hence, it remains inconclusive whether this lack of interest is genuine or is a result of players with disabilities accepting that these games are not accessible to them.

## Discussion

The aim of this study was to find out what kind of games disabled people play and what are the reasons, why multiplayer games are played less often than single-player games. To reflect on the findings, the “Discussion” section has been divided into three subsections, the first focuses on the interaction between demographics and playing habits, the second focuses on playing multiplayer games, and the third focuses on limitations and future research directions.

### Demographic Differences

The median gaming hours was 11–15 hr of playing digital games per week. Compared with statistics of people who played digital games without disability in general, our respondents are spending more time on games on average, as statistics of the gamer population at large indicate that most people play games for 1–5 hr or 6–10 hr/week (Statista, 2022) or 6–8 hr/week (Entertainment Software Association, 2021). As it seems, the survey participants were highly experienced players who played games more than average, this should be considered while reading the results of this study. It remains inconclusive whether this survey especially happened to reach highly active gamers with disabilities or if gamers with disabilities play games more on average.

While the Entertainment Software Associations claim that 77% of gamers play with others (Entertainment Software Association, 2021), the number of gamers with disabilities who play multiplayer games was significantly less than this estimate, revalidating the lived-experience perception that gamers with

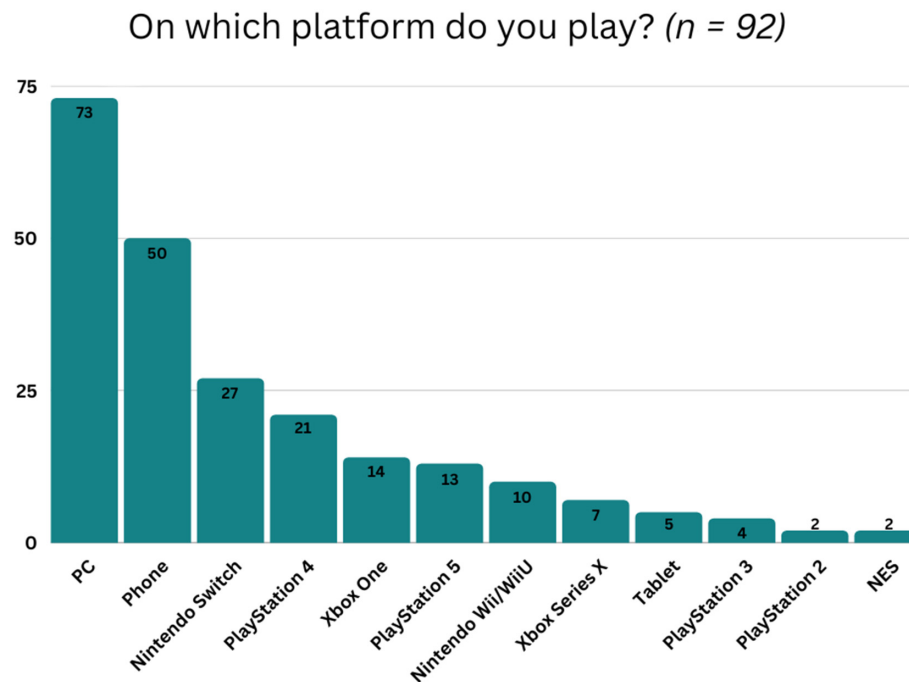


Figure 7 — Playing platform.

Table 12 Game Genres

What type of digital games do you play? ( $n = 92$ )		
Game genre	Frequency	%
Adventure	60	65
Strategy	52	56
Role playing games	45	48
Simulation	44	47
Shooter	42	45
Racing	41	44
Puzzle	39	42
Platformer	33	35
Card	31	33
Massive multiplayer online games	26	28
Sports	24	26
Digital board game	22	24
Fighting	16	17
Audio games	15	16
Rhythm/music	14	15
Gambling	9	10

disabilities do not play multiplayer games. We had specifically set out to find an answer to this question through this survey, which will be discussed in the next section.

Some studies have stated that there would be a difference between women's and men's multiplayer gaming habits (Hainey et al., 2011; Uz & Cagiltay, 2015). Previous research has indeed indicated that within binary gender models, females tend to enjoy sociality in games more than males, although they tend to also experience high levels of toxicity from masculine gamers that can

push them away from certain games (Ngoc, 2022). In this study, some gender differences were seen. Out of the men respondents, 9% ( $n = 4$ ) never played single-player games while all respondents from other genders played them at least sometimes. Surprisingly, however, men in this study were more experienced players 50% ( $n = 22$ ), have mostly been playing games for more than 20 years compared with women from whom only 23% ( $n = 8$ ) have been playing games for more than 20 years, and unlike nonbinary people of whom 80% ( $n = 8$ ) have been playing games for more than 20 years. In addition, related to multiplayer games, there were some gender differences, 20% of both women ( $n = 7$ ) and men ( $n = 9$ ) did not play multiplayer games, and out of nonbinary people, 10% ( $n = 1$ ) did not play multiplayer games. 48% ( $n = 21$ ) of men, 34% ( $n = 21$ ) of women, and 70% ( $n = 7$ ) of nonbinary people played multiplayer games several times per week.

Multiplayer games were played more online compared with local play, perhaps this can also be explained by how participants communicated difficulties in arranging a time to play with friends. Disabled people play mostly computer games and mobile games on phone. The most popular console was Nintendo Switch. As a comparison with Entertainment Software Associations statistics, most people played with their phones (57%) and then game consoles (46%), and lastly, on a computer (42%) (Entertainment Software Association, 2021), according to Lyons (2021), PC was the most popular gaming platform in 2021. The results of our survey, hence, indicate that disability potentially affects what platforms are used in gaming. This makes sense in light of how PCs tend to offer more accessibility options through button remapping and compatible assistive technology, compared with mobile phones that have smaller screens and rely on touch and multiple gestures, all of which are not the most accessible. Nintendo Switch, on the other hand, is relatively more accessible with its highly configurable controllers and larger visual, especially when connected to a TV or monitor. The used platform might have also influenced other responses, such as what games are played.

## What type of digital games do you play? (n = 92)

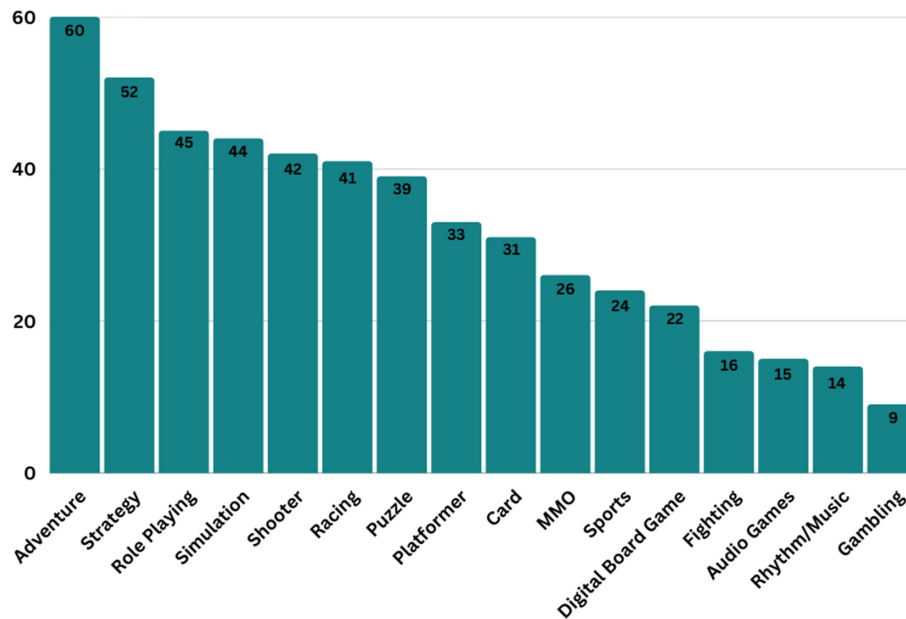


Figure 8 — Game genres.

Table 13 Most Played Single-Player Games

What single-player games do you play? (n = 84)	
Game	Frequency
The Sims Series	11
Assassin's Creed Series	7
Horizon Forbidden West	6
Minecraft	6
Cyberpunk 2077	5
Animal Crossing	5
Pokémon	5
Horizon Zero Dawn	4
The Witcher 3	4
Spider Man	4
The Last of Us	4
Hades	4
Cities Skylines	4
Final Fantasy Games	4
Red Dead Redemption 2	3
FIFA	3

Table 14 Most Played Multiplayer Games

What multiplayer games do you play? (n = 66)	
Game	Frequency
Hearthstone	7
Final Fantasy XIV	6
Mario Kart	6
Grand Theft Auto	4
World of Warcraft	4
Counter-Strike: Global Offensive	4
Warframe	3
Halo Infinite	3
League of Legends	3

Table 15 Most Accessible Games

Most accessible games (n = 92)	
Game	Frequency
The Last of Us 2	9
Hearthstone	7
The Sims Series	6
Forza Horizon 5	4
Horizon Forbidden West	3
Animal Crossing	3
Mario Kart 8	3

### Playing Multiplayer Games

The analysis identified four themes explaining why multiplayer games are played less than single-player games: playing company and insecurity about one’s own skills, lack of relaxation while playing, lack of game accessibility, and lack of interest. Each of the themes will be presented in-depth next.

In the first theme, the notable aspect was the lack of playing company, potentially a common challenge to most social gaming as it requires coordination effort. In addition, some participants mentioned avoiding playing multiplayer games, or at least avoiding communicating in the games since they do not want to disclose their disability and face any inappropriate behavior as a result. Toxic behavior in online games has been widely researched

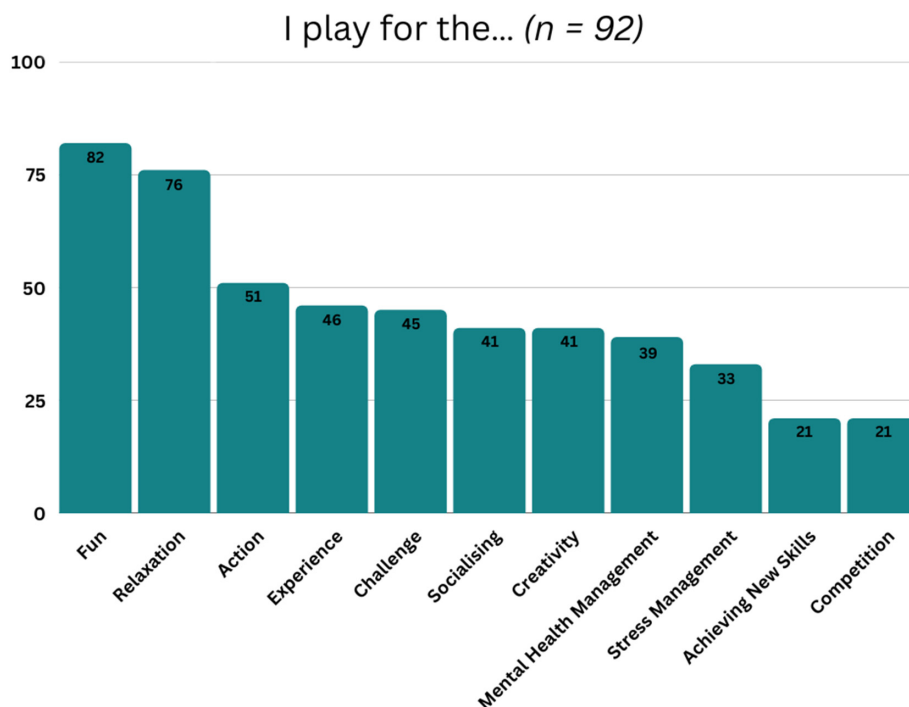
(e.g., Adinolf & Turkay, 2018; Kwak et al., 2015; Martens et al., 2015; Souza et al., 2021) and it can dominate social interaction when a stigma aspect, such as disability, is brought to the conversation. Similar toxic experiences are reported by women and nonbinary people when their gender identity is revealed in-game (Ngoc, 2022), as well as Black people and people of racial minority in their gaming community (Nakamura, 2012; Ortiz, 2019). These similar observations across minority groups within game research (Shaw, 2012) reinforces ideas put forward by the disability justice framework that systems of oppressions behave in similar ways and intersectionality is important in examining them (Berne et al., 2018).

With regard to the insecurity about one’s own skills and social retaliation to failure in games, this is an experience shared between gamers with and without disabilities (Fox et al., 2018). When a player is just learning a game, they might get aggressive comments related to the player’s performance, which hinders the gaming experience and lowers the players’ trust in their own skills. These comments can be expected to become more personal, and dark when combined with a player disclosing disability as the cause of their struggle. Empathetic responses to disability were rarely, almost never, reported by the participants.

In the second theme, we saw that disability has become the most ready explanation for why disabled people do not play multiplayer games, rather than the more actionable reason of the lack of game accessibility being seen as the problem. Thirty-three percent (n = 11) of the respondents stated that they do not play multiplayer games due to their disability. However, no one stated that they do not play multiplayer games due to poor game accessibility. Likewise, none of the participants stated that a game has technical issues, which gamers without disabilities often reflect on in other studies (Fox et al., 2018) as a theme that hinders the game experience or frustrates the players. It seemed that

**Table 16 Motivation to Play**

I play for the ... (n = 92)		
Motivation to play	Frequency	%
Fun	82	89
Relaxation	76	83
Action	51	56
Experience	46	50
Challenge	45	48
Socializing	41	44
Creativity	41	44
Mental health management	39	43
Stress management	33	35
Achieving new skills	21	23
Competition	21	23



**Figure 9** — Motivation to play.

participants thought that they were the problem and not the game. At the beginning of the survey, the participants were asked to describe how their disability affected their gaming. It might be possible that this question framed later responses and made the participant less likely to report game accessibility as a problem but themselves. It is possible, however, that we have also stumbled on a systemic issue, attributed to the medical model of disability, where disability has long been framed as the problem.

The third identified theme focused on the lack of relaxation in games, people were playing to relax from the day's stressful activities. Other studies (Kuo et al., 2016; Liao et al., 2022; Warmelink et al., 2009) have used the term *game escapism* to refer to playing games to relieve stress and escape from the real world, the games they are referring to are mostly online games, often multiplayer. There, however, appears to be an unexplored difference in escapism games between people with and without disabilities.

The last identified theme was a lack of interest in multiplayer games. As there are different types of people, player types (e.g., killers, achievers, socializers, and explorers; Bartle, 1996); play orientations, such as cerebral, social, and physical (Whitton, 2007); and reasons to play, it is natural that all game types do not interest all people. Some people were playing multiplayer games alone, which seemed to be rather common among all players (Ducheneaut et al., 2006; Korhonen & Koivisto, 2007; Vella et al., 2015). Others communicated that they dislike multiplayer games altogether. It remains inconclusive whether this lack of interest is genuine or is a result of players with disabilities accepting that these games are not accessible to them.

## Limitations and Future Research

One limitation of this study is the number of Finnish players who dominated this survey, the results might be different if other countries would have been more present in the survey. On the other hand, while most research focuses on English-speaking populations, this research is unique in its pool of participants. The participants were, also, highly experienced players so less experienced players should be more represented in future research. In addition, gamers with motor (physical) disabilities were over-represented in this study, compared with other disabilities. Furthermore, one limitation is the rather small sample size of this study. While the number of participants in this study is small, it is significant in light of the study target group being hard to access. For future research to contribute results more generalizable, more participants should be recruited, across more countries, or the participants should be interviewed to compensate for generalizability with depth. Nonetheless, future research should not only attempt to increase the sample size, but to focus it on one specific disability group at a time to allow for a much richer disability-specific analysis.

This study is also a survey study, reliant on recollection of self-reports, and is hence, like any method, subject to limitations. Another step forward would be to study accessibility in multiplayer games in practice by observing how disabled people play, or by analyzing the discourse on their gamer groups. In addition, since there are no game accessibility guidelines targeted at multiplayer games, they should be made. Future researchers are also encouraged to conduct interviews to explore the nuance of the themes reported in this study, as well as observational studies that can reflect on unfolding gaming behavior rather than self-reports.

In the analysis process, it became clear that both gamers and developers need to be involved in the conversation and make each other more aware of the different solutions there are and how to use them. Perhaps some of the presented problems of gaming with a disability could be rather easily solved if gamers' needs were more visible to the developers. For example, some participants mentioned it was difficult to find playing company and they were insecure about their own skills. One solution for this could be making dedicated game servers for popular games for players with disabilities or players who are not playing the game perhaps at a competitive level with others. Those specific servers could also allow using different tools, such as aim bots, to make the game experience better for everyone with no fear of being accused of cheating. The servers could make players more confident about their skills and finding play-company at the same level could become easier.

Also notable is that this research does not offer findings on the accessibility of emerging games, such as VR or AR games, which need investigation as well, especially as they gain popularity. Likewise, playing and spectating esports is more popular than ever, future research could focus on how disabled people participate in esports culture.

Other points for further research pertaining to exploring the emotional states occurring while gaming with a disability. Our research indicates that gamers with disabilities mask their behavior a lot and have come to mostly blame their disability for the lack of game accessibility. How does that connect to negotiating their personal and gamer identity? If we consciously enter the research space with disability removed as the main barrier, what solutions would gamers with disabilities put to the floor? What other social experiences are they likely to experience in multiplayer games besides exclusion and bullying? In exploring these questions, and many others, it would be imperative to pull in theoretical angles from disability studies, which is surprisingly rare in accessibility research although accessibility inherently deals with disability. While the background section and approach of this research focused on the social model of disability, it would be insightful to investigate game accessibility from a disability justice framework perspective (Berne et al., 2018) that examines disability in relation to other systems of oppression, such as those around gender or race. Similarly, just to name another example, a Nordic disability model perspective (Shakespeare, 2005) could enrich our understanding of the relative and subjective nature of disability that means that we can all be disabled, in a situation or another.

Overall, games are mediums with high social and creative potential. To a group of people who might experience difficulties in navigating the real world with a little sigh, mobility, or other disability, multiplayer games could especially become platforms for social integration and for disabled people experiencing many life experiences they may not otherwise experience, such as driving (in a game) with low vision. How do we get to such an inclusive, positively experienced gaming world? This research is a conversation starter. It encourages research that paves the way for such a reality.

Finally, while we focused, in this study, on understanding gamers with disabilities, we encourage future studies to conduct comparative studies of gamers with and without disabilities to arrive at unique influences disability has on gaming, as well as the extent to which gamers without disabilities may be using or appreciative of accessibility features designed for gamers with disabilities.

## Conclusions

This study's aim was to address the following research questions: (a) *What kind of games do disabled people play?* and (b) *Why do disabled people not play multiplayer games?* The questions were answered based on the collected survey data.

As presented, the data suggest that disabled people play mostly the same type of games as all other gamers. The most played games are mainstream games and not any specifically designed games for players with disabilities. In fact, the most named games are mostly among the most played and popular games in the world (James, 2021). The participants played adventure and strategy games the most, but several other game genres were also highly present. To address the first research question, the data suggest that disabled people play both single-player and multiplayer games; however, multiplayer games are played noticeably less. In addition, multiplayer games were most commonly played online, rather than locally. The data also suggest that disabled people mostly play computer games and mobile games with a phone. The most popular console was Nintendo Switch. To conclude, the results indicate that disabled people play as any other player.

To address the second research question, four themes were identified focusing on why multiplayer games are played less than single-player games: playing company and insecurity about one's own skills, lack of relaxation while playing, lack of game accessibility, and lack of interest. While disability was often presented as the main obstacle to multiplayer gaming, the challenges caused by disability appear solvable with accessibility work as discussed in this research. To conclude, we are just at the beginning of making games truly accessible for all.

## Acknowledgments

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