Digital Gaming During the Early COVID-19 Pandemic: Healthy Escapism and Social Connectedness

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ABSTRACT
The aim of the current study was to study and understand changes in digital gaming in response to the early COVID-19 pandemic and the related restrictions. A sample of 146 gamers from the US, Europe, and India participated in an online survey probing their gaming both quantitatively and qualitatively during the period of two months preceding any COVID-19 restrictions and during the first months of coronavirus restrictions. An increase in weekly gaming times was reported during the pandemic in overall gaming, online gaming, co-located gaming, gaming alone, and gaming on computers, consoles, and mobiles. The genres played significantly more included (action) adventures, role-playing games (RPGs), shooters, and puzzle/board/card/tabletop games. Qualitatively, the results suggested that much of the increased gaming during the pandemic was related to different forms of healthy escapism, for example, managing boredom and loneliness, coping from stress, seeking mental distraction, and fulfilling the need for social connectedness.

Keywords
Gaming, COVID-19, genre, habit, escapism, social connectedness.

INTRODUCTION
The COVID-19 pandemic and the related restrictions significantly changed people's daily activities and the way they play games, as they were forced to spend more time in their homes. A year later, it seems that some of the changes may be permanent, and remote work and schooling are still the new norms in many places around the world. To best understand the changes occurred in gaming, it would be beneficial to examine the very beginning of the pandemic and compare the early pandemic to the old ways of gaming still prevalent before the pandemic. As it is now, there is already information available on gaming during the pandemic available in the form of statistics, opinion pieces, and research results. However, there is still room for a more advanced understanding of gaming during early pandemic especially based on research results.

When the COVID-19 pandemic began in spring 2020, there were multiple news items and reports of increased gaming, game sales, and game-related Internet traffic throughout the world (see e.g. Amin 2020; Broughton 2020; Pantling 2020). For example, in a report by Unity Technologies Irpan et al. (2020) reported a number of early COVID-19 related changes in gaming including increases in daily active users

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for both gaming on computers/consoles and mobiles, as well as an increase in mobile game installs. On the academic side, many authors highlighted potentially important gaming related benefits and challenges, which had potential to gain central importance during the pandemic. For example, Marston and Kowert (2020) emphasized social and healing benefits of game play as well as their importance for the older age groups. When the pandemic began, it was known that gaming can have therapeutic and health-advancing qualities (Griffiths 2019). King et al. (2020) warned about increasing risk of gaming addiction related to online gaming and suggested approaches to the problem.

At the time of writing this paper, the most extensive research aiming to understand the effects of increased gaming had been carried out by Barr and Copeland-Stewart (2022). Their results based on an online survey showed increased gaming times for most participants and almost exclusively positive perceived well-being effects for gaming during the pandemic. The positive well-being effects identified were related to seven themes: mental health, stress relief, escape, cognitive stimulation, agency, normalization, and socialization. In addition, part of their participants reported no game-related changes in well-being, while negative impacts were not found besides some respondents perceiving games as not productive or good use of the time spent.

Other studies have also been published related to gaming during the pandemic. In his qualitative study on gaming during the early COVID-19 pandemic in Finland, Meriläinen (2022) found six main themes: gaming to cope, social life continues online, situated game play, spending time and money, changing family practices, and permission to play games. The first theme included, for example, escapism and stress relief related aspects, and in the second theme, a major subtheme was connecting with friends and family through gaming. Bengtsson et al. (2021) emphasized the meaning of social aspects during the early pandemic. They found based on their research on young people in Denmark that gaming practices during COVID-19 were beneficial in allowing young people to maintain a social life and in providing a legitimate social space for maintaining friendships and/or coping with boredom. Cmentowski and Krüger (2020) also emphasized the value of social play among the mostly German participants of their research. However, they noted that gaming time increased and social play was in a central role especially among those playing multiplayer games.

Besides above-mentioned themes, it would be beneficial to study the motivations for the changes in game play during the COVID-19 pandemic. Yee (2006) studied motivations behind online gaming and found three overarching components of motivations: according to him there are achievement related, socially related, or immersion related motivations. In a later classification (Yee 2016) he classified the motivations of play based on larger study as action (e.g. excitement and destruction), social (e.g. collaboration and competition), creativity (e.g. design and discovery), immersion (e.g. story and fantasy), mastery (e.g. strategy and challenge), and achievement (e.g. power and completion). These frameworks are used in the interpretation and discussion of the results of the current study.

The current study aimed at understanding some of the most important changes in gaming during the early COVID-19 pandemic, when compared the period preceding the pandemic. To serve this purpose, an online questionnaire was set up with the purpose of understanding changes in the amounts of gaming time, in game genres and individual games played, and the motivations and needs of gamers behind increased gaming. Gaming was studied and analyzed using both qualitative and quantitative methods to gain a more holistic view of the changes in gaming.

METHOD

Participants

The participants consisted of 146 gamers (101 males and 45 females), who reported playing digital games regularly. Out of original 155 responses received, nine responses were discarded due to monotonous answering style in the quantitative ratings or missing qualitative responses. The mean age reported by the participants was 35.5 years (range 18-68 years). In the final sample, there were 74 participants from the US, 48 participants from Europe (of which 23 from Germany and 11 from the UK), and 24 participants from India. The gaming experience reported by the participants was on average 17.7 years (range 3-40 years). 112 participants were employed either full time or part time before the COVID-19 pandemic, and the rest of the participants were freelancers (13), students (8), unemployed (8), retired (2), other (2), or entrepreneurs (1).

The participants reported that their lives had been affected by coronavirus restrictions for 74.9 days on average (range 30-104 days). The types of COVID-19 related restrictions or consequences that the participants had experienced were closed local services (e.g. stores and restaurants, 132 participants), ban on meeting or events (112 participants), work or school switched to remote mode (90 participants), curfew (51 participants), and temporary or permanent layoff from work (41 participants).

There were differences in the severity of restrictions between the main geographical areas studied. US participants reported restrictions as follows: closed local services (95% of participants), ban on meeting or events (70%), curfew (16%), work or school switched to remote mode (57%), and temporary or permanent layoff from work (21%). European participants reported restrictions as follows: closed local services (85% of participants), ban on meeting or events (88%), curfew (40%), work or school switched to remote mode (63%), and temporary or permanent layoff from work (35%). On average, the most severe restrictions were in India: closed services (88% of participants), ban on meeting or events (75%), curfew (79%), work or school switched to remote mode (75%), and temporary or permanent layoff from work (45%).

Procedure

An invitation to participate in the study was sent to the Amazon Mechanical Turk (MTurk) crowdsourcing platform in May 2020, and all the responses were collected between May 21st and June 3rd, 2020. The participants received a small reward of 1.50 US dollars for their participation, and the geographic area for participation was limited to three areas with a large representation of users in MTurk: the US, Europe, and India. The users accepted the task in MTurk based on an explanation of the study and the requirements for participation. The participants were required to be at least 18 years old and live in a region, which had implemented major COVID-19 related restrictions. The target group of the current study was defined as “gamers”, and consequently it was required that all the participants were regular weekly gamers with at least two hours of average gaming time per week. The estimated completion time of the questionnaire was 15 minutes.

After accepting the task, the participants were given a link to the main questionnaire, which was a web questionnaire developed using the Webropol survey tool. After completing the questionnaire, the participants were given a code, which they could enter in MTurk to claim their reward. The organizer then checked all the individual responses in Webropol system and accepted the related tasks and payments in MTurk.

Tasks and materials

The web questionnaire titled “Gaming and the coronavirus - international survey for gamers” consisted of seven pages and utilized a mixed methods approach consisting of quantitative and qualitative items. On the first page of the web questionnaire, the participants were given the general instructions for the questionnaire. They were also told that their participation is completely voluntary, and the responses will be confidential and anonymous. At the end of the page, the participants were also prompted to type their Amazon Mechanical Turk Worker IDs and indicate, whether they meet the requirements for participation mentioned above.

On the second page, the participants were presented with six questionnaire items. First, they were asked to input age in years and choose gender from three options: female, male, or other/would not like to answer. After that, they were prompted to choose their occupation just before the COVID-19 pandemic from eight options (listed above in the participants section), input their country of residence, and give an estimation of how long the COVID-19 related restrictions had affected their lives at the time of answering to the questionnaire. At the end of the page, the participants were asked to tick COVID-19 related restrictions or consequences, which had affected them personally, from a list of five options (listed above in the participants section).

On page three, the main concepts were defined for the participants as follows. "Before the coronavirus restrictions" was defined for the purposes of this study as the period of *two* months just before any major restrictions took place in the respondent’s locality. By choosing two months as the duration of the comparison period, it was possible to exclude effects of the Christmas and New Year holiday season, when people typically play more games. "During the coronavirus restrictions" was simply defined as the time period, when the coronavirus restrictions were in effect in the respondent’s locality. "Digital gaming" was defined as all the gaming, in which the game is running on a digital device such as a computer, game console, or a mobile device. These definitions were used in the evaluations on pages 4-6. On page three, the participants were also asked to enter their total digital gaming experience in years and to enter the names of up to three digital games they played significantly more *during* the coronavirus restrictions than *before* the restrictions.

On the fourth page, there were eight questions concerning the time spent in gaming before and during coronavirus restrictions (overall gaming, online gaming, co-located gaming, and gaming alone). These concepts were briefly defined for the participants. For example, gaming alone was defined as gaming without other persons present online or locally. Co-located gaming was defined as gaming involving at least two players sharing the same physical location. The participants were asked to enter the number of weekly hours spent:

- Playing digital games overall *before* and *during* the coronavirus restrictions.
- Playing online games *before* and *during* the coronavirus restrictions
- Playing co-located gaming *before* and *during* the coronavirus restrictions
- Gaming alone *before* and *during* the coronavirus restrictions

On the fifth page, the participants were asked ten questions about the time spent in gaming before and during coronavirus restrictions on different types of devices. The participant was asked to enter the number of weekly hours spent:

- Playing on computers (e.g. a desktop or laptop computer) *before* and *during* the coronavirus restrictions
- Playing on game consoles (e.g. Playstation or Xbox) *before* and *during* the coronavirus restrictions

- Playing on mobile devices (e.g. a mobile phone) *before* and *during* the coronavirus restrictions
- Playing on virtual reality devices (e.g. Oculus, HTC, Samsung) *before* and *during* the coronavirus restrictions
- Playing on public game machines (e.g. at an arcade, casino, or other public place) *before* and *during* the coronavirus restrictions

On page six, there were 16 quantitative evaluations probing the change in weekly time spent playing different game genres after the COVID-19 restrictions were in effect. A 1-9 scale was used ranging from "1 = I played this game type very much less *during* the coronavirus restrictions than *before* them" to "5 = I played this game type for the same amount of time *during* and *before* the restrictions", and "9 = I played this game type very much more *during* the coronavirus restrictions than *before* them". Alternatively, the participants had a possibility to select an option "I did not play this game type at all" for each genre. The genre classification used in this research was extended from the classification presented by Lemmens and Hendriks (2016), who identified 12 genres frequently used in the literature and game websites. Their list of 12 genres was extended for the purposes of this research by five new genres also found in the gaming literature: 1) trivia games, 2) educational and serious games, 3) location-based games, 4) casual games, mini games, or party games, and 5) gambling games. The category of massively multiplayer online games (MMOs) from Lemmens and Hendriks (2016) was dropped, because it spans multiple different game genres present in the classification used in the current study. In addition, the category of puzzle games was extended to cover puzzle, board, card, and tabletop games, and the category of music and dance games was extended to also include exercise games.

Thus, the participants evaluated the change in the average weekly time spent in playing the following genres:

1) Shooters (e.g. first-person, third-person, top-down shooters),
2) Platformers
3) Fighting games (e.g. close-range combat, beat 'em up)
4) Action-adventure or adventure games
5) Role-playing games
6) Strategy games (e.g. real-time or turn-based strategy or tactics; war strategy)
7) Simulation games (e.g. construction or tycoon games, the Sims, vehicle simulators)
8) Racing games
9) Sports games (sports and sports management games, excluding racing)
10) Puzzle, board, card, or other tabletop games
11) Casual games, mini-games, or party games
12) Trivia games
13) Music, dance, or exercise games
14) Educational or serious games
15) Location-based games (e.g. augmented reality games or geocaching)
16) Gambling games

On page seven, there was a mandatory qualitative item, in which the participant was asked to describe briefly (max 2000 characters), how and why the COVID-19 restrictions affected his or her digital gaming. In the description of the item, there were also three optional questions to guide the participants responses: 1) "How did your gaming change during the restrictions?", 2) "Which coronavirus related changes in your life or environment caused changes in your gaming habits or motivations?", and 3) "How did the coronavirus affect your life and gaming psychologically?".

Data analysis

Paired samples t-tests were used in pairwise comparisons for the quantitative gaming time estimations of different gaming types before vs. during the COVID-19 pandemic. One-sample t-tests were used for studying, whether the ratings for the gaming times for the different game genres differed significantly from the middle point of the scale, which indicated no change in gaming time for the genre.

The games named by the participants as the games played more during the pandemic were categorized to genres according to the classification consisting of 16 genres described above and developed based on Lemmens and Hendriks (2016) for the purposes of this study. Gaming websites, game reviews, and Wikipedia were used as references when deciding on the most appropriate genre for each game. If a game clearly fell into two categories, both categories received half a mention. For example, Road Redemption was categorized as both fighting and racing. The qualitative analysis regarding the participants' descriptions about the effects of the COVID-19 restrictions on their gaming was carried out using thematic analysis following Braun and Clarke (2006).

RESULTS

Quantitative results

Time spent gaming

Descriptive results (means and standard errors) for the gaming times in hours are presented in Table 1 below for the period of two months before COVID-19 and during the COVID-19 restrictions. The results showed a significant increase in overall gaming time from 9.8 hours to 17.9 hours per week. Significant increases in gaming times were also found for the following types of gaming: online gaming, co-located gaming, gaming alone, gaming on computers, gaming on consoles, and gaming on mobiles. In contrast, the results did not indicate significant changes in VR gaming or gaming using public gaming machines.

	Before COVID-19		During COVID-19		
	M	SE	M	SE	*t-test*
Gaming in general	9.8	.6	17.9	1.0	10.6***
Online gaming	6.5	.6	11.5	1.0	6.8***
Co-located gaming	2.4	.4	3.3	.6	2.7*
Gaming alone	7.0	.6	11.9	1.0	6.5***
Gaming on computers	6.9	.8	10.8	1.1	5.1***
Gaming on consoles	5.0	.6	8.0	.8	6.0***
Gaming on mobiles	4.1	.7	7.2	1.5	2.3*
VR gaming	1.2	.4	1.4	.4	ns
Public gaming	1.0	.3	1.0	.4	ns

Note * significant at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; M = Mean, SE = Standard error

Table 1: Descriptive statistics (hours of gaming) and paired sample t-tests

Gaming times by genre

The results concerning the changes in time spent playing different game genres before versus during COVID-19 restrictions are presented in Table 2 below. The results suggested that overall, there were four game genres, which the participants played significantly more during the COVID-19 restrictions: 1) adventure/action-adventure games, 2) role-playing games, 3) puzzle, board, card, and tabletop games, and 4) shooters. See section "Tasks and materials" for the description of the 1-9 scale used.

Genre	N	M	SE	*t-test*
Shooter	111	5.5	.2	2.2*
Platformer	80	5.1	.2	ns
Fighting	83	4.9	.3	ns
(Action) adventure	114	6.0	.2	4.6***
Role-playing game	109	5.9	.2	4.2***
Strategy	105	5.3	.2	ns
Simulation	91	5.3	.2	ns
Racing	84	5.1	.3	ns
Sports	82	5.3	.3	ns
Puzzle, Board, Card, Tabletop	83	5.9	.2	4.1***
Casual, Mini, Party	88	5.3	.2	ns
Trivia	74	4.8	.3	ns
Music, Dance, Exercise	53	4.6	.4	ns
Educational, Serious	56	4.7	.3	ns
Location-based, AR	51	4.7	.4	ns
Gambling	64	5.1	.3	ns

Note * significant at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; N = number of participants; M = Mean, SE = Standard error.

Table 2: Descriptive statistics (change in gaming by genre) and one-sample t-tests.

There was some variation by geographical area in the game genres played most during the early pandemic. European participants reported action/action-adventure games as the game genre with the biggest increase in gaming time (M = 6.0), whereas US participants reported role-playing games (M = 6.0) and action/action adventures (M = 5.9) as the game genres with the biggest increases in gaming time. In contrast, Indian participants reported shooters (M = 7.5) and puzzle, board, card, or other tabletop games (M = 7.1) as the game categories with the biggest increases in gaming time.

Games played more during COVID-19 restrictions

The participants named the individual games that they played significantly more during the COVID-19 restrictions than during the two months period before the restrictions. These games were then categorized by their genres and the results are presented in Table 3 below. Overall, the results were somewhat similar to the results presented in Table 2 above, as shooters, role-playing games, (action) adventures, and puzzle/board/card/tabletop games emerged as the four most salient categories in the analysis. Simulation games were also frequently mentioned with over 20 mentions.

Genre	Mentions
Shooter	47
Role-playing game	36
(Action) adventure	25
Puzzle, Board, Card, Tabletop	22.5
Simulation	21.5
Sports	12
Strategy	10
Platformers	5
Fighting	5
Racing	2.5
Gambling	2.5
Casual, Mini, Party	2
Music, Dance, Exercise	2
Educational, Serious	0
Location-based, AR	0
Trivia	0

Table 3: Game genres played more during the COVID-19 restrictions.

The individual game series and titles played more during the COVID-19 restrictions are presented in Table 4 below. After the game series, the most common title is mentioned. If two titles are mentioned, both titles have received the same number of mentions.

Game series (most common title)	Mentions	Genre
Call of Duty (Warzone, Mobile)	12	Shooter
Animal Crossing (New Horizons)	9	Simulation
PUBG	8	Shooter
Grand Theft Auto (V)	6	Action-adventure
Titanfall (Apex Legends)	5	Shooter
Red Dead Redemption (2, Online)	5	Action-adventure
Battlefield (4)	4	Shooter
Candy Crush Saga	4	Puzzle
League of Legends	4	Strategy, RPG
Ludo (Ludo King)	4	Board
Minecraft	4	Simulation
Final Fantasy (7 remake)	3	RPG
FIFA (20)	3	Sports
NBA (2k20)	3	Sports
Counter Strike (GO)	2	Shooter
Elder Scrolls (Online)	2	RPG
Guild Wars (2)	2	RPG
Super Mario (Odyssey)	2	Platformer
World of Warcraft	2	RPG

Table 4: Game series and titles played more during the COVID-19 restrictions

Qualitative results

The qualitative results shed additional light on the quantitative results about the reasons behind increased gaming. In the main qualitative evaluation, the participants were asked to describe briefly how and why the coronavirus restrictions affected their digital gaming. Most of the participants described an increase in gaming during the pandemic either in general or more specifically, for example, in relation to specific game genres or gaming on specific devices. The main themes emerging from the data were: increased availability of time and boredom, seeking social connectedness, relieving stress, and mental distraction.

Increased availability of time and boredom

The most fundamental phenomenon caused by the COVID-19 pandemic was the increased availability of time and the related boredom. According to the current results, this was among the most important single factor leading the current participants to increase their gaming times.

> "Since I can't really leave the house as much, I need something to do at home alone, and gaming is a good way to fill the gap. It's more active than just passively watching tv, and it seems like a good time to catch up on some games I never finished or just came out." (participant #84, male, 40 years, from the US; restrictions: closed services, meetings banned)

> "When I had more than adequate free time without nothing else to do while curfew was in place for nearly 2 months, I spent a lot of time playing games in PC and mobile." (#17, male, 32, India; closed services, meetings banned, curfew, layoff)

> "I am very much bored during covid-19 restrictions. When there were no restrictions, I usually went out on weekends and enjoyed some time with friends. But now I don't have choice and sitting home is boring so that's why I am playing more games." (#29, male, 27, India; closed services, curfew, remote work/school)

Seeking social connectedness

The COVID-19 pandemic limited physical social interaction in most places of the world, but for gamers, online gaming seemed to form an important means for relating to other people and regain the feeling of social connectedness lost due to COVID-19 pandemic. Another form of social connectedness was co-located gaming for those, for example families, who were forced to spend time in the same location during the COVID-19 restrictions.

> "Gaming has definitely made this time easier. It helps people to be connected even when they can't be in the same room. I'm not a huge gamer, but I do enjoy it and have noticed it's really helped my mental and physical health." (#71, female, 35, US; closed services, meetings banned, remote work/school)

> "With the lock down in place, businesses closed and people home more which leaves me less chances to go out so I play more at home on my computer. It helps pass the time and be connected with the others in the same situation. We also chat in-game and share our coronavirus restrictions." (#36, female, 55, US; closed services)

> "My family as a unit sometimes plays together and it brings us somewhat closer." (#37, male, 54, India; closed services, meetings banned, curfew, remote work/school, layoff)

Relieving stress

In many responses, relieving stress or frustration related to the new situation with the pandemic in general or its effect on the participants' lives was named as an important motivator for

increased gaming. Many descriptions suggested that it was possible to use gaming to alleviate stress successfully during the pandemic.

> "With the stress of having to deal with social distancing measures, I wanted to play games that are leisurely in nature. I would spend hours developing my characters and environment in these games and found them to take my mind off daily stresses." (#81, Male, 43, US; closed services, remote work/school)

> "During the lockdown in Germany I could do my job from home. I had very much time left to spend it on games. Gaming was a relief from stress caused by boredom."
> (#135, Female, 34, Germany; closed services, meetings banned, remote work/school, layoff)

Mental distraction

In this quite prominent theme, the primary motivation for gamers to play more was the need for escaping mentally from the reality of their daily lives during the pandemic.

> "I've been gaming more since the pandemic. My work hours have been cut a bit (with pay) so I don't even feel guilty about it. Gaming is a great way to escape and forget about what's going on in the real world for a while." (#39, male, 28, US; closed services, meetings banned, remote work/school)

> "I've been playing The Sims and Stardew Valley more because they feel like more of an "escape" from everything that is going on." (#92, female, 34, US; closed services)

Themes by game genre

In the quantitative analysis, action adventures and adventures, RPGs, puzzle/board/card/tabletop games, and shooters were found out to be games genres played significantly more during the pandemic. The above mentioned qualitative themes were also prevalent motivations for these game genres. Increased availability of time, boredom, loneliness and need for social connectedness, and escaping the reality during the pandemic were motivators for playing (action) adventures and RPGs, as well as online games more generally. For shooters, relieving stress or frustration was most often mentioned as a reason that motivated playing games from this genre during the pandemic. Some participants also noted that they have increasingly played simple games, such as puzzle games, during the pandemic often in conjunction with increased availability of time.

> "I have more time for "bigger" games with a story and a more complex world like Red Dead or Witcher. Before that I always wanted to play them, but with time limitations it's not easy to be in the right mood." (#141, male, 25, Germany; closed services, meetings banned, remote work/school, layoff)

> "I've allowed myself to spend more time playing RPGs than I normally would. I think I like how I can feel like I am somewhere else with an entire world to explore while in real life I'm stuck in the house." (#58, male, 49, US; closed services, curfew)

> "I feel lonely because of quarantine, so I decided to play MMORPG like World of Warcraft as a substitute of social life." (#13, male, 42, Italy; closed services, meetings banned, curfew, remote work/school)

> "I take out frustrations when I need to with games like Call of Duty." (#70, female, 32, US; closed services)

> "I seem to be playing games that are easier and for longer. I do not have the patience for the challenging games that I usually prefer. I do not have the patience for the sub features of the easier game that I am playing either. Just the base easy game that usually would not keep me occupied." (#28, male, 41, US; closed services, meetings banned, remote work/school)

No effect or gaming less

There were also a few single responses, which indicated no effects of the COVID-19 pandemic on gaming or playing games less during the pandemic.

> "It didn't change. I played just as often as before COVID-19." (#55, female, 30, US, closed services)

> "Being around my family, I appreciate the time with them more and spend less time on games during lockdown." (#121, male, 29, UK; closed services, meetings banned, remote work/school)

Negative effects

In the vast majority of the participants' responses, gaming was mentioned as a positive activity during the pandemic. However, emerging negative effects of gaming were also mentioned at the time of responding to the questionnaire. They could be divided to two themes: physical health concerns and getting addicted to gaming. Negative effects of gaming were, however, mentioned in only about 5% of the responses.

> "During the coronavirus I spent lots of time in digital gaming. Sometimes I fear that it has affected my health because I spent most of the time in either laptop or in my mobile." (#33, male, 42, India, curfew)

> "My husband got a really bad neck pain sitting and playing the game for long times." (#61, female, 36, US; closed services, remote work/school)

> "I think I am becoming addicted to gaming after coronavirus pandemic." (#54, male, 32, India; closed services, meetings banned, curfew, remote work/school)

> "I feel I've become more addicted to gaming and will play as much as I am now when this is all over." (#65, male, 28, US; closed services, meetings banned, remote work/school)

> "Also my 6 year old daughter started getting addicted to this game and she stopped playing physically with her little brother who is 3 years old." (#61, female, 36, US; closed services, remote work/school)

DISCUSSION

The current results showed significantly increased overall gaming times in the current sample during the first months of the COVID-19 pandemic, when compared to the two months preceding the pandemic. Increased gaming times were found for almost all of the studied specific gaming types of online gaming, co-located gaming, and gaming alone, as well as gaming on PCs, consoles, and mobiles. Based on the results, four genres of games were played significantly more during the pandemic among the current participants: 1) adventure/action-adventure games, 2) role-playing games, 3) puzzle, board, card, and tabletop games, and 4) shooters. The most common game series with increased gaming times included Call of Duty, PUBG, Grand Theft Auto, Titanfall, and Red Dead Redemption. In addition, simulations such as Animal Crossing were also often mentioned as games played more during the pandemic.

The main qualitative themes emerging from the data were: increased availability of time and boredom, seeking social connectedness, relieving stress, and mental distraction. Based on the qualitative results, it seemed that many of the motivations for playing more during the pandemic arise from the need for dealing with or avoiding negative emotions related to the unpleasant situation of living with the pandemic. In

addition, the responses in the mental distractions theme can be seen to come from a need to turn one's mind away from thinking too much about the prevalent situation.

The current qualitative results seem to be especially well in line with the notion of healthy escapism presented by Kosa and Uysal (2020) in their book chapter. They identified four pillars of healthy escapism: emotion regulation, mood management, coping, and recovery. Emotion regulation and mood management were clearly salient in the current data, especially in the context of alleviating emotions caused by COVID-19 restrictions such as boredom and loneliness. The participants were also seeking positive experiences and mental distraction from daily life by immersing themselves in games. In addition, gaming was use as a coping and recovery strategy, as many participants reported systematically scheduling gaming activities to their daily lives especially to battle stress and frustration related to the pandemic and its consequences. A good example of a game illustrating the qualitative themes found in the current research is Animal Crossing: New Horizons, which provides an ideal peaceful environment for the players to temporally escape from the unpleasant reality. On the other hand, the New Horizons world also becomes a perfect social platform to maintain social interaction with others to reduce loneliness (Zhu 2021).

When the results of the current study are compared to the results obtained by other researchers, both similarities and differences can be found. Barr and Copeland-Stewart (2022) reported the results of their study on gaming during the COVID-19 pandemic in a large sample of participants. The most important qualitative results of the current study are very well in line with their findings and thus these two studies confirm each other's most important qualitative themes. In contrast to their findings, the current results also highlighted the existence of two negative consequences of gaming during the pandemic: getting addicted to gaming and issues with physical health, which were, however, visible in only about 5% of the responses. In addition, some of the phenomena highlighted by Barr and Copeland-Stewart (2022) were nonexistent or almost nonexistent in the current data. Specifically, agency (positive effects from feelings of competence and achievement) and normalization (maintaining a sense of normality by playing games) were almost entirely missing. The current results also shed light on game genres, which were played more during the early pandemic. They have not been examined in a similar systematical way in previous literature.

The results of the current study were also compared to the results of other existing studies. Many of the themes reported by Meriläinen (2022) were salient in the current study, including two of his main themes, gaming to cope and social life continues online, which are closely related to the main themes of healthy escapism and social connectedness of the current research. The other four of his main themes were in a smaller role in the data of the current study. Bengtsson et al. (2021) found that gaming practices young people in Denmark during COVID-19 were beneficial in allowing the young people to maintain a social life and in providing a legitimate social space for maintaining friendships and/or coping with boredom. These results are also well in line with the current results, in which similar qualitative comments were clearly visible in the qualitative data. Cmentowski and Krüger (2020) also emphasized the value of social play during the early pandemic, which is in line with the current research. However, in their data social play was in a central role specifically among those playing multiplayer games, while in the current data the social aspects also included other motivations of social gaming (e.g. maintaining relationships by playing with family and friends).

Of the motivations of play suggested by Yee (2006), the social and immersion dimensions were very salient in the current data and seemed to be important motivations for increased gaming during the pandemic. In contrast, the achievement dimension was almost nonexistent in the descriptions besides few single notions of

being able to get back to games, which had remained uncompleted due to lack of time. These results suggest that achievement related issues of advancement and competition in the games may have lost importance during the pandemic in favor of the other two dimensions. Similarly, using the model of six motivations of play identified in Yee (2016) there were four categories visible in the current data: action (e.g. excitement and destruction, social (e.g. collaboration and competition), creativity (e.g. discovery), and immersion (e.g. story and fantasy). In contrast, two categories were in general not salient as motivations for increased play during the pandemic in the current data: mastery (e.g. strategy and challenge) and achievement (e.g. power and completion).

The achievement and mastery related results may be considered as surprising, as the similar concept of competence is one of the central concepts in self-determination theory (Ryan & Deci 2000), and it has been found to be one of the most important psychological needs for continued play in games and usage of virtual worlds (e.g. Ryan et al. 2006; Partala 2011). In addition, pure enjoyment (or pleasure) has been found to be an important motivation for playing games in general (e.g. Hamari and Keronen 2017), but it was very rarely mentioned in the current data. It seems that while factors such as competence and enjoyment have probably been important motivators for gamers to play games in the first place, the increased gaming during the pandemic can be explained mostly by external conditions caused by the COVID-19 restrictions and their psychological effects on the individuals.

The current research has some limitations. The current sample of participants was relatively well distributed geographically including participants from three different continents, and there were also participants from different age groups. However, the sample size in general was not especially large and thus the results have to be interpreted so that this limitation is taken into account. For example, regarding the findings about the game genres that were played statistically significantly more during the pandemic: with a larger sample size, the results for some other game genres might have also become significant. Secondly, while the genre classification of the current study and the related qualitative categorization was based on existing research and information available, there is always some room for interpretation and opinion in game genres. Thirdly, the current research was based on retrospective self-reports. While research participants usually can remember events well after a few months, there is a possibility that the accuracy of recall was diminished for some participants.

Overall, the results suggested that the increased gaming during the COVID-19 pandemic was both a consequence of the increased availability of time and a reaction to the psychological consequences of the pandemic on the personal level. Generally, the qualitative results highlighted gaming as healthy and voluntary escapism from the troublesome aspects of daily life during the pandemic. To a lesser extent, negative consequences of gaming such as addiction and issues with physical health were also visible in the data. As the COVID-19 pandemic is still ongoing at the time of writing this paper, the results continue to be relevant. Experience-based design has been used in game design to evoke specific (mostly positive) target emotions. During the pandemic, it seems that alleviating specific negative emotions (e.g. stress, boredom, anxiety, and loneliness) and giving tools for mood management may be at least as important. Future research could also explore closer the determinants of healthy vs. addictive escapism when gaming in the context of the global pandemic. This kind of research could contribute to minimizing the negative effects of gaming, while preserving the positive ones.

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