

Video Games as a Tool for Digital Emotion Regulation

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ABSTRACT

As the use of digital technology plays an increasingly important role in people's daily lives, there is a growing concern about its impact on people's emotional and mental health. Although previous studies have suggested that video games as a popular digital technology can help people unintentionally shape their emotions, little is known about how people actively use them as a tool to regulate their emotions. Therefore, the study aims to investigate the role of digital games in facilitating emotion regulation during the coronavirus crisis and identify best practices to help people manage their emotional and mental wellbeing. Forty participants were recruited to participate in two online interviews, with a 4-day diary study in between. After given instructions in the first interview, participants kept diaries of their engagement with digital emotion regulation and shared their experiences in the subsequent interview. We analyzed the data using thematic analysis to understand how people use video games to manipulate their emotions. The results showed that people played more games to socialize and mediate their negative emotions during lockdown. Meanwhile, people had different motives and different games impacted emotion regulation differently. Despite some concerns about the game use, people had their own strategies to avoid drawbacks and considered playing video games as an overall positive experience for emotion regulation. The findings imply that digital games are actively utilized as a tool to manage emotions and the social connection can be further explored as a lens for evaluating the effectiveness of games on emotion regulation.

Author Keywords

Video games; digital emotion regulation; social connection; lockdown.

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1. INTRODUCTION

In the digital age, technology use plays an increasingly important role in people's daily experience, which has aroused public concern about its impact on emotional and mental health. Existing studies have shown the use of digital technology can affect people's emotional states [54]. For example, it has been found that different mobile apps can drive different moods and emotions can affect the number of apps people use [47]. Music streaming services are being utilized to manage people's moods [55]. The emotions expressed by others on social media can affect our own emotions [35]. Watching cat-related videos can help lift people's moods [41]. However, most of them considered technology use as an unintentional impact and there is a gap in understanding how people actively use these technologies as tools to manage their emotions. Digital emotion regulation can be defined as the use of digital technology as a tool to strategically affect people's emotions, which is a field that has not been fully explored yet [56]. Meanwhile, people have recently been using their digital devices more frequently and experiencing an increase in negative emotions (e.g., stress, anxiety and panic) in response to the coronavirus crisis and lockdown situation [13], which provides a timely opportunity to explore the practices of digital emotion regulation. Therefore, the study aims to investigate the role of digital technology in facilitating emotion regulation and identify effective practices to encourage deliberation in technology use and improve emotional wellbeing.

As a form of digital technology, video games have been widely used in people's day-to-day lives, but how to properly use games to promote emotional and mental health remains a public concern. Previous research has suggested that game use can influence people's emotions. For example, playing video games can be positively associated with relaxation and recovery from work and the impact is cumulative [14,15]. It can help people restore wellbeing after negative emotional events [51]. However, little is known about how people actively use games as a tool to regulate their emotions and their effects. Therefore, the project also aims to investigate the role of video games in supporting emotion regulation and explore appropriate strategies for better game use. To achieve this, we applied a qualitative method which combined interviews with diary studies to explore participants' daily use of digital technology in response to their emotions. In terms of data analysis, we applied thematic analysis to identify how game use supported emotion regulation. We found evidence that people increasingly used video games as a tool to seek social connections and to mediate their negative emotions

during lockdown. The results also revealed different motivations for digital game use and their different effects on emotion regulation. We discussed our findings to deepen the understanding of how people use different video games to regulate their emotions and to suggest effective practices, which can inform the future creation and consumption of digital games to assist people in better managing their emotions and wellbeing.

2. LITERATURE REVIEW

The study is informed by previous research on the relationship between video games, emotion regulation, mental health, and the impact of coronavirus crisis and lockdown.

2.1 Emotion regulation and mental health

Psychologically, emotion regulation refers to the ability to initiate, maintain, inhibit, or modulate one's emotional state or behavior [16]. A number of existing studies have examined why and how people regulate their emotions in response to everyday events, as well as the effects of emotional regulation on mental health. According to the taxonomy of motivations for emotion regulation by Tamir, there are two main categories: hedonic motivations that seek for the immediate phenomenology of emotions, and instrumental triggers that seek for other possible benefits in terms of behavior, cognition, society, and happiness [50]. The process model of emotion regulation proposed by Gross helps to understand how people manage their emotions by defining five key focus during the process, which includes situation selection, situation modification, attentional deployment, cognitive change and response modification [25]. In the study, we discussed our findings in relation to these two frameworks. As for the impact, it has been proved that effective emotion regulation can bring people social and psychological benefits and assist them in facing work and life challenges [29]. Exploring the strategies people utilize to cope with negative emotions, existing research finds that proactive strategies are more effective than avoidance-based approaches in reducing negative feelings and enhancing wellbeing [21]. Additionally, effective management of emotions can help people improve career adaptability and maintain work-family balance [26,32]. Hence, effective forms of emotion regulation are positively correlated with mental health.

2.2 Video games and mental health

With regard to video games and mental health, prior studies suggest that games can be used appropriately to raise people's awareness of mental health and can work as interventions [38]. This is associated with their advantages in attractiveness, accessibility, and ability to keep people engaged and adherent [3]. For instance, the storyline in games can provide an opportunity to deliver the message, to persuade people, and to induce emotions [4]. Additionally, the investigation of gamification in applications for promoting mental health and wellbeing outlines two main roles of the game elements: improving engagement and reinforcing the impact of intervention [12]. Therefore, the

effective use of digital games can be beneficial to mental health.

2.3 Video games and emotion regulation

When researching into the relationship between video games and emotion regulation, current studies have proved that games can be used to help people manage their emotions. For example, playing video games can lead to an increase in positive emotions and a decrease in stress [46]. These positive emotions can further boost creativity and self-efficacy [30]. The efficient use of virtual reality biofeedback games can help teenagers cope with anxiety and disruptive behaviors in class [31]. By feeding back real-time physiological data (e.g., heart rate), biofeedback games encourage people to healthily reflect on their body condition and assuage their negative emotions in stressful situations and thus enhance their emotion regulation skills [37]. When researching the game experience of older adults, studies have shown that playing games is not stressful to the elderly and provides them with a 3-factor enjoyment including the joy of positive emotional affect, contributing to personal growth, and improving task performance [19]. However, it is still unclear about the active use of games for emotion regulation.

The impact of digital games on people's emotions may vary depending on the game type. For example, compared with limited-time games such as serious games, frequent commercial gaming brings more fun and help improve people's mood [53]. In comparison with other game genres, previous work shows that action shooting games are most highly correlated with stress relief and post-work recovery [15]. Looking at the trend, social instead of individual play is gradually becoming the main form of game play, with the data reporting that people take approximately 11 hours per week to play games with others both online and physically offline [39]. Meanwhile, it has been found that male players can gain social support and bond their relationships through voice communication in games [52]. However, there is still a gap in understanding the effects of different games on emotion regulation, the role of social elements in games and the triggers behind game use in emotional regulation.

2.4 The impact of coronavirus crisis and lockdown

The outbreak of coronavirus disease COVID-19 has caused serious harm to human physical and mental health and economic productivity around the world [44]. The time of the study was during the UK lockdown, when people were forced to stay inside and had to keep social and physical distancing. Recent research has shown that the lockdown measures posed challenges for people to maintain good mental health during the pandemic as they needed to face the uncertainties in the work environment and to manage family responsibilities [13]. Compared with normal, people were more likely to experience distortion to the passage of the time, which was related to reduced work load, increased level of stress and dissatisfaction with limited opportunities for socialization [42]. People felt difficult to fit in with the stay-at-home and quarantine policy and were more likely to

feel an increased level of negative emotions such as stress, depression, irritability, insomnia, frustration and boredom [17,22]. Therefore, how to help people manage their emotions and improve mental health during the chaos remains a key concern. This is a great opportunity to study how people use digital games as a tool for emotion regulation at a time of stress. Meanwhile, it is also questionable whether there exist differences in terms of approach and impact compared to normal life.

Overall, previous studies have shown the potential use of video games for regulating people's emotions and benefiting their mental health. However, they have not systematically looked at the active use of games for emotion regulation and there is a gap in understanding why and how people use games in response to their negative moods. Meanwhile, existing research has not fully examined how coronavirus crisis and lockdown affects the use of digital technology and little is known about the impact of lockdown on emotion regulation. Therefore, through the project, we explored the digital game use and potential differences due to lockdown to fill this gap and gain more insights.

3. METHODOLOGY

Based on the literature review, the guided central research question is defined as how do people use digital games to manage their emotions during lockdown and to what extent their practices are effective. We aim to answer how, when, where and why people play video games to regulate their emotions: 1) whether people play more games than before because it provides an opportunity to have some social connection even if across the internet rather than face to face, 2) what are the triggers behind using games to manage emotions, 3) whether different games have different effects on emotions, and 4) whether there are differences between lockdown and normal life in terms of the game use.

Exploratory study may be appropriate for measuring digital emotion regulation as it is suitable for exploring new emerging phenomena [36]. Interviews are a useful approach to gather in-depth data about people's perceptions, feelings and experiences [5]. Diary studies allow people to capture data in their own time, helping them make sense of the triggers and challenges [5]. Meanwhile, defining and measuring emotional states objectively is difficult and individual differences can result in some non-typical emotions in the existing research [9,24]. Moreover, prior studies at The University of Melbourne have demonstrated the feasibility of combining interviews with diary studies to measure digital emotion regulation, which collected data in the wild to investigate people's experience in terms of day-to-day life and activities [47,55]. Therefore, the study applied a similar approach, involving two online interviews, with a 4-day diary study in between. Furthermore, the study was set in the context of the coronavirus crisis and looked at the impact of different technologies.

3.1 Participants

Forty participants (aged between 18 and 59, UK based, 27 female) participated in the study. They were recruited via online platforms including Twitter, Psychology Subject Pool, and Reddit. In the setup stage, their demographic backgrounds (e.g., age group, employment situation and working arrangement) were collected by an online survey in Qualtrics. There were no restrictions on recruitment to improve the generalizability of results. We kept their information to see if any patterns or trends can be identified in the data based on their demographic backgrounds. We then emailed participants to book their first interview on Google Meet. All interviews were recorded for later transcriptions, and all audio files were destroyed after the study. Each participant was rewarded with a £25 Amazon voucher for their participation. The study was approved by the UCL Interaction Centre ethics committee. All participants read the information sheet and signed informed consent forms before filling the survey.

3.2 Data collection

The first interview was an initial briefing and participants were introduced to the study. We asked them to share examples of emotional events that they encountered in daily lives, both before and during lockdown. We asked about their commonly emotional ups and downs, how they coped with their negative emotions, and about their use of different digital technology. Subsequently, participants were given instructions for the remainder of the study and booked the second interview. In the diary study, participants recorded and reflected on their experiences of using different digital technology (e.g., listening to music, watching online videos, playing video games, and using social media) to deal with emotional events over 4 days, preferably both over working days and days off. The snippet technique is a strategy that suggests using snippets such as text, audio, or pictures to help participants make thorough and structured diary entries [7]. Therefore, we applied this technique and participants may take photographs of the situation and technology, or of their daily screen time report, which can act as prompts to capture their experiences and evoke their memory later. We also asked if participants wanted to receive reminders about the study over the course of 4 days.

In the second interview, participants interpreted in-depth about specific events they noticed during the period and how technology use impacted their affective states. Elicitation interviews are a method of gathering detailed and accurate descriptions of human experience relating to the perceptual, emotional, or cognitive process [27]. Therefore, we used this method to bring participants back to their prepared scenarios as it helps people to verbally explain their subjective experiences which are often inaccessible, unknown, or difficult to express [43]. We asked participants about the context (e.g., where they were, who they were with and what was happening), the type of emotions they experienced and triggers behind, the technology they used and its impact on their feelings, their concerns and potential strategies about technology use. To

conclude, three end goals were set: 1) how do people decide what technology to use in response to their emotions? 2) what is the effect of different technology on their emotional states? 3) In terms of the use and impact, is there any difference between the lockdown and normal life?

3.3 Data analysis

Demographic information and qualitative data from 80 interviews (40*2) were imported into NVivo for thematic analysis to seek for patterns and trends in the data [8]. For each participant, we integrated the data from the two rounds of interviews into one transcript. After familiarizing with the data, we found that 27 (aged between 18 and 59, 17 female) out of 40 participants mentioned playing video games during the interview and thus analysed these 27 transcripts. The first round of deductive coding classified the data into shorthand and exhaustive codes and generated several broad themes. Examples of initial themes were, "Different games have different effects on emotions", "Social connection in games" and "Multitasking behavior". Then, the second round of manual coding was conducted to further explore the data, defining and renaming codes and themes. Examples of the codes were, "Play games to kill time", "Feel therapeutic and calming after playing games" and "Concerns about becoming antisocial if playing games too much". The final codes and themes were identified iteratively.

4. RESULTS

Iterations of coding revealed eight main themes: (1) Individual differences in the frequency, genre, and device of gaming, (2) Emotions associated with playing video games, (3) Different motives behind playing video games, (4) Different video games impact emotion regulation differently, (5) Social connection: stay connected during lockdown, (6) Multitasking while playing video games, (7) Concerns about playing video games, and (8) Strategies for better game use.

4.1 Individual differences in the frequency, genre, and device of gaming

We asked participants how much time they normally spent on games and the results showed individual differences. In general, participants played games more when they were not working or studying. Meanwhile, participants in the younger age group tended to spend more time playing games than those in the older age group.

"During a normal workday, I don't play as many games. But during the weekend, I've been doing a lot of video games with my friends." (P13, Female, 18-29)

"The games have been every day since until now, probably about an hour each evening." (P16, Female, 18-29)

"Usually I just do one otherwise I'd be too tired." (P27, Male, 30-39)

In terms of the differences due to the lockdown, nearly all participants reported an increase in their screen time and

dependence in technology. Since they had more time to use technology, they played games more frequently or started playing games during the quarantine.

"I definitely feel like I've been using technology a lot more, spend a lot more time on my laptop or games. I definitely feel like spending way more time maybe like double my screen time because of the lockdown." (P19, Male, 18-29)

"I used to never play video games. And I only play video games now because I started during lockdown. I felt more bored and duller than usual." (P39, Female, 18-29)

Participants were asked about the types of games they usually played. Our results showed a wide range of game preferences. In terms of single-player games, participants mentioned mind games such as online chess, puzzles and Sudoku. Several participants shared their experiences about playing Sudoku. Other games including colour drawing, Mario Kart, Kingdoms, Bubble Trouble were also discussed during the interview. In terms of multi-player games, participants talked about board games, card games, strategy games, quiz games, action shooting games, fighting games and adventure games. Compared with single-player games, they shared a lot more examples such as Jackbox games, Scrabble, Animal Crossing, Codenames, Age of Empires, Lord of the Rings, Ludo club and Piccolo.

We also asked participants what devices they used to play games and what game platforms they preferred. Participants played games mainly on their computers and mobile phones. They mentioned game platforms including PlayStation, Nintendo Switch, Wii and Streams.

4.2 Emotions associated with playing video games

The results revealed a range of affective states in relation to playing games. Participants played games when they experienced negative emotions such as feeling bored, stressed, sad, frustrated, upset and down. It was worth noting that usually the degree of their negative emotions was not at a high level. Participants also played games when they felt normal and didn't have particular emotions.

"I've been playing games and stuff whenever I've been feeling a bit bored or down." (P12, Male, 18-29)

"Sometimes I just feel like I want to play this game as opposed to I'm just playing this game because I'm bored and I have nothing else to do." (P25, Male, 18-29)

As for the differences caused by the lockdown, participants reported that they were more likely to become emotionally sensitive to situations and to experience negative emotions.

"Throughout the whole lockdown process, I found it hard to sort of get into a routine. And I feel like we're a little bit more sensitive these days, I guess to things." (P18, Female, 30-39)

4.3 Different motives behind playing video games

The results showed that participants had different motivations for playing games. Boredom was the emotional state most frequently referred as motivating playing games.

“It’s usually the feel of boredom. I used to do it when I’m really bored and I’m just feeling a bit down and have nothing to do that makes me wanting to play games.” (P19, Male, 18-29)

“Maybe I get bored. I’m a final year student, so I’ve basically finished all my exams, and I don’t really have anything to do, so I start looking for things to entertain me, so sometimes I play video games.” (P21, Female, 18-29)

Participants also played video games as a way to relieve stress from work and study.

“If I’m stressed about applying to jobs I might relax and play video games.” (P12, Female, 18-29)

“If I have more time and not too much work to do, I’ll sometimes play a computer game, just to de-stress.” (P24, Male, 18-29)

The escapism in the game can be another trigger. Participants reported that they played video games to escape from negative feelings and to forget about problems temporarily.

“There was the last few weeks I spent more time just trying to forget about other things that made me worried or upset and was spending a lot of time playing video games.” (P12, Female, 18-29)

“It’s definitely a way to escape from what’s happening right now. Definitely, it’s a way of escaping from like feeling negative.” (P16, Female, 18-29)

Several participants also reported that they actively used video games to engage mind and keep focus for better performance.

“I have played it to keep my mind kind of alert. I think it’s also a bit to do with maybe brain training more like a mind game.” (P9, Male, 40-49)

“I think in a way, it helps me to concentrate better. So, I learned to concentrate in games.” (P38, Female, 18-29)

A few participants mentioned that they used games to relax their mind and get rid of the negative feelings.

“I think it helped to take my mind off the negative emotions.” (P11, Female, 30-39)

“It’s just a good way of kind of like refreshing your attention.” (P24, Male, 18-29)

4.4 Different video games impact emotion regulation differently

The results indicated that the effects of different games on people’s affective states were different.

“I definitely feel like there’s a difference between how some of the games I play make me feel different things.” (P19, Male, 18-29)

In general, participants felt better after playing games and most of them thought games can help regulate negative emotions.

“It’s bright and colourful. There’s lots of different characters that it just sorts of made me happy to play that. It’s all the nice bright colours and a nice kind of happy music as well.” (P11, Female, 30-39)

Additionally, participants felt therapeutic and relaxing in games without winning or losing.

“It’s quite calming. It’s quite therapeutic because it’s quite slow. It’s just using your mind, but you’re not really kind of having to worry about anything. So it’s definitely kind of a quiet game. It’s just kind of focusing your mind on something that doesn’t really matter, which is quite calming. I feel it’s quite settling.” (P37, Female, 18-29)

Participants reported that they felt more productive and focused after playing some mind games.

“And then after I’ve played the game, I feel a lot better and I feel a bit more productive and I should do something a bit more productive, something else.” (P19, Male, 18-29)

One participant mentioned feeling less lonely after playing social games with friends.

“There’s no way that you can just miraculously appear at your friend’s house in these times. So I think the only thing you can do is to rely on technology. And I think once you start, you feel like a bit that you’re more in control and actually doing something to bridge the gap and also address the loneliness.” (P25, Male, 18-29)

4.5 Social connection: stay connected during the lockdown

The results showed that participants wanted to feel connected to people during lockdown. Playing games provided them with an opportunity to have some social connection with people, even if across the internet rather than face to face.

“Some of the quizzes are very hard and you feel a bit deflated, but it’s always nice to talk to my friends afterwards, we’ll just always laugh about how ridiculously hard the quiz was or how good. But it definitely feels like more connected. And because a couple of my friends live by themselves, I do feel like they really benefit from having a chat to people, even though it’s not face to face.” (P18, Female, 30-39)

“Playing the game and you’re trying to like get as many points together you’re trying to both do really well in the game. So I definitely think that’s a social

connection, people build their teams and you can see like, what they're doing and stuff, even though you're not face to face, there's definitely a social elements still there in those games." (P19, Male, 18-29)

Playing games can help them spark conversations, meet new people and was a positive experience. Even when playing alone, participants tended to discuss the game content with friends or family using other digital technology such as video calls and social media.

"There are some games that are based on how well you know each other in the friend group. So it all sparks conversation. So we're playing and we're talking and we're making fun of each other so that's really nice." (P13, Female, 18-29)

"It's a single player game, but I might WhatsApp my friend saying I got to do this today on the game and she would say what she managed to achieve on that day as well. So it's not connects to the game but we would catch up about it on WhatsApp." (P16, Female, 18-29)

As for the difference due to the lockdown, participants mentioned that original physical social interactions were gradually replaced by online social interactions. They used to play games with friends physically, but changed to online recently. Additionally, some participants reported that they started playing childhood and nostalgia games and reconnected with their childhood friends, which they would like to keep after lockdown. Therefore, video games can be considered as a tool to socialize and stay connected with people during the lockdown.

"Because I haven't spoken to that person in the long time so it was quite nice to spark conversations again. Be able to talk about something that we used to have a big interest and share interest something we have in a long time ago. It's quite nice to read up that memory." (P16, Female, 18-29)

"I think online playing games online sort of brings us closer in a sense that it reminds me of the past, of the time that we enjoyed spending together, I think it adds another layer of interactions or adds better, like friendship or intimacy, to this kind of bonding activities." (P25, Male, 18-29)

4.6 Multitasking while playing video games

Participants were asked about whether they were doing other activities while playing games. We found that participants tended to multitask when the game did not require a lot of attention. For example, they reported they were watching videos, listening to music or using social media at the same time.

"Depends on the game, if I'm playing an action game, it would be kind of suicidal to text at the same time. If I'm playing a card games, then because sometimes your opponent can take a while during their turn, so I do tend to multitask. It's like, music, YouTube videos.

Sometimes I even do a bit of reading in between." (P25, Male, 18-29)

"I'm usually playing a game on my phone when I'm watching TV, because it doesn't require you to use your brain. So you can multitask." (P29, Female, 18-29)

4.7 Concerns about playing video games

We asked participants about their concerns and if there were any drawbacks of playing games. Most of participants concerned about game addiction. They worried about playing games too much and becoming too reliant on games. The results indicated that short periods of gaming helped with mood regulation, but long periods of gaming did not. Instead, participants reported that they would feel guilty, lazy, bored and depressed after hours of gaming. Meanwhile, there was a risk of becoming antisocial if people relied heavily on video game.

"I think you can become too reliant on them and there's no end. So I think it makes things worse if you just do it for hours on end, it doesn't help. I think in small doses, it's very helpful." (P11, Female, 30-39)

"I think you can be quite antisocial because if you rely heavily on using technologies like these that are antisocial, you could affect your friends and your socializing skills and you can become quite unhealthy. So I think with the drawback is feeling antisocial and not keeping in touch with people." (P19, Male, 18-29)

"If I'm playing a computer game until five or six hours, I can feel quite down and depressed after I finished playing, because I've spent so much time on my laptop and I feel quite negative." (P31, Male, 18-29)

Moreover, participants also indicated that playing games for a long time was unhealthy. They worried about their body condition such as poor vision, shoulder pain and lack of sleep.

"I worry about my eye health right now. Because I look at my phone most of the day for part of my job and I guess now playing games in the evening is probably putting more strain on my eyes." (P16, Female, 18-29)

"I think that has very bad effects on your like brain development and brain structure like losing sleep." (P17, Female, 18-29)

"Sometimes I realize how dry my eyes are and shoulders sore." (P25, Male, 18-29)

Additionally, participants mentioned that playing games online was not as natural as playing them physically, and cannot replicate playing them physically. For example, there might be some Internet issues that affect the game experience.

"I feel like it does have some drawbacks because it's not as natural as normally. And normally you wouldn't

really have that in a physical face to face conversation. So it definitely does have some drawbacks of sort of not being able to be as natural as it normally would be.” (P11, Female, 30-39)

“And we have been finding that some internet connections aren’t as good as others. So the flow of local conversations can be a little bit, not as good as normally, and you can’t pick up on like facial cues and stuff.” (P18, Female, 30-39)

4.8 Strategies for better game use

We also asked participants what strategies they applied to mediate their game use. Despite the concerns, participants were conscious of the drawbacks and had their own strategies to avoid feeling negative. Three key strategies were identified through our analysis. Firstly, don’t play too much games. Participants suggested playing games for a short time or having a break between. It was important to self-monitor the time spent on playing games. For example, setting an alarm clock can remind them to stop.

“I suppose it is fine if you can just do it for a short period of time and walk away from it.” (P11, Female, 30-39)

“You need to have a break, because then it’s more enjoyable when you return.” (P33, Female, 40-49)

Secondly, play games after finishing all the work to avoid using them as an excuse to procrastinate.

“I tend to leave gaming to the last part, like I tend to like finish all the essential work first before I start gaming. Because I know once I start, I’ll start procrastinating. So if I have any urgent work, I’ll do it first so that I can game without guilt.” (P25, Male, 18-29)

Thirdly, keep a clear awareness of the difference between the virtual game world and the real life.

“If you do things in moderation, it’s actually fun. But if you can’t differentiate between what’s real and what’s virtual, if you have a very bad addiction that has an impact on your daily life, then I think it will be like pathological.” (P18, Male, 18-29)

“You just have to bear in mind what you’re setting out to do. And you must have a keen awareness of what’s happening in real life and what things you have to do.” (P25, Male, 18-29)

5. DISCUSSION

The themes presented in the results were interrelated. We discussed these themes in more detail, explored the relationships between them in relation to theories of emotion regulation and sought support or validation from existing research. The agenda for studying digital emotion regulation proposed by Wadley suggests to identify characteristics of digital emotion regulation and clarify its benefits and harms [56]. Therefore, we discussed our findings from these two directions.

5.1 Characteristics of games for emotion regulation

The study examined the gaming practices of people during lockdown, with a focus on the use of video games as a tool for regulating emotions. The results showed that there were individual differences in the frequency, preference, and device of playing games. Notably, we found that multi-player games were played more than single-player games. Existing research also found that the use of multi-player modes was higher compared with the use of single-player modes [2]. Our data indicated that playing games can be associated with a relatively low level of negative emotions, which was in line with previous findings that games can be used in response to people’s negative feelings [15,46]. Looking at the changes due to lockdown, the results also supported recent findings that people increased their use of online games and were more prone to feeling negative [2].

The results showed different motives behind managing emotions by playing video games. Both hedonic and instrumental motives [50] was identified in the study. For example, people played games to alleviate or escape from negative emotions such as boredom and stress (hedonic trigger), but also to engage their minds, help them stay focused and improve work efficiency (instrumental trigger). Earlier research also supported that the use of video games for reducing stress and anxiety can be considered as escapism to avoid negative thoughts and induce positive emotional states [6]. Additionally, it has been proven that playing games can enhance cognitive and executive skills such as working memory efficiency and problem solving [34]. Therefore, game use may help people keep focused and achieve better performance at work or study.

The study confirmed that different game genres have different effects on emotion regulation, which can be explained by the process model of emotion regulation by Gross [25]. For instance, people feel more productive after playing mind games, which can be related to Attention Development as their attention is directed away from the original task. Existing research also suggested that puzzle games can improve resilience by learning from failure [45]. Our results also showed that games without winning or losing are soothing and people feel relieved and relaxed after playing these games. Additionally, playing social games makes people feel less lonely. Therefore, different motivations may lead to different game choices, leading to different emotional feelings after playing games.

We noticed that game outcomes also influence the effectiveness of mood regulation. Achieving good results can generate positive emotions and effectively promote emotion regulation, whereas losing the game can make people feel negative and less helpful for emotion regulation. Recent research also demonstrated that uncomfortable experiences in digital games can reduce the engagement of players and lead to richer experiences, which might be caused by high-pressure game settings, difficult choices, and player loss or exposure [23]. Furthermore, the impact is different between playing games alone and playing games with others. When playing single-player games, people

focused on doing their best without being frustrated or distracted. When playing multi-player games, people feel more enjoyable due to their social interactions.

When it comes to social aspects, our data highlighted that people wanted to stay connected during lockdown and playing games offered them an opportunity to have some social connection to people across the internet. These games helped them spark conversations and maintain their relationships, which facilitated emotion regulation. Moreover, people engaged in online social interactions rather than physical social interactions and they used nostalgia games as a way to reconnect with childhood friends. Existing research also supported our findings. According to Gross, emotion regulation can bring social benefits because it facilitates positive social interactions and improves the quality of relationships [26]. It has also been identified that the social connection in games can help people cope with their negative feelings and keep them company during difficult times in life [11,28]. Social support in social activities can effectively help reduce stress, anxiety and loneliness because it offers an opportunity to build or enhance meaningful relationships [33].

We also identified an emerging form of multitasking behavior from the data. People tended to multitask when the games did not require a lot of focus, or when they needed to wait for others' responses. This can be related to games that support "snacking", patterns of brief daily interactions [1]. In particular, the waiting mechanism in games can effectively foster snacking behavior [1]. Meanwhile, this can be associated with media multitasking as well. Prior research has compared the task performance under light, intermediate and heavy media multitasking. Interestingly, sometimes intermediate media multitaskers have better performance than both heavy and light media multitaskers, which suggests that moderate amounts of media multitasking may optimize task performance [10,48]. As our data are insufficient to validate the finding, future work can focus on multitasking behavior while playing games and investigate whether moderate amounts of multitasking can promote emotion regulation.

5.2 Potential outcomes: concerns and coping strategies

We found that people were aware of the potential downsides of playing video games and had their own strategies to deal with them. The results showed three main concerns about playing digital games. First, the major concern was game addiction. People worried about becoming antisocial and too reliant on games if they played too much. Meanwhile, excessive gaming can lead to negative emotions such as guilt, laziness and depression. Second, playing games can have a negative impact on health, such as problems with eyesight, shoulder pain and sleep insufficiency. Third, sometimes playing games online is not as natural as playing games physically, which may influence the game experience. These concerns are supported by previous research that problematic games can cause a range of physical and psychosocial problems [40].

In terms of coping strategies, our results showed three key points: self-regulating the time spent on games, playing games after completing all the work and staying aware of the virtual and the real. Existing literature also suggests that people should pay attention to and self-regulate their time of game use because continuous gaming can have a detrimental impact on mental wellbeing [33]. Self-reflection and co-experience are two sensitivities when design technology to improve mental health [18]. Therefore, people should always self-reflect on their use of digital games and future game design should address co-experience to improve the effectiveness of emotion regulation.

6. LIMITATIONS AND FUTURE WORK

Reflecting on the whole process, several limitations need to be addressed in the study. First, the data on demographic information (e.g., gender and age group) was unbalanced. Although the study aimed to recruit participants across a wide range of demographic information to explore potential general trends and to improve the generalizability, the unbalanced data might have an impact on our analysis and results. If redo the study, we need to ensure the balance of demographic background. Second, we noticed that sometimes participants were unable to recall details of their experiences based on their diary entries, which might hinder the depth of follow-up questions and adversely affect access to detailed data. Since human memory is an active reconstruction prone to errors and biases, it is unreliable and may be subject to recall bias [49]. If reconduct the study, we can inform participants more details about how to use different resources to make high-quality diary entries, such as providing them with examples. Third, conducting interviews remotely can be challenging as there might be internet issues or voice delay that impact the data quality. Additionally, when reviewing the transcripts, we found that some questions could go more in-depth and we could elaborate more during the interview. Therefore, if redo the research, we should better allocate the time and try to leave the same amount of time to the questions in each part.

As for future work, there are many potential research directions. First, we can look at the use of digital games as interventions. For instance, as we found that video games can help people cope with depression, we can further investigate emotion regulation with video games in depressed and non-depressed individuals (e.g., goals, strategies, and mechanisms). Moreover, prior research has shown that the effectiveness of digital games for post-work recovery varies based on the game genre [15]. Therefore, we may further explore using games as interventions for stress relief and examine individual game characteristics to identify the best game choice and improve recovery efficiency. Second, we can further investigate the emerging multitasking behaviour in game use. For example, we can look at potential strategies that support multitasking and the impact of such behaviour on task performance. It is worth noting that the targeted games should be good for snacking and useful for media multitasking. Third, we can look at the social impacts of games. Existing studies have suggested

that gameplay interactions can boost social bonds and closeness through cooperation and interdependence [20]. Since games are increasingly used as a social tool, we can further explore them in comparison with other social tools, such as social media and instant messaging apps. We can examine how game design can better support people in finding social connections in difficult times and what role does positive emotion play in building our resilience.

7. CONCLUSION

In conclusion, the study confirmed that digital games are actively being utilized as a tool to help people manage their emotions. Our findings provide valuable insights into why and how people play games for emotion regulation. We identified different motives behind the use of games, which led to different game choices. We found that different games have different effects on emotion regulation. In addition, other factors such as game results and the number of players can also affect the effectiveness of emotional regulation. Meanwhile, we discussed the emerging multitasking behaviour in relation to snacking and media multitasking. We noticed that during lockdown, people were more likely to feel emotionally sensitive and played more games to stay connected with others. The social connection in games can help people cope with their negative emotions. Despite certain concerns about the use of video games, people have their strategies to avoid drawbacks and considered playing games as an overall positive experience for emotion regulation.

Our contribution to the research field of measuring digital emotion regulation is three-fold: (1) Methodologically, we report on interviews combined with a diary study as an approach to conduct remote qualitative research and confirmed its effectiveness, which provides a reference for the future design of similar studies, (2) Analytically, we shed more light on the relationship between video games and emotion regulation and explore the effects of lockdown. (3) Conceptually, we reinforce the implications for future game design to facilitate emotion regulation and improve emotional wellbeing. In particular, we highlight the important role of social connection in games.

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