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**GAME STREAMING AS PANDEMIC RELIEF: HOW MIGHT
GRATIFICATIONS OF VIEWING GAMEPLAY COMBAT MENTAL STRESS**

A Thesis in

Media Studies

by

Qing Xu

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The thesis of Qing Xu was reviewed and approved by the following:

Michael Schmierbach
Donald P. Bellisario Professor of Media Studies
Thesis Advisor

Mary Beth Oliver
Donald P. Bellisario Professor of Media Studies

Christofer Skurka
Donald P. Bellisario Assistant Professor of Media Studies

Anthony Olorunnisola
Professor of Communications
Associate Dean of Graduate Programs and Research

ABSTRACT

In the course of COVID-19, the concurrent rise in mental stress concerns and video game streaming viewership have aroused many scholars' attention. This study sought to understand if and how watching game streaming might alleviate some of the COVID-19 related stress for individuals. Through the uses and gratifications, mood management and stress recovery theories, employing a sequential mixed-method approach (interviews $N = 26$ and survey $N = 267$), this study provided several overarching contributions. First, based on prior literature and a qualitative study, individuals' specific game viewing patterns and obtained gratifications as stress coping were identified. Second, quantitative results indicated individuals' stress recovery path starting from game streaming viewing and via hedonism and eudaimonia. In particular, hedonism was related to recovery dimensions of relaxation and psychological detachment, while eudaimonia was associated with mastery and control. These results offer important implications for mental health interventions.

Keywords: Game streaming, COVID-19, Stress, Twitch, YouTube gaming, Uses and gratification, Recovery

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CHAPTER 1 INTRODUCTION

Since COVID-19 was first reported in December 2019, it is increasingly recognized as a serious, worldwide public health concern. In addition to the physical health crisis, there is an ongoing concern for the toll that mental stress induced by physical harm, financial crises, and isolation will have on individuals. As Eden et al.(2020) stated, the ensuing social distancing and stay-at-home orders lead to abrupt changes to everyday life, giving rise to uncertainty, anxiety, and stress among Americans. One of the more vulnerable populations is college students. Given additional stress derived from the epidemic, such as social upheaval, financial jeopardy, academic strains, family pressure and so forth, the prevalence of COVID-19 has exacerbated the mental stress crisis among college students (Zhai & Du, 2020).

While the global pandemic had real effects on students, these large-scale catastrophic events simultaneously have had a direct impact on life in the digital world. Even before the pandemic, college students have come to rely more on mediated communication. COVID-19-related stress on college-aged students has led to a further increase in their engagement with video game streaming (Narassiguin & Garnès, 2020). Data disclose that game streaming viewership across all platforms (e.g., Twitch, Facebook Gaming, and YouTube Gaming) virtually doubled in 2020 versus 2019 (Hall, 2021), and it continues to skyrocket in 2021 with nearly 50% increase (Newzoo, 2021) and 2022. It is fair to say that abnormal and substantial growth was primarily attributed to the impacts of COVID-19. Furthermore, younger audiences are participating in this trend with astounding percentages, 41% of viewers

are from 16-24 years of age, and 32% are 25-43 years of age (Iqbal, 2021).

Corresponding differences in college students' mental stress and viewing gratifications are predictable. Thus, there is an opportunity to investigate a critical and meaningful intersection of the concurrent rise in mental stress concerns and video game streaming viewership. This study sought to understand if and how watching game streaming might alleviate some of the COVID-19 related stress for individuals.

There are at least three significant reasons to concentrate on college students' mental health and game streaming consumption. First, while much research has been carried out on game live streaming from viewers' perspective, such as their common behaviors and gratifications (e.g., Hu et al., 2017; Li et al., 2020), one of the most significant current discussions is about college students and their engagements with game streaming. More importantly, college students' experiences have been anomalous throughout the particular period. The sustained increase in viewership throughout the pandemic highlights the need to pay special attention to this key affected population, and determine what gratifications they can gain from the viewing experience. Second, many scholars (e.g., Beckmann & Kellmann, 2004; Reinecke & Eden, 2017) have verified the positive influences of media use on stress recovery on media use, but there is still insufficient data about the coping effects of game streaming viewing. Third, most existing studies in this field rely on quantitative methods to gain general insights (e.g., Narassiguin & Garnès, 2020), which is inadequate in addressing the research problem under a special context. Given the

emerging COVID-related stressors, in-depth interviews combined with an online survey are beneficial to examine college students' behavioral and emotional responses toward COVID-19 pandemic, digging into their thoughts, feelings, and actions (Jarzyna, 2021) based on their self-assessment.

This investigation draws on the uses and gratifications (U&G), mood management and stress recovery theories as theoretical frameworks to explore the specific gratifications that individuals anticipate being fulfilled for stress relief. It is expected that the information yielded in this study could be a reliable source to advance the understanding of individuals' elevated stress and the therapeutic role of game streaming viewing.

CHAPTER 2 LITERATURE REVIEW

In this literature review, I firstly offer a rationale for centering on college students and then explain the impacts of the pandemic on this population with a particular emphasis on the psychological level. Second, I provide an overview of the capacity of media to alleviate stress and allow people to improve their moods and recovery from mental stress. Moreover, I explain the background of relevant theories, including uses and gratifications theory, mood management theory, and media use for stress recovery. Finally, I describe developments in video game streaming during the pandemic and individuals' viewing behavior trends, considering key determinants and intentions behind these behaviors. Research questions are proposed based on the theoretical framework.

COVID-19 Impacts On Mental Stress

Psychological well-being and mental health are two closely related concepts that are often used interchangeably (Liu et al., 2019), but there are subtle distinctions between them. Well-being is widely related to social bonds and connections (Song & Fan, 2013), and a common theme is that lack of social connections is the main risk factor for unhappiness. Mental health contains a variety of factors, such as satisfaction with life, depression, anxiety, stress, loneliness, and self-esteem (Liu et al., 2019).

In the past decade, the issue of mental stress among college students has become more pressing and has generated considerable attention (Pedrelli et al., 2014).

Theoretically, “stress” refers to individuals' psychological state and a feeling of

affective strain and pressure (Mental Health America, 2021), which derives from their assessment of how well they can adjust according to the requirements of the social environment (Kumaraswamy & Malaysia, 2015). COVID-related stressors refer to factors linked with negative life events that may lead to strain reactions such as negative arousal, physical symptoms, or psychological impairments (Zvolensky et al., 2020).

The COVID-19 pandemic is familiarly characterized by its particular impacts on the uniquely vulnerable, including—college students. College students' susceptibility is exemplified by a topical survey conducted in April 2020, which assessed how COVID-19 impacted 2,086 college students' mental health (Active minds, 2020). The results of this survey indicated that one in five students was experiencing higher stress levels at the onset of the pandemic. This initial result was verified by the three-wave longitudinal survey undertaken by the National Center for Health Statistics (NCHS, 2021) from April to October of 2020, demonstrating that the mental health of Americans aged from 18 to 29 has gone from bad to worse in the wake of the pandemic. Over 30% of those in this age range had symptoms of depressive disorder, while over 40% had anxiety symptoms (NCHS, 2021). Similarly, Son et al. (2020) interviewed 195 college students, and most (71%) reported heightened levels of stress and anxiety due to the COVID-19 outbreak.

There are diverse factors that can be attributed to college students' overwhelming mental stress. First, it is worrisome that students themselves and their family members are at risk of contracting COVID-19. Second, the disruption in access to

education puts students in an unpredictable dilemma. Some universities closed because of the severity of the pandemic, while some universities shifted to remote teaching modes, both of which can atrophy effective connections between students and professors (Eden et al., 2020) and led to student concerns regarding academic performance. Third, it is psychologically challenging for people to not be able to see friends and family as often (Son et al., 2020); the associative loneliness could be horrible. Moreover, students may face economic burdens, particularly regarding tuition and living expenses, as a result of losing working hours. The cumulative effect of these various issues is that college students are prone to encounter unique challenges that potentially affect them across physical, academic, financial, and psychological dimensions (Kecojevic et al., 2020). The multi-dimensional nature of these challenges aligns with students investing more time on viewing game streaming, as a result of experiencing overwhelming stress and pressure.

Uses and Gratification Theory

Serving as a fundamental approach, the U&G theory investigates people's motives for their media selections and corresponding satisfaction obtained from media use (Ruggiero, 2000), further making an impact on individuals' well-being. Generally speaking, well-being can be classified into emotional, social, and psychological well-being (Diener et al., 2009). Wersebe et al. (2018) conclude that, emotional well-being emphasizes to happiness and life satisfaction; social well-being refers to meaningful relationships with other people and the society. Psychological happiness refers to living a prosperous life, including positive relationships with

others, personal control, autonomy, feelings about life goals and meaning, personal growth and development (Ryff, 1989). Regarded by major theorists as a basic psychological need that individuals want to be fulfilled, there are two important facets of psychological well-being: subjective and purposeful well being (Wersebe et al., 2018). Commonly, well-being is often interpreted from two perspectives: the hedonic approach and the eudemonic approach. According to a systematic review (Ryan & Deci, 2001), the hedonic approach focuses on happiness. It defines well-being in terms of pleasure attainment and pain avoidance; by comparison, the eudemonic approach concentrates on meaning and self-realization. It defines well-being in concerns of the degree to which a person is fully functioning.

Scholars have built up a typology of gratifications sought from media. The most prevalent view is that users intentionally choose media to satisfy given social and psychological needs (Filipovic, 2012). Oliver and Raney (2011) divided the distinction of entertainment satisfaction into eudemonic and hedonic gratifications. To further define, hedonic motivations relate to pleasure and amusement, while eudaimonic motivations are tied to meaningfulness, inspiration, and understanding life purposes (Rieger & Klimmt, 2018), a higher meaning of involvement beyond the individual. To clarify, hedonic gratifications focus more on deriving pleasure from the media content viewed (Oliver & Raney, 2011). Moreover, a large share of media effects have been researched in the specific domain of video games, revealing that video gaming is closely related to media entertainment, of which the ultimate goal or pursued outcome is enjoyment (Ryan et al., 2006).

As game-based online TV (Klimmt & Possler, 2019), streaming platforms' integrative multimedia characters offer various opportunities for viewers to bond with streamers and other viewers and shape unique entertaining experiences (Wulf et al., 2018). Using the framework of U&G theory, a couple of scholars have looked into how and why Twitch became attractive to millions viewers (Hilvert-Bruce et al., 2018, Sjöblom & Hamari, 2017). For example, Sjöblom and Hamari (2017) classified gratifications into five distinct types for Twitch audiences: cognition, emotion, personal integration, social integration, and tension release. Integrating U&G and self-determination theory, Hsu et al. (2020) proposed three gratifications for live streaming loyalty that are subdivided into intrinsic and extrinsic factors; entertainment belongs to intrinsic need while informativeness and sociability are forms of extrinsic motivations. Furthermore, in the book *Watch Me Play*, Taylor (2018) concluded with a list of six gratifications for watching game streaming, including aspirational, educational, inspirational, entertainment, community, and ambiance. Also, Taylor (2018) emphasized that those motivations are not independent, and that audiences may choose different game streaming for assorted reasons extensively related to the viewer's context and personality. For instance, stress is deeply related to and intertwined with various aspects of well being; audiences' media choices affect the links between stress and well-being. Extending this line of research in the pandemic context, during which college student use of streaming has shown particular growth, there may be additional factors contributing to their obsession.

Mood Management Theory

Mood management theory, dating back to the 1980s, was closely associated with selective exposure and media entertainment (Zillmann & Bryant, 1985). Emotion has repeatedly emerged as a key factor in the desire to use social media (van Koningsbruggen et al., 2017). Emotions and moods influence one another. Compared to discrete emotions, the term “mood” refers to individuals’ longstanding psychological states as a response to cumulative media exposure (Beedie et al., 2005). Mood has the ability to turn into a mood state (Rottenberg, 2005). According to Zillmann (1988), mood management theory means that selective media use influences and reflects individuals’ affective states. Compared to U&G theory, which emphasizes individuals’ conscious media choices, mood management theory assumes that individuals may select certain media deliberately and unintentionally. (Reinecke, 2016). Based on the hedonic premise (Zillmann, 1988), the concept of mood regulation was interpreted as two facets: 1) maintain or maximize good mood states and 2) alleviate negative mood states (Zillmann, 2000). On one side, Zillmann (2000) asserted that individuals sometimes purposely make media choices to gain gratifications, while in other circumstances they randomly consume media and obtain mindless pleasure (Zillmann, 2000). On the other side, individuals make attempts to manage the emotions associated with the stressors, and minimize the adverse effects (Extremera & Rey, 2014). In one experiment conducted by Bryant and Zillmann (1984), they found stressed participants show significantly stronger preference for more relaxing programs, while participants who felt boredom have stronger preference

for exciting programs. Essentially, media has the ability to lift individuals' aroused attentions and divert them towards other thoughts (Bryant and Davies, 2006). In the past decades, a number of researchers have articulated mood management theory in a range of media forms, such as television and film (Bryant and Zillmann, 1984), and music (Knobloch & Zillmann, 2002), indicating media intervention is effective to tone down noxious state engender upbeat thoughts.

In recent years, studying these mass media forms has paved the way to interactive media, such as video games (Bowman & Tamborini, 2013). As a flourishing entertainment industry, the capacity of video games to evoke thrills and excitement, improve mood and reduce stress has been widely investigated. For instance, in experimental research, Rieger et al. (2014) assessed the effect of playing video games on individuals' mood repair and enjoyment. They highlighted the in-game success' restorative effects on mood, and need satisfaction's effects on enjoyment.

Entertaining Media Use and Stress Recovery

As Zillmann (1988) stated, media exposure provides avenues for maintaining a positive mood and arousal, which is believed to be associated with the satisfaction of intrinsic human needs (Reinecke et al., 2014). Beyond mood management, more recent attention has focused on the ability to use media for recovery from daily stress and strain (Reinecke et al., 2011).

Recovery refers to the processes that switch the stress and strain to relaxation and pleasure (Reinecke, 2009). As is supported by the Stress-Detachment Model

(Reinecke & Eden, 2017; Sonnentag & Fritz, 2014) of stress recovery theory (SRT), people are often motivated to remove themselves from the stressful situation in order to gain positive changes in emotional states, and recharge the energy (Ulrich et al., 1991). In comparison to mood-management theory, which primarily conceptualize media use as the attempt to cease negative emotional or cognitive states, the central to the stress recovery theory is the concept of restoration focusing on continuous and long-term psychological effects (Kort & Ijsselsteijn, 2006). Restoration links recovery with various factors, such as energy and self-efficacy (Sonnentag & Fritz, 2007) as individuals have more control over their engagements. More specifically, Sonnentag and Fritz (2007) constructed four distinct aspects of the recovery experience, including 1) psychological detachment, 2) relaxation, 3) mastery experiences, and 4) control.

Psychological detachment and control are more about external resources, while relaxation and mastery experience are more relevant to internal resources (Reinecke & Eden, 2017; Sonnentag & Fritz, 2007). Concretely speaking, psychological detachment is framed as two dimensions, absence of something switching to the presence of other things, which implies mentally disengaging from stressful situations and thoughts, and in turn engaging in any other content area, typically leisure activities (Sonnentag & Fritz, 2007; Sonnentag & Fritz, 2015). The ability of individuals to actively and purposely select and manage activities is described as control (Sonnentag & Fritz, 2007). Moreover, relaxation is a process often associated with entertainment activities, beneficial to building up energy and erasing negative

emotions (Sonnentag & Fritz, 2007). Mastery experiences contribute to boosting spirits and reinforcing self-efficacy (Sonnentag & Fritz, 2007). While the difference between mood improvement and recovery may be trivial and negligible, recovery is largely consistent with Lazarus and Folkman's (1987) conception of emotional coping, as well as the cognitive theory of self-regulation in hedonic terms (Beckmann & Kellmann, 2004). That being said, benefits from emotional coping' prolonged effects, individuals can reduce stress induced in day-to-day life and be lighthearted.

More recent attention has focused on provisions of the particular choice of entertainment media for recovery support, which has led to accumulated findings. Reinecke (2009) conducted an online survey, measuring recovery experience related to game play in a specific temporal context. The results showed that emotion-focused coping style was positively related to gaming recovery purposes, helping individuals recuperate from stress and strain. In the same vein, employing a combined method of exploratory and confirmatory factor analysis, Demetrovics et al. (2011) identified seven motivational factors based on the "Motives for online gaming questionnaire," and found that recovery was one of key factors. In a recent paper, Reinecke and Rieger (2020) carried out a systematical review of the impacts of stress recovery theory on recreational media use. Reinecke and Rieger (2020) constructed a Recovery and Resilience in Entertaining Media use Model (R²EM-Model), linking both short-term experience of recovery (psychological detachment and relaxation) and long-term development of resilience-enhancing factors (mastery experiences and

control). However, as a guiding framework, there is no reliable evidence to corroborate the model of watching game streaming.

Video Game Streaming Amid COVID-19

In the past few decades, the rising popularity of Internet-based communication and an influx of social media sites has contributed to the deepening of a playful society (Klimmt & Possler, 2019), where people can seek positive hedonic value. In this context, online video gaming is one of the liveliest sectors. As online video games have increased in popularity over time, multiple video-based platforms (e.g., YouTube, Twitch) allow players to share gaming experience, producing audiovisual content. In the meantime, a new form of game consumption, spectating of others playing online, has become an emerging media phenomenon (Sjöblom et al., 2017). Adopting a wider perspective, in this study I focused research efforts on the entire set of game streaming uses. Video game streaming consumption is interpreted as watching gameplay either synchronously or asynchronously. On one hand, live game streaming is generally understood to mean an audiovisual real-time video social media that integrates traditional broadcasting and online gaming (Sjöblom & Hamari, 2017), where audiences tune into live streamers' entire gaming process synchronously via live streaming platforms. On the other hand, asynchronous game streaming refers to recorded or edited streaming videos.

In the mid-2010s, with Twitch's foundation and rapid development, game streaming became a prospering industry. At the present commercialization stage, where worldwide platforms are flourishing, Twitch plays the predominant role in the

gaming streaming space, accounting for more than half of all video streaming viewers; YouTube (22%) and Facebook gaming followed (11%) (Stream Hatchet, 2020). Recent evidence (Stream Hatchet, 2020) revealed that the viewership numbers keep dramatically rising as does the increased consumption of streaming content amid the pandemic. According to a report about the COVID-19 impact on video game streaming audiences, the increase in 2020 was remarkable compared with any previous year, as weekly viewers have increased more than 100% in the first quarter of 2020 compared to 2019 (Stream Hatchet, 2020), which happened at the point of the pandemic outbreak. Moreover, in the context of the ongoing pandemic, viewership across all game streaming platforms sky-rocketed (e.g., Twitch viewership increased from 11 billion hours in 2019 to 18.41 billion hours in 2020), and this trend is continuing in 2021 (Hall, 2021).

Concretely speaking, game streaming platforms are technology platforms as well as community sites. Typically, streamers share their video and audio content, including video games, talent performance, daily life, or anything they would like to involve during the streaming (Hu et al., 2017). On the parallel side, game streaming platforms serve as social network sites for users to communicate. Based on these two dimensions, viewers may be thought of as active or passive. Passive viewers refer to those who inactively consume game streaming but rarely comment or interact with other people, while active viewers are willing to engage in participatory and interactive behaviors (Khan, 2017). These different types of viewer engagement behaviors may involve different levels of effort and involvement. As noted, passive

viewers often scroll through others' gaming content and do not need to be fully concentrated, which refers to "low effort." For active viewers, beyond passive reception, multiple-way interactions such as chat, reward, subscription, and learning (Li et al., 2020) involve more effort, as viewers input reflections on the process rather than merely investing time watching (Khan, 2017). For instance, it's common for a single live stream to see many dynamic responses during the game streaming process. With the chat function, game streaming platforms build a virtual community for streamers and viewers to socialize in a real-time setting. As Fietkiewicz and Stock (2019) argued, gamification mechanisms' design tightens the relationship between streamers and audiences and between audiences with other audiences. The different levels of interactivity are also closely relevant to viewers' extent of gratifications. Individuals' media usage pattern is closely linked with personal situations and mental health outcomes (Shensa et al., 2018). Streaming as a particular form of media use is expected to provide gratifications for audiences. Users are highly likely to gain emotional satisfaction from such a virtual social community (McMillan & Chavis, 1986) and help boost psychological well-being. Furthermore, the interactions mentioned above may fulfill viewers' social needs. There exists evidence showing that when people are under stressful and exhausting situations, they will increase the frequency of gameplay to recuperate from emotional and cognitive exhaustion (Reinecke, 2009). That could be a valid explanation for college students' increased game streaming consumption for recovery, and game streaming might be viewed as a potentially positive strategy to mitigate negative stress in that it allows viewers to

interact with others and find psychological support.

Considering more people have turned to watch people play games rather than playing themselves during the pandemic, a handful of scholars have begun to publish work that acknowledges the role of games in coping with quarantine. Barr and Copeland-Stewart (2021) conducted a survey focusing on gameplay's impacts on individuals' well-being during the COVID-19 pandemic, demonstrating that positive effects are predominant with a variety of benefits. They identified three themes, escape, socialization, and stress relief, as responses to why individuals change gameplay habits after the pandemic. In particular, gameplay involvement help relieves anxiety, stress, and depression, and thus may promote a sense of well-being.

CHAPTER 3 QUALITATIVE STUDY

Research Questions

As a unique form of entertainment media, watching game streaming contains both interactive and non-interactive participation; either way has a considerable potential to promote recovery from stress and strain (Reinecke & Eden, 2017). A growing body of evidence has suggested multiple motivations and inspiring consequences of game streaming in broad contexts. In the view of the current COVID-19 background, in which the college students are special populations that demand more attention to psychosocial care, their increase of game streaming consumption is worthy of extensive investigation.

In this project, I adopted an exploratory sequential design, which refers to the collection of qualitative data collected before the quantitative data (Edmonds & Kennedy, 2017). Preliminary qualitative exploration of college students' experience and their perception of participation in game streaming can guide the development of scales based on quantitative evaluation methods (ie., the results of evaluation using standardized questionnaires).

The qualitative study aims to build on the prior research laid out in the previous chapter by investigating whether college-aged viewers seek and gain the same gratifications during the pandemic compared to normal period, and their impacts on stress relief, how the patterns of streaming uses could be indicative of coping. This prompts following research questions:

RQ1: What changes in mental health during the COVID-19 pandemic do

students report?

RQ2: How did COVID-19 influence college students' emotion and mood state?

RQ3: Are there some game streaming patterns developed during COVID-19 that students identify as associated with mental health outcomes?

RQ4: Do students indicate specific gratifications sought from viewing game streams during the COVID-19 isolation period?

Participants and Recruitment

Twenty-six semi-structured interviews were performed with college students (15 male, 11 female) from American Universities, for uncovering in-depth and underlying elements. The inclusion criteria were as follows: (1) English speaking, (2) Having video game streaming viewing experience, 3) Over 18 years old, and (3) Undergraduate or graduate student. Participants were recruited through convenience and snowball sampling on Reddit, a social media website where users share and discuss various topics (Shatz, 2016). It is an effective source for recruitment in this study, as it allows targetting participants with gaming interest via subreddit's communities (Shatz, 2016). I posted recruitment flyers at some game-based subreddits after getting permission from the moderator or organizer. Individuals who volunteered to share their experience then filled out a Quatrics questionnaire with contact information and available timetables, based on which we set up a Zoom meeting. Since participants are somewhat active Reddit users who show high interest in this research and are willing to share their game streaming experience, they were responsive and reflective. After interviews, some participants even reference friends

with whom I could have an interview. I stopped the phrase of interviewing and hit saturation of themes when noticing some of the same themes come up consistently instead of generating new ideas.

The duration of each interview session ranged from approximately 19 to 39 minutes. All interviews followed an IRB-approved protocol, and research questions can be found in Appendix A.

Data Analysis

Data collection and analysis occurred simultaneously, beginning with the first interview. Guided by fundamental guidelines of inductive approach (Braun & Clarke, 2006), data analysis followed three concurrent and iterative flows activities: (1) data condensation, (2) data display, and (3) conclusion drawing and verification.

Computer-aided qualitative data management software NVivo 12 software was used to manage and analyze the data.

During the data condensing process, descriptive coding and analytic coding methods were mainly adopted to capture key concepts across the interviewees' narratives. In the first cycle coding phrase, interview transcripts were coded inductively and thematically central to the RQs. In the second cycle coding phrase, several categorized themes were generated, identifying the commonalities and differences between codes based on previous literature of collegiate mental stress and game streaming gratifications. Moreover, a list of inductive codes emerged from responses and were added to existing themes. The third stream, conclusion drawing and verification, started right after data collection. The three steps occurred

continuously throughout the data analysis process, until the final report was completed.

Findings

Research Question 1 and 2

RQ1 aims to identify participants' cognitive outcomes associated with the COVID-19 pandemic, investigating what kind of changes in mental health individuals experience. RQ2 aims to determine participants' affective reactions related to the pandemic, exploring how COVID-19 influences individuals' emotion and mood state. However, in practice, participants did not always make a clear distinction between mood state and overall mental health, a couple of themes are quite intertwined. Thereby I present obtained themes mostly about mental health for RQ1, mostly about mood for RQ2, along with a few could be interpreted as either.

In light of RQ1, participants were asked whether (if at all) COVID-19 has affected their daily life and their feelings. They were encouraged to respond from various perspectives, including academic, social, political, health, and so forth. Whilst a minority said COVID-19 did not alter much of their lives, the vast majority of participants reported they were negatively affected by COVID-19. A couple of participants confessed that they were more mentally drained during the pandemic. Four main themes were identified: 1) **Nervousness**, 2) **Loneliness**, and 3) **Disturbed sleep**.

The themes of **nervousness** recurred throughout the data set. As an uneasy psychological state, it mainly associated with individuals' health concerns about

COVID-19 infection of themselves, family, and friends, along with fear of potential mortality risk. Staying in one of the countries with high caseloads, some participants took both personal and public health very seriously, holding the perception that they are susceptible. As evidenced in Participant 10's statement, "touching COVID is really a big concern, since some of them work in hospitals and were at high risk of contracting the virus.... I was very paranoid and try to be so careful because I have family members and who are vulnerable." Participant 4 also remarked that "There was a little bit of uncertainty and most like nervousness or anxiousness, I think this like not knowing much about what's going on and about the rest of the world was kind of scary." Thus, some participants were strictly following governmental policies, such as social distancing and vaccination. Participant 19 shared his experience: "I was very cautious when it came to COVID-19, the minute the vaccines became available I hopped right on that." While some participants paid much attention to health at the very outset of pandemic, other participants did not worry about health until COVID-19 became worse. But once they realized COVID-19 is a big deal, everyone showed big concerns about its physical and mental harm to people and felt outside "is not safe" (P5). In addition, participants who consume more social news during isolation period, they would be more worried about the tendency of pandemic and its long-term effects on people. Unpredictability and uncertainty about future could harm their mental state. Also, they would also voluntarily persuade others, since "there's a lot of COVID-19 skeptics, a lot of our community and stuff like that a lot of people just tried to ignore that it was a problem"(P8). They would feel anxious if

other people consider wearing masks is undue, “it was just this worry of people aren’t going to keep to themselves, they’re probably not going to follow the rules, which kind of happened as well. So it was just like a lot of worry” (P2).

Loneliness is another common state narrated by almost all participants, along with other reflections such as unaccompanied, isolated and empty. Given the immediate halting of face-to-face connection to avoid risk of infection, individuals were stuck at home for a long time. The continuous pandemic has set many individuals’ lives on “pause.” To a large extent, many participants were confined to staying in a low-stimulation situation alone, repeating a colourless daily schedule. For example, while the experience was unpleasant, participant 6 minimized outdoor activities and avoided physical touch with people for fear of COVID-19 infection, “I’d rather stay at home and feel safer about it, personally I don’t want to see people and I feel like it’s not safe.” As a matter of course, P6 complained “it was unfortunate to be at home all the time and kind of lonely.” Likewise, during the lockdown, participant 18 narrowed his outdoor visiting to grocery shopping. Another reason individuals felt lonely was lacking companions as well as real-time conversations with others. P9 felt pretty hard to go through the isolation as “We were stuck at the dormitory, all day so we need someone to talk.” Same as P3 “I would feel really lonely, especially when you don’t have people like your age to talk to like” and P19 “I would say about a month or two of feeling more so lonely, not necessarily depressed, but more so lonely during that time” (P19) .

Disturbed sleep refers to the prominent symptom of a fragile mental state and a lack of mental energy. Impaired sleep was closely related to anxiety (Xiao et al., 2020), relating to separation from families, social-distancing orders, stay-at-home recommendations, and so forth. Almost one third participants reported their sleep issues after the pandemic, some developed during the pandemic due to mental pressure, some got worsen due to disrupted schedules. Exemplary quotes include:

“I feel like it took me nine months, that's how long it took me to like figure out my schedule and like fix my sleep.” (P6)

“My sleep schedule got really messed up a lot of other things like I kept missing stuff like missing class, not turning us off on time, or like missing meetings, it was not good.” (P21)

“Because of the pandemic I lost that schedule, because I wasn't going out in person, and I didn't have to like do things outside, the sleeping issues got worse after the pandemic.” (P24)

For RQ2, participants were asked about their general feelings and mood during the pandemic. Themes of **1) Boredom, and 2) Hopelessness** emerged when analyzing questions centered around their general feelings during the pandemic, especially amid the lock-down.

The theme of **boredem** was the most damaging side effect of social isolation reported by participants, meaning they lost the interest of the usual staff or had nothing to do. As mentioned above, with schedules and social lives disrupted, individuals had to face massive daily routine changes, such as homeschooling. A

majority of participants stated that they were at a loss about what to do at the beginning of the pandemic. A few participants did not feel too much at the beginning of the pandemic, such as those who recognized themselves as homebodies (e.g., P7), they even expected to be left alone and do whatever they want freely. However, over time, they tend to lose the motivations and get bored of getting sequestered at home as the but “as it grew on, it got pretty tedious and not interacting with people is pretty not that good” (P16). Other participants were aware of the boredom consistently, the more extra time they needed to fill in, the harder they could focus and find meaning of life: “I feel like everyone was so time stuck.... We had nothing else to do really so” (P25) . Day to day, “ I feel like we’re just doing the same thing over and over again” (P20).

The theme of **hopelessness** reflects participants’ low confidence toward the pandemic. In the interview, some participants stated that they were up and down all the time (e.g., P3), but the constant news often caused their despair about the situation (e.g., P10). “It kind of felt hopeless” (P23). since there appeared to be no clear end in sight to the erratic situation. In addition, as participant 10 pointed out, the situation was out of personal control. Indeed, it was discouraging when individuals considered a turning point the pandemic was coming or hope “it can’t happen over here “(P2); the number of reported cases skyrocketed a month later. Repeated outbreaks triggered extraordinarily high levels of despair, “So having that loss of control taken away from you, kind of impacted me in terms of feelings.” (P11) Moreover, a couple of participants felt fatigued to see people argue about the situation. For instance, “it was

just like I can't deal with constantly hearing about COVID all the time, or hearing about this and this happening" (P6).

Overall, because of the extra burdens that stem from the wide scope and spread pandemic, students are confronting the challenges to a relatively stressful mindset. Two intertwined themes were normal for participants: **1) Stress, 2)**

Depression.

Stress is the most salient factor among participants. This theme contains three sub-themes: 1) academic stress, 2) financial stress, and 3) social stress. In light of academic stress, individuals were susceptible to social isolation and were poorly affected by being withdrawn from school. With a sudden transition to virtual learning, participants' lifestyles and schedules have substantially altered, and increased workload and fewer connections with professors are inevitable. Participants confronted different challenges in remote learning. First, some participants described zoom classes as a way of restricted self-teaching, as they were short of educational resources from the university. Learning difficulties increased, "especially for group projects and more interactive classes "(P24). As P21 complained that "there are not enough professors through interaction, because a lot of time is mostly just silence." Second, time management is also challenging. P7 also stated that they "get distracted easily" at home so more effort was required to hit assignment deadlines and achieve good grades.

In regard to *financial stress*, many participants were undergoing financial hardships. Some disclosed that they did not have enough income to afford rent and

other payment, since “not being able to physically go on campus or work at the dining hall where I get most of my money,” the high-priced tuition fee just like “a financial hole” (P10). They had no choice but to rely on family, which made them feel sorry. Moreover, a few participants also indicated a financial burden for their families. For example, P16 “it really hit hard during the spread of the pandemic,” which made individuals stressful and frustrated. Apart from personal considerations, some participants also felt uncertainty of the entire country’s economics, with one predicting “serious disarray financially over the next few years” (P11).

Social stress is another matter. Diminished social interactions during the isolation period had put a strain on some relationships. On one side, it surely has affected social interactions with other people individuals typically see regularly. As participants put it: “I’ve lost a lot of relationships at the started COVID” (P9), “everything I do is always been in this room for the past year. So that was just kind of exhausting”(P15). On the other side, a range of anti-pandemic policies such as quarantine, social distancing and self-isolation restricted individuals’ personal contact and social activities, being distant from the outside world led to exacerbating mental tension. Representative quotes include:

“What is going on like I've been away from civilization forever. It’s been like maybe like three months I didn't see like anybody up crowd ” (P18)

“All messed up my mind has been because my timeline is all erroneous. And just like taking a real toll on how I view myself and how I view my environment, and just really isolating” (P3)

Depression refers to the mental state characterized by a pessimistic sense of the ongoing pandemic. Mainly, the seriousness of the COVID-19 and social isolation in contributing to depression and mental morbidity. On the one hand, individuals were confronted with staying at home adhering to safety policies, which triggered mental health problems in people without previous history, as well as worsening the symptoms in those with previous mental illness. For instance, participant 9 had to get on-campus therapy and explained “COVID-19 itself affected my score as much as the restrictions that my campus made to students, interactions, and everything that is what really screwed me over. I mean, you set inside of a grey dorm room for 24 hours a day seven days a week, and that was it, you would sit down. Do your work, then you’d finish it and then you feel miserable and then you go back then. And that was just a constant cycle that would repeat.” Similarly, participant 3 eventually got a prescription for depression and anxiety because “I found myself really receding into myself and like not really speaking and kind of experiencing a lot of self hatred and insecurity. I just like was lonely.” For the other hand, seriousness of the COVID-19 caused individuals’ depression, such as P26 indicated that “I feel that it might become worse again, and that this might continue on for even longer.”

Research Question 3

RQ3 aims to determine whether there are some game streaming patterns developed during COVID-19. This question was meant to identify participants’ behavioral outcomes related to the pandemic. Three main themes were identified: **1) Increased usage, 2) Passive viewing, and 3) Active viewing.**

Increased usage was intertwined with themes such as bored and lonely. When participants were asked about their media use trend after the pandemic, 85% (22 out of 26) of participants watched game streaming progressively more often after the pandemic. In contrast, a minimal number of participants maintained a similar usage pattern.

The general increasing game stream consumption was closely tied to individuals' perceived boredom and loneliness, which were understood to be motivators for behavioral change (Westgate & Wilson, 2018). More precisely, the extended stay-at-home -for-nothing-to-do period could lead to negative (e.g., ignoring social distancing recommendations) or positive (e.g., seeking for fresh experience) behavioral impulses. Among those who invested more time watching game streaming, over half indicated significantly higher levels of involvement after the pandemic, describing it as a "skyrocket during the pandemic." For example, participant 22 noted that her usage massively increased from once a week to almost every day as a media routine, "to build a time since school didn't take as much time as it as it used to." In P13's case, while as a big fan of playing video games, she gravitated towards watching others play "over the summer during the pandemic, and it has become a "media routine." Likewise, participant 10 also became a heavy viewer due to boredom and disinterest in other activities: "I definitely feel like my media consumption has definitely increased tenfold during the pandemic for sure, but it has nothing else to do."

Interestingly, I also found a couple of the participants were new to game streams, assuming it as a novel source of entertainment amid the pandemic. In P3's case, "I had never even made an account on Twitch until this year, like I had only ever been like just a viewer, like just outside. So I finally made an account over the pandemic." Similar to P18, "I wasn't really into Twitch before like the pandemic I think the pandemic kinda made me okay like what do I have to keep me entertained."

The theme of **passive viewing** generally means viewers are surrounded by the game stream without expecting direct interaction with others (e.g., comment, chat). Compared to active engagement, passive viewing often requires less effort since it is easier to just tune in and tune out. For example, participant 10 disclosed that he was a ghost watcher, "I love watching thing but I'm weird about interacting, but I do read a lot of the chat on Twitch, and if I think they're super funny like I'll laugh to myself but I never respond on YouTube; I don't reply or write messages but I'll like people's posts and things like that, or their comments." In effect, a majority of participants consume game streaming as background noise "when I'm cleaning up or anything." (P13), "when doing homework" (P1), or "while I do any do whatever else "(P12). Often, they boot up the stream in the background and execute multiple tasks.

For some participants, they just maintained this viewing habit as before, but apparently they relied more on the background noise to fill mental emptiness during the pandemic. Not only that, some participants were struggled with sleep issue as mentioned in RQ1, turning on the game streaming noise was a strategy to cope. As

participant 14 stated “I developed my strategies to be able to like sleep on the schedule, it’s been a nice way to like kind of fill the background noise”

The theme of **active viewing** means a higher level when watching game streams, indicating viewers’ various involvement such as chatting, commenting, and sending gifts. For some participants, the active viewing trend was driven by the desire for socialisation. They enjoyed communicating with streamers as a way to immerse in the flow and “being more active in the gaming community” (P10). For other participants, they actively subscribed favorite streamers and started watching when receiving notifications. Overall, as participant 20 said, “I’m focused generally intently on the stream.”

Research Question 4

RQ4 specifically focused on identifying individuals’ gratifications sought from viewing game streams during the COVID-19 isolation period. Eight themes emerged when evaluating questions centered around participants’ feelings of game streaming watching, and categorized into two dimensions of gratifications based on prior literature review : **1) hedonic pleasure** and **2) eudaimonic pleasure**.

Hedonic pleasure

Hedonic pleasure focus more on cultivating positive emotions and combat negative feelings. This dimension is composed of five themes: **1) Entertainment, 2) Relaxation, 3) Reduce loneliness, 4) Vicarious pleasure, and 5) Escape**.

When individuals feel stressed or depressed, hedonic pleasure can serve as a quick mood booster that requires minimal effort (Prestin & Nabi, 2020). In the

interview, participants were asked questions including what got them interested in watching game streaming, what mood were they in when viewing game streams and what they gained from the viewing experience. The direct questions produced enlightening responses; many participants reflected that watching game streams have a huge footprint on their mental health going through the COVID-19 pandemic.

Entertainment. This theme primary works in two ways, having fun along with combating boredom. Nearly all participants indicated that entertainment was the basic gratification obtained from game stream viewing. First, it was gratifying to occupy additional leisure time with watching others play games. Most participants considered game streaming as a response to boredom. As participant 18 stated, “it definitely made a lot of boring situations less bored.” More important, while participants may have broad interests in various game streams, most of them had a preference for watching relaxing and light-hearted content. This common preference explains individuals’ feelings of watching streaming. Basically, the entertaining content did help them get out of negative thoughts and bring more pleasure. For instance, participant 22 commented that she “has fun to watch this video,” while participant 9 echoed the sense of fun and amusement. Especially during the pandemic, streamers were especially inspired to do more creative gameplay in response to the demand. Viewers could then experience more comedy. Speaking of streamers, participants also alluded that the game streamers’ personalities were significant. They favor personable streamers who could make gameplay hilarious and exciting, just as P10 described that “With cracking jokes on the side, just makes it 10 times more entertaining”. The most

appealing streamers, whether big or small, were usually extroverted, funny, easygoing, energetic and talkative. People tend to gravitate towards more the funnier ones, “like the people that are really the often off the cuff with their hilarity ... like their personal lines oriented to get back onto it, and bring a sense of levity towards it.” (P20).

Besides, participants also found interesting to know streamers’ private life moments.

As P12 explained, “it is fun to see what someone else’ life and what they are doing.”

Relaxation. In answer to a question regarding difference between playing games by oneself and watching someone else play, relaxation was most frequently mentioned. From the responses, relaxation refers to easily finding ways to have a rest and release tension. As noted above, light-hearted gaming and funny streamers contribute to making individuals feeling relaxed and joyful. Moreover, watching game streaming in a casual manner helped cultivate a hassle-free mindset, which was conducive for tension release. It took far less effort to watch others playing games review comments going through the chat box, and viewers could be in a relaxing and easy state. When actually playing the game, people have to concentrate on what going on on-screen and so forth, but “when you’re watching someone, you’re not in the driver’s seat so you can just kind of sit back and just enjoy the gameplay for what it is.” (P19) It was more flexible, even could be a part of multitasking. Participant 18 also explained that “It's easier for me to probably watch the streaming. Just cause I'm not really putting too much effort into a game. Got to chill and relaxing maybe eating food.” (P18)

Reduce loneliness. First, this theme was closely associated with individuals' passive viewing mode, putting game streaming as background noise. As a new viewer of Twitch, the top motivation for P3 starting watching was "just to have someone talking or being able to listen to something while I'm doing my own thing." Second, active engagements such as virtual conversation became a way for many participants to maintain connections with real-world friends, "because I can't see them in person. I feel like being able to talk to them and play with them online makes it a lot easier" (P24).

More profoundly, the sense of being a part of gaming community let individuals feel they are not isolated. For example, in P4's case, with voice on the side, he could be reassured with a sense of company. For P6, indulging in the community "helped cope with loneliness because we have these thousands of people getting excited over this one game, and what's happening here, like it made me feel like I was part of this community."

Vicarious pleasure. Many participants derived vicarious pleasure from immersing in watching others play games. Simply speaking, individuals perceived relief and enjoyment when the streamer overcomes barriers and wins the game while feeling depressed if the streamer loses the game. While those feelings were secondhand, a close effect can be obtained, as though individuals were "in the room with streamers" (P20), they can perceive themselves vicariously involved in the gameplay. "You've removed the aspect of you physically playing it and experiencing yourself, you get to watch others experience something, and you get to kind of

experience it with them. You get to add your own template and talk to them as they play it and just kind of watch him play the game”(P10). In P18’s case, the vicarious experience was prolonged if he watched a lot of the same streams from one game, “I will dream about it, even though we’re not physically playing it, I kind of just overtakes my thoughts. And my mind will just kind of wander there.” Another interesting finding is that, views often become curious about some games that they don’t have a chance to play or launched new games. As a strategy, they vicariously explore arousing moments from streamers, “I do get excited from time to time if I see something that like, I’ve never seen before” (P18).

Escape, the equivalent of distraction, is another function that was commonly perceived by participants. When faced with constant pressure, individuals are likely to get away from real life on a psychological level. For instance, many participants favor competitive games, such as action-adventure and role-playing games, but they often attempt to get into relaxing content to have a good laugh. At least while viewing gameplay, audiences are likely to “get transported to another world” (P25), as having a mental break. For example, participant 1 noted that “It’s a good break from education. And again, to my stressful times, these have kind of helped me out. That break was important, because it can get me fun, especially in the COVID-19 times.” Likewise, P15 disclosed his experience “I treat it escapism for me. So I try not to think about loneliness, or like the pandemic or whatever.”

Also, some participants felt it was healthy to have some level of detachment overall, and felt being distracted by video game streaming is an effective way to keep

their minds off real-world issues, such as isolation stress, health concerns, schoolwork pressure, and so forth. A couple of participants alluded to the notion of “escaping from reality” that watching game streaming did “help me to get my mind off the pandemic stress.” (P16) Some participants exemplified this point. P12 remarked that this entertainment put her in a better, relaxed mood, while P24 thought streaming has helped him get through difficult times when he could not interact with friends face-to-face and took him away from the seriousness of reality. Afterwards, individuals could have a fresh mind going back to real-world chores. Interviewees’ responses were consistent with the core concept of mood management, that watching video game streaming contributed to cease or mitigate negative affective states and to intensify positive affect (Reinecke, 2016), making them upbeat during COVID confinement. In summary, escaping from real-world worry and stress provided individuals lazy hedonistic pleasure.

Eudaimonic pleasure

Eudaimonic pleasure focuses more on meaningful personal growth. This dimension is composed of three themes: **1) Learn, 2) socialisation, and 3) parasocial interaction.**

Learn. This theme includes two attributes: learn techniques and strategies and be up-to-date. For most participants, acquiring new information was one of the key expectations for watching others playing video games, from which they may feel control and achievement. Commonly, participants were interested in streamers’ skill sets and exploring unknown game story lines. Like P16 said, “This person is like

really good at this. If you were to watch somebody playing chess and they were constantly beating their opponents. Oh my gosh, how are they doing it draws you in because you want to see what kind of methods or techniques they're doing."

Watching others play could excite individuals' new perspectives of gameplay, like P12 disclosed "I usually just use it to learn and get better. I will focus on the skills of the streamers. Yeah, like their technique and what they're doing." P16 also reflected his main takeaway from watching others play is "learn a new strategy or if I see something like the way they attack, like how people like count in their head like different moves and stuff like that, so I try and learn from it to make myself a better player when I play." In a word, individuals gained insightful knowledge from others' perspectives.

Moreover, it is usual that individuals desire to learn more about some games that they lack of chance to play or follow up on new games. By watching streamers' play styles and interaction with games, they can acquire information and sensory experience (Litman & Spielberger, 2003), such as deciding whether to buy a certain game or aiding conversations with friends. P20 evidenced that "Personally, because people are playing games that I don't really get the chance to play overall, this is a side of myself, but I wanted to explore but never really have the means to do it."

Socialisation. All participants appreciated the socialisation value of game streams, gaining the sense of companionship and community. Because of the constant threat of the pandemic, people are in need of virtual interactions as a big substitute of offline connections, especially the pandemic may weaken in-person interactions. As a

substitute, viewing game streaming contributed to build virtual connections among human. P23 illustrated a stressful period of transition to graduate life concurrent with pandemic isolation, where she was feeling lonely. Compared to other entertaining media (e.g., television), watching game streaming add an extra level of enjoyment—interpersonal interaction, which people have been lacking throughout the pandemic. Like P25 said, “it’s always better for me to play rather than stream” since the audience could be more immersed into the game with dynamic conversations. When participants are actively involved, such as posting comments and chatting with people, they gain more connections among like-minded people and built a lot of relationships, “even though they’re not close to me or a whole different area of country” (P18). To quote a response by P22 “I’m getting relationship, I’m getting communication with another human. Even though it’s on screen, but to me it feels more personal.” Likewise, for P4, chatting with streamers was “part of the appeal”, since it made him feel “ You’re interacting with the streamer and then they’re like, acknowledging that you’re there, which is like part of that socialisation aspect.” In a higher level, viewing game streaming can decrease loneliness and fill the gap for social interaction, that explains some participants felt as a member of the community.

Parasocial interaction. This theme refers to individuals’ one-sided feelings of intimacy and kinship that develop toward celebrities and fictional characters (Bond, 2021). During the COVID-19, the stagnating relationships and disconnection with society drove students to seek emotional support from game streaming community. The themes of parasocial interaction release recurred throughout the data set. Same as

socialisation, individuals were pleased to form connections with streamers, but one-side attachment to streamers require less expectations and burden. Mainly, individuals attached congenial streamers to gain a sense of “fellowship” and social support (Rook,1987). For example, P18 said, “it does feel like you’re playing it with a friend” when viewing the game streaming videos. Such a kind of virtual camaraderie builds up emotional rapport between streamers and viewers. Even it was not mutual, some participants intuitively felt “I am getting relationship out of it. Even though they don’t know me. I feel like I know them. And I love them in my own way”(P2). Furthermore, participants were content to support their endorsed friends through a variety of ways involving financial investment, such as subscription, membership purchase and sending gifts.

Discussion

Based on participants’ reflections, some individuals’ mental health state were hit hard during the pandemic. A variety of psychological and emotional reactions toward the unexpected pandemic were determined, such as stress, depression, disturbed sleep. Grounded in U&G, mood management and stress recovery theories, the current research confirmed that gratifications from viewing game streaming contribute to alleviate pandemic-related stress. For interpreting the influences of various gratifications, two dimensions were identified through in-depth interviews: 1) hedonic pleasure, and 2) eudaimonic pleasure. Some of the gratifications stem from ephemeral emotions, while some are from long-lasting mood states. By and large, hedonic-oriented gratifications such as entertainment, relaxation, and escapism help

get individuals out of a negative situation. Eudaimonic-oriented gratifications further such as socialisation and parasocial interactions, offer students social support that otherwise missing. These findings echo previous research (Gros et al. , 2017) about three motivations for using Twitch, including entertainment, information seeking, and socialization, suggesting that many general gratifications from non-pandemic contexts match media outcomes in a pandemic. A couple of themes including reduce loneliness, escape and socialisation were magnified to satisfy urgent need and combat mental stress.

In addition, this study also highlight extra gratifications specific to stress relief in a pandemic situation. Particularly, according to Cobb (1976), social interactions contribute to distinct effects on emotional health, of which parasocial interactions play a significant role in achieving effective adaptation to life stress. Following Cobb's (1976) argument, Rook (1987) conducted multiple studies examining the impacts of companionship in releasing life stress. Results demonstrated that companionship could offer people intrinsic satisfaction and prevent them from loneliness through compassionate activities, such as shared leisure and recreation or discussion of common interests. Moreover, findings in the current study are consistent with more recent research during initial social distancing periods. For instance, Eden et al. (2020) conducted a cross-sectional survey in March-April 2020 examining the correlation between media coping and collegiate stress, indicating that stress was significantly linked with hedonic media use as well as escapist media-based coping strategies.

The novelty of the pandemic might have contributed to changes in individuals' behaviors. This study was conducted in the middle of COVID-19 pandemic, participants reflected life changes in that certain period. At the end of interviews, participants also looked ahead to how their game stream viewing would shift as pandemic wanes. Most of them expected to spend less time dedicated in gaming watching, but getting back to other activities that have been restricted amid pandemic. It is reasonable to infer that when individuals step out of the "isolation zone", they are expected to bounce back from stressful situations; when individuals have access to alternative entertainment options again, their dependence on game streaming will surely diminish.

CHAPTER 4 QUANTITATIVE STUDY

Hypothesis

As noted above, a combination of all qualitative and quantitative methods contributes to forming a broader picture of understanding college students' psychological and behavioral responses to COVID-19, and reasoning watching game streaming as a unique media choice for many college students. Findings from the qualitative study, while preliminary, suggested that watching game streaming helped college students obtain different levels of gratifications that combat negative mood states and recovery from stress. Some specific themes emerging from the analysis are worth further consideration.

First, the notion that watching game streaming as a type of entertaining media could effectively regulate mood state is supported in study 1. On one side, immersing in watching game streaming as a way for college students to feel either joy or just distraction is warranted. For most interviewees, the immediately proximate outcome of watching game streaming was having a better mood, which links happiness and hedonic pleasure. Moreover, when individuals felt down and depressed amid the COVID-19, they desired to detach from the daily struggles and real-world pressures. These responses are consistent with Reinecke's (2017) findings; game streaming users are basically hedonically driven to dispel noxious mood states and then get into hedonically pleasant states. Aside from pure hedonic pleasure, some additional emotional outcomes were identified; individuals wanted a more meaningful experience consistent with eudemonic gratifications. Thus, it is safe to make the

assumption that watching game streaming is a predictor of both lines of pleasure.

H1: There is a positive relationship between watching game streaming and a) hedonic pleasure, b) eudemonic pleasure.

As a unique form of online communication, game streaming platforms bring people with similar interests together. Essentially, a game streaming platform is an active, dedicated, and interactive community. Audiences interested in viewing games could search and browse through a list of games currently being played or recorded (Lau, 2017). Relying on the unique and defining characteristics of the live stream, the real-time interaction features (e.g., chat box, comments), audiences are able to determine their participation levels with various motivations and needs. As Yoo (2011) claimed, audience interactivity is an intervening factor in the gratification-seeking process. The degree to which audiences engage in the communication process by interacting with the medium and other people is also closely relevant to viewers' extent of gratifications (Yoo, 2011).

Generally, based on varying degrees of effort and engagement, there are two game streaming viewing patterns: passive and active (Khan, 2017). Passive viewing is a lower level of interactivity that requires low effort; audiences often scroll through others' gaming content and rarely comment or interact with other people. Conversely, active viewing is a higher level of interactivity demanding more effort; audiences are inclined to tune into multiple-way social interactions such as chat, reward, subscription, and learning (Li et al., 2020). Stronger intention or higher frequency of social interactions could offer more social support and comfort. Thus,

whether active or passive, the trait of consumption determines which hedonic or eudemonic outcomes audiences get more. I assume that preference for passive vs. active viewing is a moderator between viewing game streaming and pleasure. As Eden et al. (2020) indicated that stress is associated with more hedonic and less eudaimonic media use, watching game streaming will amplify hedonic pleasure more if viewers prefer passive streaming. Alternatively, watching game streaming will amplify eudemonic pleasure more if viewers prefer active streaming.

H2a: For individuals who have a preference for passive (versus active) viewing there is a stronger positive relationship between game streaming viewing and hedonic pleasure.

H2b: For individuals who have a preference for active (versus passive) viewing, there is a stronger positive relationship between game streaming viewing and eudemonic pleasure.

In addition to general pleasure, stress recovery is a unique pattern worth further exploring. That being acknowledged, there are some more specific outcomes individuals could gain in the recovery range of psychological detachment, relaxation, mastery, and control. This also indicates a need to understand the relationships between diverse recovery forms and game streaming behavioral patterns. On the one hand, even if audiences merely watch game content without social interactions, during which they can enter another virtual world and detach from real-life stress, obtaining recovery outcomes of psychological detachment along with relaxation. On the other hand, considering audiences with a higher level of interactivity have more

initiative of activity selection, they are likely to recover via the sense of control (Sonnentag & Fritz, 2007). Also, active engagements in the game community help boost audiences' spirits, reinforce self-efficacy (Sonnentag & Fritz, 2007), and experience the recovery outcome of mastery. Altogether, I proposed the hypotheses.

H3: Hedonic pleasures obtained from game streaming viewing are positively related to recovery factors: a) psychological detachment and b) relaxation.

H4: Eudemonic gratifications obtained from game streaming viewing are positively related to recovery factors: a) mastery and b) control.

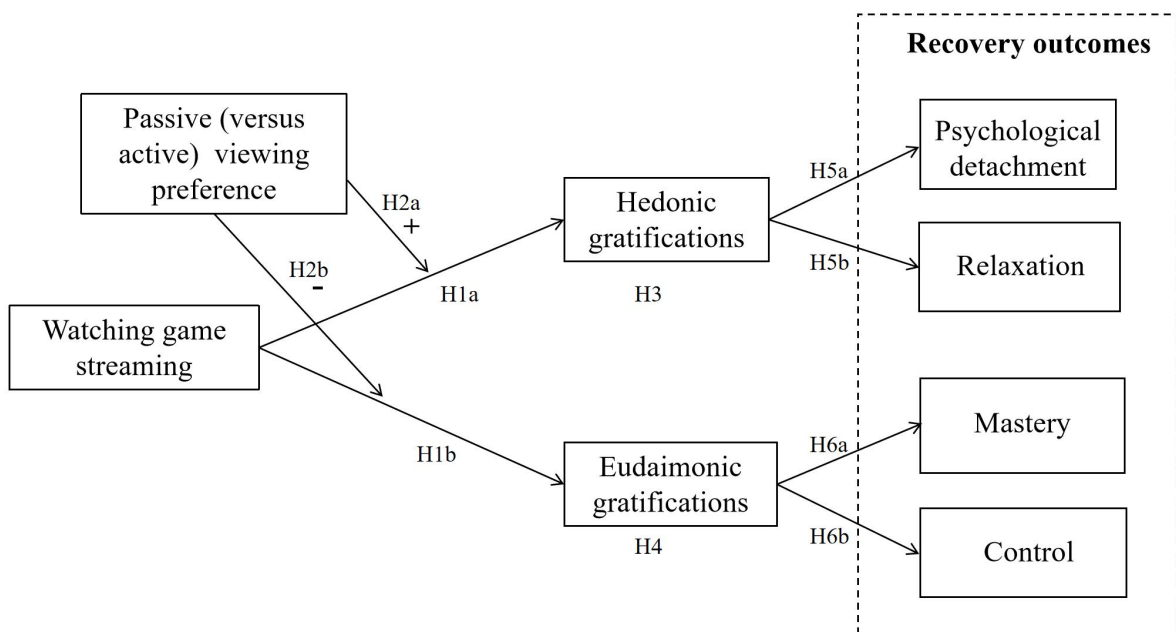


Figure1. Predicted Theoretical Model With Hypotheses Labeled

H5: Hedonic pleasures could mediate the relationship between game streaming viewing and a) psychological detachment and b) relaxation.

H6: Eudemonic gratifications could mediate the relationship between game streaming viewing and a) mastery and b) control.

For providing better insights into various influences on college students' stress

and overall well-being, this study proposed a modified model to interpret the correlations among viewing preference, gratifications and recovery outcomes.

Method

Participants and Procedure

Posts containing a brief description of the study were distributed to some sample collection and gaming related subreddits (e.g., SampleSize, Twitch) on Reddit. Individuals who intended to participate could click the Qualtrics survey link. After agreeing with the informed consent, individuals were asked a qualifying question; only those who had game stream viewing experience were advanced to the whole questionnaire. Individuals could complete the survey whenever and wherever they chose. Participation was completely voluntary without compensation.

A sample of 267 individuals participated in the study, consisting of 72.4 % males ($N = 197$), 22.8 % females ($N = 62$), 4.4 % Non-binary ($N = 12$), and one prefer not to say. Respondents' gender ratio is similar to Twitch viewership, which is around 65% male viewers (streamcheme, 2022). Among the respondents, 91% are young adults aged below 35 years old, with a average age of 25.64 ($SD = 6.79$, Range = 18-58). A large majority of the them were White (63.2%), followed by Asian (13.6%), Black or African American (8.5%), American Indian or Alaska Native (5.5 %), Hispanic or Latino (white) (5.1%), Hispanic or Latino (not white) (1.5%), other (1.8 %) and two refused to answer. In terms of academic standing, 57% were enrolled college students ($N = 155$).

Measurement

Game stream viewing. The single-item measure asked one question: “In the last six months, approximately how many hours per week do you watch game stream?” Due to positive skewness in the distribution of the overall usage scores, values were square-root transformed prior to analysis ($M = 4.30$, $SD = 2.20$).

Hedonism and eudaimonia. The 12-item scale was drawn based on existing scales (Oliver & Raney, 2011) and modified to fit the research’s theme. Participants were asked to rate their agreement with statements about preferred gratifications from watching streams (7-point Likert scale, from 1 = strongly disagree to 7 = strongly agree). Sample items of hedonism include: “The best game stream are ones that are entertaining,” “I find that even short game stream can be enjoyable as long as they are fun”. Sample items of eudaimonia include: “My favorite kinds of game stream are ones that make me think,” and “They challenge my way of seeing the world.”

An exploratory factor analysis using principal components extraction and varimax rotation was employed to examine participants’ ratings of gratifications. The analysis revealed two factors with eigenvalues greater than 1 that accounted for 62.43 % of the variance. Table 1 reports the variables and factor loadings. The first factor was labeled as eudaimonia ($M = 3.56$, $SD = 1.62$) including six items, such as “profound meaning.” The second factor was labeled as hedonism ($M = 5.52$, $SD = .99$), including six items, such as “entertaining” . Both scales showed high levels of reliability (eudaimonia, $\alpha = .92$; hedonism, $\alpha = .80$.)

Recovery experience. Sixteen items were drawn from Sonnentag and

Fritz (2007), including four subscales (psychological detachment, relaxation, mastery, and control) . On a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree), participants were asked to rate how much they agree with corresponding statements: psychological detachment (e.g., “I forget about my daily hassles”), relaxation (e.g., “I kick back and relax”), mastery (e.g., “I seek out intellectual challenges.”), and control (e.g., “I determine for myself how I will spend my time”).

Table 1. Factor Loadings and Descriptive Statistics for Eudaimonia and Hedonism Items

	Eudaimonia	Hedonism
They make me more reflective	.88	.04
They deliver profound meanings or messages	.86	.09
They help me focus on meaningful human conditions	.85	.16
They challenge my way of seeing the world	.86	.11
I am very inspired by game streams that are about people’s search for greater understanding in life	.82	.14
My favorite kinds of game streams are ones that make me think	.77	.10
I have fun when watching game streams	.08	.75
I find that even short game streams can be enjoyable as long as they are fun	-.02	.77
I laugh when watching game streams	.18	.75
The best game streams are ones that are entertaining	-.11	.74
I like watching game streams that may be considered “silly” or “shallow” if they can make me have a good time	.11	.71
My favorite kinds of game streaming are happy and positive	.21	.52
Eigenvalue	4.92	2.57
Proportion of Variance	41.03%	21.40%
Cronbach’s α	.92	.80
Mean (<i>SD</i>)	3.57(1.62)	5.50(1.02)

Note: Factor loadings in bold are considered high on the factor.

To ensure the scales for recovery outcomes are valid discriminately, a factor analysis using a principal-axis factor extraction was conducted. Results (see table 2) revealed four factors match the original structure of recovery scale with eigenvalues greater than 1 that accounted for 71.48 % of the variance: mastery ($M = 4.10$, $SD = 1.67$), psychological detachment ($M = 4.50$, $SD = 1.52$), control ($M = 5.08$, $SD =$

Table 2. Factor Loadings and Descriptive Statistics for Recovery Items

	Component			
	Mastery	Psychological detachment	Control	Relaxation
I seek out intellectual challenges	.91	.12	.14	.07
I do things that challenge me	.87	.18	.21	.03
I do something to broaden my horizons	.83	.15	.25	.08
I learn new things	.79	.09	.11	.21
I distance myself from the real-world	.07	.87	.04	.20
I can be in another world	.27	.84	.06	.21
I get a break from the real-world stress.	.10	.80	.15	.28
I forget about my daily hassles.	.11	.71	-.01	.28
I determine for myself how I will spend my time	.06	.05	.86	.24
I decide my own schedule	.18	.09	.84	.11
I take care of things the way that I want them done	.16	.03	.84	.09
I feel like I can decide for myself what to do	.35	.07	.71	.09
I do relaxing things	.13	.25	.14	.85
I use the time to relax	.11	.30	.19	.85
I take time for leisure	.09	.17	.08	.80
I kick back and relax	.10	.44	.22	.69
Eigenvalue	6.39	2.68	1.91	1.14
Proportion of Variance	39.91	16.75	11.95	7.15
Cronbach's α	.91	.88	.87	.89
Mean (<i>SD</i>)	4.10(1.67)	4.50(1.52)	5.10(1.36)	5.37(1.21)

Note: Factor loadings in bold are considered high on the factor.

1.34), and relaxation ($M = 5.39$, $SD = 1.20$). Reliability tests suggested that recovery subscales all reached satisfactory reliability: Mastery, $\alpha = .91$; psychological detachment, $\alpha = .88$; control, $\alpha = .87$; relaxation, $\alpha = .89$.

Passive versus Active viewing preference. The scale was examined as a moderator of the relationships between game stream viewing and hedonism and eudemonia. The 7-point semantic differential scale was developed based on interview responses provided in study 1, with evaluations of: passive/active, carefree/demanding, unresponsive/responsive, unplanned/purposeful and distracted/engaged. The average score of these five items was computed to be a single variable that reflects one's preference when viewing game stream (Cronbach's $\alpha = .75$, $M = 3.91$, $SD = 1.18$). To differentiate between more passive and more active viewers,

I did a median split on preferences. Individuals' scores of four and above would be active viewers ($N = 134, M = 4.88, SD = .75$) and everyone below four would be passive viewers ($N = 137, M = 2.97, SD = .65$).

Data analysis and Results

Variable Correlations

Prior to testing hypotheses, examination of correlations (see Table 3) revealed that there was a significant, positive correlation between game stream viewing and passive/active preference ($r = .41, p < .01$), hedonism ($r = .22, p < .01$), eudemonia ($r = .42, p < .01$), and four recovery factors: psychological detachment ($r = .27, p < .01$), relaxation ($r = .22, p < .01$), mastery ($r = .35, p < .01$), and control ($r = .18, p < .01$).

Table 3. Pearson and Partial Correlations of variables

Control Variables		1	2	3	4	5	6	7	8	9	10	11
none	1. Gameviewing											
	2. P/A Prefer	.41***										
	3. Hedonism	.22***	.23***									
	4. Eudemonia	.42***	.48***	.30***								
	5. PD	.27***	.14*	.30***	.32***							
	6. Relaxation	.22***	.15*	.42***	.25***	.57***						
	7. Mastery	.35***	.45***	.16**	.72***	.32***	.30***					
	8. Control	.18***	.20***	.30***	.37***	.19**	.36***	.45***				
	9. Age	0.02	0.10	-0.05	0.01	-0.07	0.02	0.04	0.04			
	10. Gender	0.01	-0.05	.13*	0.03	.15*	.13*	-0.02	0.02	-0.07		
	11. Education	-0.04	-0.12	-.18**	-.13*	-.21***	-.13*	-0.09	-0.04	.44***	-0.06	
Age & Gender & Education	1. Gameviewing											
	2. P/A Prefer	.41***										
	3. Hedonism	.22***	.22***									
	4. Eudemonia	.41***	.47***	.27***								
	5. PD	.26***	.12*	.26***	.30***							
	6. Relaxation	.22***	.13*	.40***	.23***	.55***						
	7. Master	.34***	.43***	.15*	.72***	.32***	.29***					
	8. Control	.18**	.19**	.29***	.37***	.18**	.35***	.44***				

Note: PD = Psychological detachment, P/A Prefer = Passive/Active Preference; * $p < .05$, ** $p < .01$, *** $p < .001$

Additionally, passive/active preference is positively correlated with hedonism (r

= .23, $p < .01$), eudemonia ($r = .48$, $p < .01$), and four recovery factors: psychological detachment ($r = .14$, $p < .01$), relaxation ($r = .15$, $p < .01$), mastery ($r = .45$, $p < .01$), and control ($r = .22$, $p < .01$). Those relationships still exist and be strong even after controlling for demographics (age, gender and education).

Hypotheses Testing

For H1a and H1b, after controlling age, gender and education, the correlation analysis indicated that hedonism ($r = .22$, $p < .001$) and eudemonia ($r = .41$, $p < .001$) are positive and significant predictors in game streaming viewing. Therefore, these results support H1a and H1b.

H3 proposed that hedonic pleasures obtained from game streaming viewing are positively related to recovery factors: a) psychological detachment and b) relaxation. After controlling age, gender and education, the correlation analysis revealed that psychological detachment ($r = .26$, $p < .001$) is a positive and significant predictor in hedonism, as well as relaxation, ($r = .40$, $p < .001$). Therefore, H3a and H3b are supported.

H4 predicted that eudemonic gratifications obtained from game streaming viewing are positively related to recovery factors: a) mastery and b) control. After controlling age, gender and education, the correlation analysis revealed that mastery ($r = .72$, $p < .001$) and control ($r = .37$, $p < .001$) are positive and significant predictors in eudemonia. Therefore, H4a and H4b are supported.

For testing the moderating role of passive versus active preference, along with the mediating effect of hedonism and eudaimonia, I ran four sets of Model 7 analysis

via Hayes's (2022) PROCESS macro. The first two sets of moderated mediation models were performed with passive viewing preference as the moderator (H2a), hedonism mediating the relationship between game stream viewing and a) psychological detachment b) relaxation. Contrary to expectation, game stream viewing and passive preference did not account for significant variation in hedonism, $R^2 = .2377$; $F(3,132)=2.64$, $p > .05$. The interaction term (game stream viewing X passive) was not significant in the model ($b=-.0594$, $s.e.=.0865$, $p > .05$), meaning there is no evidence supporting the moderating effect of passive viewing. Therefore, H2a was not supported. Another two sets of moderated mediation models were performed with active viewing preference as the moderator (H2b), eudemonia mediating the relationship between game stream viewing and a) mastery b) control. Game stream viewing and active preference accounted for significant variation in eudemonia, $R^2=.3477$; $F(3,128)=22.74$, $p < .001$. However, the interaction items (active preference X game stream viewing) was not significant ($b=.0083$, $se=.0639$, $p > .05$). Thus, H2b was not supported.

The collinearity of passive/active preference and game viewing usage indicated a potential problem that may undermine the reliability of statistical inferences. It makes sense that people who are more active users also consume more game streaming, while passive viewers are less addicted to game stream platforms and engage less. Thereby it may not be possible to accurately test the moderating effects of p/a preference on a measured variable of game streaming exposure. As a strategy, I set aside the moderating model but focusing on examining the indirect relationship

between game streaming exposure and four recovery outcomes mediating by hedonism and eudaimonia, via running Model 4 analysis via Hayes's (2022) PROCESS macro.

H5 predicted that hedonism could mediate the relationship between game streaming viewing and a) psychological detachment and b) relaxation, while H6 hypothesized that eudaimonia could mediate the relationship between game streaming viewing and a) mastery and b) control. Results (see table 4) showed that the indirect effect of game streaming viewing on psychological detachment ($b=.0246$, $se=.0140$, 95% CI [.0032, .0571]) and relaxation ($b=.0398$, $se=.0210$, 95% CI [.0131, .0746]) through hedonism were positive and significant. Therefore, there is evidence favoring H5a and H5b. In addition, the indirect path from game streaming viewing on mastery ($b=.2212$, $se=.0348$, 95% CI [.1530, .2896]) and control ($b=.0739$, $se=.0196$, 95% CI [.0384, .1156]) through eudaimonia were positive and significant. Therefore, H6a and H6b were supported.

Table 4. Indirect effect from hedonism and eudaimonia to recovery factors

Mediation Path	Indirect effect Bootstrap Estimate (<i>b</i>)	Indirect effect 95% CI	
		LL	UL
Game streaming→ Hedonism → PD	.0246	.0032	.0571
Game streaming→ Hedonism →Relaxation	.0398	.0131	.0746
Game streaming→ Eudaimonia → Mastery	.2212	.1530	.2896
Game streaming→ Eudaimonia → Control	.0739	.0384	.1156
Game streaming→ Eudaimonia → PD	.0569	.0185	.1010
Game streaming→ Hedonism → Control	.0269	.0072	.0507

Note: PD = Psychological detachment; * $p < .05$, ** $p < .01$, *** $p < .001$
 CI = confidence interval; LL = lower limit; UL=upper limit

Beyond the listed hypotheses, it is also intriguing to highlight two additional

findings uncovered in the mediation analysis. First, eudaimonia was found to be a significant mediator between game streaming viewing and psychological detachment ($b = .0569$, p 95% CI [.0185, .1010]). One reasonable reflection is that individuals tend to gain a sense of accomplishment being in a virtual environment away from the pressures of reality. Second, hedonism was found to significantly mediate the relationship between game streaming viewing and control ($b = .0269$, p 95% CI [.0072, .0507]). One possible interpretation is that individuals could gain immediate pleasure and satisfaction from making their own decisions of game streaming viewing (Sonnentag & Fritz, 2007), such as the game content, viewing duration, engagement level and so on.

Discussion

While the quantitative study did not find evidence to support the effects of game viewing preference on individuals' affective outcomes, each path from game streaming viewing to gratifications and recovery outcomes was supported. The findings provided evidence that game streaming viewing is indeed a positive way for individuals to seek gratification and cope with stress during difficult times.

CHAPTER 5 GENERAL DISCUSSION

The issue of mental stress and COVID-fatigue is one that has real-life ramifications and significance. Altogether, the findings presented in two studies demonstrate that individuals consume game streaming not only for pure enjoyment but also for meaningful goals. In comparison to traditional “passive” media such as television and film viewing, the uniqueness of game streaming lies in its participatory and interactive nature (Sjöblom et al., 2017). To illustrate, watching game streaming as noise background while multitasking works as similar as keeping TV or movie live, whereas game streaming allows interaction between streamers and viewers.

Theoretical Implications

The present study is important in at least two significant respects. First, the in-depth interviews allowed for holistic insights into participants’ subjective experience of the pandemic and their perceived behavior changes on video game viewing. The online survey statistically verified the mediating role of hedonism and eudaimonia, further deepening our understanding of game streams’ recovery effects. Furthermore, the U&G, mood management and stress recovery theories provided a validated theoretical framework, based on whose rationale two dimensions of gratifications were defined. Also, with particular focuses on the young population and a pandemic context, the study advances the explanatory power (more specifically, the range) of employed theories by extending our knowledge of the media exposure’s benefits for coping with pandemic stress.

In accordance with U&G theory, two dimensions of gratifications (hedonism and eudaimonia) were captured in both studies, implying that individuals could rely on game streaming to enhance psychological well-being. From the perspective of hedonism, game streaming has the capacity to help individuals relieve negative feelings but shift to positive experience (Ryan & Deci, 2001). From a eudaimonic perspective, game streaming helps promote the cultivation of personal strengths and stronger life purpose (Ryan & Deci, 2001). More importantly, the confirmed mediation model in the survey shed light on the conceptual connection of U&G and stress recovery theory (Reinecke & Eden, 2017). For example, in an empirical research, Ryff (1989) identified six core characteristics of eudaimonia, including self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy. Among the six scales, environmental mastery and autonomy are obviously linked with two recovery outcomes mastery and control, which offers rationale the mediating effect of eudaimonia.

The results of this study also reflect the similar scope of playing video games. In interviews, some participants reported increased time investment in both playing and spectating, which indicates a growth in gameplay usage pattern. Comparing to the more purposeful action, actual playing video games, watching others play in a rational or casual manner could engender stronger feelings of relaxation and unique experience of vicarious pleasure. Considering the socialisation need of people, people may enhance enthusiasm for games included more interactions, such as multiplayer games. From another perspective, for relaxing purpose, they may turn to easy games

(Barr & Copeland-Stewart, 2021). Regarding recovery experience, feelings of competence and achievement are more obtainable for players.

Practical Implications

Understanding why millions of people engaged in game streaming has several practical applications. Firstly, it confirms the positive outcome of game streaming consumption for individuals. From a hedonism level, engaging in game streaming minimize viewers' stress and anxiety, inducing a relaxed state. From a eudaimonia level, game streaming offers opportunities for viewers to in contact with people and enrich social life. This kind of virtual social life is of value in the isolated period, encouraging viewers to control their daily routines and seek for meaning in midst of the COVID-19 pandemic. Second, the findings could offer some insights for universities or public health organizations to develop intervention strategies, encouraging students to use the technology as a healthy way to ameliorate stress and corresponding adverse impacts.

Limitations and future research

The limitations of the current project provide some tangible research directions with practical relevance.

In regard to the qualitative study, the primary limitation relates to the convenience and snowball sample due to under-representation and response bias. Second, this research was conducted with a small sample of college students. The findings generated by a handful of interviewees require further examination in a more extensive study. Third, since questions regarding mental conditions are

sensitive, I didn't dig deeper from participants. More information on participants' perceptions of life condition would help establish a greater degree of accuracy on this matter. Subsequent research could include a baseline assessment of participants' mental stress levels prior to the interviews. Third, this research was limited by study design, solely relying on a self-report procedure for data collection. An approach integrating multiple ways (e.g., self-report and observer-based measures) may better capture participants' conditions and feedback. Last but not least, for some reasons, some new viewers were getting attracted to game streaming amid the pandemic, but this study did not distinguish them from long-term viewers. It is worth examining in further research.

In terms of the quantitative study, the multicollinearity among independent variables indicated a major issue, that would result in less reliable statistical inferences. To illustrate, the correlation analysis demonstrated that game streaming exposure and passive/active preference are robustly correlated with one another, showing a defect of measurement. The semantic differential scale of viewing preference may inadvertently capture the amount of individuals' game streaming usage. In specific, the more active and engaged users tend to be, the more often they are motivated to be involved in game streaming platforms. Oppositely, for viewers who used to play the game streaming as noise background with minor attention, the streaming platforms may be less appealing to them. To address this issue, it may be more fruitful to conduct an experiment to capture viewers' actual game streaming consumption and behavioral habits. For example, we could assign participants with

different viewing preference to watch a certain amount of game streaming content, and to determine whether someone with a high level of passive use would have particular outcomes. Also, the eye-tracking technique could be employed to measure participants' engagement when watching game streaming or interacting with others, further tracking their emotional and cognitive arousal. From another perspective, the active / passive preference viewing didn't work out as much. I made the attempt to map to the preference by identifying some active / passive behaviors, but that scale turning out pretty low reliability. Alternative factor structured may be further considered, such as social versus non social viewing behaviors. In addition, the interconnections of variables indicate a potential threat to causal ordering. As many scholars have documented diverse gratifications as motivations for watching game streaming, there may exist polydirectional relationships between game stream viewing, gratifications and recovery outcomes.

Beyond reported finding, there are some minor takeaways deserve discussion. In the qualitative study, a couple of participants said they consume mobile gaming a lot. It would be interesting to explore these market trends, such as what features of mobile gaming influence viewers' gratifications. Another finding worth pointing out is that some participants started streaming themselves right after the COVID-19, their motivations and gratifications of being both the consumers and creators demands additional investigation. In the quantitative study, as previously mentioned, eudaimonia's mediation role was also detected of game streaming viewing on psychological detachment, while hedonism's mediation role on control, which

warrants further study to corroborate the mediating effects toward four recovery outcomes.

In addition, benefiting from the easy access of mobile phones, mobile game streaming has become a noticeable phenomenon that could bring another positive outlook to the gaming market. Some interviewees viewed game streaming mostly on mobile phones, this tendency await further investigation, such as what features of mobile gaming (e.g., agency, control) contribute to individuals' gratifications.

Conclusion

Through a sequential mixed-method approach, the positive influence of streaming viewing experiences to combat stress was found. To emphasize, viewers' obtained hedonism was linked with recovery dimensions of psychological detachment and relaxation, since engaging in game streaming is a preferred way to shelter viewers from pressure and get relaxed. At a deeper level, viewers' obtained eudaimonia was associated with recovery dimensions of mastery and control, for which they could seek for social interactions, meaning and appreciation of life in the midst of pandemic and somehow enhance their mental health.

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APPENDIX A

Interview Protocol

Pre Brief:

Thank the informant for participating

Introduce the study

Reconfirm audiotape permission

1. Educational background

- What is your major?

- What year are you in?

2. What kind of teaching mode is in your program? And how long is has lasted?

- What were your thoughts or how were you feeling when your program announce virtual learning?

3. How would you say that COVID-19 has affected you? Could you offer a few examples to elaborate on that?

- How has COVID-19 affected your schoolwork?

- How has COVID-19 affected your personal life or your families or friends?

- How has COVID-19 affected your media use?

4. Do you remember what kind of feelings during the pandemic that affected you most?

- For most cases, what mood you are in?

5. How would you say that your game streaming viewing habits have changed since COVID-19 started?

- How often do you watch game streaming? And how long per time?
 - Do you think your usage increased during pandemic?
6. What got you interested in watching game streaming in the first place? What is the difference between playing game by yourself?
 7. When watching game streaming, what were you doing at the same time?
 8. What platforms do you watch game streaming on?
 - Do you prefer to watch synchronous or recording game streaming?
 - If you watch game streaming on a couple of platforms, which one is your favorite and why?
 - Do you invest money on game streaming? Membership? Gifts to streamers?
 9. Do you have preferences for game genres? Why or why not?
 10. How many streamers are you following?
 - Will you interact with streamers or other audiences when watching streaming?
 - Have you joined in some groups in the game streaming platforms?
 10. What do you gain from the viewing experience? What do you like watching game streaming?
 - What kind of mood would you be in when you viewed game streaming?
 - How did this help you manage your mood during the COVID-19 pandemic?
 - Why watching game streaming is somewhat unique to you?
 11. Do you consider those gratifications are transient or long-lasting?
 12. Have you ever had a negative experience when watching game streaming? If so, do you mind explaining what happened?

13. Will you maintain the same schedule of game streaming viewing when everything is back on to the right track? Why or why not?

APPENDIX B

Questionnaire

Qualifying questions

How long have you been watching game streams (both live and recorded)?

- Less than 1 year
- 1-3 years
- 4-6 years
- Over 7 years
- I don't watch game streaming

Demographic Questions

- What is your age? Please enter a number.

With which gender do you most identify?

- Female
- Male
- Non-binary/third gender
- Prefer not to say

- What is your highest grade or level of school completed?

- Eight grade or less
- Some high school
- High school graduate
- Some college, trade school, or associate's degree
- Graduated college

- Post-college

● With which ethnicity do you most identify? (Select all that apply)

- American India or Alaskan Native

- Asian or Pacific Islander

- Black or African American

- Hispanic or Latino (white)

- Hispanic or Latino (not white)

- White or Caucasian

- Other

Game streaming viewing scale

In recent months, approximately how many hours per week do you watch game streams?

Passive/active viewing preference

The following questions were asked on a 7-point semantic differential scale

Please indicate on the scale where you fall between the two values when watching streams?

1. Distracted/Engaged
2. Carefree/Demanding
3. Unresponsive/Responsive
4. Unplanned/purposeful
5. Passive/Active

Hedonism/Eudaimonia scale

The following questions were asked on a 7-point Likert-type scale

In recent months, when you watch game streams, to what degree do you agree with the following statements?

Hedonism

- I have fun
- I laugh
- I find that even short game streams can be enjoyable as long as they are fun
- I like watching game streams that may be considered “silly” or “shallow” if they can make me laugh and have a good time
- The best game streams are ones that are entertaining
- My favorite kinds of game streaming are happy and positive

Eudaimonia

- They challenge my way of seeing the world
- They make me more reflective
- They help me focus on meaningful human conditions
- My favorite kinds of game streams are ones that make me think
- I am very inspired by game streams that are about people’s search for greater understanding in life
- They deliver profound meanings or messages

Recovery scale

The following questions were asked on a 7-point Likert-type scale

Psychological detachment

- I forget about my daily hassles.
- I can be in another world
- I distance myself from the real-world
- I get a break from the real-world stress.

Relaxation

- I kick back and relax
- I do relaxing things
- I use the time to relax
- I take time for leisure

Mastery

- I learn new things
- I seek out intellectual challenges
- I do things that challenge me
- I do something to broaden my horizons

Control

- I feel like I can decide for myself what to do
- I decide my own schedule
- I determine for myself how I will spend my time
- I take care of things the way that I want them done