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Exploring the possible mental health and wellbeing benefits of video games for adult players: A cross-sectional study

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Abstract

Objective: There is mixed evidence on the psychological effects of video games. While excessive use can be harmful, moderate use can have emotional, psychological and social benefits, with games successfully used in treating anxiety and depression. More data are required to understand how and for whom these benefits occur. This paper aims to identify correlations between video game genre, player demographics, wellbeing, and the in-play psychological processes for adult players.

Method: Adult gamers (n = 2107) completed an anonymous cross-sectional survey canvassing play style, genre, perception of psychological impact and mechanisms (wellbeing, self-determination and flow). A multivariate multiple regression model explored correlations.

Results: 88.4% of participants experienced emotional benefits from gaming, with stronger benefits experienced by younger players in all categories. The genres most strongly correlated with psychological benefits were music games, role-playing games and survival horror games. Multiplayer online battle arena games had lower scores for psychological and emotional wellbeing.

Conclusions: Certain genres have stronger correlations with beneficial mechanisms, while some may be detrimental to players. These results may guide experimental studies to measure the directionality and strength of these correlations and can also impact practical aspects in development of therapeutic games to treat mental distress.

Keywords: Depression, mental health, self-determination theory, video games, wellbeing

With the inclusion of Gaming Disorder in ICD-11, it is important that mental health clinicians gain a balanced understanding of their patients' gaming. This means focussing not only on the potential *harms* but also exploring the potential *benefits* and therapeutic opportunities of video games.

Researchers, politicians and public commentators typically associate video games with negative outcomes, such as violence and addictiveness. Overall, meta-analyses show that playing video games in and of itself does not involve negative consequences.[1] Indeed, gaming can be a healthy coping mechanism. A review of the literature shows moderate amounts of play are linked to positive mood, relaxation, reduced stress and anxiety, improved emotional regulation, reduced depression and increases in self-confidence and self-esteem.[2–4] Games can also promote healthy socialising and assist with social integration.[2]

Other psychological mechanisms which have been explored include self-determination theory[3] (comprised of autonomy, competence and relatedness) and the concept of flow.[5] *Autonomy* can be experienced by relating to the in-game avatar and controlling its actions, personality and often destiny to match one's own agenda. *Competence* describes the cycle of challenge, skill testing and achievement. This teaches the player to endure frustration, and to persevere to overcome the obstacles before them. *Relatedness* refers to social integration, and can involve relating to in-game characters, or playing with others. Online games can fulfil a need to belong to

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a community, to be valued, validated and recognised as a source of social support.[6]

Flow is a state of mind characterised by immersion, accomplishment, focus and loss of time awareness. It is inherently pleasurable and linked to positive affect, better performance, lower anxiety and increased self-esteem.[5] Video games engage multiple senses simultaneously; by their nature they require significant concentration.[5]

Given the potential benefits to player mental health and wellbeing, it has been proposed that video games could be used as therapeutic interventions and adjuncts. Using games in this way has a number of benefits; video games are relatively cheap, can reach a large audience, and are acceptable to many – especially young adults. Therapeutic video games became increasingly appealing options during the COVID pandemic where psychological distress increased, especially among young people, and traditional therapies were compromised by social distancing restrictions. Video games have been accepted and enjoyed treatment options by young people with depression[7,8] and may be particularly useful in remote communities where health care is less accessible.[8]

In order to best design and deliver therapeutic games, developers must understand the relationship between gaming and psychological and emotional outcomes. It is important to consider not just the general act of 'play', but *who* is playing, *how* they are playing, *why* they are playing and *what* they get out of it. Understanding these concepts can provide direction for the development of games that maximise wellbeing, and potentially for the development of therapeutic games.

Methods

The study received ethical approval from the Human Research Ethics Committee of South Western Sydney Local Health District (HE16/151).

Data from adult (>18 years) gamers were collected through an anonymous cross-sectional survey hosted on Google Forms. Participants were recruited via invitations on relevant Twitter and Facebook groups. The survey was open 27 March–31 August 2017. Only fully completed surveys were included in the analysis.

Data were collected across 117 variables, including participant demographics, which genres participants played (see Table 1), duration of play, who they played with, whether they perceived a psychological impact from video games (and, if so, which genres) and questions investigating mechanisms of benefit. Mechanisms of benefit were explored using three established psychological theories with connections to video game play: wellbeing theory,[9] self-determination theory[10] and flow.[5]

Survey questions were derived from validated tools with reliable psychometric properties. Psychological, emotional, and social wellbeing, were assessed using the Warwick-Edinburgh Mental Wellbeing Scale[11] and the Flourishing Scale.[12] The Basic Psychological Needs Scale[13] assessed autonomy, competence and relatedness and the Flow Short Scale[14] assessed flow.

Table 1. Play time, per week, by gender (%)

	None	1–6 h	7–10 h	>10 h	Total
Female	0.2	8.0	7.1	11.1	26.4
Male	0.2	13.1	20.6	35.7	69.5
Gender diverse	0.0	0.9	1.4	1.7	3.9
Total	0.4	21.9	29.1	48.5	99.9

Summary statistics and correlations were reported for key demographic data, game genre and psychological scale outcomes. A multivariate multiple regression model was used, with the seven score variables as the response variables. Demographic variables, perceived benefit and genre were predictor variables that simultaneously explained multiple outcomes.

Results

There were 2107 valid responses; 69.5% were male, 26.4% female, 3.9% gender diverse, with 0.2% missing. The majority (81.8%) were aged 18–34 years, with 13.2% aged 35–44 and 3.4% over 45 years old. Most participants were in Australia (31%), the USA (29.5%) and the UK (25.4%), the remainder from various other countries. Almost all participants (98.1%) played single-player games, 74.5% played co-operative multiplayer and 58.8% played competitive multiplayer. A glossary of gaming genres, terms and abbreviations is available (Supplementary file 1).

The time participants spent playing is summarised in Table 1.

Most participants (88.4%) considered video games had psychological or emotional benefits for them. Nine percent were unsure and 2.4% did not experience psychological/emotional benefits. Psychological outcome scores were higher across all domains for those perceiving benefits (Figure 1). Those who perceived benefits scored higher in terms of flow state, competence, autonomy and relatedness. Younger adults identified significantly greater psychological benefits. Increasing age was negatively correlated with psychological benefits.

There were no significant correlations between time spent playing and the psychological mechanisms investigated, apart from competence. There were significant correlations between individual games genres and psychological outcome variables (Figure 2 and 3).

Perceived psychological benefits differed by genre and gender, with key findings summarised in Table 2. Role-playing games (RPGs) scored highly across participants,

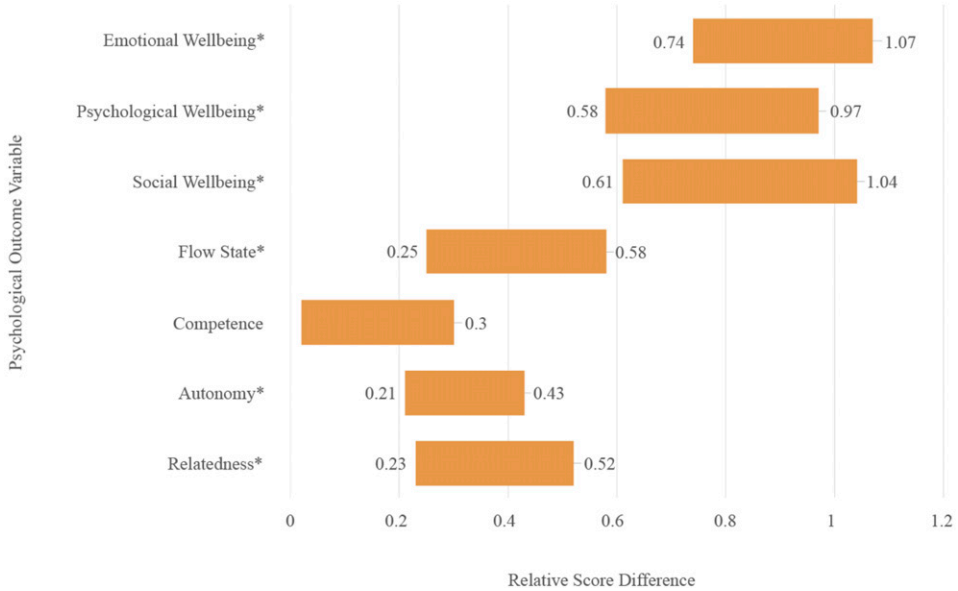

Figure 1. Relative difference (with 95% Confidence Intervals) in psychological outcome variables for people who believed that video games have a psychological benefit (88.4%) compared with those who were unsure or who did not experience a benefit after adjusting for age, gender, perceived gaming benefit, time spent playing, genre, interaction terms for gender and genre and benefit and genre. * = $p < .001$. Only the significant results are shown.

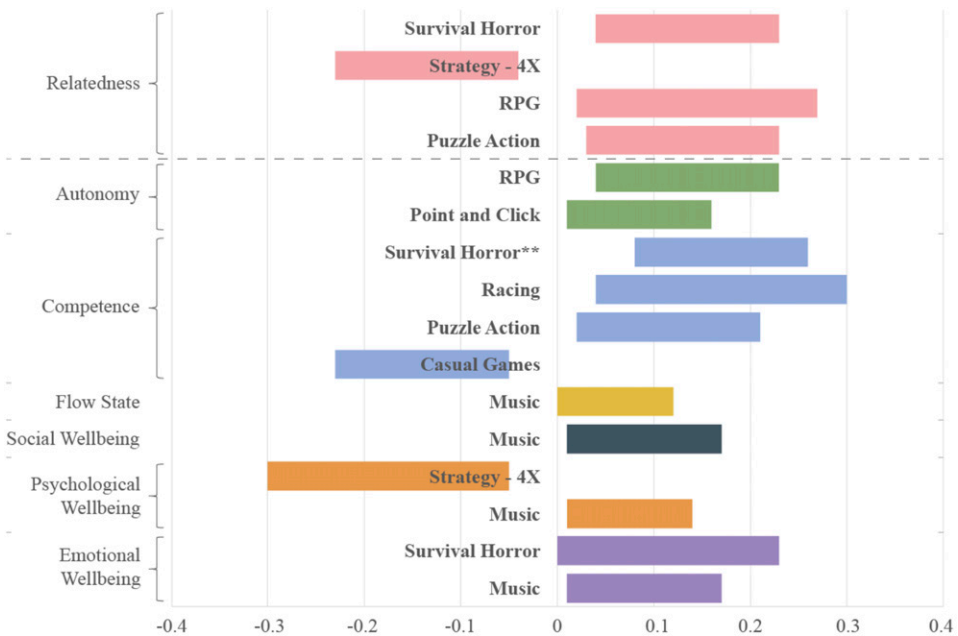

Figure 2. Relative difference (with 95% Confidence Intervals) in scores across psychological outcome variables if participant plays genre; statistically significant correlations after adjusting for age, gender, perceived gaming benefit, time spent playing, genre, interaction terms for gender and genre and benefit and genre. All = $p < .05$; ** = $p < .001$. (RPG = Role-Playing Game). Only the significant results are shown.

but men were more likely to perceive first-person shooters and stealth titles as having psychological benefits; while more women perceived mobile and life sim games as beneficial.

Supplementary datafile S2 describes genre outcomes in greater depth. Overall, RPGs were the most frequently played genre, with RPG-players scoring significantly higher in autonomy and relatedness domains. Survival

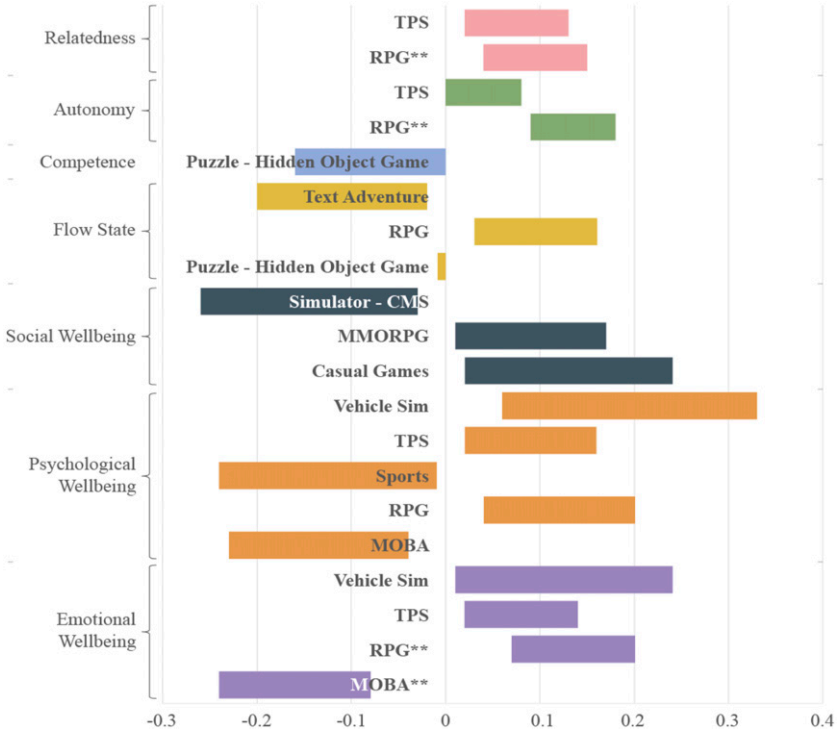

Figure 3. Relative difference (with 95% Confidence Intervals) in scores across psychological outcome variables if participant believes genre has a psychological benefit; statistically significant correlations after adjusting for age, gender, perceived gaming benefit, time spent playing, genre, interaction terms for gender and genre and benefit and genre. All = $p < .05$; ** = $p < .001$. Only the significant results are shown. (TPS = Third Person Shooter; RPG = Role Playing Game; Simulation CMS = Simulation Construction and Management Simulation; MMORPG = Massively Multiplayer Online Role Playing Game; MOBA = Multiplayer Online Battle Arena).

horror games also performed well, with players rating them highly on emotional wellbeing, competence and relatedness. Male and non-binary respondents were most likely to both play survival horror games, and to perceive benefit in them.

The data from Multiplayer online battle arena (MOBA)-players were mixed. Interestingly, participants who believed that MOBAs had psychological benefits scored lower in emotional wellbeing and psychological wellbeing domains (Figure 3).

Discussion

Strengths and limitations

A strength is the large sample size, with over 2000 adult gamers participating. The data captured correlations between genre and psychological mechanisms but cannot prove causation. Data were subjective, describing gamers' perceptions of benefits. However, subjective experiences are important because people are unlikely to use game-based therapy if they do not perceive benefits.

Data were limited by selection bias. For example, participants may have been those most interested in links between video games and psychology. Other sources of bias were mitigated by including negatively weighted statements to account for acquiescence bias, and judgement statements were removed to reduce social desirability bias. Validated scales reduced the risk of measurement bias.

Discussion of key findings

All genders (male, female and other) perceived psychological benefits from video games. There was an inverse relationship between age and perceived benefit. This might have been because younger players were more familiar with the digital world and hence more receptive to the idea of deriving tangible, real-life benefits from gaming. Older adults might consider video games less acceptable and associate play with feelings of guilt or self-stigma.

Participants playing multiplayer games scored higher on social wellbeing and relatedness measures than respondents who only played single-player games. RPGs were perceived as the most beneficial genre, particularly by female gamers, with the highest correlation to positive psychological outcomes. This could inform the choice of genre for therapeutic games. There are examples of such work underway, such as SPARX,[7,8] a New Zealand developed RPG to improve mild-to-moderate depression and anxiety in young people. These results might also

Table 2. Subgroup analysis of genre impact by demographic

Genre	Key significant findings	Significance
RPG	Female participants (73.8%) more likely than male (68.3%) and gender diverse (80.5%) to believe RPGs have psychological benefits	$\chi^2 = 10.09$, $p < .001$
Survival horror	Male (35.2%) and gender diverse (37.8%) participants more likely than females participants (28.5%) to play survival horror games	$\chi^2 = 8.66$, $p < .05$
	Male (34.8%) and gender diverse (40.2%) participants were significantly more likely than females (28.9%) to believe survival horror games have psychological benefits	$\chi^2 = 8.13$, $p < .05$
Music games	Outcomes were the same for male, female and other genders	NA
MOBA	Male participants (27.9%) were significantly more likely than females (16.2%) and other genders (22.0%) to play MOBAs	$\chi^2 = 30.19$, $p < .0001$
	Male (24.2%) and gender diverse (28.0%) participants were more likely than females (18.0%) to believe that MOBAs have psychological benefits	$\chi^2 = 10.48$, $p < .01$

Note. RGP = Role-playing games; MOBA = Multiplayer online battle arena.

guide the design of experimental studies to investigate causality and directionality of video games and their potential benefits.

In MOBA games, players manage resources within a game world in real time with players working together and against each other in teams. This would seem to predict social connectivity and relatedness. However, MOBA games are renowned for negative player interactions, with toxic behaviour appearing in an estimated 60% of game matches.[15] There is an emerging lexicography of associated terms, such the gaming 'toxicity index', and 'griefing'; deliberately hassling another player with no in-game benefit to either party; a form of cyber-bullying. Toxicity is one explanatory model for the reduction of wellbeing scores observed in MOBAs.

Conclusions

Perceived psychological benefits from video games were correlated with self-determination theory domains: autonomy, competence and relatedness; and with wellbeing theory. Despite players' beliefs, MOBA-players had lower psychological wellbeing scores, disproportionately impacting male players. As the consequences of gaming toxicity and online harassment become more apparent, this connection may warrant further investigation. RPGs were perceived to be the most beneficial genre, particularly by female gamers. Interestingly, survival horror games, most often played by men, might be of benefit to all genders. These findings may influence the design of therapeutic games to promote wellbeing and treat aspects of mental distress.

Authors' note

The first author (JH) is the co-founder of a non-profit organisation, which provides mental health resources for gamers.

Author contributions

JH conceived and designed the study, collected the data, performed the analysis and wrote the paper. HK provided statistical guidance. SEP provided supervision, guidance on methodology and reviewed and edited drafts of the manuscript. All authors reviewed and approved the final manuscript

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Supplemental material

Supplemental material for this article is available online.

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