Videogame Play and Wellbeing Among a First Episode Psychosis Population

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With ongoing interest in the relationship between videogame and mental health alongside recent focus on gaming's role in coping with stressful life events, we sought to explore the relationship between videogame play and wellbeing among people experiencing their first episode of psychosis. Specifically, we aimed to explore the associations between videogame play and wellbeing among consumers of a first episode psychosis (FEP) service and further to compare their motivations for play, need satisfaction, passion for play and wellbeing to a control group. A sample of 88 people experiencing FEP (57 who played videogames and 31 who did not) and a control sample of 46 (all of whom played videogames) completed a survey containing a range of questionnaires related to the variables of interest. Key findings include that among those experiencing FEP, people who played videogames reported better wellbeing outcomes than those who did not. Among participants who played videogames, the FEP sample reported lower levels of need satisfaction through gaming, lower levels of harmonious passion, higher levels of external types of motivation and lower levels of internal types of motivation for play than the control group. Finally, the relationships between passion orientation (both harmonious and obsessive) and psychological distress were stronger in the control group than the FEP sample, suggesting that passion for gaming may be less influential on wellbeing for those experiencing FEP.

CCS Concepts: • **Applied computing → Computer games**; • **Human-centered computing → Human computer interaction (HCI)**.

Additional Key Words and Phrases: gaming, video games, mental illness, wellbeing, psychosis, passion, SDT

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1 INTRODUCTION

Over 80 percent of young people between the ages of 15 and 24 play videogames [7]. Gamers report a variety of motivations for choosing to play, such as for escapism, to experience agency, to socialize, to have fun, and to temporarily escape from life's demands [12, 15]. Recently, increasing attention has been paid by researchers to how videogames are used by players during times of stress or in difficult circumstances—specifically, by investigating motivations for play, how players engage, and the impacts of play during such times [24, 30]). These questions have been asked with respect to unspecified stressors and also with specific regard to the COVID-19 pandemic (see related work). Recently, researchers have started to question the relationships between digital gaming habits and mental health. There are several reasons to believe that gaming can benefit wellbeing—the benefits of gaming [19] are well established, and videogame play has been specifically associated with positive emotions [31, 52], emotion regulation [31], socialisation and coping [65], and higher self-esteem [14]. Research suggests that gaming can help players repair noxious moods[6], recover from stress [48], and practice emotion regulation [26]. Further, Iacovides and Mekler [24] showed that during difficult life experiences, games provide players with respite from stress, help them deal with their feelings, provide social connections, stimulate personal growth, and even provide a lifeline in times of existential doubt; however, despite significant evidence of coping through gaming, participants in their study also referred to games as an unproductive use of time and as an obstacle to living well.

These potential negative influences of videogaming have been a matter of concern for both the World Health Organization (WHO)—who recently included 'gaming disorder' in their international classification of diseases [67]—and the American Psychiatric Association (APA)—who have included 'gaming disorder' in the most recent Diagnostic and Statistical Manual of Mental Disorders (DSM-5), although many scholars have argued against its classification as a disorder (e.g., [61]). Evidence also suggests that game addiction [34] and compulsion to play [47] are associated with reduced satisfaction of our basic psychological needs, and that more frequent play [37], along with habitual playing at night [35], is associated with higher depression scores among players.

Researchers are beginning to unpack how players use videogames to cope with life's stressors and self-manage their wellbeing; however, the majority of research is conducted with participants drawn from non-clinical populations (e.g., [24, 30])—relatively little research has looked specifically at how videogames are used for self-care among populations with serious mental illness. Although research consistently demonstrates that when played in balance with other life activities, videogames provide significant benefits to wellbeing among healthy players (e.g., [19, 43, 63]), the problem is that we cannot confirm that these benefits extend to vulnerable populations, such as those with serious mental illness. As recent work has suggested that gaming's benefits might be attenuated for vulnerable populations—such as marginalized players [44] or those going through a period of enforced social isolation [29]—we explore whether digital gaming behaviour is a positive coping strategy that benefits wellbeing, among a sample of participants experiencing their first episode of psychosis (FEP).

Psychosis is a mental illness, characterized by the loss of a sense of reality, and can include the experience of positive symptoms (delusions, hallucinations, disorganized thinking and speech, grossly disorganized or abnormal motor behaviour), and negative symptoms, such as diminished emotional expression, decreased motivated to engage in self-initiated purposeful activities (avolition), decreased ability to experience pleasure (anhedonia), and a lack of interest in social activities [3]. Those presenting with FEP may also have social cognition deficits—either lacking the skills to ask for more support, or being unable to recognise support when it's offered [22]. We explore whether people experiencing their first episode of psychosis differ in their overall wellbeing and

support, depending on whether or not they play videogames, whether those who do play games differ in their wellbeing and support from a control group of gamers, whether gaming motivations and experiences differ between a group of FEP gamers and a control group, and whether previously-established pathways of gaming's benefit (from needs satisfaction through harmonious passion) attenuate among gamers with FEP.

2 RELATED WORK

2.1 SDT and Organismic Integration Theory

One commonly applied [59] theoretical lens for understanding the impacts of videogame play is self-determination theory [52]. SDT proposes that people have key psychological needs (autonomy, competence, relatedness) and are intrinsically motivated to undertake activities that satisfy these needs [13, 50]. Autonomy refers to the feeling that one is making their own decisions about performing an activity and expressing themselves freely within the activity; Competence refers to feeling that one is acting effectively and developing skills; while Relatedness refers to connection to others and supportive interpersonal interactions. Undertaking activities that satisfy these needs has been shown to lead to improved wellbeing [13, 50], a process that has been confirmed in the context of videogame play [25, 47, 64]. In other words, videogames have been shown to be effective means of fulfilling one's needs for autonomy, competence, and relatedness and the satisfaction of same has been shown to lead to positive wellbeing outcomes in the majority of cases [19, 47, 62].

SDT includes a number of sub-theories that speak to specific issues of motivation and need satisfaction [50]. One of these, Organismic Integration Theory (OIT) presents a continuum of types of motivation and associated regulatory styles, loci of causality and associated regulatory processes. As shown in Figure 1 [reproduced from 50], OIT presents a taxonomy of motivational types that vary in the extent to which the motivations emanate from the self. In a state of amotivation, a person lacks the intention to act and may not act at all or may act without intent (i.e., simply going through the motions). Moving from amotivation, OIT presents 4 regulatory styles associated with extrinsic motivation—these styles primarily vary in the degree of autonomy experienced by a person. The least autonomous extrinsic motivation, external regulation, refers to behaviours that are performed in order to satisfy an external demand or reward contingency. Introjected regulation refers to behaviours where a person has internalised a regulation without fully accepting it as their own—in other words, performing the behaviour to avoid guilt or anxiety or to attain ego-enhancements such as pride. A more self-determined form of motivation is identified regulation, wherein a person consciously values a behaviour, finding it personally important. Meanwhile, integrated regulation includes motivations that are fully assimilated and have been bought into congruence with a person's other values and needs. The final component of the continuum is fully intrinsic regulation wherein a person is fully intrinsically motivated and undertakes a behaviour purely for its inherent satisfaction, interest, and enjoyment. Research has established a number of wellbeing benefits of higher levels of internalisation that are absent for more external forms of regulation [50, 51], across a range of domains from physical exercise [9] to intimate relationships [5].

Confirming the value of OIT in understanding videogame play, researchers have shown the expected associations between type of motivation and wellbeing; with less extrinsic and more intrinsic regulatory styles associated with better wellbeing outcomes. With a sample of players of various games, Lafrenière and colleagues [32] found that higher levels of need satisfaction were more associated with intrinsic motivation, integrated regulation, and identified regulation than with introjected regulation, external regulation, and amotivation. Looking specifically at players of League of Legends, Bruhlmann et al. [8] found that players with more intrinsic motivations for play experienced greater enjoyment and vitality as well as less negative affect and tension.

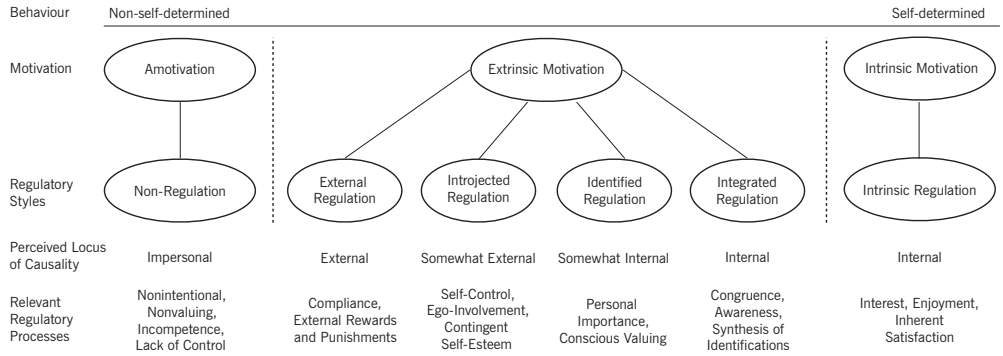

Fig. 1. Taxonomy of motivation types, as described by OIT, reproduced from [50].

Finally, exploring motivations for videogame play among a group of cancer survivors, Comello et al. [10] found that the same pattern extended to communication self-efficacy, resilient coping, and flourishing.

2.2 The Dualistic Model of Passion

Over time, a person who regularly undertakes an activity that satisfies their psychological needs will come to develop a passion for that activity [60]. The Dualistic Model of Passion (DMP) suggests that the passion a person comes to develop can be either harmonious or obsessive [36, 60]. Harmonious passion is evident when the activity is balanced with other areas of a person's life, is described in positive terms, and is engaged in freely without negative consequences. Obsessive passion, in contrast, is shown when a person experiences more of an uncontrollable urge to engage in the activity and the activity tends to cause conflict with other parts of the person's life. Unsurprisingly, obsessive passion is more often associated with negative outcomes.

These antecedents and consequences of passion have been confirmed in the context of videogame play. Looking specifically at players of World of Warcraft (WoW), Mandryk and colleagues [38] found that harmonious passion facilitated in-game social capital while also combating loneliness and increasing wellbeing. Conversely, while obsessive passion also led to social capital, this did not, in turn, combat loneliness and no positive impact of obsessive passion on wellbeing was found. Similar patterns were evident in players of the massively-multiplayer online game Destiny for whom harmonious (but not obsessive) passion mediated a positive association between playing with others and the building of social capital [45]. In a study of players of a variety of videogames, Schellenberg et al. [53] found that compared to harmonious passion, obsessive passion was associated with a range of negative physical symptoms (e.g., sleep disorders, carpal tunnel syndrome). Finally, Johnson and colleagues [25] found that among players of a range of videogames, obsessive passion was associated with higher levels of addiction and psychological distress and lower levels of vitality.

Further, previous work has shown there to be a consistent path model that leads from need satisfaction through the two types of passion to wellbeing outcomes [e.g., 2, 25, 33, 46]. In general, when needs are satisfied through play, there is an associated increase in passion, with the path through harmonious passion facilitating the benefits of gaming and the path through obsessive passion facilitating the potential harms of gaming.

2.3 Obsessive Passion as a Compensatory Response

With respect to both videogames and other activities, the research has consistently shown that while need satisfaction within the passionate activity predicts both types of passion, it is a lack of need satisfaction (or need frustration) on other areas of life that reliably predicts obsessive passion [25, 33, 58]. In other words, when a person is relying on a single activity for the majority of their psychological needs, obsessive passion is more likely to occur—a compensatory response to the lack of need satisfaction in other areas. This creates a challenging situation as although obsessive passion is more likely to lead to negative outcomes, removing an activity for which a person is obsessively passionate may be denying them their primary source of need satisfaction. For this reason a better solution in such situations may be to explore and encourage the building of other sources of need satisfaction [25].

2.4 Videogames and Stressful Life Events

Moving beyond research exploring the broad benefits of videogame play [19], recent research has focussed specifically on how videogames may be beneficial to those experiencing difficult life circumstances [24]. Iacovides and Mekler [24] undertook a large scale qualitative analysis of how players engage with videogames when going through difficult events and disruptions in their lives. Through thematic analysis they found that when in difficult circumstances, people reported games offered a range of benefits including a break from stress, ways to deal with their feelings, connections to others, the stimulation of personal growth and change, and a lifeline in times of existential doubt. While their findings provide strong evidence for the positive role videogames can play during stressful life events, it should be noted their participants also reported that games could lead to them being unproductive or could act as an obstacle at such times.

In response to the COVID-19 pandemic, researchers have turned their attention to the ways in which videogame players have engaged with games during the stress and associated social isolation that the pandemic has caused. Assessing the social media posts (specifically, tweets) made by videogame players during the pandemic, Kleinman and colleagues [30] identified a number of themes, many of which relate directly to wellbeing. For example, they found that people were using games as a tool to stay connected with others, as a way to connect with new people, and to help with mental stability. While research has not yet directly explored the question, it seems reasonable to expect that stressful life events reduce general levels of need satisfaction which would, in turn, be expected to increase the chance of a compensatory response and increased obsessive passion. In the current study, we explore the play experience and associated impacts on wellbeing among the FEP sample—a group experiencing an extremely stressful life event.

2.5 Videogames and Psychosis

While videogame use in FEP samples has been researched, to date, the question of whether it is broadly beneficial has not yet been explored. Rather, existing research has explored, for example, the utility of videogames as Cognitive Remediation Therapy (CRT) or motivational enhancement training for those with serious mental illnesses such as schizophrenia (an illness which often includes episodes of psychosis [41, 54, 57]). In short, this work has assessed the ways in which videogames provide benefits equivalent to training exercises for working memory, target attention, social cognition, and executive functioning, as such tasks have been shown to have benefits for those with schizophrenia [20]. To that end, Adbel-baki and colleagues [1] assessed the prevalence of videogame use among those experiencing first-episode psychosis with a view to employing videogames in the development of technology enabled therapeutic applications such as CRT. They found that videogame (and other technology) use was similar or higher in an FEP sample as in other

populations, concluding that videogames offered an effective opportunity for psychosis treatment. Finally, research has also explored the benefits of a serious game designed to help young people who have experienced FEP learn how to better prevent and manage symptoms [42]).

2.6 The Present Study

The motivations for and associated impacts of videogame play are increasingly well understood in the general population. A large part of what draws people to play videogames is their satisfaction of psychological needs for autonomy, competence, and relatedness [8, 32, 52, 59]. The satisfaction of such needs leads to the development of passion for play [25, 38, 45, 53]. However, when need satisfaction is low in other domains, it is more likely that people will develop an obsessive passion for play with a reduction in the resulting benefits and increase in potential harms to wellbeing [33]. In contrast, those who develop a harmonious passion for play are likely to enjoy a range of benefits [25, 38, 45, 53]. Recent research has revealed a number of benefits of play during stressful life events [24]. However, to date, there is a dearth of research exploring these patterns among those experiencing a significant mental illness. Our aim was to explore the associations between videogame play and wellbeing among consumers of a first episode psychosis service and further to compare their motivations for play, need satisfaction, passion for play and wellbeing to a control group (a group of videogame players drawn from a sample of undergraduate university students). To this end we developed a number of research questions.

Based on research showing positive wellbeing outcomes associated with videogame play as well as work highlighting the role that videogames can play during stressful life events, we firstly sought to explore the differences in wellbeing and social support among those with FEP who do and don't play videogames.

- **RQ1. Do people experiencing first episode psychosis differ in their wellbeing and emotional support depending on whether or not they play video games?**
  - *RQ1a. Among people experiencing first episode psychosis, does wellbeing differ depending on whether or not they play videogames?*
  - *RQ1b. Among people experiencing first episode psychosis, does social support differ depending on whether or not they play videogames??*

Having explored the differences within the FEP group, we sought to compare the FEP-gamer group to our control group of gamers in terms of wellbeing and social support.

- **RQ2. Do people experiencing first episode psychosis differ from a control group in their wellbeing and support?**
  - *RQ2a. Do people experiencing first episode psychosis differ from a control group in wellbeing?*
  - *RQ2b. Do people experiencing first episode psychosis differ from a control group in their overall levels of support?*

Given that need satisfaction, passion and motivations for play have all been shown to have implications for wellbeing in previous research, we also sought to understand whether the control and FEP-gamer group differed on these constructs.

- **RQ3. Do people experiencing first episode psychosis differ from a control group in their gaming experiences and motivations?**
  - *RQ3a. Do people experiencing first episode psychosis differ from a control group in how much they experience need satisfaction within games?*
  - *RQ3b. Do people experiencing first episode psychosis differ from a control group in their passion orientation (obsessive and harmonious) for gaming?*
  - *RQ3c. Do people experiencing first episode psychosis differ from a control group in their motivation orientation for gaming?*

Finally, given the established pathways from need satisfaction to passion and then wellbeing alongside research regarding the role of vidoegames during stressful life events we sought to explore whether this pathway differed for the FEP and control groups.

- **RQ4. Are the indirect effects of in-game need satisfaction to psychological distress, through harmonious and obsessive passion, different when people are experiencing first episode psychosis?**

We address these research questions through a quantitative study of self-reported wellbeing, social support, and gaming motivations and experiences among a sample of participants experiencing their first episode of psychosis (FEP) and a control group of gamers.

3 METHODS

3.1 Participant and Procedures

The FEP sample was recruited from an Early Psychosis Service located in Brisbane (Australia), which includes a community-based team that provides treatment for young people aged between 16 and 25 years who have experienced a first episode of a psychotic illness. Eighty-eight clients of the Early Psychosis Service completed the questionnaire. Of these, 57 reported playing videogames and 31 reported that they did not play. Two participants from the gaming group were excluded from further analysis due to incomplete data, leaving 55 FEP gamers and 31 FEP non-gamers. The control group was recruited from a population of undergraduate university students. Although 61 participants started the survey, and reported videogame play, 7 participants closed the survey before completing the gaming experience questions, and a further 7 participants did not complete the entire survey. We also removed the one participant who failed the attention check questions, leaving 46 Control group gamers in our sample. Data was collected from the FEP sample between 2014 and 2020 (the extended data collection period required due to the rate at which clients attend the early psychosis service and consent to undertake the survey) and from the control group between March and June in 2020. The study protocol was reviewed and approved by the research ethics board at [anonymised for blind review]. The demographics of both samples are provided below.

3.1.1 Characterizing the Samples. The FEP sample had a range of diagnoses that involve psychosis, as shown in Table 1. The most common diagnoses were unspecified non-organic psychosis, drug-induced psychosis, and various forms of schizophrenia.

Diagnosis	N
Unspecified non-organic psychosis	19
Drug-induced psychosis	16
Schizophrenia (inc. paranoid, hebephrenic)	16
Schizophreniform, Acute schizophrenia-like disorder	8
Bipolar disorder	8
Depressive episode with psychotic features	8
Schizoaffective disorder	6
Other	5
Total	86

Table 1. Frequency of different diagnoses among the FEP sample

To determine whether the groups differed in terms of demographics or general video game play habits, we conducted independent-samples t-tests. Because we compared different samples for the

different research questions, we consider the sub-populations that were contrasted in answering our research questions.

	N	Gender			Age		Hrs/Week		Sessions/Week		Hours/Session	
		Men	Women	Unknown	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Control	46	38	6	2	20.0	3.7	30.9	37.6	6.5	6.1	4.6	2.6
FEP-gamer	55	39	16	0	21.4	2.1	16.9	23.6	5.4	6.8	2.9	3.1
FEP-non-gamer	31	17	14	0	21.9	2.4	-	-	-	-	-	-

Table 2. Descriptive statistics for the three groups: Control, FEP-gamers, and FEP-non-gamers. Two participants in the control group selected "prefer not to disclose" for the gender question.

In our research questions on the influence of gaming on the wellbeing of people with psychosis, we contrasted the FEP participants who reported that they play video games to those who reported not playing video games; see Table 2 for means and standard deviations. The age of the FEP-gamer group was comparable to the FEP-non-gamer group, and an independent-samples t-test showed no significant difference ($t_{84} = 1.052, p = .296$). As shown in Table 2, both groups were skewed male; however, the gamer group was much more imbalanced. As a result, we control for age and gender in all subsequent analyses. An imbalance in gender is expected, as FEP is more prevalent in men than women [40].

In our research questions on the effects of gaming for people with and without a diagnosis of psychosis, we contrasted gamers from the FEP group with gamers from the Control group; see Table 2. The age of the FEP-gamer group was slightly higher than the Control group ($t_{99} = 2.30, p = .024$). The hours played per week was higher for the Control group than the FEP-gamer group ($t_{99} = 2.28, p = .025$). The number of gaming sessions per week was similar for both groups ($t_{99} = .853, p = .396$); however, the Control group tended to play longer per gaming session ($t_{99} = 2.93, p = .004$). As shown in Table 2, both groups were significantly skewed with more men. As a result, we control for age and gender in all subsequent analyses, and hours played per week in all analyses involving measures of gaming habits and preferences.

3.2 Measures

In addition to demographics data, the following self-report questionnaires were completed:

3.2.1 Measures of Wellbeing. All included participants completed the measures of wellbeing ($N = 132$).

Kessler Psychological Distress Scale (K10). The K10 [27] is a 10-item measure of non-specific psychological distress (e.g., "*About how often did you feel so sad that nothing could cheer you up?*"). Participants are asked to rate their responses to items over the past four weeks on a five-point Likert Scale (0 = none of the time, 5 = all of the time). Items are averaged, with higher scores indicating more distress. The K10 is routinely used as a screening tool in mental health services in the UK and US. In our sample, the K10 had a Cronbach's $\alpha = .920$, which is in line with previous work: $\alpha = 0.92$ [11]; $\alpha = 0.93$ [27]. The K10 has high specificity and can effectively discriminate levels of psychological distress [11, 18, 27].

Two-way Social Support Scale. This scale [55] was developed to measure the amount of emotional and instrumental support that a person is able to give and receive; the four-factor solution was supported by a factor analysis. Participants are asked to rate how true each statement is on a 6-point Likert Scale, e.g., "*There is someone I can talk to about the pressures in my life*" (receiving emotional

support), "*I help others when they are too busy to get everything done*" (giving instrumental support). Higher scores indicate greater support. In our sample, Cronbach's α ranged from .810 − .909.

Depression, Anxiety, Stress Scales–21 items. The DASS-21 [4] is a 21-item self-report measure requiring participants to indicate which symptoms of depression, anxiety and stress they have experienced over the previous week; e.g., "*I found it difficult to work up the initiative to do things*" (depression), "*I felt scared without any good reason*" (anxiety), "*I was intolerant of anything that kept me from getting on with what I was doing*" (stress). Responses are rated on a four-point Likert scale (0 = never, 3 = almost always) and are summed for each sub-construct, with higher scores indicating greater stress, anxiety, or depression. Antony et al. [4] conducted a factor analysis on the scale, which supported the three-factor solution. In our sample, Cronbach's α ranged from .872 − .910, in line with previous work (α = .88: [23]; α = .87 − .94: [4]).

Rosenberg Self-Esteem Survey. This scale [49] consists of ten statements exploring participants' perceptions of themselves, e.g., "*All in all, I am inclined to feel that I am a failure*", or "*I am able to do things as well as most other people*". Participants rated these statements on a 4-point scale ranging from 0 ("strongly disagree") to 3 ("strongly agree"); items are summed so that higher scores reflect higher self-esteem. In our sample, Cronbach's alpha was quite low (α = .262). We report on self-esteem, but do not draw inferences from it, as $\alpha < 0.5$ is considered unacceptable reliability [17].

3.2.2 Measures of Gaming Experience and Motivation. Participants who responded "yes" to the question: "Do you play videogames?" (N = 102) answered the following self-report questionnaires.

Player Experience of Need Satisfaction. This scale [52] consists of 21 items across three subscales: Competence (i.e., experiencing mastery over challenges, example item; "I felt very capable and effective when playing."), Autonomy (i.e., a sense of choice and volition, example item; "I experience a lot of freedom in the game") and Relatedness (i.e., feeling connected to others, example item; "I find the relationships I form in this game important."). Items were rated on a 7-point Likert scale with higher scores indicating greater satisfaction, and referred to videogame play in general (rather than play of a specific game). The PENS scale also includes subscales for immersion and intuitive control, which we gathered but do not report on further, as our focus is on how much satisfaction of basic psychological needs the participants get through gaming, and not on characteristics of the games themselves. In our sample, the scales had Cronbach's α = .594, .741, .473, and .803 for competence, autonomy, relatedness, and mean satisfaction, respectively; however, the scale creators also report moderate reliabilities (α = 0.63 − 0.72) [52]. Due to the unacceptable α for relatedness, we report on it, but do not draw inference from its results, and instead use overall need satisfaction (Cronbach's α = .803) , as done in [47], to answer RQ4.

Obsessive/Harmonious Engagement Scale. Passion was assessed using a shortened 10-item version [66] of Vallerand's [60] Passion Scale. It measures harmonious passion, which reflects a balanced and authentic passion for a loved activity (e.g., "*My playing videogames reflects the qualities I like about myself*") and obsessive passion, which reflects a preoccupation with and persistent inflexibility toward a beloved activity (e.g., "*I have a tough time controlling my need to play videogames*") for people who play videogames. In our sample, Cronbach's α = .830 and .873 for harmonious and obsessive passion, respectively, which is in line with previous reports of α = 0.85 for this scale [47].

Gaming Motivation Scale. This scale [32] consists of 18 items asking participants why they play videogames. It has six subscales: Intrinsic Motivation (e.g., "*Because it is stimulating to me*"), Integrated Regulation (e.g., "*Because it is aligned with my personal values*"), Identified Regulation (e.g., "*Because it is a good way to develop social and intellectual abilities that are useful to me*"),

Introjected Regulation (e.g., "*Because I must play to feel good about myself*"), External Regulation (e.g., "*For the prestige of being a good player*"), and Amotivation (e.g., "*I used to have good reasons, but now I am asking myself if I should continue*"). In our sample, the subscales had Cronbach's α values that ranged from .728 for external regulation through .856 for amotivation, which is in line with previously-published values ($\alpha = .75 - .89$: [32]).

3.3 Data Analyses

We used SPSS 26 for all analyses. The moderated mediations were conducted using Process 3.4 [21]. Two participants from the FEP sample reported 'yes' to playing games, but also reported playing zero sessions per week on average (and zero hours per week by extension). These two participants were therefore assigned to the non-gamer group prior to analysis. Details of the statistical tests are presented in the results section.

4 RESULTS

Table 3 shows the correlations between the measures presented in our results, from all participants (all groups combined). Our hypotheses relate to group differences, so we do not interpret these correlations, but do note that there are clear relationships, particularly of the gaming variables with each other and of the wellbeing variables with each other. Due to this shared variance among groups of measures, we use MANCOVA analysis to test group differences, rather than ANCOVA analysis. We organize our results by research question.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(1)	Age			**																				
(2)	Hours per Week	-.134											*	*	*	**		*		*	*		*	
(3)	Self-Esteem	-.230			**	**	**	**	**	*	**											**		**
(4)	DASS-21 Stress	.136	-.100	-.326		**	**	**													*	**		
(5)	DASS-21 Anxiety	.137	-.056	-.330	.839		**	**										*				**		
(6)	DASS-21 Depression	.047	-.085	-.350	.793	.791		**	**		*											**		
(7)	K10 Distress	.008	.038	-.354	.759	.761	.808		**									*				*		
(8)	Receiving Emotional	.020	.126	.264	-.160	-.143	-.249	-.194		**	**	**		*			*							**
(9)	Giving Emotional	-.125	.112	.207	-.014	.025	-.001	.039	.591		**	**	**	**		**			*		*	**		
(10)	Receiving Instrumental	-.035	.040	.289	-.127	-.134	-.198	-.159	.719	.512		**	*	**		*	**		**				*	
(11)	Giving Instrumental	-.009	.043	.165	.052	.080	-.011	.068	.532	.833	.443		*	**		*			*			*		
(12)	Competence	-.167	.240	-.010	.027	.012	.026	.135	.141	.271	.225	.215		**	**	**	**	**	**	**	**		**	
(13)	Autonomy	-.143	.206	.068	-.023	-.037	-.030	.046	.240	.309	.276	.291	.788		**	**	**	**	**	**	**		**	*
(14)	Relatedness	-.076	.251	-.128	.028	.090	.013	.100	.056	.091	.072	.023	.471	.339		**	**	**	*	**	**	**	**	
(15)	Need Satisfaction	-.156	.277	-.021	.010	.022	.001	.109	.182	.275	.236	.220	.906	.873	.708		**	**	**	**	**		**	*
(16)	Harmonious Passion	-.017	.025	.057	-.032	-.002	-.047	-.053	.199	.153	.269	.134	.520	.640	.417	.641		**	**	**	**		**	*
(17)	Obsessive Passion	.110	.213	-.179	.185	.221	.120	.198	.001	-.029	-.026	.092	.271	.322	.347	.378	.496		**	**	**	**	**	**
(18)	Intrinsic motivation	.028	.146	.051	.038	-.002	-.048	.031	.182	.212	.333	.243	.515	.635	.225	.564	.588	.559		**	**		**	**
(19)	Integrated regulation	-.104	.200	-.115	.157	.165	.126	.126	.008	.024	.062	.043	.428	.446	.462	.536	.508	.537	.593		**	**	**	**
(20)	Identifed regulation	-.081	.242	.098		.159	.174	.156	.071	.194	.124	.170	.498	.513	.377	.560	.582	.503	.624	.730		*	**	**
(21)	Introjected regulation	.066	.034	-.421	.260	.291	.291	.220	-.184	-.256	-.118	-.214	.031	-.017	.356	.139	.089	.389	.074	.451	.208		**	**
(22)	External regulation	.010	.207	-.083	.088	.090	.053	.142	.120	.045	.222	.089	.497	.488	.292	.516	.492	.543	.659	.552	.480	.313		**
(23)	Amotivation	.059	-.088	-.263	.125	.068	.138	.104	-.255	-.108	-.148	.004	.171	.216	.146	.217	.227	.512	.376	.426	.326	.472	.456	

Table 3. Correlations (Pearson r) between age, hrs per week, and all measures in our study. As groups were combined, N=132 for correlations with wellbeing and N=101 for correlations with gaming variables. $^{*}p < .05$, $^{**}p < .01$.

4.1 RQ1. Do people experiencing first episode psychosis differ in their wellbeing and emotional support depending on whether or not they play video games?

Our first research question is concerned with the differences in the wellbeing and support of our FEP group, based on whether or not they play video games.

4.1.1 RQ1a. Among people experiencing first episode psychosis, does wellbeing differ depending on whether or not they play videogames? A MANCOVA on Stress (DASS-S), Anxiety (DASS-A), Depression (DASS-D), Psychological distress (K10) and Self-esteem (RSE), with video game playing

	Control Gamers		FEP Gamers		FEP Non-gamers		FEP: Gamers vs. Non			Gamers: Control vs. FEP		
	Mean	SD	Mean	SD	Mean	SD	$F_{1,82}$	p	η_p^2	$F_{1,97}$	p	η_p^2
Self-Esteem	26.1	3.7	23.6	2.8	23.8	1.7	0.27	.604	.00	**11.2**	**<.001**	**.10**
K10 distress	21.0	6.9	21.3	8.8	26.1	8.7	**5.62**	**.020**	**.06**	0.00	.956	.00
DASS-Stress	4.6	4.2	6.9	5.6	7.4	4.8	0.44	.511	.00	**4.28**	**.041**	**.04**
DASS-Anxiety	3.4	3.7	5.6	5.3	6.8	5.4	1.28	.261	.02	**4.35**	**.040**	**.04**
DASS-Depression	4.4	4.0	6.3	5.8	8.6	6.2	**4.13**	**.045**	**.05**	3.89	.051	.039
Receiving Emotional	4.5	1.3	3.9	0.8	3.7	1.2	1.75	.190	.02	**13.3**	**<.001**	**.12**
Giving Emotional	4.6	1.1	3.5	1.1	3.6	1.1	0.00	.998	.00	**28.1**	**<.001**	**.23**
Receiving Instrumental	4.3	1.1	3.7	1.0	3.6	1.3	0.73	.395	.01	**13.7**	**<.001**	**.12**
Giving Instrumental	4.2	1.3	3.4	1.1	3.5	1.0	0.00	.950	.00	**13.9**	**<.001**	**.13**

Table 4. Means and Standard Deviations for Wellbeing measures for Control-gamers, FEP-gamers, and FEP-non-gamers; Univariate ANCOVA results from the reported MANCOVAs

as the between-subjects factor and using age and gender as co-variates was significant for playing video games ($F_{5,78} = 2.90; p = .019, \eta_p^2 = .16$). We used the Bonferonni correction for multiple comparisons.

The between-subjects effects showed that FEP-gamers had significantly lower levels of psychological distress and depression than FEP-non-gamers. There was no difference in self-esteem, anxiety, or stress; see Table 4 and Figure 2.

4.1.2 RQ1b. Among people experiencing first episode psychosis, does emotional support differ depending on whether or not they play videogames? A MANCOVA on the four types of giving and receiving emotional and instrumental support (GES, GIS, RES, RIS), with video game playing as the between-subjects factor and using age and gender as co-variates was not significant for playing video games ($F_{4,79} = 0.651; p = .628, \eta_p^2 = .03$). The between-subjects effects were also not significant for any of the measures related to support; see Table 4 and Figure 2.

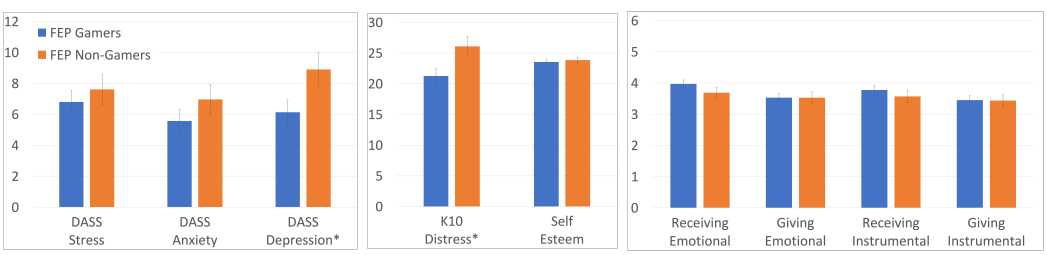

Fig. 2. Estimated marginal means and standard errors for wellbeing measures comparing FEP Gamers and FEP Non-Gamers: Left: DASS-21; Middle: K10 and Rosenburg Self Esteem; Right: Two-way Emotional Support. Significant differences are marked with *.

4.2 RQ2. Do people experiencing first episode psychosis differ from a control group in their wellbeing and support?

Our second research question is concerned with the differences in wellbeing and support between our FEP-gamers and a control group of gamers.

4.2.1 RQ2a. Do people experiencing first episode psychosis differ from a control group in wellbeing? A MANCOVA on Stress (DASS-S), Anxiety (DASS-A), Depression (DASS-D), Psychological distress (K10), Self-esteem (RSE), with group as the between-subjects factor and using age and gender as

co-variates was significant ($F_{5,92} = 5.99; p < .001, \eta_p^2 = .24$). We used the Bonferonni correction for multiple comparisons.

The between-subjects effects showed that FEP-gamers experienced higher DASS-S and DASS-A than the Control group, with non-significantly elevated levels of DASS-D ($p = .051$). The FEP-gamers showed significantly lower self-esteem; however, there was no difference in Kessler's Psychological Distress. See Table 4 for descriptive statistics and tests of significance. See Figure3.

4.2.2 RQ2b. Do people experiencing first episode psychosis differ from a control group in their overall levels of social support? A MANCOVA on the four types of giving and receiving emotional and instrumental support (GES, GIS, RES, RIS), with group as the between-subjects factor and using age and gender as co-variates was significant ($F_{4,94} = 7.95; p < .001, \eta_p^2 = .25$). We used the Bonferonni correction for multiple comparisons.

The between-subjects effects showed that FEP-gamers reported giving less instrumental and emotional support and also receiving less emotional and instrumental support than a control group of gamers. See Table 4 and Figure3.

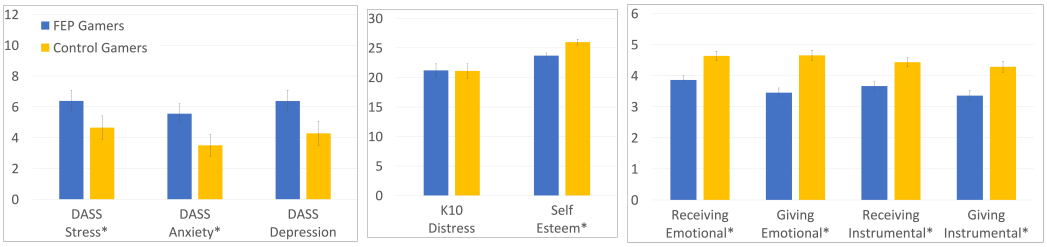

Fig. 3. Estimated marginal means and standard errors for wellbeing measures comparing FEP Gamers and Control Gamers: Left: DASS-21; Middle: K10 and Rosenburg Self Esteem; Right: Two-way Emotional Support. Significant differences are marked with *.

4.3 RQ3. Do people experiencing first episode psychosis differ from a control group in their gaming experiences and motivations?

A MANCOVA on Need Satisfaction (overall), Competence, Autonomy, Relatedness, Harmonious Passion, Obsessive Passion, and the six types of gaming motivation (Intrinsic Motivation, Integrated Regulation, Identified Regulation, Introjected Regulation, External Regulation, Amotivation), with group as the between-subjects factor and using age, gender, and hours played per week as co-variates was significant for group ($F_{11,86} = 17.0; p < .001, \eta_p^2 = .68$). We used the Bonferonni correction for multiple comparisons.

4.3.1 RQ3a. Do people experiencing first episode psychosis differ from a control group in how much they experience need satisfaction within games? The between-subjects effects from the MANCOVA showed that FEP-gamers experienced less Competence, Autonomy, and overall Need Satisfaction than the Control group; see Table 5 and Figure 4.

4.3.2 RQ3b. Do people experiencing first episode psychosis differ from a control group in their passion orientation (obsessive and harmonious) for gaming? The between-subjects effects from the MANCOVA showed that FEP-gamers also reported having less Harmonious Passion for gaming than the Control group, but the difference in Obsessive Passion was not significant. See Table 5 for descriptive statistics and tests of significance. See Figure 4.

	FEP Gamers		Control gamers		ANCOVA results		
	Mean	SD	Mean	SD	$F_{1,96}$	p	η_p^2
Competence	5.7	0.8	5.0	1.2	**10.9**	**<.001**	**.10**
Autonomy	5.7	0.9	4.3	1.4	**29.7**	**<.001**	**.24**
Relatedness	4.4	1.2	4.7	1.0	2.15	.145	.02
Need Satisfaction	5.3	0.8	4.6	1.1	**8.66**	**.004**	**.08**
Harmonious Passion	4.9	1.1	4.3	1.4	**6.11**	**.015**	**.06**
Obsessive Passion	2.6	1.1	3.0	1.7	1.38	.243	.01
Intrinsic Motivation	4.8	1.2	3.6	1.8	**17.4**	**<.001**	**.15**
Integrated Regulation	3.7	1.6	3.6	1.6	0.00	.982	.00
Identified Regulation	4.0	1.6	3.3	1.4	**4.09**	**.046**	**.04**
Introjected Regulation	2.3	1.4	4.4	1.3	**58.7**	**<.001**	**.38**
External Regulation	3.8	1.5	3.6	1.8	0.19	.661	.00
Amotivation	2.2	1.5	3.0	1.7	**6.83**	**.010**	**.07**

Table 5. Means and Standard Deviations for Wellbeing measures for FEP-gamers and FEP-non-gamers; Univariate ANCOVA results from the reported MANCOVAs

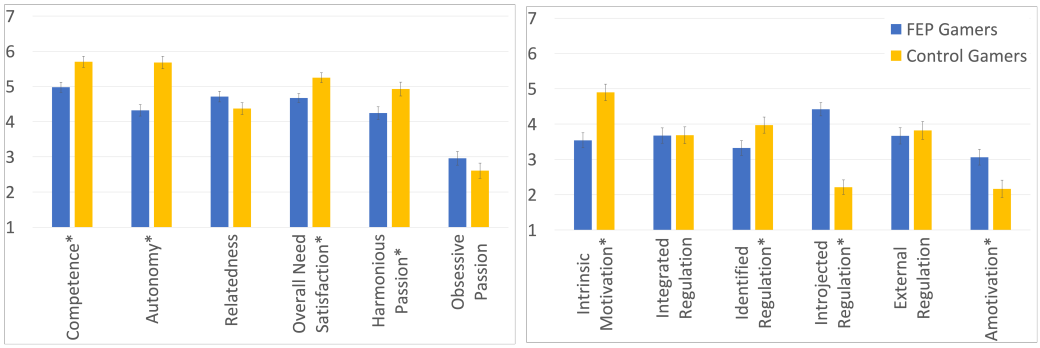

Fig. 4. Estimated marginal means and standard errors for gaming experiences comparing FEP Gamers and Control Gamers: Left: Need Satisfaction and Passion; Right: Gaming Motivation. Significant differences are marked with *.

4.3.3 RQ3c. Do people experiencing first episode psychosis differ from a control group in their motivation orientation for gaming? The between-subjects effects from the MANCOVA showed that FEP-gamers reported less Intrinsic Motivation and identified Regulation than the Control group, but significantly higher Introjected Regulation and Amotivation than the Control Group. There was no difference between groups in terms of Integrated and External Regulation. See Table 5 for descriptive statistics and tests of significance. See Figure 4.

4.4 RQ4. Are the indirect effects of in-game need satisfaction to psychological distress, through harmonious and obsessive passion, different when people are experiencing first episode psychosis?

Previous work has shown there to be a consistent path model that leads from need satisfaction through the two types of passion to wellbeing outcomes [e.g., 2, 25, 33, 46]. In general, when needs are satisfied through play, there is an associated increase in passion, with the path through harmonious passion facilitating the benefits of gaming and the path through obsessive passion

facilitating the potential harms of gaming. We tested the mediation model shown in Figure 5 ($R = .351, F_{6,94} = 2.20, p = .049$), but with Group included as a moderating variable in the translation of passion orientation into psychological distress. Specifically, we tested model 15 in Process 3.4, with X=Need satisfaction, M1=Harmonious Passion, M2=Obsessive Passion, Y=K10 Psychological Distress, W=dummy-coded group (Control=-1; FEP=1), and controlling for C1=Age, C2=Gender, and C3=Hours played per week (see Figure 5).

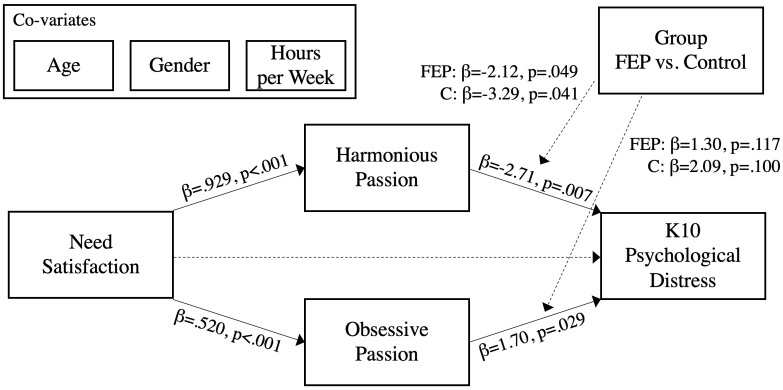

Fig. 5. Moderated Mediation Model of Need Satisfaction in Games on K10, via Harmonious and Obsessive Passion. Beta values are unstandardized.

As expected, higher satisfaction of needs (overall) was significantly associated with higher harmonious passion ($\beta = .929, p < .001$) and also with higher obsessive passion ($\beta = .520, p < .001$). In predicting K10 from passion, we see an expected negative association between HP and K10 ($\beta = -2.71, p = .007$) and positive association between OP and K10 ($\beta = 1.70, p = .029$). The moderations were not significant, nor did the inclusion of the moderator improve the model fit ($R = .361, F_{10,90} = 1.35, p = .219$); however, the conditional effect revealed different strengths of prediction, based on Group. For the prediction of HP on K10, the effect for the Control group is stronger than the effect for FEP-gamers (Control: $\beta = -3.29, p = .041$, FEP: $\beta = -2.12, p = .049$). Similarly, for the prediction of OP on K10, the effect for the Control group is stronger than the effect for FEP-gamers (Control: $\beta = 2.09, p = .100$, FEP:$\beta = 1.30, p = .117$). The influence of passion orientation on K10 in the model was about twice as strong for the Control group than for FEP-gamers, suggesting that passion for gaming may play a less relevant role in predicting the degree of psychological distress among participants with a diagnosis of psychosis. However, this effect would need to be demonstrated in a larger sample that supported the inclusion of a moderator in an established mediation model.

5 DISCUSSION

Overall, we sought to understand how consumers of a first episode psychosis service engage with videogames, the impact of videogames on this group, and also to compare their engagement with a control group.

5.1 Summary of Results

Together, our results suggest the following findings:

- Among a sample experiencing FEP, gamers experienced less psychological distress and reported lower depression than those who do not play games.

- Gamers experiencing FEP reported lower wellbeing (i.e., lower self-esteem, higher stress, higher anxiety) and lower giving and receiving of emotional and instrumental supports than a control group of gamers.
- Gamers experiencing FEP reported lower need satisfaction from gaming and lower harmonious passions for gaming than a control group of gamers; however, there was no difference in reported obsessive passion for games.
- Gamers experiencing FEP reported higher external types of motivation (i.e., introjected regulation, amotivation) and lower internal types of motivation (i.e., intrinsic motivation, identified regulation) for videogame play than a control group of gamers.
- The influence of passion orientation on psychological distress in an established model was twice as strong for a control group of gamers than for gamers experiencing FEP for both harmonious and obsessive passion orientation, suggesting that passion for gaming may be less influential—both in known beneficial and harmful influences—in predicting the degree of psychological distress among participants experiencing FEP than among a control group.

5.2 Explanation of Findings

5.2.1 RQ1. Do people experiencing first episode psychosis differ in their wellbeing and emotional support depending on whether or not they play video games? Our study provides important, initial empirical evidence that among a group experiencing a significant life stressor (in this case, experiencing a first epsiode of psychosis early in life), those who play videogames show better wellbeing outcomes than those who do not. Specifically, videogame players reported less psychological distress and depression than non-players. While it is not possible to make any conclusions about causation based on the current sample, this finding fits with the established pattern in which videogames satisfy the needs of players with associated benefits to wellbeing [19, 38, 63]. It also fits with more recent work highlighting the role that videogames can play in coping with life-stressors for example by providing a break from the source of stress, dealing with negative emotions, or facilitating connections to others [24, 30]. Within this context of established connections between games and wellbeing as well as recent evidence for games as a way to cope, it is tempting to conclude that videogames are playing a protective role for players experiencing FEP. However, it's equally feasible that those experiencing less distress and depression are more likely to play or that some external factor (e.g., socio-economic status, living conditions, personality) both increases the likelihood of videogame play and reduces depression and distress. Further research is needed to determine the presence and direction of any causal relationship.

5.2.2 RQ2. Do people experiencing first episode psychosis differ from a control group in their wellbeing and support? As a second step, we sought to confirm that the FEP sample differed from the control group on key mental health and wellbeing measures. The control group reported less stress and anxiety, higher self-esteem, and higher giving and receiving of emotional and instrumental support. It is important to note that the result for self-esteem should be interpreted with caution given the low reliability of the measure in the current study. Overall, these findings lend support to existing evidence that those experiencing psychosis also have lower mental health and wellbeing on a range of associated measures (e.g., [28, 39]). It also aligns with existing research identifying social cognition deficits among those experiencing FEP (e.g., [16, 22]). More broadly, these findings confirm that the FEP sample can appropriately be considered to be a group undergoing a stressful life event with associated impacts.

5.2.3 RQ3. Do people experiencing first episode psychosis differ from a control group in their gaming experiences and motivations?

RQ3a. Do people experiencing first episode psychosis differ from a control group in how much they experience need satisfaction within games? The results show that the control group are experiencing higher levels of overall need satisfaction through videogame play than the FEP group and specifically, higher levels of competence and autonomy. This suggests that the experience of videogame play is in some ways more rewarding or impactful for the control group than the FEP group. It may be that the way the control group play, who they are playing with or what they play results in their experience of play having a different impact to that of the FEP group. Alternatively, it may be that, regardless of these game and play related factors, the broader context of higher wellbeing experienced by the control group supports the ability to derive greater need satisfaction from the activity. This interpretation fits with the "rich-get-richer" hypothesis explored in other research [56] that suggests that healthy individuals prosper in online contexts compared to less healthy peers. Future research is needed in order to determine the extent to which either of these explanations is appropriate.

Regardless, it is important to realise that assuming a "rich-get-richer" process is occurring does not preclude the possibility that videogames are providing a key source of need satisfaction for the FEP sample. It may be that as a proportion of total need satisfaction from all sources, the FEP group are deriving a larger relative proportion of need satisfaction from videogame play (compared to all other sources) than the control group. In other words, videogames may be playing a critical protective role for some of the FEP sample in terms of being a respite from stress and a way to deal with challenging feelings [24]. This interpretation is consistent with our finding that among the FEP sample, those who play videogames had better outcomes in terms of psychological distress and depression (RQ1). It may also be that for the FEP group, videogame play is a compensatory response to relatively poor need satisfaction in other areas of life [25, 33, 47].

RQ3b. Do people experiencing first episode psychosis differ from a control group in their passion orientation (obsessive and harmonious) for gaming? The FEP group were found to have lower levels of harmonious passion than the control group suggesting that their engagement with videogames may be less balanced and less in harmony with other areas of their lives. As with the differences found for need satisfaction, this likely reflects the larger life issues being experienced by the FEP group. With larger, more impactful issues occurring in their life, the FEP group may have less "room" for balance and may simply be leaning more heavily on videogame play as a source of need satisfaction. In other words, there is more potential for videogame to become difficult to keep in balance.

Previous research has established that harmonious passion is associated with both need satisfaction from videogame play and need satisfaction in other areas of life [25, 33]. The current study provides evidence of lower need satisfaction from videogames in the FEP group which can be expected to reduce resulting levels of harmonious passion. While not assessed in the current study, it also seems likely that the FEP group experience lower levels of need satisfaction in other areas of life (consistent with the finding that they have poorer mental health and wellbeing than the control group as per RQ2). Relatively lower levels of general need satisfaction would also lead to lower levels of harmonious passion for play (though future research should seek to confirm this pattern for this population).

RQ3c. Do people experiencing first episode psychosis differ from a control group in their motivation orientation for gaming? The overall pattern of results with respect to motivations for play suggests that the FEP group are higher on external types of motivation and lower on internal types of motivation for videogame play. More specifically, the higher levels of amotivation among the FEP sample indicate that they more often may be "going through the motions" when playing videogames than players in the control group potentially as a result of the broader context of reduced wellbeing

they are experiencing. This finding is consistent with a negative symptom of psychosis—avolition describes a lack of motivation or ability to do tasks or activities that have an end goal, and occurs commonly in schizophrenia, depression, and bipolar disorder [3].

Consistent with this, their higher levels of introjected regulation suggest that the FEP sample may not be accepting the motivation to play as their own and undertaking play in order to avoid negative emotions (e.g., anxiety) or to attain ego enhancements. Once again, this aligns with the differences seen between the groups on related mental health and wellbeing measures (RQ2) in that the FEP population have greater levels of negative affect in their lives and, consistent with previous research [24] greater reason to turn to videogames to relieve such feelings. Conversely, the higher levels of identified regulation reported by the control group suggest that they have a greater sense of consciously valuing the activity of playing videogames finding it personally important. This finding most likely directly relates to the control groups overall higher levels of intrinsic motivation suggesting they experience greater interest, enjoyment and satisfaction through videogame play than the FEP group (aligning directly with the findings related to higher levels of autonomy and competence in this group, RQ3a). As noted, previous research on motivation suggests a number of benefits of higher levels of internalisation [50, 51] across a range of domains from physical exercise [9] to intimate relationships [5]. Thus, the higher levels of internal motivation (and lower levels of external motivation) for the control group would be expected to lead to higher levels of wellbeing which aligns with our findings for RQ1 and RQ4.

5.2.4 RQ4. Are the indirect effects of in-game need satisfaction to psychological distress, through harmonious and obsessive passion, different when people are experiencing first episode psychosis? Consistent with previous research [33, 45, 53, 58], we see for both the FEP and control group that harmonious passion is associated with better wellbeing outcomes (less psychological distress) and obsessive passion is associated with worse wellbeing outcomes (greater psychological distress). Moreover, we further confirm the finding that the type of passion experienced is the important factor in terms of implications for wellbeing (as opposed to the activity itself or the associated satisfaction of needs).

The indication of differing strength of associations show that the relationship between passion and psychological distress may be somewhat stronger for the control group than the FEP group. This was the case for both the benefits associated with harmonious passion and the risks associated with obsessive passion. This makes intuitive sense from the point of view that, by definition, the FEP group have significant events/stressors occurring in their lives, effectively reducing the relative contribution of passion for videogames to their overall well- or ill-being—whether the positive influence of harmonious passion or the negative influence of obsessive passion. However, it is important to consider that despite the fact the impact of videogames may be reduced for this sample (both in terms of positive and negative impact), that videogames may still play a valuable role in terms of providing a "haven" (for example a way to connect to others) during the stress of the onset of psychosis or alternatively, in other cases, add to their burden (for example creating further stress related to balance with other activities).

5.2.5 The Broad Picture. The broader picture that emerges from our results fits with the larger literature related to videogames and wellbeing. Among the FEP sample, those who played videogames showed better wellbeing outcomes (in terms of depression and psychological distress) than those who did not play. It should be noted that our findings cannot speak to causation nor to the linearity of this relationship (for example, whether any associated benefits extend to those who play extremely little or a great deal). Among those who play videogames, comparing the FEP sample to a control group confirmed that the FEP group had poorer wellbeing outcomes (in terms of stress, anxiety and giving and receiving support). These findings provide important context for our

analysis comparing the play experience, motivations and passion of the FEP and control group and the association between their passion and wellbeing.

The control group reported more internal motivations for play, higher levels of need satisfaction through play as well as higher levels of harmonious passion all of which are consistent with their overall higher levels of wellbeing. Similarly, presumably due to the larger life stressors they are experiencing and lower levels of overall wellbeing, the FEP group reported more external motivations for play which would be expected, in turn, to lead to fewer associated benefits from play. This pattern (reduced benefit associated with external motivations) was supported in the final part of our analysis, which showed that while for both groups harmonious passion was associated with better wellbeing outcomes and obsessive passion with worse wellbeing outcomes, the relationships were not quite as strong for the FEP group.

5.3 Limitations and Future Work

Our study accessed an underrepresented sample of existing gamers in the context of a clinical system, and as such afforded unique insights in to the role of gaming in the lives of people with a specific and severe mental health concern. However, as a result of recruiting participants in a clinical context, a number of limitations exist and future research could usefully validate and extend our findings. First, our sample did not include any non-gamers in the control group, which precluded any comparisons with this population. Second, we did not clinically screen our control group, and it is possible that some were experiencing significant life events at the time they were surveyed (including the potential impacts of the COVID-19 pandemic). While our control group data was collected in an area with relatively minor COVID-related impacts and the majority of participants took part in the survey prior to any lock-downs or business shut-downs, it is likely that some participants were experiencing greater than normal levels of stress and anxiety. Further research could usefully seek to exclude such cases from any comparison sample. Third, our sample is skewed in having a greater proportion of men than other genders; however, this is not unexpected as early psychosis is more common in men [40]. Fourth, our data collection methodology is limited in being purely survey based and collected from each participant at a single time point (i.e., is cross-sectional data). Relatedly, it took several years to complete data collection with the FEP sample and only months to complete data collection with the control group, which may also have had an influence. Future research employing prospective methods would afford greater insights related to causation and more qualitative methods will provide greater depth of insight around the associations identified in the current study. More broadly, future research could usefully seek to confirm our results in other populations experiencing significant and acute mental health issues (or other major life stressors).

5.4 Implications

Our results further confirm the largely established finding that engaging with videogames is not in itself the key factor associated with wellbeing, rather it is the type of passion that a person develops that is important. The implication here is that those seeking to increase the benefits associated with play and/or reduce the risk of harm (e.g., players, parents, mental health practitioners) should focus on creating an environment in which videogame play is not the sole source of need satisfaction in a person's life.

With respect to populations that are undergoing significant stress or a major life event (such as our first episode psychosis sample), our findings suggest that videogames play a less important role in terms of wellbeing outcomes than they do for those not currently undergoing significant stress. This raises two important possible implications. In terms of harmonious passion, although the associated benefits are less for the first episode psychosis group than the control group, it may

still be that games are a key source of wellbeing for harmoniously passionate players experiencing the onset of psychosis. The significant path from need satisfaction through harmonious passion to psychological distress for the FEP group supports this interpretation. Indeed, given their overall lower levels of wellbeing, the benefits associated with videogame play might be proportionally larger for the first episode psychosis group than the control group.

Encouraging someone experiencing first episode psychosis to stop playing videogames might effectively place them at greater risk by removing a key source of wellbeing. Conversely, although the association between obsessive passion and wellbeing was reduced for the first episode psychosis group, they can realistically be considered to be more vulnerable than the control group (for example, as a result of their lowered overall wellbeing). With this in mind, the impact of obsessive passion for play, while reduced, might still be concerning in terms of further depleting relatively low levels of wellbeing. In other words, although our results suggest the absolute importance of passion is less for the first episode psychosis sample, the relative importance (in terms of impact on wellbeing) may be greater. With this in mind, our findings with respect to motivations for play suggest the potential value of seeking to help players with first episode psychosis change the way they approach videogames. By seeking to help these players further internalise and integrate their motivations to play (e.g., by identifying the reasons a person finds play satisfying and how those reasons align with other values) we might reasonably expect to increase the benefits and reduce the risks associated with play.

6 CONCLUSIONS

While further research is needed, our study provides initial empirical evidence that among people experiencing their first episode of psychosis, videogame play is associated with more positive wellbeing outcomes, specifically in terms of psychological distress and depression. However, the FEP sample (who played videogames) reported less need satisfaction through play, more external and less internal motivations for play, and less harmonious passion for play than the control group. This may largely reflect the nature of their mental illness, as people experiencing psychosis commonly experience *avolition* (a reduction in motivation), *anhedonia* (a decreased ability to experience pleasure), and a lack of interest in *social* activities—common among experiences of gaming are being motivated to play, experiencing pleasure from play, and satisfying social needs through play. Regardless, our findings identify an opportunity for improving the way that those experiencing FEP engage with videogames, and how videogames might play a role in how they manage with difficult life circumstances. For both groups (FEP and control), harmonious passion for play was associated with reduced psychological distress and obsessive passion with increased psychological distress, reinforcing previous findings that a balanced and authentic passion for games can provide benefits to players, whereas an uncontrollable and inflexible passion for games can result in harm to the wellbeing of players. The relationships were somewhat weaker among FEP gamers than in the control sample, suggesting that passion for videogames may play a less important role in wellbeing for those experiencing their first episode of psychosis. Our work contributes to the ongoing conversation about the beneficial role that balanced gaming can provide in the lives of people who are experiencing major challenges, such as a first episode of psychosis.

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