HHS Public Access

Author manuscript

Comput Human Behav. Author manuscript; available in PMC 2019 February 01.

Published in final edited form as:

Comput Human Behav. 2018 February ; 79: 238–246. doi:10.1016/j.chb.2017.10.029.

Gamers' insights into the phenomenology of normal gaming and game "addiction": A mixed methods study☆

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Abstract

In response to calls for further research into the phenomenology of Internet gaming disorder (IGD), we used a community-engaged consensus development approach to evaluate how members of the "gamer culture" describe problematic gaming and the relationship of these descriptions to the proposed IGD criteria. Two focus groups of gamers were recruited at a video game convention. Participants were asked to submit suggestions for signs of game "addiction". Participants discussed and ranked the criteria in order of conceptual importance. The rankings were analyzed quantitatively, and then a multidisciplinary team compared the ranked criteria to the DSM-5 IGD proposed criteria. The strongest agreement between participants' rankings and IGD symptomatology was found for harms/functional impairment due to gaming, continued use despite problems, unsuccessful attempts to control gaming, and loss of interest in previous hobbies and entertainment. There was less support for other IGD criteria. Participants also offered new content domains. These findings suggest that collaborative knowledge-building approaches may help researchers and policymakers understand the characteristics and processes specific to problematic video game play and improve content validity of IGD criteria. Future efforts may benefit from multi-stakeholder approaches to refine IGD criteria and inform theory, measurement and intervention.

Keywords

Internet gaming disorder; Video game addiction; Qualitative research; Mixed methods research; Community-based participatory research

☆This research was supported by the National Institute of Mental Health Training Grant 5T32MH014592-39.

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1. Introduction

Despite the century-old history of epidemiology of mental disorders, there is still no straightforward approach to defining new disorders. Rather than being able to rely on the presence or absence of biomarkers such as blood sugar levels or antibodies, researchers and clinicians must rely on methods that involve evidence synthesis and expert decision about the definition of constructs, which may sometimes be inadequate for understanding disorders in an appropriate cultural and social context (Bass, Bolton, & Murray, 2007; Snodgrass et al., 2017; Wakefield, 2007). Current classification systems for mental disorders may be considered "field guides" in that their criteria describe only signs and symptoms. They allow clinicians and researchers to recognize and classify individuals as having a disorder but are agnostic to etiology (McHugh, 2005).

However, many thoughts, feelings and behaviors that could be used to define a disorder may also occur outside the context of psychopathology. For example, even symptoms of psychosis in the form of auditory perceptual anomalies are common in the community (Rössler et al., 2015). In addition, conditions may overlap, co-occur, or precede or follow one another, making it difficult to determine which symptoms and signs represent a given condition and which may be part of a comorbid condition, a causal mechanism, or an outcome. For example, slow speech and lack of pleasure in life activities are symptoms of both depression and schizophrenia (American Psychiatric Association, 2013). Although alternative approaches to understanding the interplay between psychiatric symptoms and disorders such as network structure analysis have been proposed (Boschloo et al., 2015), current clinical classification systems use only symptoms and signs of disorder in combination with functional impairment to make a diagnosis.

With respect to problematic video gaming,[1] some of the proposed criteria for Internet gaming disorder (IGD, American Psychiatric Association, 2013), such as preoccupation, tolerance and withdrawal, have been criticized for lacking specificity as these criteria may often be endorsed by enthusiastic or passionate "engaged" gamers, leading to potential epidemiological misclassification when used in population studies where assessment of functional impairment is often lacking (Aarseth et al., 2016; Griffiths et al., 2016). Although the criteria for IGD (as proposed in the DSM-5) have not yet been finalized, these criteria have already been used to generate survey scales for population studies (e.g., Fuster, Carbonell, Pontes, & Griffiths, 2016; Lemmens, Valkenburg, & Gentile, 2015; Pontes & Griffiths, 2015), a practice which has received criticism from psychometric and epidemiological perspectives (Van Rooij & Kardefelt-Winther, 2017b; Van Rooij, Van Looy, & Billieux, 2017c).

The development and expression of problematic behaviors in individuals is heterogeneous and dependent on multiple interacting factors (Billieux et al., 2015; Griffiths, 2005). Problematic electronic media behaviors have been couched as addictions, habits, and maladaptive coping (Billieux, 2012; Griffiths, 2005; Kardefelt-Winther, 2016), and efforts to

[1]Consistent with ongoing efforts to reach consensus on behavioral "addictions", in this paper we will use the term "problematic" to refer to a persistent pattern of behavior that causes significant distress and functional impairment, is not reduced by the person, and persists over a significant period of time (Schimmenti et al., 2016).

reach a consensus on defining behavioral addictions continue (Schimmenti et al., 2016). Most conceptualizations agree that problematic behaviors are frequent and/or intense behaviors that continue despite problems or consequences. Models differ in the extent to which they emphasize the cognitive and behavioral processes that lead to problematic behaviors and their recognition of syndromic similarities to substance addictions. Cognitive and behavioral theories emphasize the role of media habits, beliefs (e.g., perceived control), and expectations (e.g., feeling better as a result of playing video games) in reinforcing an initially volitional media behavior to the point where individuals experience (or perceive) significant loss of control and harm or impairment (Caplan, 2010; Kardefelt-Winther, 2016; Lange, 2009). Some models describe different pathways of development, such as impulsive pathways driven by problems in self-regulation, or social pathways driven by the desire to maintain relationships, make new friends, or compensate for social discomfort (Billieux, 2012; Caplan, 2003; Liau et al., 2015). These theories also support the likelihood for problematic behaviors to become a feedback cycle, with harms/negative consequences of excessive behavior leading to even more of the behavior as a way to cope (Billieux, 2012; Kowert, 2014; LaRose, 2010).

In contrast to cognitive and behavioral models, biopsychosocial models based in traditional addiction theory suggest that both substance and behavioral addictions are characterized by repeated responses to a stimulus (such as a drug or a rewarding behavior) that leads to dysfunctional use and impaired control over the behavior, with subsequent harms (Wakefield & First, 2013). These models emphasize similarities between substance addictions and problematic behaviors (Griffiths, 2005; Shaffer et al., 2004). For example, the components model of addiction suggests that both substance and behavioral addictions are characterized by the common components of salience, mood modification, tolerance, withdrawal, conflict and relapse (Griffiths, 2005, 2017), while the syndrome model emphasizes the common pathogenesis of substance and behavioral addictions (Shaffer et al., 2004). Whether conceptualizations emphasize processes or syndrome, it is crucial to ensure that the actual definitions of addiction allow for the heterogeneous expression in populations and are able to distinguish normative from problematic behavior (Colder Carras et al., 2017; Kräplin, 2017; Wakefield, 2015).

1.1. Engaged gaming as normative experience

The term “engaged gamers” is used to identify those who are passionate and motivated to play and may play intensively but would not be classified as problematic gamers. Although about half of all adults in the United States play video games, only 10% identify as “gamers”, i.e. enthusiastic or frequent players (Duggan, 2015). Engaged gamers may experience some IGD symptoms (usually described as “peripheral” criteria) without experiencing harm or impairment (Brunborg, Hanss, Mentzoni, & Pallesen, 2015; Charlton & Danforth, 2007). In fact, some aspects of gaming that are an important part of the gaming experience (i.e. “theory-crafting”, which involves carefully analyzing game elements that will improve a player’s gameplay) may resemble symptom criteria such as preoccupation (Colder Carras, 2016). As a result, for engaged gamers, distinguishing symptoms of a disorder from normative play might be challenging in some cases. If IGD scales do not assess and prioritize the presence of functional impairment, then the result might be

misclassification, i.e. “false positives” (Billieux et al., 2017; Colder Carras et al., 2017; Griffiths et al., 2016; Kardefelt-Winther, 2017).

Engaged gamers may be uniquely positioned to provide insights into problematic gamers’ choice of game genres, motivations to play, play context and experiences, and patterns of other media use (Colder Carras et al., 2017; Snodgrass, Lacy, Dengah, Fagan, & Most, 2011a; Van Rooij, Schoenmakers, Vermulst, Van den Eijnden, & Van de Mheen, 2011). Such information may assist in helping to describe the diagnostic features of IGD. If criteria are not in line with gamers’ own experiences or do not reflect all of the domains of disorder as they are experienced in the population, the proposed classification may lack content validity. When research approaches are not inclusive enough of the perspectives of their target populations, researchers may ask the wrong questions or end up looking in the wrong places for answers (Heaney, 2016), limiting the scope of idea generation (e.g., which domains are relevant to problematic gaming) and hypothesis testing (e.g., assessing depression as a predictor of problematic gaming as well as an outcome e.g., Gentile et al., 2011).

1.2. Alternative approaches to formulation of criteria for behavioral addictions

A useful approach to ensuring that the formulation of a mental disorder reflects the experience within a population is to use an emic or “bottom-up” approach that directly involves the community as experts in defining disorder (Bass et al., 2007). In the case of problematic gaming, consulting with self-identified gamers as an expert community may identify a “cultural insider” view of problematic gaming (Consalvo, 2009; Quandt et al., 2015; Snodgrass et al., 2017). As part of a “gamer culture” (Consalvo, 2009; Quandt et al., 2015), this group can provide a culturally specific understanding of the mental and behavioral symptoms and harms/impairment associated with excessive gaming and their contrast to normative experiences (Snodgrass et al., 2017). Through their extensive knowledge and participation in the ideas, customs and language used to describe experiences both positive (e.g. the joy of “pwning n00 b s” as part of an elite competitive team), and negative (e.g. feeling compelled to keep pursuing a game goal after multiple failures or mistakes, King & Delfabbro, 2016), self-identified gamers are a potentially invaluable resource for refining the idea of what it means to play in an enthusiastic (yet culturally normative) versus a disordered way.

In contrast to systematic, researcher-directed inquiry such as qualitative interviews, group consensus techniques such as the Delphi Method and Nominal Group Technique are social, collaborative, knowledge-building approaches that are driven by the belief that ideas can be iteratively refined and improved upon when groups share their opinions and perspectives (Adler & Ziglio, 1996; Mylopoulos & Scardamalia, 2008). Fostering deliberation within and between expert groups and communities may be especially useful to refine normative assumptions about health (Lehoux, Daudelin, Demers-Payette, & Boivin, 2009). Aside from their empowering participatory nature, knowledge-building approaches have additional benefits for conservation of public health resources: When stakeholders for a health topic are included in efforts to identify future areas of research, subsequent studies are more likely to address topics of greater importance to the community, lead to more valid measures, and

enhance the value of research (Claassen et al., 2014; Johns Hopkins Bloomberg School of Public Health, 2016).

Therefore, it seems clear that refining criteria for a public health issue as complex as problematic gaming, including identifying domains that separate normal from problematic gaming, would benefit from broad-based feedback from groups such as engaged gamers who are able to collaboratively discuss ideas and share perspectives and experiences that may not be apparent to researchers and clinicians. The present study aimed to engage experienced gamers to critically evaluate their understanding of problematic gaming and its constituent symptomatology. A specific point of interest was the degree of convergence between current addiction models as reflected in the DSM and gamers' own understanding of problematic gaming. This research was guided by the following research questions:

RQ1: How do members of a "gamer culture" define problematic gaming?

RQ2: How do their definitions compare to the proposed IGD content domains and other relevant theory?

2. Methods

2.1. Sample

Two panels were presented at a large gaming convention, MAGfest, held in Washington, D.C. in 2016 and 2017. The convention featured the opportunity to play games and attend gaming themed music events; to see and interact with other game fans, game developers and celebrities; to attend educational and interactive panels; and to participate in other aspects of video game fan culture. The convention was attended by approximately 20,000 gamers in 2016 and 25,000 in 2017. Participants were recruited passively through panel descriptions in the convention schedule and posters on the door to the panel room. The panel was advertised as an interactive discussion in which attendees and panelists would "crowdsource consensus development," and "improve research by gathering the thoughts and opinions of people who play games, people who create games, and people who study games."

At the beginning of each panel, the presenters (MCC, AMP, AL and MC) introduced themselves as researchers and gamers and described the presentation as a study aimed at using group decision-making procedures to improve research about video games and health. Attendees were offered the opportunity to participate or to leave if they did not consent; none left. Sessions were not recorded but field notes were taken and used to supplement data analysis. Although we did not specifically collect demographics, based on our field notes for 2017 the sample was estimated to be consistent with the demographics of United States regular gamers (Duggan, 2015), e.g. there were six white females, two African-American males, one Asian female, and twenty white males. Most participants were young adults. The study was considered exempt by the sponsoring institutional review board.

2.2. Procedure

In 2016, the presentation began with an overview of current topics in studies of video games and health, such as concerns about violence and videogames and research into the use of video games for health. We also briefly introduced the idea of Internet gaming disorder and

displayed a list of abridged criteria (e.g., the word “Preoccupation” instead of “Preoccupation with Internet games”. We then used a free list approach to elicit participants’ views by asking the open-ended question “What are signs of video game addiction, Internet gaming disorder, or disordered gaming?” and requesting that participants record responses in a paper and pencil format. All responses were collected, transcribed onto a slide, and then displayed to all participants. The presenters then facilitated a discussion with gamers in which criteria were deliberated upon, duplicate criteria were omitted, and similar statements were combined. Participants were asked to rank up to 10 criteria they felt were the most important “signs of game addiction”. A similar procedure was followed in 2017, except the initial presentation of the IGD criteria was omitted to avoid influencing gamer-generated criteria suggestions. During the guided discussion, the presenters explained the concept of thematic grouping and asked participants to group the listed criteria by themes. Finally, participants rated their ideas for the top five most important thematic criteria.

2.3. Analysis

Descriptive statistics were conducted for each item, rankings were generated, and the team of authors put the criteria into categories of known theoretical domains. To address the first research question and describe the perspectives and knowledge developed within each sample, we performed a quantitative consensus analysis (Section 3.1) and provided examples of how gamers clarified and combined problematic gaming criteria (Section 3.2). We calculated the weighted sum of centered ranks (WSCR) in Stata 13 S EE using the Skillings–Mack statistic (skilmack), where the problematic gaming criteria rankings are considered the factor variable representing treatment options, and missing values are replaced with zero to ensure the down weighting of non-ranked criteria (M. Chatfield, personal communication, September 18, 2016; Chatfield & Mander, 2009; StataCorp. 2013). With this method, high consensus criteria, i.e. those that are usually agreed to be “important signs of game addiction” will have a positive WSCR while low consensus criteria, i.e. those that are ranked fewer times, ranked as less important, or show greater disagreement among gamers will have a negative WSCR (M. Chatfield, personal communication, September 18, 2016).

To answer the second research question, the research team (public health, addictions and health psychology researchers, a clinical psychologist/addictions researcher, an industry developer and an independent game add on developer) classified gamer-generated criteria by content domains and compared them to the currently proposed IGD criteria or other constructs that have been associated with problematic gaming in the scientific literature. For analyst triangulation, each author first separately mapped items to existing IGD criteria, the IGD domain of “problems in functioning/clinically significant impairment” or to “no match to IGD”. The authors’ responses were compared and areas of disagreement were discussed, paying specific attention to perspectives from the analysts’ diverse fields, until convergence on existing criteria, functional impairment, or “no match” was achieved. Qualitative (examples of gamer-submitted criteria and results of author comparisons to IGD criteria) and quantitative (gamer consensus) results were synthesized and samples were chosen to represent gamer-criteria for presentation (Section 3.4 and Table 2).

3. Results

3.1. Quantitative

The average panel attendance was 21 people in 2016 and 30 people in 2017. In 2016, 14 people participated in the free listing round and contributed 31 criteria. After discussion, clarification and combining of criteria as described in Section 3.3, 21 criteria remained for ranking. Twenty-one people then participated in the ranking round, ranking between one and ten criteria each. In 2017, 19 people submitted criteria during the free listing round, contributing a total of 44 criteria. Participants were able to discuss and develop categories for 38 of these in the time allotted, resulting in 11 main themes. All original submitted criteria are available on request. Table 1 presents the ranked criteria for both years, the times they were ranked by attendees, and the WSCR.

3.2. Research question 1: Identifying problematic gaming

For the gamer-led discussion, gamers debated the merits of their own suggested criteria, clarified, reworded and combined criteria. Four areas of discussion and clarification stand out. First, in a discussion of the submission *obsessive thoughts*, some gamers clarified that this could be a normal occurrence with many types of media. Second, when prompted on the temporal relationship between *isolation/social phobia/social anxiety* and problematic gaming, the 2017 sample suggested that this was a feedback cycle, with anxiety about social situations spurring excessive amounts of gaming, and subsequent isolation leading to more social anxiety. Third, in discussing the submitted criterion *control over person's schedule,* gamers described the influence of game characteristics such as login rewards and time-dependent game events on feeling that gaming was out of control. Following this discussion, the criterion was reworded to *games control/determine your schedule-interval reinforcement ratios,* which was then used in the ranking round. Finally, gamers combined some of the individually-submitted criteria during discussion to create composite or thematic criteria. In 2016, gamers combined loss of reality and dissociative attitude into a single composite criterion, *loss of reality/dissociative attitude*. For example, gamers described this criterion as players having images from the game world "leak" into real life. In 2017, the theme *separating game world from real world* was created from grouping several individual criteria. Gamers in 2017 clarified that this criterion reflected specific thought processes about and expectancies of gaming such as the game world (a) being more appealing than real life, (b) having logic that is more understandable than an open-ended real world, and (c) creating unrealistic life goals and expectations, which led to difficulty disconnecting from gaming.

3.3. Research question 2: Internet gaming disorder (IGD) comparisons

The authors matched gamer-proposed criteria to IGD criteria over several rounds of independent rating and multiple discussions that took place in person and over email. Gamer-proposed criteria were compared to existing IGD symptom criteria, the IGD domain of "problems in functioning/clinically significant impairment" or determined by consensus to be "no match to IGD". Many of the gamer-proposed criteria were easily matched to IGD criteria, while others were more difficult to match or were evaluated as matching a different content domain, including domains that were not actually criteria such as potential causes or

outcomes. Criteria with keywords similar to proposed criteria, such as *stress when not playing/withdrawal, anger or irritability when not gaming or have to stop gaming*, and *continuing to use after recognizing problems* seemed to clearly correspond to IGD criteria, with convergence achieved in a single mapping round. Other items, such as those that seemed to reflect functional impairment and negative consequences were more difficult to categorize. During multiple discussions, the authors considered whether these criteria were potential matches for IGD criteria, causal factors, processes, or outcomes of disordered or excessive gaming or concurrent psychological conditions, returning to field notes regularly to ensure that participants' perspectives were reflected accurately.

For example, *spending too much money* was seen by some authors as "no match", but after some discussion was ultimately was judged to refer to "awareness of harm" and may be related to the IGD criterion "continued excessive use despite knowledge of psychosocial problems". Items related to socializing, such as *takes away from quality of life (isolation), isolation/social phobia/social anxiety*, and *avoiding socializing/cancelling in-person plans* remained unmatched to the IGD diagnostic criteria Although these could represent various elements of IGD, the explicit focus on isolation and social anxiety happening in relation to other activities and persons prompted both researchers and gamers in the 2017 discussion to keep it separate from other criteria. *Games control/determine your schedule-interval reinforcement ratios* was determined to be "no match" because it reflected an etiological or maintenance factor for disordered gaming, not a criterion of IGD. Lastly, items related to cognitive processes or distortions such as *loss of reality/dissociative attitude* and s*eparating game world from real world* were categorized as "no match" due to a lack of similarity to any IGD criteria.

3.4. Combined analysis

To synthesize answers to both research questions, we present in Table 2 sample gamer-proposed criteria that were judged by the authors to correspond to IGD domains or "no match" as well as the gamer consensus for these items. Among those criteria determined by the authors to correspond to the proposed IGD diagnosis, gamers agreed that the domain of functional impairment was the most important sign of problematic gaming, proposing criteria such as *neglecting needs/responsibilities/doesn't feed kids* or the more general *interference with everyday life*. Behavioral salience and loss of control, including both *loss of interest in other activities* and unsuccessful attempts to control gaming (e.g. *inability to stop*), were also endorsed with high consensus in both years. The criterion *continued use despite problems* had high consensus, but was submitted in only one year, although gamers in both years suggested criteria related to financial problems. The withdrawal domain was expressed differently between years. In our 2016 sample, gamers agreed that stress (but not aggression) was a withdrawal symptom, but our 2017 sample showed low consensus on *anger/irritability when not gaming.* There was low consensus among gamers on the remaining IGD content domains, except for tolerance, which was not mentioned in either year.

When comparing the "no match" criteria between 2016 and 2017, there was high agreement among gamers on one item from 2016, *games control/determine your schedule-interval*

reinforcement ratios. Gamers in both years also agreed on the importance of criteria related to social isolation, including social anxiety and avoidance of in-person activities. Between years, gamers disagreed on items related to thoughts or beliefs about gaming, including the composite ranked criterion *loss of reality/dissociative attitude* (2016), and the theme *separating game world from real world* (2017).

4. Discussion

This study employed a community-engaged, knowledge-building mixed methods approach to investigate what gamers consider the most important signs and symptoms of problematic gaming and to compare gamers' perspectives on problematic gaming to currently proposed IGD criteria. Groups of participants shared, discussed and evaluated their experiences and perspectives on gaming-related problems, thereby providing a "cultural insider" view on what might be considered problematic patterns of behavior and symptoms within the gamer culture. Despite concerns that a public setting celebrating all things related to video gaming might lead gamers to be unwilling to discuss harms or impairment associated with gaming, audience members were enthusiastic about contributing to idea generation and discussions. It was found that gamers emphasized the importance of life interference and functional impairment in their understanding of problematic gaming. Gamers also ranked highly three of nine IGD symptom criteria: continued use despite problems, unsuccessful attempts to control, and loss of interest in previous hobbies and entertainment. In addition, the consensus development process within our multidisciplinary author team identified three of the gamer-submitted criteria as potential new content domains: two domains related to potential symptoms of problematic gaming and one domain related to the etiology or maintenance of IGD. By inviting and evaluating gamers' insights about problematic gaming, this study provides support for commonalities between problematic gaming and other addictions but also potential differences. Findings also suggest that theory and intervention development would benefit from paying greater attention to characteristics and processes specific to video game play.

4.1. Comparisons between gamers' perspectives and existing IGD criteria

Gamers demonstrated strong support for the IGD domain of clinically significant impairment or distress due to gaming. While impairment is specified in DSM 5 and ICD-11 descriptions of problematic gaming, some population surveys do not always require the impairment criterion to be fulfilled when identifying problem cases (Kardefelt-Winther et al., 2017; Király et al., 2017; Lemmens et al., 2015; Pontes & Griffiths, 2015; Van Rooij, Van Looy, & Billieux, 2016). Consistent with the proposed classifications for ICD-11 Gaming disorder (World Health Organization, 2017), this sample was well aware of negative consequences resulting from excessive gaming and supported the centrality of these for classification. Additionally, the sample identified a diverse range of consequences, harms and impairment associated with problematic gaming, including health-related risks, psychological distress, and burdens on quality of life. While previous research suggests that some individuals with problematic Internet behaviors may minimize harms (Tzavela et al., 2015), the findings here suggest that gamers as a community support the importance of harms and functional impairment, and offer specific suggestions as to signs that resonate

with them. For example, gamers in both years suggested that problematic gaming affects health, yet the potential health consequences are not described in much detail in behavioral addictions and are mentioned only as a possible comorbidity in the IGD category (American Psychiatric Association, 2013; Shaffer et al., 2004). Future survey studies should consider the inclusion of a wider suite of questions to capture the broad range of problems related to gaming that interfere with health such as those suggested by our sample, including sleep, eating, hygiene, and more general activities of daily living (Tao, 2010; Van Rooij, Schoenmakers, & Van De Mheen, 2015).

There was also consensus for three of the nine proposed IGD criteria among gamers: continued excessive use despite problems, loss of interests in previous hobbies and entertainment, and unsuccessful attempts to control. This appears consistent with studies reporting that some symptoms belong to a set of “core” criteria that are reliably associated with cases of problematic gaming (Brunborg et al., 2015; Charlton, 2002) and suggests that screening for problematic gaming might be improved if a gated approach is used, where core criteria are given greater priority or assigned more weight in scoring (Shaffer et al., 2004). Such practices are evident in the diagnosis of major depressive disorder, for example, which requires either depressed mood or loss of interest or pleasure for clinical classification. A similar requirement for IGD might require one or two of the three high-consensus core criteria.

Participants demonstrated mixed or low consensus on five IGD criteria: withdrawal, preoccupation, lying, use of games to escape a negative mood, and jeopardized or lost a significant relationship, work or school opportunity. This was consistent with the ongoing debates in the IGD field regarding these topics (Griffiths et al., 2016). Withdrawal symptoms were described by participants in an inconsistent manner, suggesting that this may be a heterogeneous experience. In 2016 gamers ranked *stress when not playing/withdrawal* highly, but in 2017 the criterion *anger or irritability when not gaming or [when] have to stop gaming* was ranked with low consensus. Some studies suggest that withdrawal symptoms are a core criterion of problematic gaming that has high predictive value (Brunborg et al., 2015; Charlton, 2002; Rehbein, Kliem, Baier, Mossle, & Petry, 2015). The nonspecific wording of the proposed IGD criteria (i.e., “withdrawal symptoms”) is suitable for capturing the heterogeneity of experience reflected in findings here. However, our results also support the need for broadening the language about the conditions under which withdrawal symptoms might arise. The proposed wording of “when Internet gaming is taken away” might not capture other situations or contexts that gamers feel may lead to withdrawal symptoms (Kaptsis, King, Delfabbro, & Gradisar, 2016).

Although *preoccupation* was identified consistently by gamers, it was generally ranked lower than other criteria which means it might be a peripheral criterion that is less useful for identifying problem gamers (Brunborg et al., 2015; Király et al., 2017). Alternatively, the term “preoccupation” may be too broad (King & Delfabbro, 2014) or narrow (Griffiths, 2005) to adequately capture dysfunctional cognitions related to disordered gaming. Considering both the nonspecificity of preoccupation in previous studies and the endorsement of behavioral core criteria here, we might suggest that behavioral salience (rather than cognitive preoccupation) may be a better way to distinguish the extreme focus

on gaming that reflects IGD. In either case, this criterion would benefit from additional approaches such as item response theory that evaluate the potential utility of specifically worded scale items.

Criteria relating to *lying* and *failing out of school/work* were mentioned only in one year. This may be a result of the daily role responsibilities of our young adult sample. As adults, they may not have restrictions on gaming imposed by parents, and thus have less of a need to lie about it. Likewise, official job reviews or evaluations that could result in "failing" out of work are likely to be less frequent than grades in school. Thus, the context for this criterion may not be as applicable to the young adult population. Alternatively, as these convention attendees are particularly enthusiastic gamers who pay and may travel hundreds of miles to attend, they may also have a better ability to self-regulate and perhaps they have learned how to maintain a more successful work-life balance. They can enjoy many hours of gaming without impairing significant social and work-related relationships and responsibilities. Thus, the contribution of this criterion to understanding problematic gaming may be heavily context-dependent.

Participants did not discuss the use of games to escape a negative mood per se, but the sample in 2017 pointed to the habitual use of games to cope with stress as a potential indicator of problematic gaming. Games and other forms of media, like many hobbies or leisure activities, perform the very meaningful function of any form of recreation, i.e. allowing for enjoyment and temporary relief from daily stressors (Iwasaki, Coyle, & Shank, 2010). Media habits are strong predictors of media behaviors, and habit is also associated negatively with perceived behavioral control (Lange, 2009). However, habitually using games to escape in the face of high levels of stress may lead to maladaptive coping and subsequent problematic gaming (Kardefelt-Winther 2015). This supports treatment approaches that include helping gamers find other ways to cope with challenges and suggests that teaching gamers to recognize when games are being used habitually as a coping mechanism may be a useful component of preventive interventions (Van Rooij, Zinn, Schoenmakers, & van de Mheen, 2012).

One proposed IGD criterion, tolerance, was not mentioned in either sample. Tolerance is another criterion whose value in classification of problematic gaming has been much debated (Kardefelt-Winther, 2015; Kuss, Shorter, Van Rooij, Griffiths, & Schoenmakers, 2014). For example, problematic gamers may not merely seek increasing time in a game, as described in the DSM-5, but instead may be driven by specific reward-based needs (King, Herd, & Delfabbro, 2017). Further research is necessary to determine whether and how tolerance might manifest in populations and to clarify its place in theory.

4.2. Unique content domains

Three gamer-proposed criteria did not seem to match existing IGD domains as defined by the proposed DSM criteria but were consistent with other theoretical domains reflected in the literature, including etiological factors.

First, gamers in both years agreed that withdrawing from social interactions was concerning and chose to differentiate social-related items from other criteria submissions. The fact that

our gaming sample felt that the line between normal and abnormal should be drawn at objective signs of isolating oneself or fearing social interactions suggests that engaged gamers feel that waiting until relationships are actually in jeopardy may overlook important changes in social behavior and feelings that could be warning signs of disorder. An alternative possibility has to do with this sample being members of the gamer culture. Individuals who identify themselves as gamers may be more invested in the social need satisfaction they get from being involved in the gamer community (Grooten & Kowert, 2015). Whether they identify as gamers or not, individuals who attend fan conventions will likely place higher value on face-to-face social interaction. While the authors agreed that this gamer submission might be a sign or symptom that could be used to define disorder (see Sections 3.3 and 3.4), this criterion may instead indicate a contributing factor on the pathway to disorder (e.g., social anxiety) or an outcome of disorder. It will be important to compare the experiences of social isolation and withdrawal between self-identified gamers and other enthusiastic video game players to see if including a separate assessment of changes in social behavior—as opposed to the more severe "jeopardized or lost a significant relationship … because of participation in Internet games"—would improve classification or enhance prevention interventions.

Second, the gamer-proposed *games control/determine your schedule-interval reinforcement ratios* seemed to suggest that gamers might view the cause or maintenance of problematic gaming as an interaction between vulnerable players and certain game design features. During discussion, the 2016 sample related the idea of "controlled schedules" to feeling compelled to arrange schedules and activities around logging in at a certain time to receive rewards. Although our sample considered these a "sign of addiction", these seem to reflect etiological factors rather than signs or symptoms of disorder, much as substance use is a necessary (but not sufficient) cause of substance use disorder. Factors like appointment mechanics that are often used in free-to-play games or notifications that trigger game play have been described as structural characteristics of games that affect problematic gaming (King, Delfabbro, & Griffiths, 2011; Wood, Griffiths, Chappell, & Davies, 2004) or game-driven triggers of engagement (Van Rooij, Daneels, Liu, Anrijs, & Looy, 2017a). Although this is not something that would be part of a problematic gaming diagnosis according to the current classification systems, it implies that changes in the game industry itself will be important for future research. Recent monetization mechanics in particular have led to some blurring of gambling and video game play into hybrid "gambling/gaming activities", which will present additional challenges to research and nosology (King, Gainsbury, Delfabbro, Hing, & Abarbanel, 2015). As technology advancement often outpaces the speed of health research (Nilsen et al., 2012), engaging gamer community and game industry members to develop research questions rapidly will be even more important to identify relevant topics and features of games that may affect the development of problematic behavior.

Items related to thoughts or beliefs about gaming had discrepant consensus between years. Although the 2016 composite criterion *loss of reality/dissociative attitude* had high consensus, the 2017 theme *separating game world from real world* had low consensus. Participants in both years described changes in beliefs related to dealing with problems in the "real world". Attendees discussed that these ideas reflect specific thought processes about and expectancies of gaming, such as the game world being more appealing and easier

to understand. These criteria seem to reflect cognitive states or processes related to problematic gaming. As a recreational activity, many players use games as a normal and enjoyable way to separate from offline selves and realities in a healthy or "normal" dissociation (Snodgrass, Lacy, Dengah, et al., 2011b). Heavy involvement in games may enhance self-esteem (Adachi & Willoughby, 2014; Snodgrass, Lacy, Francois Dengah II, & Fagan, 2011b), but could also lead to over involvement in virtual life at the expense of real life (Billieux et al., 2015; Delfabbro & King, 2015; Snodgrass, Lacy, Francois Dengah II et al., 2011b). From a theoretical perspective, this implies an individual vulnerability (e.g., low self-esteem or low tolerance for uncertainty) at play rather than simply a maladaptive form of coping with stress and supports a view of problematic gaming that emphasizes the affordances of virtual worlds and accomplishments over a biological pathogenesis. From a more psychoanalytic perspective, predisposing factors such as a traumatic childhood are said to lead to dissociation through the use of games as a "psychic retreat" to counteract disturbing thoughts and feelings (Schimmenti & Caretti, 2010). However, this part of the discussion was especially complex, so the findings may not reflect true psychopathology but rather a colloquial, nuanced meaning that was not captured within the limited time of the panel. In addition, as the composite nature of these submissions may reflect conflation between disparate concepts, this potential feature of problematic gaming warrants additional exploration with gamers to more clearly describe the nature and duration of these experiences and the function they may serve in addressing unmet psychological needs.

4.3. Limitations

Our study has several limitations that should be considered. Our sample was small and self-selected, but this reflected the purposive sampling design used to promote thorough discussion and consensus development among a specific population. This sample of gamers was mostly young adults, so the experiences in this population might not reflect those of children and adolescents or older adults. There is some heterogeneity in the "cultural insider" view among gamers (Snodgrass et al., 2017), therefore results from this sample may not generalize to other engaged gamer samples or gamers who don't attend conventions, which may not reflect the experiences of problematic gaming for all gamers. In addition, there was a time constraint for our panels; additional time or use of an online discussion board format might have enabled more content, collection of additional data on demographics or involvement with gaming, or further clarification of nuances in ideas and themes. While we attempted to elicit ideas about participants' suggested criteria, our initial discussion of IGD in the 2016 panel may have had some priming effects on participants. Finally, use of an interactive and persistent method of knowledge development such as a wiki would be optimal for making the iterative and complex approach to mapping gamers' submissions more transparent.

5. Conclusions

We used a consensus-development approach with self-identified video gamers to obtain their suggestions for criteria of "game addiction" and to compare these to the proposed formulation of IGD. The findings support the content validity of some behavior-based IGD items and provide a "cultural insider" perspective on other criteria and content domains that

may help to guide classification and a theoretical understanding of problematic gaming. Participants' consistent emphasis on functional impairment, continued use despite problems, loss of interests in previous hobbies and entertainment, and unsuccessful attempts to control gaming aligned with the DSM and ICD systems and suggest that these criteria may be more likely to identify cases of problematic gaming. There were also indications that some symptoms, such as withdrawal, may be heterogeneous and expressed differently between different player profiles. In addition, gamers offered perspectives on areas not listed in the IGD criteria that may be useful in improving IGD criteria or understanding the development or maintenance of disorder.

These findings highlight the value of engaging experienced gamers in research related to problematic gaming. Community-based participatory approaches that use formal and transparent consensus development between gamers, industry members, clinicians, and researchers may speed the development of clinical and epidemiological terminology, descriptions and measures by building a broad-based knowledge of problematic gaming that incorporates rapidly changing technology and new types of communities and norms. Gamers' insights, when combined with the knowledge and expertise of researchers, clinicians, and policymakers may strengthen theory and assessment of problematic gaming, as well as interventions such as the promotion of guidelines for healthy gaming and education about warning signs and symptoms of problematic gaming.

Acknowledgments

We would like to acknowledge Jeremy Pesner and Tim MacNeil of MAGfest for their support in preparation of and during our panels. We would also like to thank our anonymous reviewers for their thoughtful comments on our manuscript. We would especially like to acknowledge the gamers who attended our panels and whose ideas have shaped our study.

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Table 1

Gamer-generated criteria and rankings.

2016	Times ranked	Rank	2017	Times ranked	Rank
Neglect [s] needs/responsibilities/[doesn't] feed kids	15	77.55	Affects health	9	56.50
Loss of reality/dissociative attitude	13	45.79	Isolation/social phobia/social anxiety	6	33.00
Stress when not playing/withdrawal	12	35.82	Prioritizing gaming over all other aspects	7	22.50
Games control/determine your schedule-interval reinforcement ratios	12	18.83	Can't stop	6	18.00
Continuing to use after recognizing problem	9	14.77	Interfering with everyday life	12	7.50
Eat/sleep/health/hygiene	8	14.77	Prioritizing spending money on games	3	−13.50
Loss of interest in other activities	9	11.45	Anger or irritability when not gaming or have to stop gaming	5	−19.00
Avoiding socializing/cancelling in person plans	9	6.65	Separating game world from real world	10	−22.50
Inability to stop	9	4.43	Obsessive thoughts	2	−22.50
Continuing when physically exhausted	8	−0.37	Affects hygiene	2	−29.50
Aggression when not able to play	7	−0.74	Habit-go to [in order] to de-stress, distracts-coping	5	−30.50
Lying	7	−3.69			
Failing out of school/work	8	−5.17			
Denial of there being a problem	7	−5.17			
Takes away from quality of life (isolation)	7	−9.97			
Spending too much money	7	−10.71			
Playing games to the exclusion of other things	6	−10.71			
Preoccupation/distraction	3	−33.97			
Speaks too much about the game	2	−46.90			
Feeling guilty for not playing the game	2	−49.85			
Social awkwardness	1	−52.81			

Note: Rank based on the Skillings–Mack statistic, i.e. the weighted sum of centered ranks.

Table 2

Gamer-generated criteria, gamer consensus and comparison to IGD criteria or other content domains.

Sample items	Consensus	Comparison to IGD criteria[a]
Matched to IGD criteria		
Neglects needs/responsibilities, interfering with everyday life	**High**	Clinically significant impairment or distress requirement for diagnosis.
Continuing to use after recognizing problem[b]	**High**	Continued excessive use of Internet games despite knowledge of psychosocial problems.
Prioritizing gaming over all other aspects, loss of interest in other activities	**High**	Loss of interests in previous hobbies and entertainment as a result of, and with the exception of, Internet games.
Inability to stop, can't stop	**High**	Unsuccessful attempts to control the participation in Internet games.
Stress when not playing/withdrawal	**High**	Withdrawal symptoms when Internet gaming is taken away.
Anger or irritability when not gaming or have to stop gaming	**Low**	
Preoccupation/distraction, obsessive thoughts	**Low**	Preoccupation with Internet games.
Habit, go to [in order] to de-stress, distracts-coping[b]	**Low**	Use of Internet games to escape or relieve a negative mood.
Failing out of school/work[b]	**Low**	Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games.
Lying[b]	**Low**	Has deceived family members, therapists, or others regarding the amount of Internet gaming.
No match		
Avoiding socializing/cancelling in person plans, isolation/social phobia/ social anxiety	**High**	_____
Games control/determine your schedule-interval reinforcement ratios[b]	**High**	_____
Loss of reality/dissociative attitude	**High**	_____
Separating game world from real world	**Low**	

Notes: High consensus criteria are those that many gamers ranked as highly important, while low consensus criteria were ranked by fewer gamers or with less consistency in ranking.

[a] Gamers did not suggest any criteria that were judged comparable to the tolerance domain, i.e. Tolerance–the need to spend increasing amounts of time engaged in Internet games.

[b] Criterion was only mentioned in one year.