

Working towards an international consensus on criteria for assessing internet gaming disorder: a critical commentary on Petry *et al.* (2014)

*This commentary paper critically discusses the recent debate paper by Petry *et al.* (2014) that argued there was now an international consensus for assessing Internet Gaming Disorder (IGD). Our collective opinions vary considerably regarding many different aspects of online gaming. However, we contend that the paper by Petry and colleagues does not provide a true and representative international community of researchers in this area. This paper critically discusses and provides commentary on (i) the representativeness of the international group that wrote the 'consensus' paper, and (ii) each of the IGD criteria. The paper also includes a brief discussion on initiatives that could be taken to move the field towards consensus. It is hoped that this paper will foster debate in the IGD field and lead to improved theory, better methodologically designed studies, and more robust empirical evidence as regards problematic gaming and its psychosocial consequences and impact.*

INTRODUCTION

In this commentary, we discuss critically the recent debate paper by Petry and colleagues [1] which argued that there was now an international consensus for assessing internet gaming disorder (IGD). The Petry *et al.* paper was interesting reading for all of us that work in the gaming studies field, as it aimed to review two contentious issues, namely the (i) inclusion of behavioural addictions (and more specifically IGD) in the latest (fifth) edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) [2], and (ii) intended meaning behind the DSM-5 criteria for IGD. The present paper takes a critical look at the second of these aims, as the first aim has already received considerable debate elsewhere [3–14].

The present commentary paper has been written by a group of researchers from a number of different academic fields with a shared interest in research into online addiction, and more specifically video game addiction and online gaming addiction. Our collective opinions vary considerably regarding many different aspects of online gaming addiction, including (but not limited to) (i) the operational definition of IGD, (ii) on whether IGD should be conceptualized as an addiction, (iii) on whether components such as 'tolerance' and 'withdrawal' should be included as defining characteristics, (iv) on whether there is a difference between 'gaming disorder' and 'gaming addiction', (v) on

whether IGD is a subtype of internet addiction or video game addiction, (vi) how relevant IGD concepts are best assessed, (vii) on whether IGD is properly conceptualized as a unique condition or the consequence of other underlying mental dysfunction, (viii) whether there is a heterogeneity in IGD related to the videogame types (role-playing, real time strategy, first-person shooter, etc.) and game play (e.g. binge gaming, continuous excessive gaming, etc.), (ix) on whether IGD should be viewed as a parenting issue instead of a form of psychopathology, (x) on whether IGD might be a coping style for some people with mental health difficulties as opposed to a cause of problems (or even both) and (xi) whether researchers should use polythetic or monothetic criteria to assess IGD.

Our varied opinions about the nuances of the research in the IGD field notwithstanding, we contend that the paper by Petry and colleagues does not provide a representative international community of researchers in this area and that the 'consensus' provided by the 12 authors of their paper does not constitute an international consensus. Moreover, the published papers by the authors of the 'consensus' paper relied heavily on survey sample data, and completely omitted the core issues of clinical assessment and treatment-seeking patients.

REPRESENTATIVENESS OF THE INTERNATIONAL GROUP AND PROBLEMATIC GAMING INSTRUMENTS ASSESSED

The criteria for selecting the members of this international panel that met to discuss the IGD criteria were not stated clearly, and we would argue that the panel does not represent adequately the international community of gaming researchers. The authors of the 'consensus' paper came from nine different countries (i.e. United States, Germany, the Netherlands, China, Singapore, Mexico, France, Spain and Australia), with at least one author from Europe, North America, Asia and Australasia. Africa and South America were not represented. However, there were no representatives from countries where many empirical studies on IGD have been carried out, including the United Kingdom, Canada, Belgium, Norway, Czech Republic, Turkey, Hungary, Switzerland, Taiwan and South Korea. With regard to the representativeness of the problematic gaming

assessment scales reviewed, only eight instruments for assessing IGD were reported. In 2013, King and colleagues [15] reviewed the 18 instruments that had been developed to assess video game addiction up to that point, with new instruments having been developed since, which include several that have been modelled on the nine IGD criteria in the DSM-5 [16–21].

CRITERIA FOR INTERNET GAMING DISORDER

The remainder of the present paper discusses briefly each of the nine (consensually agreed in Petry *et al.*'s paper) criteria for IGD. We would also like to point out that as a group we do not all necessarily agree on the criticisms of each criterion, which is the point of this commentary. Ideally, we would have liked to suggest new wordings for each of the IGD criteria but this was not possible among the 28 authors of this paper, and again highlights (and reinforces) the contention we are making that there is no consensus on many issues in the international field of IGD. Additionally, any new proposed wording should also include the 12 authors of the 'consensus' paper that we are providing critical commentary upon. However, we consider some initiatives for moving towards consensus later in the penultimate section of the present paper.

DO YOU SPEND A LOT OF TIME THINKING ABOUT GAMES EVEN WHEN YOU ARE NOT PLAYING, OR PLANNING WHEN YOU CAN PLAY NEXT? (PREOCCUPATION)

Kardefelt-Winther [5,6] has argued that because gaming constitutes one of the most popular forms of entertainment for children, adolescents and adults, it is not entirely straightforward to assume that a preoccupation with on-line games is indicative of problematic engagement. Much like a group of friends who might get together a few times a week to talk about their favourite soccer team in anticipation of an upcoming game so, too, might gamers spend their spare time talking about upcoming e-sport events or anticipated new video games that are about to go on sale. Furthermore, gaming is an active hobby in which a player can exert a great deal of agency and control, which means that spending time strategizing about game play or thinking about tactics during times of non-play is an important part of the play-experience, in particular for high-achieving and/or professional gamers [28]. This needs to be considered so that highly engaged gamers are not stigmatized and to reduce the risk for over-diagnosis. Any high level commitment (e.g. sports, music, school) will have some detrimental consequences as other important activities are not given as much priority, but it would be a mistake to always confuse this with addictive

behaviour. The challenge here seems to be to understand how to differentiate more clearly between healthy engagement and harmful compulsion [28], which is in line with what a number of the present authors have suggested [23–25].

However, the current IGD wording of the preoccupation criterion does at least acknowledge the view of King and Delfabbro [23], who have previously emphasized the complexity of the preoccupation criterion. In their view, preoccupation should not be assessed in terms of time alone but also in terms of cognitive content. In other words, it is just as important to explore the adaptability of cognitions as the frequency of gaming-related thoughts. However, the current wording has removed almost all behavioural elements, meaning that any gamer who plays all day every day would not endorse this item because they are constantly playing. Some of the co-authors of the present paper also note that assessment of the preoccupation criterion might also include the significance attached to gaming. The corresponding questions could enquire whether the person perceives gaming as central to their lives and/or whether they could imagine their lives without gaming.

DO YOU FEEL RESTLESS, IRRITABLE, MOODY, ANGRY, ANXIOUS OR SAD WHEN ATTEMPTING TO CUT DOWN OR STOP GAMING, OR WHEN YOU ARE UNABLE TO PLAY? (WITHDRAWAL)

Withdrawal is one of the most debated criteria (especially among the authors of the present paper), because in the case of behavioural addictions there is no ingestion of a psychoactive substance and therefore what the body produces neurochemically is generated by the behaviour alone [14]. Pies [26] was perhaps the first to note that in addition to players' self-report, those in the field should use physiological measures such as blood pressure or pulse rate to assess withdrawal symptoms. Some (but not all) of the present authors, like others [26,27]—and including Petry and colleagues—agree that withdrawal should not be conflated with the negative emotions that arise when gaming is suddenly stopped by an external force (e.g. an angry parent, sibling, partner or spouse). In contrast, unpleasant symptoms that are experienced for a couple of hours (up to several days) after stopping playing should be considered as genuine withdrawal symptoms. Emotions that are felt days or weeks after gaming has ceased should be characterized as cravings, rather than as part of a withdrawal syndrome [27]. Therefore, if the withdrawal criterion is to remain, it should also include some reference to the time-period (e.g. 'Do you feel restless, irritable, moody, angry, anxious or sad over a period of up to two days when attempting to cut down or stop gaming, or when you are unable to play?'). Assessment of the withdrawal symptoms

might include an additional question (e.g. 'Do you stop feeling restless, irritable, moody, angry, anxious or sad when you are able to play again?') to distinguish withdrawal-related negative emotions from the occurrence of such emotions for a different reason. Any criterion for withdrawal should also include acknowledgement that there is a difference between consequences that result from psychopharmacological processes and those that result from affective-behavioural outcomes.

Although some in the field (including some of the present authors) argue that withdrawal should not be associated with activities that do not involve the ingestion of a psychoactive substance, the criterion was one of the three core criteria of IGD according to a comprehensive literature review conducted by King and colleagues [15] prior to the publication of DSM-5. Additionally, this criterion was reported to have high diagnostic accuracy when tested in a clinical sample [28]. However, this does not necessarily mean that the criterion has adequate face validity in the context of IGD, nor that it may usefully distinguish a highly engaged player from a player who has lost control. Some of the present authors would argue that before we understand why the player becomes restless or irritable when attempting to stop gaming, the criterion might be limited in its ability to predict problematic engagement accurately [5,22].

DO YOU FEEL THE NEED TO PLAY FOR INCREASING AMOUNTS OF TIME, PLAY MORE EXCITING GAMES OR USE MORE POWERFUL EQUIPMENT TO GET THE SAME AMOUNT OF EXCITEMENT YOU USED TO GET? (TOLERANCE)

Like withdrawal, tolerance is another highly debated criterion (especially among the present authors), and for much the same reason (i.e. the lack of an ingested psychoactive substance). The criterion also conflates a number of things (time, excitement, type of equipment) and does not really get to the heart of what tolerance really means in this sense [i.e. needing to game more often or intensively than before to gain the desired level of reinforcement (i.e. pleasure)]. Ko [29] has also noted that many individuals with IGD play so excessively that they are unable to increase the time they play any further. Instead, they experience lower levels of satisfaction while playing compared to when they initially began to play. The playing of 'more exciting games' is arguably a poor indicator of tolerance. The 'tolerance' criterion is clearly a consequence of modelling IGD criteria on that of substance disorder criteria and grounded in physiological reasons for requiring a greater intake. Consequently, this may not be as useful an indicator for problematic gaming as for other addictions [5,6]. This notion was emphasized

in a recent electroencephalograph (EEG) study [30] that demonstrated that patients suffering from IGD were less likely to reveal reward sensitivity when playing a simple video game than healthy regular gamers. This effect remained stable regardless of the daily gaming amount of the patients.

Furthermore, excitement is typically a function of doing well in the game, and over time it is the experience of novelty (along with reinforcement schedules) that will maintain players gaming for longer periods rather than the perception of whether one game is deemed as more exciting than another. However, the wording on the consensually agreed statement also assumes that problematic players will transition from one game to another to seek out more exciting experiences. The research evidence on dedicated players of Massively Multiplayer Online Role-Playing Games (MMORPGs), as an example, would not support this notion [31]. A number of studies suggest it is the opposite, and that problematic players seek out games that make them relax, de-stress and/or dissociate [32–34]. Also, while there is some merit in tolerance being assessed by the need to use more 'powerful equipment' (among the present authors who think tolerance is a core criterion of IGD), the criterion would be better described by using the words 'frequently upgrading playing equipment', although such symptoms are arguably marginal from the perspective of genuine tolerance. This was pointed out more than 15 years ago by Griffiths [35] in his case studies of individuals with internet and online gaming addictions. For instance, one of the young males in the study upgraded his computer 11 times during a 2-year period. However, as a number of the present authors noted, this might simply be a consequence of wanting to be able to play the latest and most technologically demanding games with the best available equipment, rather than reflecting a pathology.

Many people spend a great deal of money on their hobbies (e.g. fishing and motor enthusiasts). Therefore, some of the present authors do not think this criterion adequately differentiate fascination from compulsion, and its usefulness may therefore be questionable [5,22]. The type of hardware used may also impact upon how such a question is answered. For instance, gaming consoles offer only very limited potential for upgrades compared with gaming on a personal computer. Given that tolerance is hard to assess in gaming, there are also those among the present authors who suggest there could be an additional assessment question such as: 'Do you feel that the same amount of time spent gaming no longer produces the same initial satisfaction or excitement?'. However, a couple of the present authors noted that this depends upon the type/genre of video game played. For instance, goal-based video games

can become boring after reaching the goal and, similarly, task-/quest-based games can become boring once the player knows all the tasks and quests, as playing becomes repetitive. Competitive team playing (e.g. eSports games) might remain satisfactory and demanding for much longer periods.

DO YOU FEEL THAT YOU SHOULD PLAY LESS, BUT ARE UNABLE TO CUT BACK ON THE AMOUNT OF TIME YOU SPEND PLAYING GAMES? (REDUCE/STOP)

Many of the present authors felt this criterion of IGD (i.e. the inability to stop one's gaming in spite of a desire to no longer play) is arguably a hallmark sign of an individual with IGD. For instance, in the study by Ko *et al.* [28], this criterion (which was labelled continued excessive use) was the best overall criterion of IGD with 100% diagnostic accuracy. However, there were some issues raised, particularly with the consensually agreed wording. Some of the present authors feel that this question does not reflect adequately the corresponding DSM-5 criterion for IGD. The question should also mention a desire or intention to stop playing, not only to 'cut back on the amount of time' spent gaming. Also, some of the present authors thought the question should enquire about repeated, unsuccessful attempts to stop or decrease gaming. Even with such wording, this criterion may not be endorsed very often. For example, in one study it was endorsed by only 45.5% of individuals with problem video game use [36]. In addition, the question depends upon how much someone is playing in the first place.

It has also been noted by a number of authors that there is no reason that some addictive behaviours cannot be both destructive to the individual and something they do voluntarily [14,22,37–39]. If an inability to control gaming could be demonstrated convincingly (beyond the use of self-report), this would be consistent with a disease model of addiction. However, in addition to loss of control, it would be important to demonstrate that gaming could not be stopped (even in the presence of alternative rewarding activities). Moreover, if the long-term (global) perspective is ignored and the focus is on the short term, spending substantial time on gaming might very well be a rational choice, as the benefits are substantial but the costs are spread over time and hard to judge—in line with Heyman's argument for the escalation of drug use [38].

One question that is rarely asked in relation to this criterion is why a person feels that they should spend less time playing games. Societal perceptions of gaming have historically not been favourable, and it is still considered a 'lesser' hobby today that holds many negative stereotypes about such individuals [40,41], an attitude that some authors

of the present paper are working to change. If children feel pressured to stop gaming because their parents reprimand them whenever they play, does that indicate that these children have a problem with their gaming or is it in fact the parents who are pathologizing the behaviour? If the same children cannot resist playing because their friends also spend their afternoons playing, is that really indicative of problem behaviour? Hypothetically, given the widespread popularity of gaming, if a child stops playing they might be socially excluded, which can have severe negative consequences at a younger age. While this criterion presumes that the individual positively desires to play less, it fails to consider how that feeling is connected to societal pressures, parenting styles, friendships and a need for social interaction [5,22].

Finally, the clinicians among the present authors noted that clinical experience demonstrates that affected adolescents have a higher subjective view of self-syntony of the behaviour than those without problems. More specifically, they might be aware of spending many hours online but it never crossed their minds to play less. This might be due to the fact that negative consequences arising from the addictive behaviour are of lesser intensity than within affected adults (e.g. losing their job and/or family). Thus, it may be worth thinking of a possible adaptation of this criterion in order to take into account the possible cultural bias, rational choice approach and age-dependency.

DO YOU LOSE INTEREST IN OR REDUCE PARTICIPATION IN OTHER RECREATIONAL ACTIVITIES (HOBBIES, MEETINGS WITH FRIENDS) DUE TO GAMING? (GIVE UP OTHER ACTIVITIES)

A number of the present authors felt that 'giving up other activities' is a somewhat weak criterion of IGD for two main reasons: (i) giving up other activities for gaming may reflect a normal developmental process, and/or (ii) it may reflect the withdrawal that is associated with major depression. All activities have associated opportunity costs. True damage occurs when gaming impacts negatively overall physical and psychological wellbeing or impacts very negatively in an important area in one's life (e.g. relationships, school performance, professional life, etc.), not if it diverts gamers from other recreational activities. Many people have to give up enjoyable pastimes for noble pursuits, such as school or a demanding job. There is also the potential for false-positive results, as people may shift interests and activities routinely as a normal course of life. Ending participation in one hobby or activity to spend more time in another is not, in and of itself, maladaptive or unusual. However, should the forsaken activities have been highly valued by the individual, the loss of them regretted,

or ceasing those activities result in other practical 'harm' to the individual, this criterion may be appropriate. As with many of the criteria, we are concerned that the distinction between maladaptive and adaptive behaviour remains unclear. There is nothing wrong with gaming instead of spending time on activities that may be felt to be less enjoyable (e.g. gardening). In fact, the question of age-dependency again arises. One developmental task for adolescents has to be seen in acquiring autonomy from the parents. Especially in the phase of puberty, (healthy) adolescents retreat from former activities not originating from their intrinsic interests but rather as parentally induced habits. Therefore, it might be necessary to define—for adolescents—more detailed types of interests and certain activities may lose importance. Moreover, as technology develops rapidly, one has to think of adolescents who never were motivated to acquire any kind of alternative interests or activities, apart from going online or playing computer games. Thus, it might be beneficial to define this criterion on a broader level and to add the aspect of impaired development of interests because of excessive computer game use.

Kardefelt-Winther [5] argues that this is a residual criterion from the behavioural salience item of substance disorder criteria that aims to capture the state of mind where substance use has become the sole focus of the individual's life to the detriment of everything else. However, unlike drugs, gaming is not harmful *per se* [42], and therefore an intense focus on gaming is not necessarily a problem [25]. For example, a longitudinal analysis based on avatar monitoring demonstrated that a high involvement in MMORPGs, reflected by fast in-game rankings progression, is not necessarily associated with negative outcomes upon daily living [43]. Some of us believe that the criterion should assess whether a person is, for example, feeling increasingly lonely or socially isolated due to their gaming habits, and if this is perceived as a problem by the individual. Although there is current disagreement as to whether this is then an effect of the game itself (e.g. operant conditioning) or indicative of underlying problems (e.g. coping), it would offer a more reliable way to assess whether or not the gaming habits lead to problems. In its current state, the criterion at best manages to assess an individual's personal priorities in terms of recreational activities, which is inadequate for a criterion included in a psychiatric diagnosis [39]. Research on decision-making demonstrates consistently circumstances under which healthy people engage in non-optimal, and often ultimately detrimental, behaviours [44]. As described by Van Rooij and Prause [14], reframing negative consequences as the result of non-optimal decision-making might well be the more parsimonious approach to interpreting the behaviour.

In contrast to the difficulty presented by the suggested wording in distinguishing normal from abnormal behaviour change, the same criterion is essential for diagnosing

(unipolar) affective disorders (e.g. major depression). IGD and depressive disorders have been demonstrated to co-occur frequently [20,45,46] and, to some extent, to share genetic variance [47]. It therefore appears necessary to regard this criterion as a secondary indicator of IGD.

DO YOU CONTINUE TO PLAY GAMES EVEN THOUGH YOU ARE AWARE OF NEGATIVE CONSEQUENCES, SUCH AS NOT GETTING ENOUGH SLEEP, BEING LATE TO SCHOOL/WORK, SPENDING TOO MUCH MONEY, HAVING ARGUMENTS WITH OTHERS OR NEGLECTING IMPORTANT DUTIES? (CONTINUE DESPITE PROBLEMS)

Among the present authors, very few had any major problems with this criterion. However, cognitive recognition and acceptance of the negative consequences associated with the behaviour are often highly dependent upon the perceived short- and long-term consequences. The time-frame and persistence in playing over time is also important here. There is periodic/episodic extreme use where 'normal' players experience the same symptom (i.e. 'playing through' a certain game after it was released). There is some literature from the gambling field suggesting that the perceived seriousness of problems may be temporally dependent, with adolescents only perceiving long-term negative consequences [54].

DO YOU LIE TO FAMILY, FRIENDS OR OTHERS ABOUT HOW MUCH YOU GAME, OR TRY TO KEEP YOUR FAMILY OR FRIENDS FROM KNOWING HOW MUCH YOU GAME? (DECEIVE/COVER UP)

Deception is another controversial criterion in IGD. Tao and colleagues [49] decided to eliminate this symptom from their diagnostic IGD instrument, one that served as a basis for the DSM-5 criteria [50], because the frequency of deception among online addicts in their sample was significantly lower than other IGD symptoms. Also, in another Chinese study deception was reported as having the lowest diagnostic accuracy and prevalence among adult players with IGD [28]. Furthermore, in their comprehensive review of problematic gaming screens, King and colleagues [15] reported that very few of the 18 instruments included this criterion.

A key argument against the suitability of this criterion is that in western societies, gaming takes place typically in the player's home. If the gamer is not living alone, he or she would not be able to keep the behaviour hidden from partners or family members [51]. In addition, personal relationships and with whom the gamer resides have a

significant influence over this criterion. For instance, single men or women who live alone may experience problematic gaming but do not have to lie or deceive others about it. A few of us also noted that there can be much social stigma against telling lies. To some extent, this may be mitigated by rephrasing the criterion as concealment or reluctance to inform others. Kardefelt-Winther [5] also notes that for children, the need for deception depends heavily upon whether their parents are opposed to or supportive of gaming as a hobby. If parents complain repeatedly that gaming is not a useful leisure activity the child may be more likely to lie about their involvement with games. Therefore, this reflects more on the parents' perception of gaming than a potential sign of IGD. One of the present authors also noted that this criterion is more likely to identify children who have gaming problems as being delinquent or having a conduct disorder. This may conflate problems that are less severe with those that are very severe, and could be used to inflate the prevalence of true problems.

DO YOU GAME TO ESCAPE FROM OR FORGET ABOUT PERSONAL PROBLEMS, OR TO RELIEVE UNCOMFORTABLE FEELINGS SUCH AS GUILT, ANXIETY, HELPLESSNESS OR DEPRESSION? (ESCAPE ADVERSE MOODS)

Gaming as a form of escape has much support in the literature. For instance, among players of MMORPGs, escapism is the most significant motivational predictor of problematic gaming, suggesting that escapism contributes to excessive gaming-related problems [52,53]. Another recent study by Király and colleagues [56] demonstrated that escapism was both a direct predictor of problematic online gaming and also a mediator between psychiatric distress and problematic online gaming. However, a number of recent studies [16,19,28,33] reported that gaming to escape or relieve a negative mood has low specificity (i.e. a significant proportion of non-addicted gamers also play to escape problems in their lives). For instance, the results from a latent profile analysis by Pontes *et al.* [19] showed that escaping adverse moods is also present in non-disordered highly engaged players. Additionally, Kardefelt-Winther [39] showed that a high degree of escapism through online gaming was only a significant indicator of problematic gaming if an individual also had low psychosocial wellbeing. This confirms earlier research showing that many non-disordered gamers play video games as a way to spend time and forget about other problems [34,55].

A couple of the present authors also felt that the criterion is problematic because many gamers are not necessarily aware that the purpose of their gaming is to escape something. By asking them this question, we may 'implant' an explanation for their gaming that is not necessarily

accurate. Another problem is that this criterion suggests implicitly that IGD may be secondary to a primary depressive, anxiety or other disorder.

Despite the above criticism, we feel that this criterion might offer some utility when investigating if gaming has become a problem because it is used as the primary way to avoid difficult life situations [33,39]. In this respect, it may be likened to a maladaptive coping strategy that might take up a great deal of time and effort and thus lead to a neglect of other important activities [22,23]. This would explain both why the behaviour occurs and persists, which is useful for diagnosis. Therefore, we are not arguing that this criterion should be removed (as the majority of those with IGD report playing to escape) but that, as worded, this criterion does not necessarily differentiate between disordered and non-disordered gamers, and therefore this needs to be taken into consideration when assessing whether an individual has IGD.

DO YOU RISK OR LOSE SIGNIFICANT RELATIONSHIPS, OR JOB, EDUCATIONAL OR CAREER OPPORTUNITIES BECAUSE OF GAMING? (RISK/LOSE RELATIONSHIPS/OPPORTUNITIES)

A recent study with 32 clinical patients that were being treated for problematic gaming by Van Rooij, Schoenmakers and van de Mheen [56] demonstrated that all but one problem gamer endorsed this item. A study by Domahidi and Quandt [30] reported that most disordered players presented to the clinical setting with high risk of jeopardizing relationships and opportunities, but also found that highly engaged non-disordered players also endorsed this criterion, and therefore it is not necessarily an exclusive feature of IGD. A few of the present authors also felt that this item should highlight whether gaming is a barrier to seeking opportunities (i.e. the difference between losing something versus impaired capacity to seek out something), which would be more applicable to those in an advanced disordered state when most opportunities and relationships have been lost. Another study [36] reported that fewer than 50% of their sample of individuals with problem video game use had problems in their significant relationships. Some of the present authors also questioned whether the 'because of gaming' in this criterion might be better replaced by 'because of the amount of time spent gaming and your preoccupation with gaming'. It might also be useful to simplify and specify this criterion so that it relates to the negative effects on 'school/university or work performance' instead of risking or losing 'job, educational or career opportunities'. Overall, most of the present authors felt this criterion, if worded appropriately, would be very useful, and a number of the

present authors believed that problems caused by gaming should be a requirement criterion.

MOVING TOWARDS CONSENSUS

Some may argue that it is questionable whether consensus in the IGD field will ever be possible, given the lack of consensus in other fields of addiction. However, we would like to end on a more positive note, and suggest some initiatives that might help in taking the lack of consensus in the field forward. Underlying all these suggestions is the need for international groups to be genuinely cross-national and representative of the research carried out in the IGD field.

- Host dedicated symposia at international behavioural addiction conferences that include representatives from both different theoretical perspectives and different cultures.
- Form an online discussion group including every researcher that has published empirical data on the topic of IGD.
- Propose and contribute to special issues on IGD in high impact addiction journals.
- Carry out more studies from treatment-seeking individuals in the clinical population (i.e. live field-testing) rather than further epidemiological studies in countries that have already carried out such studies. Epidemiological studies are not the best place to identify and examine new disorders.
- Carry out studies on heavy use of gaming among those without any problems (i.e. high engagement players).
- Form an international alliance of IGD researchers to generate an item pool of IGD items for use in a multi-national collaborative study.
- Form working parties that comprise multi-stakeholders rather than just academics (e.g. gaming industry, gamers, psychiatrists, therapists, etc.).
- Re-evaluate already existing data on IGD more effectively and critically to help develop consensus (as this might be helpful for understanding the nature of some aspects such as withdrawal).
- Give further consideration to potential criteria for IGD that might be unique to this behaviour, rather than deriving most or all of the criteria from substance use or gambling disorder.

CONCLUDING COMMENTS

In this paper, we have attempted to summarize our main concerns about the IGD criteria in the 'consensus' paper by Petry *et al.* [1]. We would like to reiterate that we have wide-ranging disagreements on a number of the issues raised. We conclude that (i) there is no consensus in the IGD field at present on how best to assess IGD, (ii) the

IGD criteria put forward by Petry *et al.* omit several important elements of assessment, such as instructions, time-frame and response format/alternatives, and (iii) that there are many problems with some of the items in the new 'consensual' statements. We hope that our paper will foster debate in the IGD field and lead to improved theory, better methodologically designed studies and more robust empirical evidence with regard to problematic gaming and its psychosocial consequences and impact.

Declaration of interests

None.

Keywords Gaming addiction, gaming addiction assessment, IGD assessment, internet gaming disorder, problematic gaming, video game addiction.

MARK D. GRIFFITHS¹, ANTONIUS J. VAN ROOIJ², DANIEL KARDEFELT-WINTHER³, VLADAN STARCEVIC⁴, ORSOLYA KIRÁLY⁵, STÅLE PALLESEN⁶, KAI MÜLLER⁷, MICHAEL DREIER⁷, MICHELLE CARRAS⁸, NICOLE PRAUSE⁹, DANIEL L. KING¹⁰, ELLIAS ABOUJAOUDE¹¹, DARIA J. KUSS¹, HALLEY M. PONTES¹, OLATZ LOPEZ FERNANDEZ¹², KATALIN NAGYGYORGY⁵, SOPHIA ACHAB¹³, JOËL BILLIEUX¹², THORSTEN QUANDT¹⁴, XAVIER CARBONELL¹⁵, CHRISTOPHER J. FERGUSON¹⁶, RANI A. HOFF¹⁷, JEFFREY DEREVENSKY¹⁸, MARIA C. HAAGSMA¹⁹, PAUL DELEFABRO¹⁰, MARK COULSON²⁰, ZAHEER HUSSAIN²¹ & ZSOLT DEMETROVICS⁵, Nottingham Trent University, Nottingham, UK,¹ iMinds-MICT-Ghent University, Ghent, Belgium,² Karolinska Institutet, Stockholm, Sweden,³ University of Sydney, New South Wales Australia,⁴ Eötvös Loránd University, Budapest, Hungary,⁵ University of Bergen, Bergen, Norway,⁶ Mainz University, Mainz, Germany,⁷ Johns Hopkins University, Baltimore, MD, USA,⁸ University of California Berkeley, CA, USA,⁹ University of Adelaide, Adelaide, Australia,¹⁰ Stanford University, Stanford, CA, USA,¹¹ Université Catholique de Louvain, Louvain, Belgium,¹² University Hospitals of Geneva, Geneva, Switzerland,¹³ University of Münster, Münster, Germany,¹⁴ Universidad Ramon Llull, Barcelona, Spain,¹⁵ Stetson University, DeLand, FL, USA,¹⁶ Yale University, New Haven, CT USA,¹⁷ McGill University, Montréal, Québec, Canada,¹⁸ University of Twente, Enschede, The Netherlands,¹⁹ Middlesex University, Hendon, UK²⁰ and University of Derby, Derby, UK²¹

E-mail: mark.griffiths@ntu.ac.uk

References

1. Petry N. M., Rehbein E., Gentile D. A., Lemmens J. S., Rumpf H. J., Mossle T., *et al.* An international consensus for assessing internet gaming disorder using the new DSM-5 approach. *Addiction* 2014; **109**: 1399–406.

2. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5th edn, text revision. Washington, DC: American Psychiatric Association; 2013.
3. Griffiths M. D., King D. L., Demetrovics Z. DSM-5 internet gaming disorder needs a unified approach to assessment. *Neuropsychiatry* 2014; **4**: 1–4.
4. Griffiths M. D., Pontes H. M. Internet addiction disorder and internet gaming disorder are not the same. *J Addict Res Ther* 2014; **5**: e124. doi: 10.4172/2155-6105.1000e124.
5. Kardefelt-Winther D. A critical account of DSM-5 criteria for internet gaming disorder. *Addict Res Theory* 2014; **23**: 93–8. doi: 10.3109/16066359.2014.935350.
6. Kardefelt-Winther D. Meeting the unique challenges of assessing internet gaming disorder. *Addiction* 2014; **109**: 1568–70.
7. Kuss D. J. Internet gaming addiction: current perspectives. *Psychol Res Behav Manage* 2013; **6**: 125–37.
8. Kuss D. J., Griffiths M. D., Karila L., Billieux J. Internet addiction: a review of epidemiological research for the last decade. *Curr Pharm Des* 2014; **20**: 4026–52.
9. Kuss D. J., Griffiths M. D. Internet gaming addiction: a systematic review of empirical research. *Int J Ment Health Addict* 2012; **10**: 278–96.
10. Kuss D. J., Griffiths M. D. Online gaming addiction in children and adolescents: a review of empirical research. *J Behav Addict* 2012; **1**: 1–20.
11. Starcevic V. Is Internet addiction a useful concept? *Aust NZ J Psychiatry* 2013; **47**: 16–19.
12. Starcevic V. Video-gaming disorder and behavioural addictions. *Aust NZ J Psychiatry* 2013; **47**: 285–6.
13. Van Rooij A. J. Online video game addiction. Exploring a new phenomenon [PhD thesis]. Rotterdam, the Netherlands: Erasmus University Rotterdam; 2011.
14. Van Rooij A. J., Prause N. A critical review of 'internet addiction' criteria with suggestions for the future. *J Behav Addict* 2014; **3**: 203–13.
15. King D. L., Haagsma M. C., Delfabbro P. H., Gradisar M., Griffiths M. D. Toward a consensus definition of pathological video-gaming: a systematic review of psychometric assessment tools. *Clin Psychol Rev* 2013; **33**: 331–42.
16. Lemmens J. S., Valkenburg P. M., Gentile D. A. The Internet Gaming Disorder Scale. *Psychol Assess* 2015; **27**: 567–82. doi: 10.1037/pas0000062.
17. Pontes H. M., Griffiths M. D. The assessment of internet gaming disorder in clinical research. *Clin Res Regul Aff* 2014; **31**: 35–48.
18. Pontes H. M., Griffiths M. D. Measuring DSM-5 internet gaming disorder: development and validation of a short psychometric scale. *Comput Hum Behav* 2015; **45**: 137–43.
19. Pontes H. M., Király O., Demetrovics Z., Griffiths M. D. The conceptualisation and measurement of DSM-5 internet gaming disorder: the development of the IGD-20 Test. *PLOS ONE* 2014; **9**: e110137. doi:10.1371/journal.pone.0110137.
20. Müller K. W., Beutel M. E., Wölfling K. A contribution to the clinical characterization of internet addiction in a sample of treatment seekers: validity of assessment, severity of psychopathology and type of co-morbidity. *Compr Psychiatry* 2014; **55**: 770–77.
21. Rehbein E., Kliem S., Baier D., Mößle T., Petry N. M. Prevalence of internet gaming disorder in German adolescents: diagnostic contribution of the nine DSM-5 criteria in a statewide representative sample. *Addiction* 2015; doi: 10.1111/add.12849.
22. Kardefelt-Winther D. Excessive internet use—fascination or compulsion? [PhD thesis]. London, The London School of Economics and Political Science; 2015.
23. King D. L., Delfabbro P. H. The cognitive psychology of internet gaming disorder. *Clin Psychol Rev* 2014; **34**: 298–308.
24. Domahidi E., Quandt T. 'And all of a sudden my life was gone...': a biographical analysis of highly engaged adult gamers. *New Media Soc* 2014; doi: 10.1177/1461444814521791.
25. Griffiths M. D. The role of context in online gaming excess and addiction: some case study evidence. *Int J Ment Health Addict* 2010; **8**: 119–25.
26. Pies R. Should DSM-V designate 'internet addiction' a mental disorder? *Psychiatry (Edgmont)* 2009; **6**: 31.
27. Ko C. H., Yen J. Y., Chen C. C., Chen S. H., Yen C. F. Gender differences and related factors affecting online gaming addiction among Taiwanese adolescents. *J Nerv Ment Dis* 2005; **193**: 273–7.
28. Ko C. H., Yen J. Y., Chen S. H., Wang P. W., Chen C. C., Yen C. F. Evaluation of the diagnostic criteria of internet gaming disorder in the DSM-5 among young adults in Taiwan. *J Psychiatr Res* 2014; **53**: 103–10.
29. Ko C. H. Internet Gaming Disorder. *Curr Addict Rep* 2014; **1**: 177–85.
30. Duven E., Müller K. W., Beutel M. E., Wölfling K. Altered reward processing in pathological computer gamers—ERP-results from a semi-natural gaming-design. *Brain Behav* 2014; doi: 10.1002/brb3.293.
31. Debeauvais T., Nardi B., Schiano D. J., Ducheneaut N., Yee N. If you build it they might stay: retention mechanisms in World of Warcraft. Paper presented at the Proceedings of the 6th International Conference on Foundations of Digital Games 2011. Available at: http://www.artifex.org/~bonnie/WoW_retention_04_24_11.pdf (accessed 6 March 2015).
32. Snodgrass J., Lacy M., Dengah H., Fagan J., Most D. Magical flight and monstrous stress: technologies of absorption and mental wellness in Azeroth. *Cult Med Psychiatry* 2011; **35**: 26–62.
33. Kardefelt-Winther D. The moderating role of psychosocial well-being on the relationship between escapism and excessive online gaming. *Comput Hum Behav* 2014; **38**: 68–74.
34. Wood R. T. A., Griffiths M. D., Parke A. Experiences of time loss among videogame players: an empirical study. *CyberPsychol Behav* 2007; **10**: 45–56.
35. Griffiths M. D. Does internet and computer 'addiction' exist? Some case study evidence. *CyberPsychol Behav* 2000; **3**: 211–18.
36. Porter G., Starcevic V., Berle D., Fenech P. Recognising problem video game use. *Aust NZ J Psychiatry* 2010; **44**: 120–8.
37. Griffiths M. D. Is 'loss of control' always a consequence of addiction? *Front Psychiatry* 2013; **4**: 36. doi: 10.3389/fpsy.2013.00036.
38. Heyman G. M. *Addiction: A Disorder of Choice*. Cambridge, MA: Harvard University Press; 2009.
39. Kardefelt-Winther D. A conceptual and methodological critique of internet addiction research: towards a model of compensatory internet use. *Comput Hum Behav* 2014; **31**: 351–4.
40. Kowert R., Griffiths M. D., Oldmeadow J. Geek or chic? Emerging stereotypes of online gamers. *B Sci Technol Soc* 2012; **32**: 371–9.
41. Kowert R., Festl R., Quandt T. Unpopular, overweight, and socially inept: reconsidering the stereotype of online gamers. *Cyberpsychol Behav Soc Netw* 2014; **17**: 141–6.
42. Hellman M., Schoenmakers T., Nordstrom B., van Holst R. Is there such a thing as online video game addiction? A cross-disciplinary review. *Addict Res Theory* 2013; **21**: 102–12.

43. Billieux J., Van der Linden M., Achab S., Khazaal Y., Parakevopoulos L., Zullino D., *et al.* Why do you play World of Warcraft? An in-depth exploration of self-reported motivations to play online and in-game behaviours in the virtual world of Azeroth. *Comput Hum Behav* 2013; **29**: 103–9.
44. Lin C.-H., Chiu Y.-C., Lee P.-L., Hsieh J.-C. Is deck B a disadvantageous deck in the Iowa Gambling Task? *Behav Brain Funct* 2007; **3**: 16. doi: 10.1186/1744-9081-3-16.
45. Carli V., Durkee T., Wasserman D., Hadlaczky G., Despalins R., Kaess M., *et al.* The association between pathological internet use and comorbid psychopathology: a systematic review. *Psychopathology* 2012; **46**: 1–13.
46. Morrison C. M., Gore H. The relationship between excessive internet use and depression: a questionnaire-based study of 1,319 young people and adults. *Psychopathology* 2010; **43**: 121–6.
47. Han D. H., Lee Y. S., Yang K. C., Kim E. Y., Lyoo I. K., Renshaw P. E. Dopamine genes and reward dependence in adolescents with excessive internet video game play. *J Addict Med* 2007; **1**: 133–8.
48. Gillespie M., Derevensky J., Gupta R. The utility of outcome expectancies in the prediction of adolescent gambling behaviour. *J Gambl Issues* 2007; **19**: 69–85.
49. Tao R., Huang X., Wang J., Zhang H., Zhang Y., Li M. Proposed diagnostic criteria for internet addiction. *Addiction* 2010; **105**: 556–64.
50. Petry N. M., O'Brien C. P. Internet gaming disorder and the DSM-5. *Addiction* 2013; **108**: 1186–7.
51. King D. L., Delfabbro P. H. Internet gaming disorder treatment: a review of definitions of diagnosis and treatment outcome. *J Clin Psychol* 2014; **70**: 942–55.
52. Billieux J., Chanal J., Khazaal Y., Rochat L., Gay P., Zullino D., *et al.* Psychological predictors of problematic involvement in Massively Multiplayer Online Role Playing Games (MMORPG): illustration in a sample of male cybercafés players. *Psychopathology* 2011; **44**: 165–71.
53. Kuss D. J., Louws J., Wiers R. W. W. Online gaming addiction? Motives predict addictive play behavior in Massively Multiplayer Online Role-Playing Games. *Cyberpsychol Behav Soc Netw* 2012; **15**: 480–5.
54. Király O., Urbán R., Griffiths M. D., Ágoston C., Nagygyörgy K., Kökönyei G., *et al.* Psychiatric symptoms and problematic online gaming: The mediating effect of gaming motivation. *J Med Internet Res*; **17**: e88.
55. Wood R. T. A., Griffiths M. D. Time loss whilst playing video games: is there a relationship to addictive behaviours? *Int J Ment Health Addict* 2007; **5**: 141–9.
56. Van Rooij A. J., Schoenmakers T. M., van de Mheen D. C-VAT 2.0. Klinische toepassing en validatie van een assessment tool voor gameverslaving [Clinical Application and Validation of an Assessment Tool for Game Addiction]. Rotterdam: IVO; 2014.

GRIFFITHS ET AL.'S COMMENTS ON THE INTERNATIONAL CONSENSUS STATEMENT OF INTERNET GAMING DISORDER: FURTHERING CONSENSUS OR HINDERING PROGRESS?

Our recent paper [1] outlined the DSM-5 criteria for internet gaming disorder (IGD), and Griffiths *et al.* [2] commented upon it. As they note [2], their collective opinions vary considerably, but they contend that our report

does not constitute an international consensus. They also critique our interpretations of the criteria for IGD in the *Diagnostic and Statistical Manual of Mental Disorders, Revision 5 (DSM-5)* [3].

With regard to their first point, Griffiths *et al.* [2] appear to start from incorrect assumptions. We did not claim there was a consensus throughout the world (is there on anything?). We also made no assertion that our group was representative of all countries or researchers. 'International', according to the *Merriam-Webster Dictionary*, is defined as 'involving two or more countries'. Clearly, our group is international. Our group also achieved a consensus, 'a general agreement about something'. Although including more experts from a greater number of countries may have been desirable by having more members who are diverse in their information sources, large groups tend to be too complex for decision-making, e.g. [4], as appears to be the case among Griffiths *et al.* [2], who have not agreed upon any aspect of the criteria. Our goal was to take the DSM-5 as a starting point and suggest ways in which researchers and clinicians around the globe could begin to assess these criteria similarly given that framework. Griffiths *et al.* [2] support our original intent by continuing the types of discussion that our paper was promoting.

Although we are encouraged that our report stimulated consideration of the DSM-5 criteria, we found Griffiths *et al.* [2] to be dismissive of what we accomplished, given other positive reactions to our consensus [5–8]. Our paper provides a guideline for future research to consider more carefully and consistently what is being measured in the context of assessing IGD. We did not debate the appropriateness of the DSM-5 criteria, the proposed threshold for diagnosis, or whether IGD is a behavioral addiction or even a mental disorder. The jury is still out on those issues. It will be indefinitely if researchers and clinicians do not begin to assess the condition in some consistent manner.

In terms of their second point critiquing our interpretation of the criteria, we believe that some authors of Griffiths *et al.* [2] may be more in agreement than disagreement with our consensus based on review of their own publications. As depicted in Table , a 2015 publication by two of their authors [9] included many items with similar content to the meanings we recommended [1]. That study [9] states explicitly that the items are 'valid, reliable, and proved to be highly suitable for measuring IGD', so it is unclear why they now [2] contest the meanings we concluded represented the DSM-5 IGD criteria.

Furthermore, Griffiths *et al.* [10] have called for an aim common to ours: 'the gaming addiction field must unite and start using the same assessment measures'. Nevertheless, Dr Griffiths continues to apply disparate tools and items, some of which appear not to overlap even with respect to meaning. For example, one recent study [11] used the items: 'I have tried to control, cut back or stop playing,