Contextualizing Pathological Gaming
– A Proof-of-Concept Study

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ABSTRACT

In 2013, "Internet Gaming Disorder" (IGD) was proposed as a formal disorder, by the American Psychiatric Association (APA).

We present the results of a qualitative interview study wherein we apply a screening tool to "gaming professionals". We compare our subjects' perception of their own gaming habits, with how they are scored by a questionnaire and discuss where and how they differ or overlap. Our results indicate that screening tools designed to measure game addiction may not measure what they are intended to measure. Questionnaire items that are not properly contextualized may over-pathologize otherwise healthy players without appropriate context. The context of the individual's everyday life is crucial to understanding and evaluating their relationship to gaming. We argue, that de-contextualized questionnaire items are insufficient to gauge whether a given behaviour is problematic and if those problems are best understood as an addiction or something else.

Keywords

Video game questionnaires; Qualitative methods; Gaming; Addiction; Internet gaming disorder; Video games

INTRODUCTION

Video games have experienced increased popularity during the past four decades (Pruett, 2003), and has in recent years taken significant steps towards becoming a legitimate sport. This development began in 2013 when the United States of America recognized eSport players as professional athletes (Tassi, 2013), and, in 2017, it was being considered to allow eSports to compete in the Olympics in London in 2024 (NBCSport, 2017). However, with the ongoing increase in popularity, there have also been an increase in criticism of gaming (the playing of video games). One outcome of this, is the proposed inclusion of "Internet Gaming Disorder" (IGD) into the American Psychiatric Association's (APA) fifth edition of the "Diagnostic and Statistical Manual of Mental Disorders" (DSM-5; APA, 2013). This proposition by APA sparked a debate concerning whether or not IGD should be a diagnosable condition, and what consequences this would entail (Nielsen, 2017). Furthermore, the World Health Organization (WHO) has in

its draft for their 11th edition of the International Classification of Diseases (ICD-11; Bean et al., 2017) included "Gaming disorder" as a disorder due to addictive behaviours.

One of the main arguments concerning why IGD should be accepted as an official diagnosis builds on the premise, that if problematic gaming does exist (which many researchers believe it does), then it should be diagnosable, and therefore treatable (Griffiths et al., 2017). However, there is also concern that a causal link between problematic behaviour and video games has not been demonstrated in existing research (e.g. Bean et al., 2017). In other words, it is unclear whether problematic behaviour stems from an addiction to video games, or from a different underlying condition (Bean et al., 2017). Variations on this argument can be found in papers which argue that gaming can be used as a non-pathological coping mechanism, which quantitative screening tools might not be sufficiently sensitive to detect (e.g. Aarseth et al., 2016). One of the screening tools that has inspired the proposal of IGD (Petry & O'Brien, 2013) as an addictive disorder was devised by Gentile (2009). In a nationally representative sample of 8-18-year-old Americans, he found that around 8% were 'pathological players'. Although other estimates have it more conservatively estimated at 1% (Festl et al., 2013, in Bean et al., 2017). As of yet, there is no consensus on what screening tool to use when measuring IGD (Nielsen, 2015).

According to the APA (2013), more qualitative research is needed as the current evidence in this area comes almost exclusively from quantitative studies. Nielsen (2015) supports this, and further argues, that questions in prevalence studies may be misunderstood by respondents and that the tools therefore lack measurement validity. One reason why this could be so, is that such prevalence studies do not take the individual's situation and circumstances into account. We believe, that this is a major shortcoming in the current research conducted in this area, and will therefore aim to explore this further through a qualitative study. Nielsen (2015) further found that 'pathological gaming'[1], in their small group of respondents, were better understood as coping strategies, symptoms of underlying problems such as anxiety, or simply just serious investment in a cherished hobby. Another study that highlights these issues is "The Role of Context in Online Gaming Excess and Addiction: Some Case Study Evidence" (Griffiths, 2010). In this paper Griffiths examines the case of two individuals with similar gaming habits and finds evidence that while their approach to gaming looks similar on the surface, their motivation and experience of the activity varied.

This current paper employs the methodology of earlier work (Nielsen, 2015), but with the added perspective of Griffiths' (2010) attention to context. Because previous research focused on leisure gaming the current paper focuses on gaming professionals (i.e. people who have chosen to turn video game play into a career path or are aspiring to do so) (e.g. Griffiths, 2010 & Griffiths et al., 2017). The aim of this paper is to critically assess the relevance of a screening tool for video game addiction (i.e. Gentile, 2009) in the context of professionalized gaming.

By focusing on professionalized gaming, we aim to highlight the importance of context in 'video game addiction' research more broadly. With this proof-of-concept study we hope to bring to light a perspective that we believe should receive more attention than it currently does. We aim for this research to serve as inspiration for other studies to be more mindful of the importance of context when studying IGD. To our knowledge, the present paper is the first study of a screening tool in the context of professionalized gaming.

METHOD

Data was gathered through semi-structured interviews according to the guidelines set forth by Kvale and Brinkmann (2015). We recruited four gaming professionals as our respondents. We define gaming professionals as people who either play games as their primary occupation or are aspiring to do so. This does not include people who work in the games industry (i.e. people who make, sell, review, or promote games). For this proof-of-concept study respondents were found through some of the authors' personal networks. However, the interviews were arranged so that the interviewee and interviewer did not know each other beforehand.

The two professions in gaming that we work with, in this study, are eSport players (competitive gaming), and streamers (people broadcasting the game they are playing in real-time on the internet).

Definition of Addiction

We chose to work with the definition of the term addiction, provided by the American Association of Addiction Medicine (ASAM). ASAM defines addiction as follows:

"Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviours.
Addiction is characterized by inability to consistently abstain, impairment in behavioural control, craving, diminished recognition of significant problems with one's behaviours and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death." (ASAM, n.d., para. 1)

Thus, addiction is a primary, chronic disease of brain reward, and not a symptom of underlying problems. The disease is characterized by a pathological pursuit of reward or relief and the inability to consistently abstain from an activity or substance, as well as difficulty recognizing significant problems in one's behaviour and interpersonal relationships. We consider craving and loss of behavioural control to be significant features of the disease. As a primary and chronic disease, we also consider it to be stable and binary. Or in other words, addiction is not a fluid state that one drifts in and out of.

Screening Tool and Interview Procedure

Gentile's screening tool consists of 11 questions, which can be seen in table 1 in the following section. The questionnaire items are adapted from the DSM criteria for pathological gambling (Gentile, 2009). The respondents were asked to fill out Gentile's questionnaire before the interview. During the interview the respondents were asked to elaborate on their answers to the questionnaire, as well as to reflect on a few related topics, such as their perspective on addiction and gaming. All interviews were conducted over Skype, recorded, and transcribed by hand. Furthermore, it is worth noting that the interviews were conducted in Danish, and that the quotes used in this paper have been translated by the authors.

Each respondent was scored according to the guidelines set forth by Gentile (2009): Answering "Yes" yields 1 point, answering "Sometimes" yields 0.5 points, and answering "No" yields 0 points. According to the instrument, a cumulative score of six points or more indicates pathological game use.

All respondents have been anonymized. During the interviews with the respondents it was made clear that they were not obligated to answer questions that they were not comfortable answering.

The analysis of the data was conducted by the first four authors. Individually, each author went through all of the data and wrote memos to highlight sections that they found of specific interest to the study. The most recurring memos were then gathered collaboratively and used as a guideline for further analysis and discussion. These would later develop into the two themes: "Playing Professionally or Leisurely" and "Semantic Challenges". These will be discussed in later sections.

RESULTS & ANALYSIS

In this section we will discuss each interviewee's relationship to gaming and how it relates to their score on the questionnaire. Next, we discuss the highlighted points of interest in regards to two different themes: (1) Semantics, and (2) the differences between leisure and professional gaming.

A brief overview of our respondents and their relation to gaming, as well as their score on Gentile's questionnaire ("addiction score") can be found in table 2. The questions and the respondents' individual answers can be seen in table 1.

Number	Question	Ida	John	Dean	Lars
1	Over time, have you been spending much more time thinking about playing video games, learning about video-game playing, or planning the next opportunity to play?	Yes	No	Yes	Yes
2	Do you need to spend more and more time and/or money on video games in order to feel the same amount of excitement?	Some-times	No	No	No
3	Have you tried to play video games less often or for shorter periods of time, but are unsuccessful?	No	No	No	No
4	Do you become restless or irritable when attempting to cut down or stop playing video games?	No	No	No	Some-times
5	Have you played video games as a way of escaping from problems or bad feelings?	Yes	Yes	Yes	Yes

6	Have you ever lied to family or friends about how much you play video games?	Yes	Yes	No	No
7	Have you ever stolen a video game from a store or a friend, or have you ever stolen money in order to buy a video game?	No	No	No	No
8	Do you sometimes skip household chores in order to spend more time playing video games?	Yes	Some-times	Yes	Yes
9	Do you sometimes skip doing school work in order to spend more time playing video games?	Yes	No	Yes	Yes
10	Have you ever done poorly on a school assignment, because you spent too much time playing video games?	Some-times	No	Yes	Yes
11	Have you ever needed friends or family to give you extra money because you spent too much money on video-game equipment, software, or game/Internet fees?	No	No	No	No

Table 1: Each question from Gentile's questionnaire, used in this study, is displayed in the above table. It further includes the respondents' answer to each item.

Respondent	Age	Career branch	Questionnaire addiction score
Ida	22	Part-time streamer	6 (Addicted)
John	30	Full-time streamer	2 (Not addicted)
Dean	20	Former eSport player	5 (Not addicted)
Lars	22	Aspiring eSport player, and former part-time streamer	5.5 (Not addicted)

Table 2: Displays an overview of the four respondents in this study, including their alias, age, their gaming related occupation, as well as their score on Gentile's questionnaire

Ida is 22 years old and has been playing video games since she was six years old. When not working her full-time job in customer service, she live-streams while playing. Ida aspires to become a full-time streamer, and for it to become her main source of income. She spends approximately 12 hours per week playing video games – most of this is also live- streamed. When Ida was asked if she believes if she is addicted to gaming, she answered: "*(..) I would definitely say that I am addicted. But maybe not in a way where it's unhealthy."* This indicates that she does not see 'addiction' as a disease that necessarily have negative outcomes. Ida's use of the word does not match that of the

ASAM (n.d.), which does not allow "healthy addictions". Even though Ida does occupy herself a lot with gaming, it is mostly in relation to her aspiring career in gaming: "*I spend a lot of time thinking [about gaming], as it relates a lot to the amount of views you get (..)*" - and she does not seem to believe that it interferes with her other interests in life, such as her boyfriend, family and full-time job. She also mentioned, that she has never tried to stop gaming, and does not want to - and if she tried, she does not believe she would be successful: "*I think gaming is awesome, and I don't want to try to play less. Um, and I definitely don't think I'd be successful in trying [to stop], either*". This answer reveals a potential problem with the questionnaire, as question 3 (see table 1) is intended to reveal if she has been unsuccessful in abstaining from the activity. Ida's elaboration of the answer reveals, that she is basing her answer on the fact that she has never *attempted* to abstain from gaming, not that she would be unable to do so if she tried.

Ida was evaluated to be 'addicted', with six points, by the questionnaire.

John is a 30-year-old full-time streamer, who has been playing computer games since he was very young. By streaming and selling self-promoting merchandise (t-shirts, bracelets, etc.) he earns enough money to support himself. He believes, that he is not addicted to gaming and was also evaluated to be 'not addicted', scoring two and half points on the questionnaire. A finding that supports this, is that one of the characteristics of addiction is the inability to consistently abstain from the substance/activity, which, by his own account, John is able to do without any difficulties. When he is asked directly if he thinks a lot about gaming, he answers: "*(..) I don't really do that. Because I know I will be gaming the next day, but it's not like I am excited about it and cannot think about anything else but gaming.*", which shows us that he himself does not perceive gaming as something that needs to fill every part of his life. Likewise, he told us "*I can easily go on holiday and have fun with that. Without thinking about computer games*", meaning that he is able to occupy himself with other activities than gaming, without craving the activity.

Throughout the interview, when asked to elaborate on the different answers he had given in the questionnaire, it becomes evident that he has understood the intention of the questions. This indicates that, in contrast with Ida's perception of addiction, John's understanding of it is more in accordance with the clinical definition of the term. This can be a possible explanation as to why he did not misunderstand any of the questions.

Dean is a former professional eSports player who is 20 years old and currently is a full-time student. He spends approximately 50 hours per week playing computer games, and believes that he is not addicted to gaming, but points out that he is occupied with gaming a lot: "*I wouldn't say that I am addicted. I would say I do it [gaming] a lot, and that it is a very big part of my life... But I wouldn't say that I am addicted.*" Dean also explains that he has used gaming as a coping mechanism for various unpleasant situations, for example following the death of a pet. He explains how it, in these situations, can be difficult to take your mind off the unpleasant experience, but that gaming can help. Dean describes how gaming functions as something to pass time with, and believes that this activity could potentially have been substituted with some other activity: "*But, if it was because I found out that I would, all of the sudden, rather play football instead [of gaming], then I don't think it would be a problem for me [to stop gaming]*". This indicates that gaming in itself might not be an issue, but rather that something else could result in his high consumption of games. Dean's perception of himself matches with the questionnaire, where he scored five points, in the sense that they both evaluate him to not

be addicted. He does, however, not seem to occupy himself with anything other than gaming and his studies. When he is not gaming or in school, Dean does, by his own account, not do much else than sleep. Therefore, Dean might be someone that many people would think of as an addict. If this was the case, Dean would be considered a false-negative, and we believe that this could be due to several misinterpretations of the questionnaire. An example of this can be seen in the question concerning increase in time and/or money spent on gaming. To this question he answered "no", but when elaborating on it, it is evident that he already spends as much time as possible on gaming. Thus, the time spent on gaming has not necessarily increased - which is what the question asks - but only because this would not be possible.

It would also appear that he misinterprets the question about abstaining in the same way as Ida did, as he has never attempted to stop gaming. In line with this, he has also answered "no" to question 4, about getting restless or irritated when trying to stop gaming. However, he mentioned that he had never tried to stop, and thus he would not be able to answer this question accurately.
These examples indicate that the two items in the questionnaire do not always measure what they are intended to measure, because of how they are worded and interpreted. This kind of ambiguity can lead to both false-positives, and false-negatives.

Lars is 22 years old and has been playing digital games since around the age of 10. He works full-time at a net café, is a former professional streamer, and is now aspiring to become a professional eSports player. He spends approximately 42 hours per week playing computer games and believes that he is addicted to gaming. He points out that he becomes irritable when he cannot relax, and he feels like he can only relax when gaming: *"I can get irritated or restless, when I do not get my opportunity to relax."*. However, Lars also explains that he would never turn down a party, or an opportunity to spend time with friends, in favour of gaming - but, he also states, that *"I don't wanna be around people who aren't from the gaming-environment. (..) It is such a big part of me [the gaming], that I wouldn't know what to talk to them about."* Lars also states that he has used gaming as a coping mechanism, for example when going through his parents' divorce: *"...Because in that world [the virtual world of "World of Warcraft" (Blizzard Entertainment, 2004)], I was just mega awesome, but in my everyday life, I was just not as awesome..."*. One might argue that Lars' case is a false-negative because he himself believes that he is addicted while he is not scored as such by the questionnaire. However, it is worth noting, that Lars appears to be using the term addiction in the layman's sense of the word because he would never turn down an opportunity to socialise with friends in favour of playing games. If this is true, one might also argue that Lars' case comes dangerously close to a false-positive. The complexity of Lars' case highlights the inherent difficulties associated with attempting to measure game addiction in a culture where games are seen as legitimate spaces for social interaction and professional pursuits. Lars' private and professional life seems to revolve almost exclusively around games and other people who play games. Such cases blur the line between passionate athletes and 'pathological players'. With a score of five and a half points, his behaviour was scored as 'non-pathological' by the questionnaire, just half a point below the threshold.

It is apparent, in our data, that even though all of the respondents fit our definition of gaming professionals, their experiences, and approach to gaming still differ significantly from respondent to respondent. We have seen cases in our study where the evaluation of the questionnaire matches the respondent's evaluation of themselves, as well as cases

where they do not. However, even when the respondents and the questionnaire arrive at similar conclusions this might only be because the respondents use the term addiction in a layman's fashion and not a clinical one. These semantic differences will be the focus of the next section.

Semantic Challenges

During the interviews we encountered semantic challenges because they were conducted in Danish. Unlike English, Danish does not distinguish between "dependency" and "addiction". These words are conflated into one word ("afhængighed"). This mirrors how in English layman's terms, one can be addicted to sex, work, exercise, eating, shopping and so forth despite the fact that the DSM only recognizes one behaviour (gambling) as an addictive disorder (APA, 2013). This conflation of addiction and dependency (or clinical terminology and layman's understandings) is seen in Ida's interview, where on the surface, Ida's perception of her gaming habits match that of the questionnaire - they both evaluate her to be addicted. However, when Ida describes her everyday life, it becomes clear that she might be using "addiction" as a lay term. This becomes exceedingly clear, as she continues to describe herself as "mildly addicted". In her view one can be addicted without necessarily suffering negative consequences. This is in clear conflict with the APA's description of mental disorders (2013) and most definitions of addiction (e.g. ASAM, n.d.).

Lars' perception of his own gaming habits does not match with the evaluation of the questionnaire, as he thinks he is addicted to gaming. However, as with Ida, he appears to be using the lay term addiction, rather than the clinical definition of the word. This appears to mirror other instances where the term addiction is used as a way for people to emphasize how dedicated they are to an activity, rather than as a disease category (Nielsen, 2017). This can be seen, when Lars states, that he considers himself addicted to gaming, simply because he spends a lot of time on it. When he talks about his daily life, he describes spending a large amount of time playing, but most of it seems to be related to his career. In contrast with Ida's and Lars' perception of addiction, John's understanding of it seems to be in agreement with the clinical definition the term. This is worth noting, as it appears that those who understand addiction to be a disease associated with negative outcomes are more likely to answer 'no' to items in the questionnaire even if they could also have answered yes. In contrast, it appears that those who understand addiction in lay terms are more likely to answer yes and thus be labelled 'pathological players'. As such, our data suggests that the way our respondents understand addiction varies, and that this can influence the way they interpret the questions.

Due to these semantic challenges it can sometimes be hard to understand exactly what the respondents' mean when they, for example, label themselves as being "addicted". This made it difficult to interpret the interviews.

Playing Professionally or Leisurely

Throughout the interviews, the difference between leisure and professional gaming was highlighted multiple times by the interviewees. We want to briefly analyse some of these cases, to better understand the meaning of the gaming context for the individuals.

Context, in relation to gaming, can be a very ambiguous term. It is an abstract, situational concept, and refers both to the external and internal factors that affect players. Examples

of external factors can be the respondents' physical location while playing, where examples of internal factors can relate to respondents' current state of mind or mood.

In our study, we did not actively inquire about their physical context, but rather about their internal context.

Ida thinks a lot about gaming in her daily life, but explains that it is due to her aspirations of becoming a full-time streamer. Likewise, when John says that he now plays roughly 48 hours per week, he adds that he only does so because it is his job. Thinking about gaming outside of work does not occupy John much, but he says that this is because he knows he will be playing the next day, and that he does not play outside of his work. He explains that gaming is his job, but he still uses it as a way to relax and have fun. It seems like he treats gaming as work, but explains that he doesn't perceive it as "work". Dean has a different experience, as he points out that when he was playing professionally, it was much more scheduled. He had a responsibility to be at practice on time, and act professionally - and he would sometimes miss out on other appointments because of this, which is in contrast to when he was playing for leisure. The distinction between the contexts of playing professionally and leisurely is an aspect that is difficult to take into account in a questionnaire. This can be problematic, as missing appointments due to work is usually not considered an addiction problem. It is worth noting that our respondents perceived gaming as a positive and social activity. Therefore, it may not make sense to them when the questionnaire asks them if they have spent time planning when to play and assumes this to be negative. For Lars, playing has many different functions in his life; he uses it both to pursue a career, and at a competitive level, but also for leisure and relaxation. Play in these different contexts is associated with different states of mind, and Lars approaches the activity in very different ways, depending on the context.

John mentions changes in his gaming habits when he went from living at home, with his parents, to living on his own. When living at home, he remembers how he would lie about how much time he spent playing, to avoid his parent's restrictions. They did not allow him to play as much as he wanted, because, in his own words, "*They were very scared of it back then, you know?*". When he moved out he was able to manage his own playing habits as he saw fit. His motivations for gaming, however, did not change, even when it became his full-time job: "*I don't feel like it's work as such. So, I feel, that it's fun and that I'm having a good time with it. It's always been a safe haven for me, that gaming thing. Um, so in that way it's just nice - I don't feel like it's a working day, at least*". For John, gaming has been a constant. When going through changes in his life gaming has remained the same and his motivation for playing has remained unchanged even if the surrounding context has changed.

We see how the respondents have different approaches to gaming professionally, as opposed to gaming leisurely. For example, John treats it as the same thing, as he can both relax and have fun while gaming professionally. Conversely, Dean seems to have a very different approach to professional gaming, where he treated it as an activity separate from his leisure time. This further emphasizes the importance of context, seeing how the concepts of leisure gaming and professional gaming seems to be approached differently by our respondents. It further underlines how play is not a uniform activity, it is perceived differently by different people and in different contexts.

DISCUSSION

In this section we will first discuss key findings that highlight issues with the questionnaire. This will lead us to a discussion of our findings in relation to previous studies on the subject of IGD, as well as a discussion of the importance of context.

Throughout the analysis there were occasions where several respondents misunderstood the same question (e.g. questions 3) in the questionnaire. These misunderstandings could indicate potential flaws in the questionnaire. Even if the questions were understood correctly, there were also occurrences where the respondents answered in the correct manner to a question, but the phrasing of the question resulted in a flawed assessment. For example, as previously discussed, three of our respondents answered "no" to the question "Have you tried to play video games less often or for shorter periods of time, but are unsuccessful?". When discussing their answers with them during the interviews, it became apparent that they answered "no" to the first part of the question - if they had tried to play less often - which, in turn, made them unable to answer whether they believe that they would have been successful or not. This reveals a potential flaw in the wording of the item, because (at least as our respondents are concerned) it does not measure what it is supposed to measure. The question contains two questions, but the respondents are only allowed one answer. By only answering the first part of the question the respondent ends up avoiding the second part, which is the important part of the question.

Another occasion where we encountered problems with the questionnaire can be seen in the question concerning increasing amounts of time and money spent on gaming (question 2). This question is intended to reveal if the respondents feel the need to consistently increase the resources they spend on the activity, in order to feel the same amount of excitement. However, there is only a certain amount of time in a day. When every waking hour is spent on the activity it becomes impossible to increase it any further. As it can be seen in table 1, Dean answers "no" to this question, as his time spend gaming has not increased. However, that is only because he is already spending every waking hour of his spare time on gaming. This issue does not seem to be sufficiently considered in the questionnaire, which is why Dean received 0 points, instead of 1 point, even though he is exhibiting potentially problematic behaviour. Conversely, it might be argued that Dean, because he still attends classes, should not be scored a point by the questionnaire. However, even someone who had been spending all of their time playing for an extended period would still, like Dean, be able to truthfully state that their time spent playing had not increased.

The wording of the question concerning stealing (question 7) also raises some issues. Considering the allowed answers to each question is "yes", "no" and "sometimes", this particular question leaves room for multiple interpretations. "Yes" could be understood as just once, whereas "sometimes" would indicate that a respondent has stolen multiple times. Scoring repeated incidents of thefts as less severe than just a single incident is problematic.

It is worth noting, that two respondents were right on the threshold of being evaluated as addicted, scoring 5 and 5.5 points. Gentile has also used versions of the questionnaire where "sometimes" equalled either 0 or 1 points (instead of half a point) (Gentile, 2009). If we had used the latter of the two methods, the evaluation of two of our respondents would therefore have been different, as they would have been assessed to be addicted.

In the article Turning Data Into People (2015), Nielsen argues that Gentile's questionnaire might not be measuring what it tries to measure - which is whether or not a person is a pathological gamer. The findings of the current study support this argument. The findings indicate that a questionnaire, like the one we used, might both underestimate the problems experienced by some people and overestimate those of others. Thus, our findings highlight the complexity and difficulty associated with attempting to measure pathological video game use. We find that context is extremely important, and we recognize how difficult it is to evaluate answers provided to questionnaire items without proper context. We find that the screening tool in question does not seem to take context sufficiently into account when we apply it to people who aspire to be gaming professionals. This is in line with Griffiths (2010), who argues that while individuals might be behaviourally identical in terms of their gaming, their motivation and the meaning and experience of their behaviour might differ. He stresses the importance of this difference in context, in the life of a gamer, and argues in connection with this, that excessive gaming does not necessarily mean that a person is addicted. Griffiths further argues that one of the individuals in his study appears to be genuinely addicted to online gaming, where the other does not. This assessment was based on their context and consequences of their gaming habits, and Griffiths suggests that online gaming addiction should be characterized by the extent to which excessive gaming impacts negatively on other areas of a gamers' lives, rather than the amount of time spent playing. His study also suggests that any new diagnostic and measurement criteria for video game addiction needs to consider context of the behaviour.

Our study indicates that the concept of addiction might not be well-suited to understand the experiences of our respondents. Concepts such as "tolerance" and "withdrawal" may serve to obscure rather than illuminate important nuances. We therefore argue, that a bottom-up approach would be a more viable route to take for researchers who are interested in examining social and psychological problems related to gaming. Criteria adapted from substance abuse disorders may not be well-suited to describe so called "behavioral addictions". A bottom-up approach might result in a more comprehensive understanding of the relationship between the game and the player and provide a stronger foundation for arguments regarding addiction. Future research in this field based on screening-tools, would benefit from engagement with deep descriptions of professionalized gaming (e.g. Taylor, 2012).

We believe that our study highlights the importance of context when researching gaming addiction quantitatively. In the context of a person who spends all of his free time on gaming it does not make sense to ask if he has been spending increasing amounts of time playing. As one of us have argued already (Nielsen, 2015), the interviewees might be prone to misjudge the intention of the questions presented by the questionnaire, and the phenomena it is attempting to evaluate. This is apparent in our interviewees' different interpretations of the questions, as well as their different understandings of addiction, as they seem to use the word "addiction" with a variety of meanings. As previously mentioned, some of them seem to be using the word in a clinical sense, while some seem to be using it as a way to say that they are passionate about gaming, or highly dedicated to it.

CONCLUSION
Somewhat paradoxically our findings indicate that this screening tool for 'pathological gaming' may, at the same time, overestimate and underestimate the prevalence of the

'disorder'. If video game addiction exists, it appears to be extremely difficult to measure quantitatively. Our data suggests that, the three respondents who perceived 'addiction' in layman's terms, as something that is not necessarily associated with negative outcomes, were more likely to answer 'yes' to ambiguous questions. Conversely, the one respondent who perceived addiction as a severe disorder was more likely to answer 'no'. This indicates that the respondents' notions of what addictions are plays a significant role, in diagnosing them. This is obviously problematic as addiction in a clinical sense is different from addiction in lay terms.

Thus, such questionnaires may not measure what they are intended to measure. Our data suggests, that the context of individuals' gaming habits has a large impact on how they experience their own relationship to gaming. We believe, that the questionnaire does not take the respondents' context sufficiently into account, considering how different the gaming experience, and motivation, can be for each individual gamer. As a result of this, the questionnaire may potentially over-pathologize otherwise healthy people, as well as underestimate the problems experienced by individuals who have problematic relationships with gaming.

On the basis of this proof-of-concept study we propose that more research is needed in this area. The goal of this is to gain a better understanding of the subject, as well as working towards developing more context-aware methods for assessing the potential diagnosis. Furthermore, we also underline the importance of acknowledging the apparent significance of the respondents' own understanding of addiction, when working to develop these new methods. For this purpose we believe, that answering questions regarding both validating questionnaires like Gentile's, and more general concerns of characterizing non-substance addictions, are highly relevant.

LIMITATIONS

The present study has several limitations. Firstly, the questionnaire was originally intended for a different target group: 8 to 18- year-olds. Because of this, some of the questions were no longer relevant. Respondents who were no longer students answered the question in accordance with their behaviour at a time when they were still students. This could have impacted our data, as they might not be able to fully recall the lived experiences of being in these situations. Conversely, one might argue that the respondents are perhaps now more mature, and therefore better able to reflect on their own behaviour, even though their perspective and gaming habits might have changed.

Secondly, a possible limitation could be that the questionnaire was administered to people who were not native speakers of English. However, we do not perceive this to be a significant limitation as all respondents are fluent in English. The interviews themselves were however, conducted in Danish to assure that the respondents would be able to formulate their thoughts and opinions as accurately as possible. Translating from one language to another, as we have done, always entails the risk that something may be lost in translation.

Lastly, we would like to acknowledge that the experience of professional gamers can vary significantly. It might therefore not be enough to simply distinguish between leisure and professional gaming, considering that there are multiple branches of professional gaming, each with its own criteria and demands to the player. We would therefore like to

encourage further research to be mindful of how the segment of professional gamers can have varying experiences in gaming, as was evident in this study.

AUTHOR CONTRIBUTIONS

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ENDNOTES

[1] The terms "Pathological gaming", "Video game addiction" & "Internet game addiction" are used interchangeably in this paper, as these generally seem to cover the same phenomenon in the applied literature.

BIBLIOGRAPHY

Aarseth, E., Bean, A. M., Boonen, H., Colder Carras, M., Coulson, M., Das, D., … Van Rooij, A. J. (2016). Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal. *Journal of Behavioral Addictions*, 1–4. https://doi.org/10.1556/2006.5.2016.088

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition: DSM-5* (5 edition). Washington, D.C: American Psychiatric Publishing.

ASAM (n.d). "Definition of addiction". Available at https://www.asam.org/quality-practice/definition-of-addiction (Accessed Nov. 2017)

Bean, A. M., Nielsen, R. K. L., van Rooij, A. J., & Ferguson, C. J. (2017). Video game addiction: The push to pathologize video games. *Professional Psychology: Research and Practice, 48*(5), 378-389.

Blizzard Entertainment (2004) *World of Warcraft* [PC Computer, Online Game] Blizzard Entertainment. Irvine U.S.A.

Gentile, D. (2009). Pathological video-game use among youth ages 8 to 18: a national study. *Psychological Science*, 20(5), 594–602.

Griffiths, M. D., Hunt, N. (1998). Dependence on computer games by adolescents. *Psychological Reports*, 82, 475-480

Griffiths, M. D. (2010). The Role of Context in Online Gaming Excess and Addiction: Some Case Study Evidence. *International Journal of Mental Health and Addiction*, 8, 119-125.

Griffiths, M. D, Kuss, D. J., Lopez-Fernandez, O., Pontes, H.M. (2017). Problematic gaming exists and is an example of disordered gaming. *Journal of behavioral Addictions*, 6, 3, 296-301

Kuss, D. J. (2013). Internet gaming addiction: current perspectives. *Psychology research and behavior management*, 6, 125.

Kvale, S. Brinkmann, S. (2015). *Interview – det kvalitative forskningsinterview som håndværk*. Hans Reitzels Forlag, København

Lemmens, J.S., Valkenburg, P.M., Peter, J. (2009). Development and Validation of a Game Addiction Scale for Adolescents. *Media Psychology*, 12, 1, 77–95.

NBCSport (2017). *Paris open to eSports on 2024 Olympic program.* Available at http://olympics.nbcsports.com/2017/08/08/esports-olympics-paris-2024/ (Accessed Nov. 2017)

Nielsen, R. K. L. (2015). Turning Data into People: Player Perspectives on Game Addiction (pp. 76-83). Presented at the 2015 International Conference on Interactive Technologies and Games, IEEE.

Nielsen, R.K.L. (2017) Is game addiction a mental disorder? PhD Dissertation. IT University of Copenhagen, Copenhagen.

Petry, N. M., & O'Brien, C. P. (2013). Internet gaming disorder and the DSM-5. *Addiction*, 108, 7, 1186-1187. https://doi.org/10.1111/add.12162

Pruett, C. (2003). The Evolution of Video Games. *Interface: The Journal of Education, Community and Values*, 3, 7. Available at http://commons.pacificu.edu/cgi/viewcontent.cgi?article=1053&context=inter03 (Accessed Nov. 2017)

Tassi, P. (2013). *The U.S. Now recognizes eSports Players As Professional Athletes*. Available at https://www.forbes.com/sites/insertcoin/2013/07/14/the-u-s-now-recognizes-esports-layers-as-professional-athletes/#67c96ac63ac9 (Accessed on Nov. 2017)

Taylor, T. L. (2012). *Raising the Stakes: E-Sports and the Professionalization of Computer Gaming*. MIT Press.