

Clarifying terminologies in research on gaming disorder and other addictive behaviors: distinctions between core symptoms and underlying psychological processes

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There exists ongoing debate regarding the clinical validity of single symptoms of and diagnostic criteria for gaming disorder. In particular, the potential symptom of gaming disorder that addresses coping with and escaping from negative feelings has received much attention and remains a focus of intensive discussion. We argue that it is important to consider differences or distinguish between, on the one hand, symptoms of and criteria for a disorder due to addictive behaviors, such as gaming disorder, versus, on the other hand, motivations, mechanisms, and psychological processes that may be involved in promoting addictive behaviors and that may explain symptom severity and course of the addictive disorder including potential treatment responses.

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Introduction

It has been debated for more than a decade which gaming-related features may represent core criteria of gaming disorder and justify its delineation as a formal mental health disorder [1,2]. Arguably, the first consensus-oriented and expert-opinion-based presentation of

potential diagnostic criteria for gaming disorder was included in section III of the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) [3], with internet gaming disorder (IGD) considered as an entity requiring further research before being considered as a formal psychiatric condition. Six years later, the World Health Organization included gaming disorder in the 11th revision of the *International Classification of Diseases* (ICD-11) [4]. The proposed diagnosis of IGD in the DSM-5 requires experiencing at least five or more out of nine potential criteria over a period of one year. The ICD-11 diagnosis of gaming disorder requires the experience of all three core diagnostic criteria, usually for 12 months. The diagnosis is justified only if the behavioral pattern is associated with functional impairment in important life domains.

Given that multiple terms may be used in nuanced ways in different contexts, we briefly define how we consider several terms in this manuscript. A symptom may be defined as “a phenomenon that arises from and accompanies a particular disease or disorder and serves as an indication of it” [5]. A symptom may be understood as subjective experience related to a disorder, while a sign of a disorder may be defined as an objective expression of the disorder. The core symptoms and signs of a disorder often are contained within the diagnostic criteria defining a disorder, which means that the criteria may reflect the most characteristic indicators of a disorder.

Debates about symptoms of and diagnostic criteria for gaming disorder

Debate regarding the validity of diagnostic criteria for gaming disorder has persisted for years. While there seems to be a broad consensus regarding some core criteria, including diminished control [6], adverse consequences of gaming and functional impairment [7], other potential criteria have been criticized and debated.

One DSM-5 criterion of IGD appears in particular to have motivated ongoing controversy: the use of gaming to cope with negative mood states and to escape from negative feelings [8–10]. Data suggest that this criterion, as assessed in screening instruments and compared to other DSM-5 criteria for gaming disorder, may not have strong clinical validity. For example, in the study by Müller *et al.* [11^{*}], the ‘escape criterion’ showed a specificity of 33.3%,

indicating that this criterion — although having a sensitivity of 100% — may not be useful for differentiating disordered from non-disordered gaming [12]. Earlier findings based on item response theory and large-scale assessments similarly demonstrate that the item measuring escape from negative feelings (along with a deception item) showed the lowest model-fit values [13]. In another large-scale study on general internet-use disorder symptoms in a non-clinical sample [14], the ‘escape item’ was endorsed by 76.5%–85.6% of respondents in three population-based non-clinical samples, which has been interpreted as a ceiling effect that questions the clinical validity of the item or criterion. Similar findings have also been reported in other studies [15,16], and the validity of specific items in screening tools has been discussed recently [17]. A recent systematic review of screening instruments for gaming disorder [18**] discusses these and other considerations when aiming to identify reliably individuals with IGD.

Furthermore, it has been proposed that gaming, even when performed excessively, may not represent an addictive behavior if it is done for coping with negative mood or stress [19]. The authors argued that gaming in order to cope with or escape from negative feelings should be considered an exclusion criterion for gaming disorder as an addictive behavior, which has motivated ongoing debate [1,9,20]. A main argument raised by the authors defending the position that using games for coping may nevertheless represent an addictive behavior emphasizes parallels with many other addictions, in which negative reinforcement motivations may promote engagement in substance use or other addictive behaviors. In alcohol-use disorder, both long-term/trait motivations for using alcohol and short-term coping motivations influence alcohol consumption [21], which is compatible with the self-medication hypotheses of alcohol use [22]. Using alcohol for coping with negative mood is, however, neither an inclusion nor an exclusion criterion for alcohol-use disorder in the DSM-5 and ICD-11. In contrast, gambling when feeling distressed is an inclusion criterion in DSM-5 for gambling disorder, the only formal non-substance addictive disorder in DSM-5 [3]. Additionally, within clinical settings, therapists may include within treatment plans approaches for identifying and utilizing more effective strategies for coping with uncomfortable internal states that may promote engagement in addictive behaviors. For example, in cognitive behavioral therapy, developing more adaptive skills to identify and cope with uncomfortable states (cravings or negative mood states) are an important focus, as has been reported for gambling disorder and substance-use disorders and more recently for gaming disorder [23]. These considerations may be especially important to consider for females as they are more likely to report negative reinforcement motivations to engage in addictive behaviors such as gambling [24**], and

existing data suggest that these motivations may also be particularly relevant to gaming in females [25].

Proposal of a precise rationale for considering defining criteria

In this opinion paper, we do not aim at reviving the discussion about the validity of a single criterion, which has been maintained intensively before the WHO decision about gaming disorder in 2019. Instead, we aim at contributing to future research and debates by highlighting a conceptual perspective on using terms such as symptom/criterion versus motivation/mechanism, which has been considered rarely in previous discussions, although some studies have briefly commented on this conceptual differentiation [e.g., 13]. We argue that it is important to be precise in using terms when considering symptoms of and criteria for disorders due to addictive behaviors (such as gaming disorder) and to distinguish these from motivations, mechanisms, and processes that may be involved in addictive behaviors and that may explain symptom severity and course of the addictive behavior. We acknowledge that this may be a challenging task, and one should not mistake the absence of these factors from the symptoms or features in the criteria defining the disorder as a reflection that they may not be clinically relevant. Examples for motivations and processes include not only coping with negative mood, but also craving, attentional bias, approach action tendencies, and inhibitory control (see Section ‘Relationships between processes and symptoms’). This means that these processes may be underlying bases for diminished control over the addictive behavior, the continuation or escalation of the behavior despite experiences of negative consequences, and the increasing priority given to the specific behavior. They represent the core symptoms of and therefore diagnostic criteria for gaming disorder.

The development of symptoms of gaming disorder may be generated by predisposing factors, motivations to engage in gaming, and subsequent psychological processes, such as cue reactivity, craving, as well as implicit and explicit cognitions [26,27**]. Developing symptoms of gaming disorder may initially be linked to specific predisposing variables, such as genetics [e.g., 28,29], early childhood experiences and problems in parent-child relationships [e.g., 30,31], psychopathological symptoms including depression, social anxiety, and attention deficits [e.g., 32,33], temperamental features including impulsivity [e.g., 34–36], and specific motivations including discovery-seeking and need for achievement [e.g., 37,38]. However, in the light of these numerous predisposing variables potentially underlying the development of addictive behaviors, we would not expect all of these features to be present in all individuals suffering from gaming disorder. Furthermore, we would not expect that one of these features in isolation would be specific for developing gaming disorder. The predisposing variables

are considered to interact with each other and with further psychological and neurobiological processes in the course of developing addictive behaviors.

Again, we argue that it is important not to conflate core symptoms and mechanisms in research on gaming disorder and other potentially addictive behaviors. An important reason for the need for this differentiation is that specific mechanisms may or may not represent a main feature of an addictive behavior for a specific individual, even though they may represent important targets for clinical interventions. For example, coping with negative mood may be a major motivation for engaging in gaming behaviors in some individuals [39,40], while in others, the desire to play and the anticipation of gratification (in terms of reward craving) related to gaming may be a main feature [41], and each may be difficult to control and lead to symptoms of gaming disorder. Both escape motivations/coping with negative feelings and desire elaboration/reward anticipation may also be present in recreational gamers [42,43]. Core symptoms, contrastingly, which justify diagnosing a behavioral pattern as an addictive disorder, may better focus on the behavioral pattern and on the consequences related to the specific behavior, for which psychological (and neurobiological) processes may be the underlying bases. When considering potential explanations for the development of specific disordered behaviors and for understanding the nosology, psychological constructs, and neurobiological processes are relevant [26,44–46]. Considering these features, even when not included in the diagnostic criteria, may also be important for developing and enhancing optimal prevention and treatment strategies and improving the public health.

Relationships between processes and symptoms

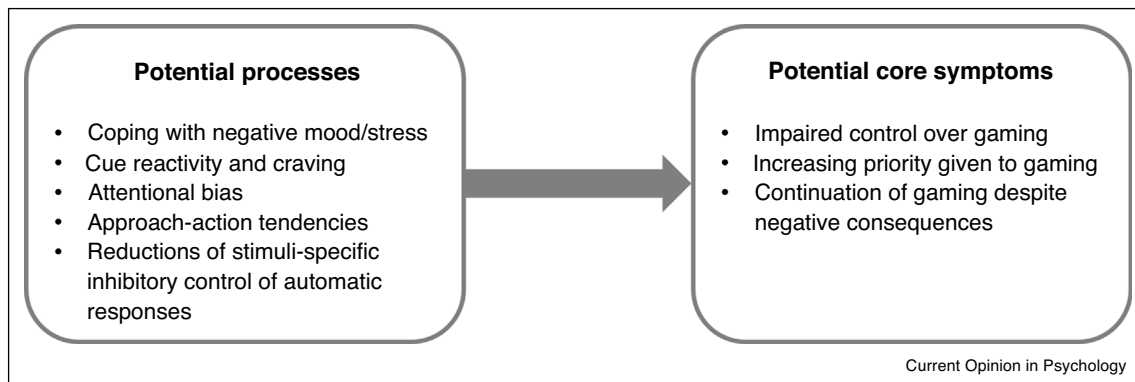
Although we have proposed a distinction between processes and symptoms and have recommended not using these terms synonymously, there are strong relationships between processes and symptoms. In short, the processes may be considered the underlying basis for developing and maintaining symptoms. Symptoms may be considered the behavioral and mental manifestation of the disorder. Studies investigating psychological processes involved in gaming disorder have shown, for example, reductions in the capacity to inhibit seemingly automatic responses to gaming-related stimuli [cf., 47]. These reductions of stimuli-specific inhibitory control in gaming disorder [48], as observed in specific experimental paradigms, such as go/no-go tasks or stop-signal tasks, are likely related to the diminished control over the gaming behavior in daily life, which is considered a behavioral manifestation of gaming disorder. Reductions of decision-making capacities [49] and the preference of short-term rewarding options may also contribute to diminished control over the gaming behavior in daily life [50], in

particular over onset, frequency, termination, and context of gaming. In addition, decision-making impairments may also contribute to the continuation or escalation of gaming behavior despite experiencing negative consequences. Attentional bias in gaming disorder [51,52], as measured by dot-probe tasks and other paradigms assessing implicit attentional processes including eye-tracking, may explain why individuals dedicate increasing priority to gaming. A recent meta-analysis of neurocognitive functioning in gaming disorder and other internet-use disorders shows medium to large effects regarding the involvement of the aforementioned processes [53**], which is comparable to a recent meta-analysis of neurocognition in gambling disorder [54]. Cue reactivity, craving, and desires, frequently observed in gaming disorder [55] and other addictive behaviors [56], may also increase the probability of difficulties in controlling the behavior and making it more likely to continuously game despite negative consequences (Figure 1).

In all of these cases, the psychological processes may be considered the underlying bases of gaming-disorder symptoms, but — from our perspective — the behavioral patterns in daily life (or tendencies over a period of time given the potential for short-term abstinence, relapses, and temporal distances that at times separate behaviors from consequences, both in the escalation towards and recovery from gaming disorder) should justify a diagnosis, rather than factors that may reflect underlying processes. In other words, if an individual would have strong desires and craving but would be able to control the gaming behavior and consequently would not experience negative consequences and functional impairments in daily life, we would not diagnose gaming disorder. In turn, if an individual would use gaming for coping with negative feelings and would continue to do so despite experiences of negative consequences related to the gaming behavior, this would mean that treatment for the dysfunctional behavioral pattern would be justified. Further, assessing for and considering underlying motivations and other clinically relevant processes in treatment settings and employing interventions that target these processes are often very important [23], whether or not they are specifically included in the diagnostic criteria.

The interactions of psychological processes, if they continue over a longer period of time, may result in relatively stable or entrenched mental states. For example, the process of cue reactivity and craving in combination with reduced stimuli-specific inhibitory control of automatic responses (e.g., approach-action tendencies) may develop into a situation-non-specific mental state of craving, which one may consider a symptom of the addictive behavior. However, one may argue that only if a process becomes a stable or entrenched mental state may it represent a symptom in terms of the definition mentioned in section 1 (a phenomenon that arises from and

Figure 1



Differentiation between main psychological processes potentially underlying the engagement in gaming and core symptoms of gaming disorder according to ICD-11 criteria [4].

accompanies a particular disease or disorder and serves as an indication of it). Further research including longitudinal studies should investigate these relationships over time in at-risk and clinical populations to provide additional empirical support in this area.

In summary, potential processes and behavioral manifestations may be related, but may not be identical. When diagnosing an individual, it is important to consider both not over pathologizing and not trivializing potentially addictive use of games, and it is important to consider the behavioral pattern and consequences related to the behavior as a main focus. This view is also consistent with the focus on the drinking pattern and consequences related to alcohol consumption in the ICD-11 description of alcohol-use disorder [4]. However, it is also important to note that craving is incorporated into criteria for substance-use disorders in both DSM-5 and ICD-11, and the current considerations presented here may have direct relevance for how craving is considered uniformly across substance and behavioral addictions.

Many motivations and psychological processes including predispositions, such as early childhood experiences, may have important clinical utility in treating individual cases with addictive behaviors in order to optimize and target individualized treatment [57,58**]. The systematic investigation of common psychological and neurobiological processes involved in gaming disorder and other addictive behaviors is very important. This, however, does not mean that processes frequently observed in addictive behaviors should necessarily constitute symptoms or diagnostic criteria.

Conclusion

Predispositions and processes including coping strategies may explain reasons for developing addictive disorders, and should therefore be considered in assessment and treatment. They may not be, however, the core symptoms resulting from the

addictive behavior and leading to functional impairment. In this context, coping, as a core mechanism involved in most types of addictive behaviors, may be best considered neither a symptom necessary for diagnosing a behavior as addictive nor a criterion for excluding a problematic gaming behavior from being diagnosed as gaming disorder.

Authors' contributions

MB, MNP, and EW wrote the manuscript. All co-authors contributed comments to the draft. The manuscript's content was discussed with and approved by all co-authors.

Conflict of interest statement

DLK, MNP and HJR have been members of the WHO or other networks, expert groups or advisory groups on addictive behaviors.

MB, DLK, MNP, and HJR are members or observers of the COST Action 16207 'European Network for Problematic Usage of the Internet'.

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