

AKADÉMIAI KIADÓ


Journal of Behavioral Addictions

9 (2020) 4, 942–944

DOI:  
10.1556/2006.2020.00094  
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# Addressing taxonomic challenges for Internet Use Disorders in light of changing technologies and diagnostic classifications

Commentary on: “How to overcome taxonomical problems in the study of Internet use disorders and what to do with “smartphone addiction”?” (Montag et al., 2020)

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Received: July 27, 2020 • Revised manuscript received: October 20, 2020 • Accepted: October 29, 2020  
Published online: December 8, 2020

## COMMENTARY



## ABSTRACT

Drawing a distinction between mobile and non-mobile Internet Use Disorders is an important step to clarify blurred current concepts in the field of behavioral addictions. Similarly, future technological advances related to virtual or augmented reality, artificial intelligence or the Internet of things might lead to further modifications or new taxonomies. Moreover, diagnostic specifiers like offline/online might change with technological advances and trends of use. An important taxonomical approach might be to look for common structural characteristics of games and applications that will be amenable to new technical developments. Diagnostic and taxonomical approaches based on empirical evidence are important goals in the study of behavioral addictions.

## INTRODUCTION

The paper published by Montag, Wegmann, Sariyska, Demetrovics, and Brand (2020) is timely and helps to clarify some of the current nosological jumble in relation to Internet Use Disorders (IUD). In fact, it is important to specify distinct and evidence based disorders such as those related to gaming, online pornography use, online shopping or social networks use (Brand et al., 2020; Rehbein & Möble, 2013) and to avoid misleading and sometimes populist concepts like nomophobia (A. L. S. King, Valenca, & Nardi, 2010) or selfitis (Balakrishnan & Griffiths, 2018) in the context of IUD (c. f. Starcevic, Billieux, & Schimmenti, 2018). It has to be commended that the taxonomy suggested by Montag and colleagues elegantly overcomes the dubious concept of smartphone addiction. In fact, differentiating mobile and non-mobile use is a valuable approach to consider more carefully the impact of availability and accessibility on behavioral pattern and the risk of developing addictive behaviors. At the same time, it might be worthwhile to consider the specific role of technology in IUD and discuss how the proposed taxonomy relates to diagnostic classifications.

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## TAXONOMY OF IUD AND TECHNOLOGICAL ADVANCES

Specific technical advances of the Internet can be regarded as a prerequisite of IUD which includes – among others – availability of content and interactivity. As a consequence, specific Internet applications such as gaming, online shopping, watching pornography or using social network sites can be extremely rewarding and can lead to positive emotional states like happiness or flow (Hull, Williams, & Griffiths, 2013), cognitive absorption (Agarwal & Karahanna, 2000) or a sense of belonging (Nadkarni & Hofmann, 2012). These initially positive mental states can lead – in some vulnerable users – to continued use and the development of addictive behavior patterns. Related symptoms can be characterized by loss of control, priority given to the specific behavior and continued use despite negative consequences as outlined in the diagnostic guidelines of gaming disorder in the eleventh edition of the International Classification of Diseases (ICD-11; World Health Organization, 2018).

The new technological advancement of smartphones increases the properties of Internet in terms of availability and easy access. Therefore, new risks of developing behavioral addictions emerge. However, the underlying principles like rewards within games or social interaction follow the same or at least similar principles. Moreover, the proposed taxonomy might become outdated or less applicable as soon as new technologies emerge. Some developments like wearable technology is covered by the proposed taxonomy and can be defined as mobile use. However, new technological developments like virtual reality, augmented reality, internet of things (everyday objects that are connected with the Internet and are able to send and receive data) as well as artificial intelligence are independent from the mobile/non-mobile distinction. In the future, it might be more relevant to distinguish between applications with or without artificial intelligence or with or without visual or augmented reality. To give one example: The addictive potential of a game will become more related to the use of artificial intelligence than by being played mobile or non-mobile. Finally, non-invasive brain-computer-interfaces may play an important role in the future. Within these lines of development, it can be expected that the distinction between mobile and non-mobile use will lose importance. In general, it is likely that mobile applications and devices will become more important. Nevertheless, in case of gaming, powerful gaming computers might still offer specific advantages that will not be caught up by mobile opportunities in the near future. Notwithstanding, the line between mobile and non-mobile will become more blurred. Moreover, the specific underlying mechanisms are likely to be very similar and regardless of mobile or non-mobile use. In the case of gaming, a number of researchers have looked for structural characteristics of games that are related to problematic gaming and gaming disorder (Griffiths & Nuyens, 2017; D. L. King, Delfabbro, & Griffiths, 2011). While some of the findings may be related to technical features like fast loading times (D. L. King et al., 2011)

others are more general in nature like achievement in games as well as reward and punishment, or social features (Griffiths & Nuyens, 2017). Some of these structural components are specifically related to vulnerability characteristics of players (D. L. King et al., 2019). It is still a challenge to isolate characteristics that makes games appealing versus addictive and to relate these mechanisms to the vulnerability of players, however, understanding such interactions is crucial for the ethics of game designs (D. King, Koster, & Billieux, 2019).

## TAXONOMY OF IUD AND DIAGNOSTIC CLASSIFICATIONS

If we look at substance-use disorders, classification systems like the 5th revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) and the ICD-11 (World Health Organization, 2018), have very few specifiers that can serve taxonomical purposes for clinical or research purposes. In the DSM-5, these are related to full or partial remission status or the severity of the disorder. In the ICD-11, specifiers are also related to different categories on current use or remission. The specification of predominantly online or predominantly offline use in gambling and gaming is exceptional. This might be considered comparable to distinguishing between different applications of a specific drug, e.g. administering cocaine orally, intranasally, intravenously, or by inhalation. Both the distinction between online/offline use or mobile/non-mobile use is of importance for research purposes, especially in times when use patterns are changing. However, both distinctions might lose importance in the future as new technologies arise. Therefore, such specifiers might turn out as temporal developments. However, from the perspective of diagnostic classification, taxonomies should be stable over time. Nevertheless, for research purposes current technological trends are important and can serve as taxonomical specifiers.

## CONCLUSIONS

Distinguishing between mobile and non-mobile use in behavioral addictions is important and should be more carefully considered in future research. This will improve our understanding of different types of problematic use and thus might be useful for tailoring specific therapeutic interventions. The imposing differentiation between mobile and non-mobile is primarily reflected in current technical developments. Whereas elaborated use of games in the past was related to high-end computers, current developments related to streaming games enables similar entertainment on mobile devices. Moreover, current and future technical developments will continue a shift from stationary to mobile devices – and maybe vice versa in some areas – and future technical changes might even be more important than the distinction between mobile vs. non-mobile use. Additionally,



the taxonomy needs to be flexible to adapt to technological changes. Finally, we need a better understanding of the structural components of games and applications relevant for addictive use. Such approaches are even more relevant in the light of the convergence of gambling and gaming (D. L. King & Delfabbro, 2020). If this development continues, gambling and gaming might merge to a unified diagnostic entity with the specifiers “predominantly gaming” and “predominantly gambling” in the future. Diagnostic and taxonomical approaches based on solid empirical evidence are one of the most important current goals in the study of behavioral addictions.

**Funding sources:** No financial support was received for the preparation of this paper.

**Authors' contribution:** The initial draft of this paper was prepared by H-JR. All authors have contributed materials, provided comments, or intellectually supported the content. All have approved the final version of this paper.

**Conflict of interest:** The authors have no conflicts of interest to declare.

**Acknowledgement:** We would like to express our thanks to Daniel L. King who made valuable comments to an earlier version of this commentary.

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