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Are you on the internet or using screen-based devices?

Revisiting the concepts of 'internet addiction' and 'smartphone addiction'

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VIEWPOINT

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ABSTRACT

The concept of 'internet addiction' was introduced in the 1990s and has increasingly been recognized as a clinical and public health issue. Although umbrella terms can be useful for screening, theoretical considerations, and intervention planning, the term itself has received criticism because of its conceptual heterogeneity, implying an addiction to a medium and not including a wide range of problematic behavioral patterns that are below the diagnostic threshold of a clinical disorder. To address this criticism, we propose adopting the term 'problematic use' instead of 'addiction'. Furthermore, we argue that while 'problematic usage of the internet' is currently a useful umbrella term, recent technological advancements and increasing online presence may in the future require a conceptual and methodological shift in terminology from 'internet' to the more specific 'screen-based devices' or 'screens' that would enable more accurate assessment and intervention strategies. Terms focusing on specific devices, such as 'smartphone addiction,' should also be used with caution, as problematic use relates to applications rather than the hardware itself and may extend to various devices.

KEYWORDS

internet addiction, problematic internet use, internet use disorder, problematic screen-based device use, screen use, smartphone addiction, behavioral addiction, addictive behavior, social media, technology addiction, video games, impulsive behavior, online social networking, internet addiction disorder

BRIEF HISTORY OF THE TERM 'INTERNET ADDICTION'

The term 'internet addiction' was first introduced in the scientific literature in the 1990s, shortly after the internet became increasingly available in households on personal computers. Griffiths (1996), Young (1996), and others reported that the internet was being used in an addictive manner by a minority of individuals. Scholars argued that this was an issue for the mental health field (Stein, 1997) and proposed criteria for diagnosing people with such a putative mental disorder (Shapira et al., 2003).

Internet availability and penetration have continued to increase in the past decades, and the recent COVID-19 pandemic also led to an increase in time spent online (Montag et al., 2024b). Moreover, scientific research on internet addiction has markedly increased, and internet addiction has become increasingly recognized as a clinical and public health issue (Fineberg et al., 2018, 2022, 2025).

Subsequently, various theoretical models have been proposed to indicate the core features of addictions [e.g., the components model (Griffiths, 2005)], the potential development mechanisms [e.g., the cognitive-behavioral model (Davis, 2001), the interaction of person-affect-cognition execution (I-PACE) model (Brand, Young, Laier, Wölfling, & Potenza, 2016; Brand et al., 2019, 2025b)], and the potential consequences [e.g., the vicious circle of addiction model (Brailovskaia, 2024)]. Among different theories and prior research, numerous alternative terms have been used, such as 'problematic internet use' or 'problematic use/usage of the internet' (PIU/PUI), 'excessive internet use', 'compulsive internet use', 'pathological internet use', and 'internet use disorder'. All such terms have generically and non-specifically emphasized "*internet*" use rather than more specifically delineating the types of internet use (Fineberg et al., 2018, 2022).

CRITIQUES RELATED TO USING THE TERM 'INTERNET' FOR ADDICTIVE OR PROBLEMATIC ONLINE ACTIVITIES

The term 'internet use' serves as an umbrella term covering a broad range of online activities, including browsing for information, using social media, online buying/shopping, playing online video games, online gambling, consuming online pornography, watching online videos, etc. (Zare-Bidoky et al., 2025). Relatedly, the term 'internet addiction' has been criticized because of its conceptual heterogeneity (i.e., it refers to a variety of very different online activities and behaviors) and because it implies addiction to a medium or a channel through which specific content or activities are accessible (Griffiths, 2000). It has also been pointed out that, according to empirical data, different people engage in specific online activities, which provides an important contextual background for their internet use (Griffiths & Szabo, 2014; Pontes, Szabo, & Griffiths, 2015), and that specific activities are more likely to be associated with negative mental health consequences than others (Csibi, Griffiths, Cook, Demetrovics, & Szabo, 2018).

Moreover, the term 'addiction' for internet use has also been criticized because it may be a correct 'diagnosis' only in the case of a minority of individuals who experience severe symptoms and can be considered to have a 'disorder' in the clinical sense. However, it does not include a wide range of excessive and problematic behavioral patterns that do not reach the severity of a clinical disorder while still negatively affecting the individual (Starcevic, 2013). Moreover, generalized or unspecific 'internet addiction' might be closer to some online behaviors than others (e.g., the large overlap with problematic gaming).

Finally, besides the excessive use of the internet that is associated with significant impairment, the umbrella term of 'problematic internet use' frequently encompasses a wider range of other problematic behaviors related to the internet, such as 'cyberbullying' (Fineberg et al., 2018, 2022).

PREVIOUS RECOMMENDATIONS

Three major recommendations have been proposed to address these criticisms. First, the term 'internet' should be

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replaced with terms that refer to specific behaviors (e.g., shopping/buying, gaming, pornography use, online gambling, social media use, etc.), irrespective of whether these are performed online or offline (Starcevic & Aboujaoude, 2017) – an approach also taken by the major psychiatric classification systems (Rumpf et al., 2018; Brand et al., 2025a; Stein, Black, Shapira, & Spitzer, 2001). Even though the eleventh revision of the *International Classification of Diseases* (ICD-11) differentiates between 'predominantly online' and 'predominantly offline' forms of gambling disorder and gaming disorder, the main concept and the emphasis is still on the specific behaviors (World Health Organization, 2019).

Additionally, it has been observed that those reporting predominantly online gaming also report the highest gaming disorder tendencies (Montag, Schivinski, & Pontes, 2021). Furthermore, even though the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013) uses the term 'internet gaming disorder', in reality, it refers to any type of disordered video game use irrespective of the medium in which they are played (Király, Griffiths, & Demetrovics, 2015) as explained in the description: *"Internet gaming disorder most often involves specific Internet games, but it could involve non-Internet computerized games as well, although these have been less researched"* (Americal Psychiatric Association, 2013, p. 796).

Second, the term 'addiction' should be replaced with 'problematic use' to be more inclusive and also cover less severe cases that deserve attention because of the behavior's detrimental effects – an approach that has been taken by several authors who have emphasized problematic use of the internet as a major public health issue (Fineberg et al., 2018; Stein & Hartford, 2022) and an approach which was also reflected by the categories of hazardous gambling and gaming included in the ICD-11 (World Health Organization, 2019). Moreover, it has been argued that there is not enough scientific evidence to use the term 'addiction' (Aarseth et al., 2017), while the term 'problematic use' is less specific and consequently, more acceptable. Furthermore, the term 'problematic' should be used when referring to problematic behaviors with different levels of severity and inclusively, while the term 'disorder' should be retained to refer to specific diagnoses and diagnosed cases.

Third, new constructs should be developed to address emergent behavioral problems in this area. For example, there is increasing evidence for the value of recognizing social media use disorder, as both a clinical and a public health issue. Having specific names for specific types of internet-related behavioral problems would have the advantage of making 'problematic internet use' less heterogeneous. But before such a diagnosis can be accepted, validating evidence is also needed, and this remains scant in some areas of research (for instance, in the realm of problematic use of social media, Montag, Marciano, Schulz, & Becker, 2023; Montag et al., 2024a; Moretta, Buodo, Demetrovics, & Potenza, 2022).

CHALLENGES AFTER THREE DECADES OF TECHNOLOGICAL AND SCIENTIFIC CHANGES

Although we acknowledge and agree with many critiques of imprecise terms, such as problematic use of the internet, and despite the aforementioned recommendations, we consider the use of an umbrella term to be helpful for several important reasons. Beyond their specificity, internet activities and behaviors may have common motives and etiological mechanisms, and the problems related to them may have common roots that deserve general attention. For instance, several recent meta-analyses suggest commonalities across different forms of problematic internet use (e.g., problematic gaming, social media use) such as shared similarities in some of the clinical comorbidities (Niu et al., 2023), executive dysfunctions (Ioannidis et al., 2019), brain differences (Solly, Hook, Grant, Cortese, & Chamberlain, 2022) or interventional approaches found to be effective (Saletti, Van den Broucke, & Chau, 2021). Therefore, umbrella terms may be helpful for screening purposes, theoretical considerations, and planning interventions and policies (Carvalho et al., 2025; Zare-Bidoky et al., 2025). They may facilitate the measurement of general risk, after which subsequent assessments may identify high-risk cases of specific behaviors. For instance, 'anxiety disorder' is also an umbrella term used to cover a broad range of specific anxiety disorders such as 'social anxiety disorder', 'panic disorder', or 'agoraphobia' as proposed in the DSM-5 (American Psychiatric Association, 2013) and in the ICD-11 (World Health Organization, 2019).

However, another challenge is evident – that is, the 'internet' as a general term and concept describing this set of behaviors may have become outdated due to its increased pervasiveness in everyday life. Since its emergence, the internet and its applications have undergone dramatic changes. In the mid-1990s, the internet was only accessible on personal computers and primarily available in universities and libraries for a limited range of activities. Soon after, it became rapidly available in homes, and its role gradually expanded to include a wide range of activities on a variety of devices. Initially, going online at home had severe limitations. For a considerable time, the internet could only be accessed via "dial-up" using modems and landline home telephones. These technical limitations meant that joining and disconnecting from the internet were clear, often planned actions.

Later, wireless network protocols (first Wi-Fi, then mobile networks) emerged and, together with the popularization of portable devices (first laptops, then smartphones and tablets), quickly became the leading technology used to access the internet. Technological advancements also impacted traditional screen-based devices such as televisions. While for many decades they only provided passive entertainment, now smart televisions offer numerous interactive entertainment options involving the use of the internet, such as playing video games. Moreover, watching TV does not require TV equipment anymore. Instead, either live channels or past programs can be followed on various devices, including smartphones. In 2023, an estimated

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69% of the global population owned smartphones and had internet access available anytime from almost anywhere, and this is expected to continually grow (Statista, 2024).

These technological advances have rapidly changed the nature and extent of internet use. While in the 1990s, as aforementioned, using the internet was a well-defined activity both in time and space (i.e., the individual was sitting at their desktop computer, established a connection to the internet by phone, and shut down everything after they finished), today, online presence is almost constant due to the portability of internet-connected devices and mobile access to the internet, and 'organically' fits into people's everyday lives, making it difficult to be observed and measured. Therefore, for example, while the self-reported question, "How many hours do you spend using the internet?" could be more readily estimated in the 1990s or early 2000s, it is considerably more challenging today given use of the internet on multiple devices and the fact that 'dual screening' and 'multitasking' have become commonplace (e.g., texting or messaging on a smartphone while viewing content on streaming services). Moreover, young generations, sometimes called 'digital natives' or 'screenagers' (Griffiths, 2010), and children, especially, may not be familiar with what the term 'internet' means exactly because, for them, being online and using digital devices is now an integral part of their lives. Furthermore, the 'internet' is a term which is often interchangeably used with the World Wide Web, although these terms are not the same (BBC, 2019).

Some digital well-being applications and other behavioral tracking tools may help objectively measure time spent using smartphones and specific applications by built-in tracking methods (Elhai et al., 2021). This has led to a movement in the psychological and psychiatric sciences studying digital footprints of study participants via mobile sensing or digital phenotyping approaches (Brand et al., 2025a; Montag & Rumpf, 2021). Nonetheless, such approaches used alone are often insufficient to provide comprehensive assessments if individuals use multiple types and brands of digital devices (e.g., smartphones, computers, tablets, gaming consoles), which is now frequently the case. Moreover, while they provide hard data about use, they often omit subjective or contextual information (e.g., they do not provide information on the social aspect of usage such as playing video games together with family members as a joint recreational activity). Therefore, they cannot fully replace self-reported measures (Montag, Dagum, Hall, & Elhai, 2022). Consequently, newer, more up-to-date and ecologically relevant concepts and terms should be considered, and ongoing changes to psychological and psychiatric terminology in this area can be expected as technology continues to evolve.

SCREEN-BASED DEVICE USE: A NEW TERMINOLOGY

As a start, we suggest focused research to evaluate the advantages and disadvantages of replacing the term 'internet addiction' with terms such as 'problematic use of screen-based devices,' or 'problematic screen use'/'problematic usage of screens.' Screen-based devices would comprise all digital devices with a screen or something similar (including smartphones, laptops, PCs, and tablets, as well as televisions,

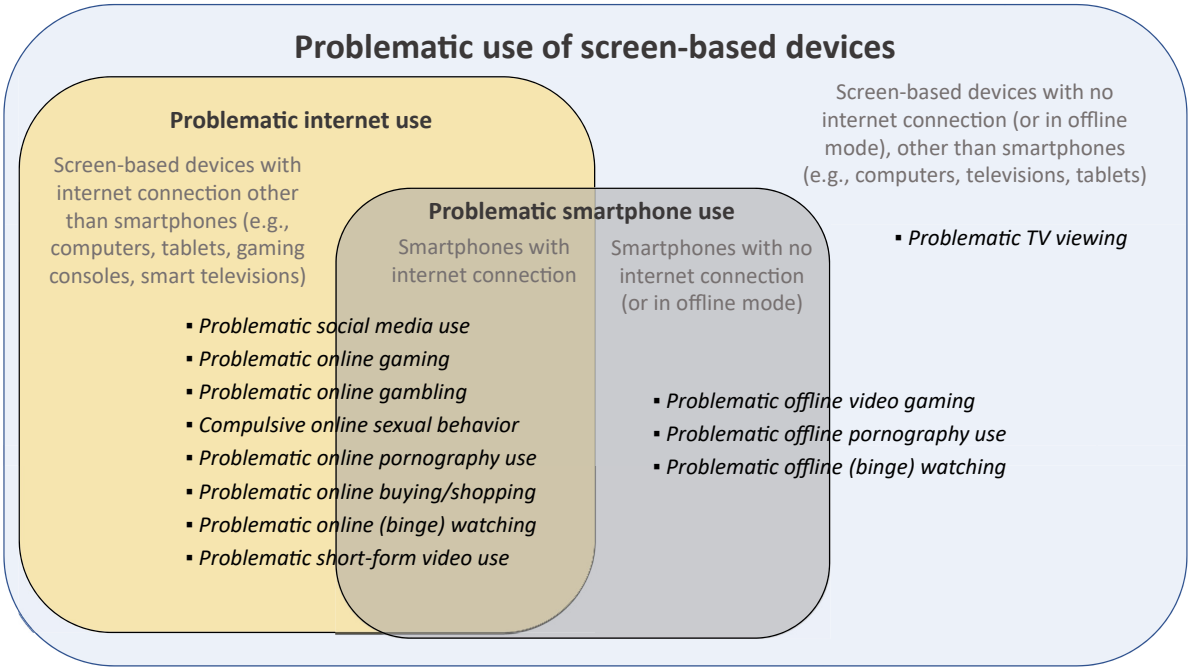

Fig. 1. Problematic use of screen-based devices
Note: The figure includes representative examples of problematic behaviors, and not all possible manifestations of screen-based device use problems.

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MP3 players, smartwatches, and virtual reality devices). An advantage of moving to the term 'screen-based devices' would be capturing the common feature of such devices having screens through which content is consumed and through which these devices are often controlled. Moreover, the term 'screen' is a concrete and common term, easy to understand, and widely used in everyday language. In addition, 'screen time' is a popular term understood and used both by scholars (Madigan, Browne, Racine, Mori, & Tough, 2019; McArthur, Volkova, Tomopoulos, & Madigan, 2022) and the general public, including different age groups or individuals from various cultural backgrounds.

Given the importance of visual elements in everyday communication and entertainment, it is unlikely that screens will soon be replaced by a completely different output surface, although we acknowledge that as technology advances, there may be quite different types of screens, such as "smart glasses", and other common ways to access the internet using a range of sensory modalities. Therefore, it is quite possible that additional terms will need to be considered.

Relatedly, we also acknowledge the numerous alternative terms which could be used to describe the same concept, such as 'digital device', 'digital media', 'digital technology', or 'information and communication technology.' While these seem broader, less concrete, and more difficult for the public to understand and operationally define, empirical work to provide evidence for this assertion is needed.

Moreover, we also recommend that popular terms, such as 'smartphone addiction' should be used with caution. Smartphone addiction refers to problematic use of the most popular screen-based device used by adolescents and emerging adults (among other age groups) but neglects the fact that many other types of devices are used for the same purposes, interchangeably and often simultaneously, and that older adults may still use other more traditional screen-based hardware (e.g., television). It should also be noted that in problematic smartphone use (like problematic internet use), individuals may not be dependent on the device but rather to the applications that can be accessed on the device (Kuss & Griffiths, 2017). Although the same critique also applies to the concept of 'screen-based devices', it is more appropriate in the sense that it covers more devices in a comprehensive way (see Fig. 1)

CONCLUSIONS AND FUTURE STEPS

In summary, we recommend empirical research to determine the advantages and disadvantages of "problematic usage of the internet" versus "problematic use of screen-based devices." The aim would be to optimize our ability to refer to, monitor, and assess problems (including somatic and psychological consequences and symptoms) related to potentially addictive behaviors conducted on screen-based devices more generally, but not including the wider range of problems outside the scope of excessive usage patterns. It should be emphasized that the use of the internet or of screen-based devices *per se* does not equate to problematic use, as has also been stressed in the case of behavioral addictions: none of the relevant behaviors or activities are inherently problematic (Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015; Huang, 2017; Király, Tóth, Urbán, Demetrovics, & Maraz, 2017). Using such terms and screening for addiction-like problems, in general, could be the first step of the assessment, followed by the screening of specific behaviors and, finally, clinical diagnosis of high-risk cases of specific behavioral addictions. This would be consistent with a pluralistic approach to psychiatric diagnosis, in which multiple different possibilities can be flexibly considered, and in which reification of any particular construct is avoided (Stein et al., 2024). This approach could also be helpful when trying to develop institutional, national, or international policies.

The concept of problematic smartphone use also has its rationale but, at the same time, is limited because it applies to only one device of the many now used in contemporary society. We propose substituting both these terms with a term such as 'problematic use of (name of specific online activity)' or an umbrella term. However, in this swiftly advancing field, we would encourage an approach to diagnosis and evaluation which "holds our diagnoses lightly" (Stein et al., 2024), so as to optimize the use of different theoretical perspectives, which may contribute usefully to clinical practice, research, and public health policy.

We would also encourage that empirical research to seek the views of those working in prevention, treatment, and policymaking, and those with lived experience. Such input is important for determining what terminology is optimal for what purposes, and to consider further updating this terminology as new technologies come into use. Broad involvement of diverse experts in refining the use of terminology and shaping assessment and intervention strategies will ensure that different perspectives are captured and will facilitate the adaptation of these changes. Relatedly, we encourage the development of more detailed guidelines to support the practical implementation of such modifications across clinical work, prevention, assessment, research, and policymaking. These guidelines should also account for the specific needs of different populations, including minors, older adults, and people from various cultural and ethnic backgrounds, and how interventions can be tailored for them.

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MNP has consulted for Boehringer Ingelheim and Neurofinity; has been involved in a patent application with Yale University and Novartis; has received research support (to Yale) from Mohegan Sun Casino and the Connecticut Council on Problem Gambling; has participated in surveys, mailings, or telephone consultations related to internet use, addictions, impulse-control disorders or other health topics; has consulted for and/or advised gambling, non-profit, healthcare and legal entities on issues related to impulse control, internet use and addictive disorders; has performed grant reviews for research funding agencies; has edited journals and journal sections; has given academic lectures in grand rounds, CME events, and other clinical or scientific venues; and has generated books or book chapters for publishers of mental health texts. MNP is an associate editor of the Journal of Behavioral Addictions.

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NAF reports in recent years she has obtained support for research or networking from the UK NIHR, COST Action, Orchard, Horizon Europe, UKRI, Compass Pathways; accepted travel and/or hospitality expenses from the BAP, ECNP, RCPsych, CINP, World Psychiatric Association; received honoraria from Elsevier for editorial duties and the Mental Health Academy and Children and Screens for lecturing. She leads an NHS treatment service for OCD. She holds Board membership for various registered charities linked to OCD.

DJS has received consultancy honoraria from Discovery Vitality, Johnson & Johnson, Kanna, L'Oreal, Lundbeck, Orion, Sanofi, Servier, Takeda and Vistagen.

CM reports no conflict of interest. However, for reasons of transparency Dr. Montag mentions that he has received (to Ulm University and earlier University of Bonn) grants from agencies such as the German Research Foundation (DFG). CM has performed grant reviews for several agencies; has edited journal sections and articles; has given academic lectures in clinical or scientific venues or companies; and has generated books or book chapters for publishers of mental health texts. For some of these activities he received royalties, but never from gaming or social media companies. CM mentions that he was part of a discussion circle (Digitalität und Verantwortung: https://about.fb.com/de/news/h/gespraechskreis-digitalitaet-und-verantwortung/) debating ethical questions linked to social media, digitalization and society/democracy at Facebook. In this context, he received no salary for his activities. Finally, he mentions that he currently functions as independent scientist on the scientific advisory board of the Nymphenburg group (Munich, Germany). This activity is financially compensated. Moreover, he is on the scientific advisory board of Applied Cognition (Redwood City, CA, USA), an activity which is also compensated.

Outside the scope of the present paper, JDE notes that he receives royalties for several books published on post-traumatic stress disorder (PTSD); is a paid, full-time faculty member at University of Toledo; occasionally serves as a paid, expert witness on PTSD legal cases; and has recently received grant research funding from the U.S. National Institutes of Health.

MB receives funding from the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation), the EU, and the German Federal Ministry of Education and Research; has performed grant reviews for research-funding agencies; has edited journals and journal sections; has given academic lectures in clinical or scientific venues; and has generated book chapters for publishers of mental health texts. MB is associate editor of the Journal of Behavioral Addictions.

ZD is the editor-in-chief of the Journal of Behavioral Addictions.

REFERENCES

Aarseth, E., Bean, A. M., Boonen, H., Colder Carras, M., Coulson, M., Das, D., … Van Rooij, A. J. (2017). Scholars' open debate paper on the World Health Organization ICD-11 gaming disorder proposal. *Journal of Behavioral Addictions*, *6*(3), 267–270. https://doi.org/10.1556/2006.5.2016.088

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing.

BBC. (2019). What's the difference between the internet and the world wide web? Retrieved 22 October from https://www.bbc.co.uk/newsround/av/47523993.

Billieux, J., Schimmenti, A., Khazaal, Y., Maurage, P., & Heeren, A. (2015). Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. *Journal of Behavioral Addictions*, *4*(3), 119–123. https://doi.org/10.1556/2006.4.2015.009

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Brailovskaia, J. (2024). The "vicious circle of addictive social media use and mental health" model. *Acta Psychologica*, *247*, 104306. https://doi.org/10.1016/j.actpsy.2024.104306

Brand, M., Antons, S., Bőthe, B., Demetrovics, Z., Fineberg, N. A., Jimenez-Murcia, S., … Potenza, M. N. (2025a). Current advances in behavioral addictions: From fundamental research to clinical practice. *American Journal of Psychiatry*, *182*(2), 155–163. https://doi.org/10.1176/appi.ajp.20240092

Brand, M., Müller, A., Wegmann, E., Antons, S., Brandtner, A., Müller, S. M., … Potenza, M. N. (2025b). Current interpretations of the I-PACE model of behavioral addictions. *Journal of Behavioral Addictions*, *14*(1), 1–17. https://doi.org/10.1556/2006.2025.00020

Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience and Biobehavioral Reviews*, *104*, 1–10. https://doi.org/10.1016/j.neubiorev.2019.06.032

Brand, M., Young, K. S., Laier, C., Wölfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience and Biobehavioral Reviews*, *71*, 252–266. https://doi.org/10.1016/j.neubiorev.2016.08.033

Carvalho, I. P., Dores, A. R., Cataldo, I., Catalani, V., Pellegrini, L., Prevete, E., … Corazza, O. (2025). Forms of interventions for problematic usage of the internet: A scoping review. *Journal of Behavioral Addictions*, *14*(3), 1159–1198. https://doi.org/10.1556/2006.2025.00058

Csibi, S., Griffiths, M. D., Cook, B., Demetrovics, Z., & Szabo, A. (2018). The psychometric properties of the Smartphone Application-Based Addiction Scale (SABAS). *International Journal of Mental Health and Addiction*, *16*(2), 393–403. https://doi.org/10.1007/s11469-017-9787-2

Davis, R. A. (2001). A cognitive-behavioral model of pathological internet use. *Computers in Human Behavior*, *17*(2), 187–195. https://doi.org/10.1016/S0747-5632(00)00041-8

Elhai, J. D., Sapci, O., Yang, H., Amialchuk, A., Rozgonjuk, D., & Montag, C. (2021). Objectively-measured and self-reported smartphone use in relation to surface learning, procrastination, academic productivity, and psychopathology symptoms in college students. *Human Behavior and Emerging Technologies*, *3*(5), 912–921. https://doi.org/10.1002/hbe2.254

Fineberg, N. A., Demetrovics, Z., Potenza, M. N., Mestre-Bach, G., Ekhtiari, H., Roman-Urrestarazu, A., … Stein, D. J. (2025). Global action on problematic usage of the internet: Announcing a lancet psychiatry commission. *The Lancet Psychiatry*, *12*(1), 11–13. https://doi.org/10.1016/S2215-0366(24)00323-7

Fineberg, N. A., Demetrovics, Z., Stein, D. J., Ioannidis, K., Potenza, M. N., Grünblatt, E., … Chamberlain, S. R. (2018). Manifesto for a European research network into problematic usage of the internet. *European Neuropsychopharmacology*, *28*(11), 1232–1246. https://doi.org/10.1016/j.euroneuro.2018.08.004

Fineberg, N. A., Menchón, J. M., Hall, N., Dell'Osso, B., Brand, M., Potenza, M. N., … Zohar, J. (2022). Advances in problematic usage of the internet research–A narrative review by experts from the European network for problematic usage of the internet. *Comprehensive Psychiatry*, *118*, 152346. https://doi.org/10.1016/j.comppsych.2022.152346

Griffiths, M. D. (1996). Internet addiction: An issue for clinical psychology? *Clinical Psychology Forum*, *97*, 32–36. https://doi.org/10.53841/bpscpf.1996.1.97.32

Griffiths, M. D. (2000). Internet addiction – Time to be taken seriously? *Addiction Research*, *8*, 413–418. https://doi.org/10.3109/16066350009005587

Griffiths, M. D. (2005). A 'components' model of addiction within a biopsychosocial framework. *Journal of Substance Use*, *10*(4), 191–197. https://doi.org/10.1080/14659890500114359

Griffiths, M. D. (2010). Trends in technological advance: Implications for sedentary behaviour and obesity in screenagers. *Education and Health*, *28*, 35–38.

Griffiths, M. D., & Szabo, A. (2014). Is excessive online usage a function of medium or activity?: An empirical pilot study. *Journal of Behavioral Addictions*, *3*(1), 74–77. https://doi.org/10.1556/JBA.2.2013.016

Huang, C. (2017). Time spent on social network sites and psychological well-being: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, *20*(6), 346–354. https://doi.org/10.1089/cyber.2016.0758

Ioannidis, K., Hook, R., Goudriaan, A. E., Vlies, S., Fineberg, N. A., Grant, J. E., & Chamberlain, S. R. (2019). Cognitive deficits in problematic internet use: Meta-analysis of 40 studies. *The British Journal of Psychiatry*, *215*(5), 639–646. https://doi.org/10.1192/bjp.2019.3

Király, O., Griffiths, M. D., & Demetrovics, Z. (2015). Internet gaming disorder and the DSM-5: Conceptualization, debates, and controversies. *Current Addiction Reports*, *2*(3), 254–262. https://doi.org/10.1007/s40429-015-0066-7

Király, O., Tóth, D., Urbán, R., Demetrovics, Z., & Maraz, A. (2017). Intense video gaming is not essentially problematic. *Psychology of Addictive Behaviors*, *31*(7), 807–817. https://doi.org/10.1037/adb0000316

Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health*, *14*(3), 311. https://doi.org/10.3390/ijerph14030311

Madigan, S., Browne, D., Racine, N., Mori, C., & Tough, S. (2019). Association between screen time and children's performance on a developmental screening test. *JAMA Pediatrics*, *173*(3), 244–250. https://doi.org/10.1001/jamapediatrics.2018.5056

McArthur, B. A., Volkova, V., Tomopoulos, S., & Madigan, S. (2022). Global prevalence of meeting screen time guidelines among children 5 years and younger: A systematic review and meta-analysis. *JAMA Pediatrics*, *176*(4), 373–383. https://doi.org/10.1001/jamapediatrics.2021.6386

Montag, C., Dagum, P., Hall, B. J., & Elhai, J. D. (2022). Do we still need psychological self-report questionnaires in the age of the internet of things? *Discover Psychology*, *2*(1), 1. https://doi.org/10.1007/s44202-021-00012-4

Montag, C., Demetrovics, Z., Elhai, J. D., Grant, D., Koning, I., Rumpf, H.-J., … Van Den Eijnden, R. (2024a). Problematic

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social media use in childhood and adolescence. *Addictive Behaviors*, *153*, 107980. https://doi.org/10.1016/j.addbeh.2024.107980

Montag, C., Marciano, L., Schulz, P. J., & Becker, B. (2023). Unlocking the brain secrets of social media through neuroscience. *Trends in Cognitive Sciences*, *27*(12), 1102–1104. https://doi.org/10.1016/j.tics.2023.09.005

Montag, C., Pontes, H. M., Kannen, C., Rozgonjuk, D., Brandt, D., Bischof, A., … Rumpf, H. J. (2024b). Examining the interplay between internet use disorder tendencies and well-being in relation to sofalizing during the COVID-19 pandemic. *Comprehensive Psychiatry*, *130*, 152452. https://doi.org/10.1016/j.comppsych.2024.152452

Montag, C., & Rumpf, H. J. (2021). The potential of digital phenotyping and mobile sensing for psycho-diagnostics of internet use disorders. *Current Addiction Reports*, *8*, 422–430. https://doi.org/10.1007/s40429-021-00376-6

Montag, C., Schivinski, B., & Pontes, H. M. (2021). Is the proposed distinction of gaming disorder into a predominantly online vs. offline form meaningful? Empirical evidence from a large German speaking gamer sample. *Addictive Behaviors Reports*, *14*, 100391. https://doi.org/10.1016/j.abrep.2021.100391

Moretta, T., Buodo, G., Demetrovics, Z., & Potenza, M. N. (2022). Tracing 20 years of research on problematic use of the internet and social media: Theoretical models, assessment tools, and an agenda for future work. *Comprehensive Psychiatry*, *112*, 152286. https://doi.org/10.1016/j.comppsych.2021.152286

Niu, X., Xie, Y.-X., Gou, L.-X., King, D. L., Gu, J.-J., & Wang, J.-L. (2023). The association between adult attachment and problematic internet use: A three-level meta-analysis. *Computers in Human Behavior*, *149*, 107957. https://doi.org/10.1016/j.chb.2023.107957

Pontes, H. M., Szabo, A., & Griffiths, M. D. (2015). The impact of internet-based specific activities on the perceptions of internet addiction, quality of life, and excessive usage: A cross-sectional study. *Addictive Behaviors Reports*, *1*, 19–25. https://doi.org/10.1016/j.abrep.2015.03.002

Rumpf, H.-J., Achab, S., Billieux, J., Bowden-Jones, H., Carragher, N., Demetrovics, Z., … Poznyak, V. (2018). Including gaming disorder in the ICD-11: The need to do so from a clinical and public health perspective: Commentary on: A weak scientific basis for gaming disorder: Let us err on the side of caution (van Rooij et al., 2018). *Journal of Behavioral Addictions*, *7*(3), 556–561. https://doi.org/10.1556/2006.7.2018.59

Saletti, S. M. R., Van den Broucke, S., & Chau, C. (2021). The effectiveness of prevention programs for problematic internet use in adolescents and youths: A systematic review and meta-analysis. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *15*(2). https://doi.org/10.5817/CP2021-2-10

Shapira, N. A., Lessig, M. C., Goldsmith, T. D., Szabo, S. T., Lazoritz, M., Gold, M. S., & Stein, D. J. (2003). Problematic internet use: Proposed classification and diagnostic criteria. *Depression and Anxiety*, *17*(4), 207–216. https://doi.org/10.1002/da.10094

Solly, J. E., Hook, R. W., Grant, J. E., Cortese, S., & Chamberlain, S. R. (2022). Structural gray matter differences in problematic usage of the internet: A systematic review and meta-analysis. *Molecular Psychiatry*, *27*(2), 1000–1009. https://doi.org/10.1038/s41380-021-01315-7

Starcevic, V. (2013). Is internet addiction a useful concept? *Australian and New Zealand Journal of Psychiatry*, *47*(1), 16–19. https://doi.org/10.1177/0004867412461693

Starcevic, V., & Aboujaoude, E. (2017). Internet addiction: Reappraisal of an increasingly inadequate concept. *CNS Spectrums*, *22*(1), 7–13. https://doi.org/10.1017/S1092852915000863

Statista. (2024). Smartphone penetration worldwide as share of global population 2016–2023. Retrieved September 20, 2024, from https://www.statista.com/statistics/203734/global-smartphone-penetration-per-capita-since-2005/.

Stein, D. J. (1997). Internet addiction, internet psychotherapy. *The American Journal of Psychiatry*, *154*(6), 890. https://doi.org/10.1176/ajp.154.6.890

Stein, D. J., Black, D. W., Shapira, N. A., & Spitzer, R. L. (2001). Hypersexual disorder and preoccupation with internet pornography. *American Journal of Psychiatry*, *158*(10), 1590–1594. https://doi.org/10.1176/appi.ajp.158.10.1590

Stein, D. J., & Hartford, A. (2022). Health-policy approaches for problematic internet use: Lessons from substance use disorders. *Current Opinion in Behavioral Sciences*, *46*, 101151. https://doi.org/10.1016/j.cobeha.2022.101151

Stein, D. J., Nielsen, K., Hartford, A., Gagné-Julien, A. M., Glackin, S., Friston, K., … Aftab, A. (2024). Philosophy of psychiatry: Theoretical advances and clinical implications. *World Psychiatry*, *23*(2), 215–232. https://doi.org/10.1002/wps.21194

World Health Organization. (2019). ICD-11 for mortality and morbidity statistics. Retrieved 12 October 2024 from https://icd.who.int/browse11/l-m/en.

Young, K. S. (1996). Psychology of computer use: XL. Addictive use of the internet: A case that breaks the stereotype. *Psychological Reports*, *79*(3), 899–902. https://doi.org/10.2466/pr0.1996.79.3.899

Zare-Bidoky, M., Baldacchino, A. M., Demetrovics, Z., Fineberg, N. A., Kamali, M., Khazaal, Y., … Ekhtiari, H. (2025). Problematic usage of the internet: Converging and diverging terminologies and constructs. *Journal of Behavioral Addictions*. https://doi.org/10.1556/2006.2025.00085

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