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Methodological issues in behavioral addictions' research: A call for an unbiased analysis of excessive behaviors☆

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ABSTRACT

In the psychological literature, there has been a proliferation of new behavioral addictions, often biased by an aprioristic and confirmatory approach that applied the addiction framework without adequately considering other potential explanations of excessive behaviors. This position paper further extends the critiques previously pointed out in the literature by highlighting the methodological issues underlying the current behavioral addiction research and the need for future studies to avoid a confirmatory and aprioristic approach (whatever the etiological hypothesis). Analyzing repetitive behaviors in their own specifies could help find a balance between the risk of over-pathologizing common behaviors and not exploring new potential clinical disorders related to everyday (excessive) behaviors associated with functional impairment and deserving public health attention. Finally, we underline the value of recalling that if an existing diagnosis might explain the problematic behavior under consideration, a new clinical disorder should not be introduced in the literature.

1. Introduction

The concept of behavioral addiction as a clinical diagnosis is quite new. The Diagnostic and Statistical Manual of Mental Disorders (DSM) has formally recognized it only in its fifth edition (DSM-5; American Psychiatric Association, 2013). However, we can find some cases descriptions looking back in history. For example, problematic gambling was already widespread in ancient Greece. The Emperor Commodus seems to have caused the decline of the Roman Empire, among other things, because of his excessive and problematic gambling habits (Hekster, 2002). Moreover, in the 90s Marks (1990) proposed the concept of non-chemical addictions in the literature, hence introducing the study of those conditions that subsequently will be defined as behavioral addictions. Since then there has been an exponential increase in publications about behavioral addictions. 2013, which is the year in which the DSM-5 was published, saw a peak of 2563 papers (Billieux et al., 2015). The DSM-5 has included pathological gambling (or using the official terminology, Gambling Disorder) in the addictive behaviors section and the Internet Gaming Disorder in the section related to Emerging Measures and Models. This may have legitimated the study and the proposal of new behavioral addictions. In fact – as Mihordin (2012) warned when discussing the possible introduction of "behavioral addiction" as a new class of diagnoses in the DSM-5 – it could have led to the perception that every human behavior might have been medicalized. Unfortunately, in line with his preoccupation, we have reached a point in which many common behaviors have been labeled as potential behavioral addictions, such as tanning (Kourosh et al., 2010), dance – which has been proposed as an addiction based on a sample of salsa and ballroom dancers (Maraz et al., 2015), but which was already also studied in the specific form of Tango addiction (Targhetta et al., 2013) – and fortune-telling (Grall-Bonnec et al., 2015). Some scholars introduced problematic behaviors not explicitly defining them as behavioral addictions, like for series watching (Orosz, Böthe, & Tóth-Király, 2016) and problematic Tinder use (Orosz, Tóth-Király, Böthe, & Melher, 2016). Though, they clearly referred to the core addiction components while developing their assessment instruments. Most notably, the pathologization trend is still a significant issue, as testified by recent publications about problematic mukbang watching – where mukbang stands for broadcasts of people eating a lot of food while interacting with viewers (Kircaburun et al., 2021), milk tea addiction (Qu et al., 2023), and artificial intelligence chatbot dependence (Zhang et al., 2025). However, this tendency might affect the relevance and credibility of the behavioral addiction field (Kardafelt-Winther et al., 2017) and even of the study of excessive common behaviors as potential clinical disorders,

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whatever the theoretical framework adopted.

2. Methodological issues in the analysis of excessive behaviors

Billieux et al. (2015) promptly stressed that scholars were proposing several new potential behavioral addictions concerning many daily behaviors, with the risk of overpathologizing them, usually based on "the *observation* that excessive involvement in those activities is associated with key addiction symptoms such as *apparent* tolerance and withdrawal, loss of control, craving, cognitive salience, or mood regulation" (p. 120). More specifically, they highlighted that the creation of these diagnoses generally follows a *three-step approach that is atheoretical and confirmatory*. In the first step, following an anecdotal observation, the researchers consider the specific behavior (such as tanning or dancing) as an addictive behavior (*a priori* approach). Following this, they develop a screening instrument referring to the core symptoms of substance addictions (confirmatory approach). Finally, they carry on studies to unearth those risk factors that are usually associated with substance addictions and that, by analogy, they suppose characterize the new behavioral addiction too (confirmatory approach). However, there are some issues with each of the three steps.

First, we underline that an anecdotal observation should not be sufficient for proposing a new behavioral addiction. As an example, Orosz, Tóth-Király, et al. (2016) suggested a new potential problem behavior, namely problematic Tinder use, concluding that it is a condition deserving the attention of scientific investigation. They reported two anecdotes about girls who defined Tinder as addictive. However, in clinical practice, we should not rely totally on the patients/clients' definitions, especially when related to clinical diagnoses. The fact that people define themselves as addicted (or whatever else, such as obsessed, depressed or having panic attacks) does not mean that they actually have the core symptoms of the diagnosis they made by themselves. The clinician should not accept their diagnoses as true but rather conduct an accurate clinical assessment aiming to define the correct diagnosis, which in some case could be the same proposed by the patients, but this is not always the case. Hence, even if Tinder users define themselves as addicted, we should not immediately think of proposing a new behavioral addiction but rather try to analyze whether some other already existing diagnoses, or no diagnosis at all, could be better applied to the case. In line with this, Calvo et al. (2018) showed that Star Wars Universe Gamers who defined themselves as addicted and reported functional impairment due to their activity did not reach the cut-off score required by the instrument they used to evaluate if they were addicted to the game. Along this line, a researcher suspecting a case of a new behavioral addiction should make a comprehensive assessment of the person *without hypotheses* and not conduct a complete interview to verify the addiction hypothesis, as, for example, has been done in the case of Argentine Tango addiction (Targhetta et al., 2013).

Second, concerning the development of screening instruments for the presumed new behavioral addiction, Billieux et al. (2015) observed that developing items based on the addictive disorders criteria is not simple for all the addictions components, and it is indeed quite difficult, especially as concerns tolerance, which is one of the key addiction features (Shaffer et al., 2004). They reported examples of proposals for assessing tolerance in behavioral addictions that do not seem to capture tolerance accurately. Block (2008), referring to Internet addiction, proposed that tolerance correspond to the need for more hours of use and for better computer equipment and more software. Similarly, Chóliz (2010), in the context of mobile phone addiction, proposed tolerance as increase in mobile phone use and the need for new models, following the market trends. These are only two of the examples of weak operationalization of tolerance that are reported by Billieux et al. (2015), but there are others in literature. For example, in the Internet gaming disorder area, Razum et al. (2023) conducted a systematic review of quantitative and qualitative studies using the conceptualization of tolerance as an increasing amount of time spent on gaming. They showed that while psychometric studies highlighted that the tolerance item has from acceptable to high factor loading on the single factor, there are other quantitative studies (analyzing the relationships with well-being outcomes) suggesting tolerance might be a peripherical criterion, in line with qualitative research showing that it is not viewed by gamers as a sign of addiction and pointing out that the motivation to increase the time devoted to gaming is for a purpose, such as reaching more complicated goals or reaping rewards. Moreover, Brevers et al. (2021) highlighted a similar issue for the Exercise Addiction Inventory (EAI; Terry et al., 2004), as it includes a tolerance item asking about the increase in time spent doing exercise. This might reflect a healthy progression or training effect instead of a tolerance issue. Similarly, Andreassen et al. (2012) proposed, as a tolerance item for work addiction, having spent more time working than initially intended. However, this could also reflect a component of positive engagement (i.e., absorption) instead of the negative addictive aspect of tolerance. In line with this, the Bergen Study Addiction Scale (BStAS; Atroszko et al., 2015) – that has been developed by changing in the Bergen Work Addiction Scale (BWAS; Andreassen et al., 2012) items the words related to work with words about study – showed issues with items 1 and 2 (i.e., salience and tolerance items) in the Italian version (Loscalzo & Giannini, 2018). Specifically, these two items have low communality values and low factor loadings. Thus, Loscalzo and Giannini (2018) pointed out that the content of the tolerance item (i.e., spending more time studying than initially intended) could represent study absorption rather than tolerance. In the same line, they suggested a similar problem for the salience item. Students could think about freeing up more time for study because they usually devote little time to study or are engaged in their studies. In sum, Loscalzo and Giannini (2018) suggested that both addicted and engaged students could endorse these two items. Thus, it is unsurprising that Atroszko et al. (2023) recently showed that these two BStAS items are problematic in some countries and suggested removing them to get an acceptable fit across different countries and genders.

In line with this, Fournier et al. (2023), focusing on social media use, showed that salience and tolerance are peripheral features and that instruments based on the six-component model (i.e., salience, tolerance, mood modification, relapse, withdrawal, and conflict) tend to pathologize the involvement in appetitive behaviors. Similarly, in the field of problematic Instagram use, Marengo et al. (2024) showed that salience and tolerance constitute a high engagement factor distinguished from a second factor comprehending mood modification, relapse, withdrawal, and conflict. Thus, scholars increasingly suggest the crucial distinction between "regular"/positive high involvement and pathological high involvement (e.g., Billieux et al., 2019; Charlton & Danforth, 2007; Loscalzo & Giannini, 2017a, 2017b). For instance, in the work area, Loscalzo and Giannini (2017b) suggested using the Heavy Work Investment model by Snir and Harpaz (2012) and distinguishing between engaged and disengaged workaholics as this prevents overpathologizing a common behavior such as work. Thus, they differentiate among three different types of heavy work investor. In their theorization, workaholics have addictive and obsessive symptoms but might be characterized by either low (disengaged workaholics) or high (engaged workaholics) work engagement. Moreover, there are workers who are highly engaged in their jobs but do not have workaholism (i.e., engaged workers). Since it is crucial to avoid defining as pathological a person who is positively highly devoted to the job, Loscalzo and Giannini (2019) created an instrument that allows the evaluation of both workaholism and work engagement (Work-related Inventory) and distinguishes among the three types of heavy work investor. Similarly, they analyzed heavy study investment by distinguishing among disengaged studyholics, engaged studyholics, and engaged students (Loscalzo & Giannini, 2017a) and supporting the conceptualization of Studyholism as an OCD-related disorder rather than a behavioral addiction (Loscalzo, 2024). However, in the work and study area, the tendency in the literature is still to adopt the behavioral addiction framework with the related risk of pathologizing engaged workers/students.

Ko and Yen (2015) stressed that there is an operationalization problem also for the withdrawal criterion. They wrote that the onset of withdrawal symptoms occurs because the addictive substance has a half-life, and that the variations in the symptoms depend on the pharmacological effect of the substance on the brain, which is not the case for behavioral addictions. In line with this, the review by Kaptis et al. (2016) showed that (for Internet gaming disorder) the withdrawal criterion is usually referred to as irritability and restlessness after the activity's cessation. Moreover, there are cases where withdrawal symptoms are not identified despite being present. Therefore, the operationalization problem might lead to labeling as an addictive-related withdrawal symptom a "regular" reaction of distress due to the interruption of an activity that positively engages the person. Finally, we suggest that an operationalization problem is present for the relapse criterion too, which in the case of work addiction has been translated into an item asking people if they have been requested by others to reduce working and have not listened to them. Though, this item does not reflect the main feature of the relapse addictive component, that is trying and succeeding in stopping the problematic behavior and then coming back to the previous addictive behavior.

Then, still concerning the second phase of the three-step approach, there are several instruments proposed to evaluate these new excessive behaviors. These instruments, beside all being based on the core components of addiction, such as those proposed by Griffiths (2005) or Goodman (1990), in some cases also can be defined as near-plagiarism of previous instruments (Griffiths et al., 2016). There are many instruments that share the same identical items and differ only in changing the word related to the specific behavior. Some examples are the 28-item pilot version of the Bergen Shop Addiction Scale (BSAS; Andreassen et al., 2015) and the Compulsive Online Shopping Scale (COSS; Manchiraju et al., 2016), the BWAS (Andreassen et al., 2012), and both the BStAS (Atroszko et al., 2015) for all the seven items and the Problematic Series Watching Scale (PSWS; Orosz, Böthe, & Tóth-Király, 2016) for four of its six items (a fifth item has changed also the word "stressed" to "restless or troubled"). Blaszczynski (2015), in line with this, reported that when proposing the diagnostic criteria for Gambling Disorder, Lesieur and Rosenthal (1991) used as model the substance addictions. However, since then, researchers are increasingly following this trend by "simply substituting and/or modifying the relevant wording to define a range of non-substance related behaviors as addictions" (Blaszczynski, 2015, p. 143). He believes that researchers should instead take a step back and consider the conceptual, theoretical and phenomenological features of the specific behaviors, consider alternative etiological explanations beside the addictive one, and distinguish common and enjoyable daily behaviors from pathological ones (Blaszczynski, 2015). However, there is still recent evidence about the lack of proper conceptualization of new potential clinical disorders. For example, scholars have recently devoted attention to problematic financial trading. Though, they usually adopted the lens of behavioral addictions and, especially, the gambling perspective (Loscalzo et al., in press) due to similarities between gambling and financial markets (Arthur et al., 2016; Newall & Weiss-Cohen, 2022).

Finally, there is also an issue concerning the third step, namely looking for biopsychosocial correlates of the new behavioral addictions based on the literature on substance addictions. Billieux et al. (2015) pointed out that, by using instruments that are based on the addiction framework, it is obvious that the researchers will find the expected relationships with the risk factors typical of addictions. Moreover, Billieux et al. (2015) underscored that the addiction model leads to a lack of specifity and of theoretically sound models that can specify the particular factors involved in each problematic and excessive behavior. In agreement with these authors, Van der Linden (2015) highlighted that the addiction model leads to treating as marginal other important factors such as the psychosocial, cultural, political and historical ones. Among the elements that Van der Linden (2015) suggested considering in the explanation of behavioral addictions are weak social ties, hyperindividualism, and unemployment. Kardefelt-Winther (2015) is also in line with the critical reflection about behavioral addictions introduced by Billieux et al. (2015). He extended their thoughts about the risk of overpathologizing common behaviors by pointing out that "the atheoretical approach also take us one step further away from conceptualizing psychiatric disorders that can be properly validated" (p. 126). He stressed that positing equality between two disordered behaviors because they share some traits may be problematic since some differences must exist between these two conditions. For this reason, he suggested that researchers should propose theoretically sound models that show the peculiar factors and processes of the problem behavior. Hence, he prompted researchers to consider alternative criteria to the addiction ones, since in his opinion going beyond the addiction framework could lead, at least in some cases, to more useful results, as it could allow us to identify the authentic manifestation of the new potential clinical condition. In the same line, Starcevic (2016) underlined that conceptualizing repetitive and problematic behaviors as addictions may be limiting for many reasons. First, the analogies imposed with substance addiction could be inaccurate, as shown by the difficulties in the operationalization of addictive features such as tolerance and withdrawal. Then, he stressed that usually the treatment for substance addictions includes abstinence, which, in the case of behavioral addictions, cannot be recommended, as for example it is not usually possible to recommend abstinence from work. Moreover, he referred to the stigma that it is associated with addictions. Finally, he affirmed that in the addiction model the repetitive and problematic behavior is postulated to be enacted to avoid unpleasant emotional states that are associated with abstinence from the behavior. However, while this is true in the case of substance addictions, this is not always the case with behavioral addictions. The purposes of these problematic behaviors might be different, and this has been shown for gambling disorder too (e.g., coping and escaping or emotion management). It is interesting to note that Starcevic (2016) stressed that referring only to the addiction model could lead to the same problems found with the concept of the obsessive–compulsive spectrum disorders: it leads to not considering the function of the behavior and hence prevents the understanding of the phenomenon and the development of specific treatments. He concluded his paper by highlighting that it would be a mistake to look only at the external expression of addiction-like symptoms and not addressing the problems underneath. He suggested taking a step back and considering the fact that a few years ago there was a similar excess with regard to the obsessive–compulsive spectrum disorders, and hence avoiding again repeating the same mistakes. He believes that the "addiction framework is only one way of conceptualizing disorders characterized by repetitive and problematic behaviours and poor impulse control. There is no evidence that other conceptual approaches are inferior" (Starcevic, 2016, p. 725), and that we still have to understand whether specific behaviors are better conceptualized as impulse control disorders, obsessive–compulsive disorder, addiction, or other.

An example of the *a priori* and confirmatory addiction model approach applied to a new potential behavioral addiction is the paper of Grall-Bronnec et al. (2015), which described a proposed case of fortune-telling addiction. The authors presented the case of a 45-year old woman that came to their department, which is specialized in addictive disorders, since she reported being clairvoyance addicted. However, even if they considered three other differential diagnoses (i.e., Obsessive-Compulsive Disorder, Generalized Anxiety Disorder, and Unspecified Anxiety Disorder), they concluded that the woman had a fortune-teller addiction. This could be the case; however, it appears that they referred to competing diagnoses only in terms of differential diagnoses, and not as real alternative diagnostic hypotheses. In other words, it seems as if they were gathering information to confirm their addiction hypothesis. For example, as far as concerns Obsessive-Compulsive Disorder (OCD) features that could be found in their case report, they said that she is characterized by ego-syntonic feelings, which is in contrast with the ego-dystonic nature of OCD symptoms, even though they also

recognize that this ego-dystonic feature is not actually always present in OCD. They also wrote that her compulsion regarding clairvoyance is not stereotyped (as it should be in OCD), since she did not have a preferred way of consultation: she could use either the phone or Internet. However, just as substance addiction symptoms must be adapted to the specificity of behavioral addictions, the same should be done for OCD symptoms when applied to particular kinds of obsessions and compulsions, especially considering the heterogeneous nature of OCD. For example, in a study about attachment, Pozza et al. (2021) found that different OCD symptoms might be characterized by different facets of attachment insecurity. Finally, they did not stress appropriately her two major depression episodes and two negative life events, namely sexual abuse and the death of a family member, for which she was in therapy. Both Major Depression and Post-Traumatic Stress Disorder should also be considered as competing explanations for the compulsion for fortune-teller consultations before proposing a new addiction diagnosis.

As a last point that further complicates the field of behavioral addiction research, there is disagreement about the definition of OCD as a behavioral addiction. Grassi et al. (2015) published a study in which they compared 38 OCD patients with 39 healthy controls on impulsivity, decision-making and probabilistic reasoning. They found that the OCD group had higher impulsivity, decision-making that is characterized by risky behaviors, and biased probabilistic reasoning, which are addiction features. Based on these findings, they concluded that the addiction model could be better than the anxiety-avoidance model for OCD, in line with some previous studies (e.g., Holden, 2001; Grant et al., 2006) and suggesting a dependency on compulsions. However, Abramovitch and McKay (2016) replied that such a conclusion cannot be drawn. They stressed that Grassi et al. (2015) actually found evidence for difficulties in planning and cognitive impulsivity (which are typical in OCD), but not in behavior impulsivity, an addiction feature. Hence, they concluded that the literature currently indicates that OCD is not characterized by the two main components of addictions, behavior impulsivity and risky decision-making. Moreover, they stressed that currently impulsivity and compulsivity are conceptualized as orthogonal factors in many conditions (Finenberg et al., 2010). Grassi et al. (2016) answered Abramovitch and Mckay (2016)'s commentary on their study by re-affirming their conclusion. They stated that the lack of findings related to higher motor impulsivity in their OCD sample could be due to the limits of the instrument they used (the Barratt Impulsiveness Scale, version 11; BIS-11, Patton et al., 1995) in evaluating this dimension, not because of the lack of this feature in OCD. Moreover, they affirmed that their "study supports the presence of cognitive impulsivity in OCD patients as has also been observed in addictive disorders, and therefore supports the behavioral addiction model of OCD" (p. 399). We believe, in line with Abramovitch and Mckay (2016), that such a conclusion cannot be drawn yet, especially because of the conceptualization of impulsivity and compulsivity not as two mutually exclusive constructs, but rather as orthogonal factors across many disorders that could be present at different levels in different people with the same diagnosis (Cuzen & Stein, 2014). Moreover, their answer does not seem to address adequately Abramovitch and Mckay (2016)'s point related to the lack of behavior impulsivity, since they only refer to a possible limitation of the instrument they used. In conclusion, it seems that conceptualizing OCD as a behavioral addiction could create further confusion in the behavioral addiction field. This seems even more problematic if we consider that el-Guebaly et al. (2011) previously conducted a review intended to clarify the debate about considering pathological gambling (the only behavioral addiction recognized by the DSM-5; APA, 2013) as an addiction, an impulse control problem, or a disorder belonging to the obsessive–compulsive disorder category.

3. Conclusions

The picture provided by this paper about behavioral addiction research seems to indicate that many issues mar the research in the field and that, using the words of Reinarman and Granfield (2015), scholars have become addicted to addiction. However, it should be noted that these authors' primary aims are to stress the risk of over-pathologizing common behaviors and to promote more accurate research in the field of excessive behaviors, so to avoid to over-pathologizing common behaviors on the one hand, but also to avoid not considering new potential clinical conditions on the other. For example, Potenza (2015) stressed that the fictitious case of Research Addiction presented by Billieux et al. (2015) in their provocative paper is more controversial than how they depicted it. He reported that in Palo Alto (California, USA), there have been many teenage suicides that seem related to high academic pressures and distress. By reporting this information, Potenza (2015) wanted to stress that besides the fact that these teenagers were or were not addicted to their work, it is important not only to avoid an over-pathologization of common behaviors but also not to reject prematurely potential new clinical conditions related to academic features that could seriously negatively affect the person. In line with this, both Atroskzo et al. (2015) and Loscalzo and Giannini (2017a) analyzed a potential new clinical disorder associated with problematic over-studying. However, Atroszko et al. (2015) embraced the behavioral addiction framework and adapted a previous work addiction instrument by changing the terms about work with terms about study. Loscalzo and Giannini (2017a), instead, considered the possibility that problematic overstudying might be conceptualized as a behavioral addiction, an OCD-related disorder, or even as a condition made up by both internalizing and externalizing features (as they suggested for problematic overworking; Loscalzo & Giannini, 2017b). More importantly, Loscalzo and Giannini (2018) pointed out the need to distinguish between different types of heavy study investor since it is critical to avoid labeling as pathological or studyholics students who are highly engaged in their studies (also in line with their workaholism model; Loscalzo & Giannini, 2017b). Then, they designed two scales specifically developed for measuring Studyholism: the Studyholism Inventory (SI-10; Loscalzo et al., 2018; Loscalzo & Giannini, 2020), which also evaluates study engagement, and the Studyholism Inventory – Extended Version (SI-15; Loscalzo & Giannini, 2022), that includes a subscale about functional impairment as a core component to define the behavior as problematic. Finally, growing empirical research supported the definition of problematic overstudying as an OCD-related disorder (Loscalzo, 2024). However, the debate about its definition is still open (Loscalzo, 2024), and we believe it is vital to adopt an open approach when analyzing it, thus favoring the unveiling of the real nature of this new potential clinical disorder.

In conclusion, we recommend that future research about problematic repetitive behaviors be conducted by following Billieux et al. (2015) and Kardefelt-Winther (2015) suggestions: it is vital to avoid a confirmatory and aprioristic approach (whatever it is: behavioral addiction or any other kind of framework, such as OCD disorder). By analyzing the construct in its own specifies, we could find a balance between the risk of over-pathologizing a common behavior and not investigating new potential clinical disorders related to everyday (excessive) behaviors. As pointed out, for example, by Perales et al. (2020) and Brand et al. (2022), it is crucial to avoid over-pathologizing everyday life behaviors, but we should also avoid trivializing conditions that are of clinical and/or public health significance (e.g., problematic gaming, working or studying), whatever the proper theoretical conceptualization. Moreover, with a thorough and unbiased analysis of new potential clinical conditions, we could prevent proposing new clinical disorders when an existing diagnosis might explain the problematic behavior under consideration. Finally, this approach could also help avoid creating new diagnoses for excessive reward-driven behaviors that do not necessarily indicate the presence of a psychopathology (Starcevic et al., 2018).

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Yura Loscalzo: Writing – original draft, Conceptualization. **Marco**

Giannini: Writing – review & editing.

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References

American Psychiatric Association (2013). DSM-5. Diagnostic and statistical manual of mental disorders – 5th ed. Washington, DC: Author.

Abramovitch, A., & McKay, D. (2016). Behavioral impulsivity in obsessive-compulsive disorder. *Journal of Behavioral Addictions, 5*(3), 395–397. https://doi.org/10.1556/2006.5.2016.029

Andreassen, C., & S., Griffiths, M. D., Hetland, J. & Pallesen, S.. (2012). Development of a work addiction scale. *Scandinavian Journal of Psychology, 53*, 265–272. https://doi.org/10.1111/j.1467-9450.2012.00947.x

Andreassen, C. S., Griffiths, M. D., Pallesen, S., Bilder, R. M., Torsheim, T., & Aboujaoude, E. (2015). The Bergen shopping addiction scale: Reliability and validity of a brief screening test. *Frontiers in Psychology, 6*, 1374. https://doi.org/10.3389/fpsyg.2015.01374

Arthur, J. N., Williams, R. J., & Delfabbro, P. H. (2016). The conceptual and empirical relationship between gambling, investing, and speculation. *Journal of Behavioral Addictions, 5*(4), 580–591. https://doi.org/10.1556/2006.5.2016.084

Atroszko, P. A., Andreassen, C. L., Griffiths, M. D., & Pallesen, S. (2015). Study addiction – A new area of psychological study: Conceptualization, assessment, and preliminary empirical findings. *Journal of Behavioral Addictions, 4*(2), 75–84. https://doi.org/10.1556/2006.4.2015.007

Atroszko, P. A., Charzyńska, E., Buźniak, A., Czerwiński, S. K., Griffiths, M. D., Jankowska, A., & Pallesen, S. (2023). Validity, reliability, and cross-cultural comparability of a problematic overstudying scale across European, North American, and Asian countries. *International Journal of Mental Health and Addiction, 1–23*. https://doi.org/10.1007/s11469-023-01128-5

Billieux, J., Flayelle, M., Rumpf, H.-J., & Stein, D. J. (2019). High involvement versus pathological involvement in video games: A crucial distinction for ensuring the validity and utility of gaming disorder. *Current Addiction Reports, 6*, 323–330. https://doi.org/10.1007/s40429-019-00259-x

Billieux, J., Schimmenti, A., Khazaal, Y., Maurage, P., & Heernen, 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

Blaszczynski, A. (2015). Commentary on: Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. *Journal of Behavioral Addictions, 4*(3), 142–144. https://doi.org/10.1556/2006.4.2015.016

Block, J. J. (2008). Issues for DSM-V: Internet addiction. *American Journal of Psychiatry, 165*, 306–307. https://doi.org/10.1176/appi.ajp.2007.0710155

Brand, M., Rumpf, H.-J., Demetrovics, Z., Müller, A., Stark, R., King, D. L., Goudriaan, A. E., Mann, K., Trotzke, P., Fineberg, N. A., Chamberlain, S. R., Kraus, S. W., Wegmann, E., Billieux, J., & Potenza, M. N. (2022). Which conditions should be considered as disorders in the ICD-11 designation of "other specified disorders due to addictive behaviors"? *Journal of Behavioral Addictions, 11*(2), 150–159. https://doi.org/10.1556/2006.2020.00035

Brevers, D., Maurage, P., Kohut, T., Perales, J.C., & Billieux, J. (2022). On the pitfalls of conceptualizing excessive physical exercise as an addictive disorder: Commentary on Dinardi et al. (2021). Journal of Behavioral Addictions, 11(2), 234-239. DOI: 10.1556/2006.2022.00001.

Calvo, F., Carbonell, X., Oberst, U., & Fuster, H. (2018). May the passion be with you: The addictive potential of collectible card games, miniatures, and dice of the Star Wars universe. *Journal of Behavioral Addictions, 7*(3), 727–736. https://doi.org/10.1556/2006.7.2018.73

Charlton, J. P., & Danforth, I. D. W. (2007). Distinguishing addiction and high engagement in the context of online game playing. Computers in Human Behavior, 23(3), 1531 1548. DOI: 10.1016/j.chb.2005.07.002.

Chóliz, M. (2010). Mobile phone addiction: A point of issue. *Addiction, 105*, 373–374. https://doi.org/10.1111/j.1360-0443.2009.02854.x

Cuzen, N. L., & Stein, D. J. (2014). Behavioral addiction: The nexus of impulsivity and compulsivity. In K. P. Rosenberg, & L. C. Feder (Eds.), Behavioral Addictions. Crtieria, Evidence, and Treatment, (pp. 19-34). London: Academic Press, Elsevier.

el-Guebaly, N., Mudry, T., Zohar, J., Tavares, H., & Potenza, M. N. (2011). Compulsive features in behavioural addictions: The case of pathological gambling. *Addiction, 107*, 1726–1734. https://doi.org/10.1111/j.1360-0443.2011.03546.x

Finenberg, N. A., Potenza, M. N., Chamberlain, S. R., … Hollander, E. (2010). Probing compulsive and impulsive behaviors, from animal model to endophenotypes: A narrative review. *Neuropsychopharmacology, 35*, 591–604. https://doi.org/10.1038/npp.2009.185

Fournier, L., Schimmenti, A., Musetti, A., Boursier, V., Flayelle, M., Cataldo, I., Starcevic, V., & Billieux, J. (2023). Deconstructing the components model of addiction: An illustration through "addictive" use of social media. *Addictive Behaviors, 143*, Article 107694. https://doi.org/10.1016/j.addbeh.2023.107694

Goodman, A. (1990). Addiction: Definition and implications. *British Journal of Addiction, 85*, 1403–1408. https://doi.org/10.1111/j.1360-0443.1990.tb01620.x

Grall-Bronnec, M., Bulteau, S., Victorri-Vigneau, C., Bouju, G., & Sauvaget, A. (2015). Fortune telling addiction: Unfortunately a serious topic. About a case report. *Journal of Behavioral Addictions, 4*, 27–31. https://doi.org/10.1556/jba.4.2015.1.7

Grant, J. E., Brewer, J., & Potenza, M. N. (2006). The neurobiology of substance and behavioral addictions. *CNS spectrum, 11*, 924–930. https://doi.org/10.1017/s109285290001511x

Grassi, G., Pallanti, S., Righi, L., … Stratta, P. (2015). Think twice: Impulsivity and decision making in obsessive-compulsive disorder. *Journal of Behavioral Addictions, 4*(4), 263–272. https://doi.org/10.1556/2006.4.2015.039

Grassi, G., Figee, M., Stratta, P., Rossi, A., & Pallanti, S. (2016). Response to Cognitive impulsivity and the behavioral addiction model of obsessive compulsive disorder: Abramovitch and McKay (2016). *Journal of Behavioral Addiction, 5*(3), 398–400. https://doi.org/10.1556/2006.5.2016.069

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., Andreassen, C. S., Pallesen, S., Bilder, R. M., Torsheim, T., & Aboujaoude, E. (2016). When is a new scale not a new scale? The case of the Bergen Shopping Addiction Scale and the Compulsive Online Shopping Scale. *International Journal of Mental Health and Addiction, 14*, 1107–1110. https://doi.org/10.1007/s11469-016-9711-1

Hekster, O. (2002). *Commodus: An emperor at the crossroads (Dutch monographs on ancient history and archaeology)*. Amsterdam: Brill Academic Publishers.

Holden, C. (2001). "Behavioral addictions": Do they exist? *Science, 294*, 980–982. https://doi.org/10.1126/science.294.5544.980

Kaptsis, D., King, D. L., Delfabbro, P. H., & Gradisar, M. (2016). Withdrawal symptoms in internet gaming disorder: A systematic review. *Clinical Psychology Review, 43*, 58–66. https://doi.org/10.1016/j.cpr.2015.11.006

Kardefelt-Winther, D. (2015). Commentary on: Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. Problems with atheoretical and confirmatory research approaches in the study of behavioral addictions. *Journal of Behavioral Addictions, 4*(3), 126–129. https://doi.org/10.1556/2006.4.2015.019

Kardefelt-Winther, D., Heeren, A., Schimmenti, A., van Rooij, A., Maurage, P., Carras, M., Edman, J., Blaszczynski, A., Khazaal, Y., & Billieux, J. (2017). How can we conceptualize behavioral addiction without pathologizing common behaviors? *Addiction, 112*, 1709–1715. https://doi.org/10.1111/add.13763

Kircaburun, K., Stavropoulos, V., Harris, A., Calado, A., Emirteking, E., & Griffiths, M. D. (2021). Development and Validation of the Mukbang Addiction Scale. International Journal of Mental Health and Addiction, 19, 1031-1044 (2021). DOI: 10.1007/s11469-019-00210-1.

Ko, C.-H., & Yen, J.-Y. (2015). Commentary on: Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. Excessive behaviors are nor necessarily addictive behaviors. *Journal of Behavioral Addictions, 4*(3), 130–131. https://doi.org/10.1556/2006.4.2015.015

Kourosh, A. S., Harrington, C. R., & Adinoff, B. (2010). Tanning as a behavioral addiction. *The American Journal of Drug and Alcohol Abuse, 36*, 284–290. https://doi.org/10.3109/00952990.2010.491883

Lesieur, H., & Rosenthal, R. (1991). Pathological gambling: A review of the literature (prepared for the American Psychiatric Association Task Force on DSM-IV committee on disorders of impulse control not elsewhere classified). *Journal of Gambling Studies, 7*, 5–40. https://doi.org/10.1007/BF01019763

Loscalzo, Y. (2024). Studyholism as a new potential OCD-related disorder: What evidence have we gathered until now? *A narrative review. Behavioral Sciences, 14*, 684. https://doi.org/10.3390/bs14080684

Loscalzo, Y., & Giannini, M. (2017a). Studyholism or study addiction? A comprehensive model for a possible new clinical condition. In A. M. Columbus (Ed.), *Advances in Psychology Research* (volume 125, pp. 19–37). New York: Nova Publishers.

Loscalzo, Y., & Giannini, M. (2017b). Clinical conceptualization of workaholism: A comprehensive model. *Organizational Psychology Review, 7*(4), 306–329. https://doi.org/10.1177/2041386617734299

Loscalzo, Y., & Giannini, M. (2018). Problematic overstudying: Studyholism or study addiction? Commentary on: Ten myths about work addiction (Griffiths et al., 2018). *Journal of Behavioral Addictions, 7*(4), 867–870. https://doi.org/10.1556/2006.7.2018.124

Loscalzo, Y., & Giannini, M. (2019). What type of worker are you? Work-Related Inventory (WI-10): A comprehensive instrument for the measurement of workaholism. *WORK: A Journal of Prevention, Assessment & Rehabilitation, 62*(3), 383–392. https://doi.org/10.3233/WOR-192875

Loscalzo, Y., & Giannini, M. (2020). Studyholism Inventory (SI-10): A short instrument for evaluating study obsession within the Heavy Study Investment framework.

Europes' Journal of Psychology, 16(4), 688–706. https://doi.org/10.5964/ejop.v16i4.1911

Loscalzo, Y., & Giannini, M. (2022). When Studying Becomes an Obsession: The Studyholism Inventory - Extended Version (SI-15). *Current Psychology, 41*(10), 6867–6879. https://doi.org/10.1007/s12144-020-01168-3

Loscalzo, Y., Giannini, M., & Golonka, K. (2018). Studyholism Inventory (SI-10): Psychometric properties of the Italian and Polish versions. In T. M. Ostrowski, B. Piasecka, & K. Gerc (Eds.), *Resilience and Health. Challenges for an Individual, Family and Community* (pp. 205–217). Jagiellonian University Press.

Loscalzo, Y., Rogier, G., & Velotti, P. (2025). Problematic trading: A systematic review of theoretical considerations. *Frontiers in Psychiatry. Manuscript accepted for publication*.

Manchiraju, S., Sadachar, A., & Ridgway, J. L. (2016). The compulsive online shopping scale (COSS): Development and validation using panel data. *International Journal of Mental Health and Addiction, 15*(1), 209–223. https://doi.org/10.1007/s11469-016-9662-6

Maraz, A., Urbán, R., Griffiths, M. D., & Demetrovics, Z. (2015). An empirical investigation of dance addiction. *PLoS ONE, 10*(5), Article e0125988. https://doi.org/10.1371/journal.pone.0125988

Marengo, D., Mignogna, A., Elhai, J. D., & Settanni, M. (2024). Distinguishing high engagement from problematic symptoms in Instagram users: Associations with big five personality, psychological distress, and motives in an Italian sample. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 18*(5), 4. https://doi.org/10.5817/CP2024-5-4

Marks, I. (1990). Behavioural (non-chemical) addictions. *British Journal of Addiction, 85*, 1389–1394. https://doi.org/10.1111/j.1360-0443.1990.tb01618.x

Mihordin, R. (2012). Behavioral addition - Quo vadis? *Journal of Nervous and Mental Disease, 200*(6), 489–491. https://doi.org/10.1097/NMD.0b013e318257c503

Newall, P. W. S., & Weiss-Cohen, L. (2022). The Gamblification of Investing: How a New Generation of Investors Is Being Born to Lose. *International Journal of Environmental Research and Public Health, 19*, 5391. https://doi.org/10.3390/ijerph19095391

Orosz, G., Böthe, B., & Tóth-Király, I. (2016). The development of the Problematic Series Watching Scale (PSWS). *Journal of Behavioral Addictions, 5*(1), 144–150. https://doi.org/10.1556/2006.5.2016.011

Orosz, G., Tóth-Király, I., Böthe, B., & Melher, D. (2016). Too many swipes for today: The development of the Problematic Tinder Use Scale (PTUS). *Journal of Behavioral Addictions, 5*(3), 518–523. https://doi.org/10.1556/2006.5.2016.016

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulisveness Scale. *Journal of Clinical Psychology, 51*, 768–774.

Perales, J. C., King, D. L., Navas, J. C., Schimmenti, A., Sescousse, G., Starcevic, V., van Holst, R., & Billieux, J. (2020). Learning to lose control: A process-based account of behavioral addiction. *Neuroscience and Biobehavioral Reviews, 108*, 771–780. https://doi.org/10.1016/j.neubiorev.2019.12.025

Potenza, M. N. (2015). Commentary on: Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. Defining and classifying non-substance or behavioral addictions. *Journal of Behavioral Addictions, 4*(3), 139–141. https://doi.org/10.1556/2006.4.2015.023

Pozza, A.; Dèttore, D.; Marazziti, D.; Doron, G.; Barcaccia, B.; Pallini, S. Facets of adult attachment style in patients with obsessive-compulsive disorder. Journal of Psychiatry Research, 144, 14-25. DOI: 10.1016/j.jpsychires.2021.09.045.

Qu, D., Zhang, X., Wang, J., Liu, B., Wen, X., Feng, Y., & Chen, R. (2023). New form of addiction: An emerging hazardous addiction problem of milk tea among youths. *Journal of Affective Disorders, 15*(341), 26–34. https://doi.org/10.1016/j.jad.2023.08.102

Razum, J., Baumgartner, B., & Glavak-Tkalić, R. (2023). Psychometric validity and the appropriateness of tolerance as a criterion for internet gaming disorder: A systematic review. *Clinical Psychology Review, 101*, Article 102256. https://doi.org/10.1016/j.cpr.2023.102256

Reinarman, C., & Granfield, R. (2014). Addiction is not just a brain disease: Critical studies of addiction. In R. Granfield and C. Reinarman (Eds,), Expanding Addictions. Critical Essays. New York, NY: Routledge (pp. 1-21).

Shaffer, H. J., LaPlante, D. A., LaBrie, R. A., Kidman, R. C., Donato, A. N., & Stanton, M. V. (2004). Toward a syndrome model of addiction: Multiple expressions, common etiology. *Harvard Review of Psychiatry, 12*(6), 367–374. https://doi.org/10.1080/10673220490905705

Snir, R., & Harpaz, I. (2012). Beyond workaholism: Towards a general model of heavy work investment. *Human Resource Management Review, 22*, 232–243. https://doi.org/10.1016/j.hrmr.2011.11.011

Starcevic, V. (2016). Behavioural addictions: A challenge for psychopathology and psychiatric nosology. *Australian & New Zealand Journal of Psychiatry, 50*(8), 721–725. https://doi.org/10.1177/0004867416654009

Starcevic, V., Billieux, J., & Schimmenti, A. (2018). Selfitis, selfie addiction, Twitteritis: Irresistible appeal of medical terminology for problematic behaviours in the digital age. *Australian and New Zealand Journal of Psychiatry, 52*, 408–409. https://doi.org/10.1177/0004867418763532

Targhetta, R., Nalpas, B., & Perney, P. (2013). Argentine tango: Another behavioral addiction? *Journal of Behavioral Addictions, 2*, 179–186. https://doi.org/10.1556/JBA.2.2013.007

Terry, A., Szabo, A., & Griffiths, M. (2004). The exercise addiction inventory: A new brief screening tool. *Addiction Research & Theory, 12*(5), 489–499. https://doi.org/10.1080/16066350310001637363

Van der Linden, M. (2015). Commentary on: Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. Addictions as a psychosocial and cultural construction. *Journal of Behavioral Addictions, 4*(3), 154–1147. https://doi.org/10.1556/2006.4.2015.019

Zhang, X., Yin, M., Zhang, M., Li, Z., & Li, H. (2025). The Development and Validation of an Artificial Intelligence Chatbot Dependence Scale. *Cyberpsychology, Behavior and Social Networking, 28*(2), 126–131. https://doi.org/10.1089/cyber.2024.0240