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## Expanding the Definition of Addiction: DSM-5 vs. ICD-11

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### Abstract

While considerable efforts have been made to understand the neurobiological basis of substance addiction, the potentially ‘addictive’ qualities of repetitive behaviors, and whether such behaviors constitute ‘behavioral addictions’, is relatively neglected. It has been suggested that some conditions, such as gambling disorder, compulsive stealing, compulsive buying, and compulsive sexual behavior, and problem internet use, have phenomenological and neurobiological parallels with substance use disorders. This review considers how the issue of ‘behavioral addictions’ has been handled by latest revisions of the Diagnostic and Statistical Manual (DSM) and International Classification of Disease (ICD), leading to somewhat divergent approaches. We also consider key areas for future research in order to address optimal diagnostic classification and treatments for such repetitive, debilitating behaviors.

### Introduction

The field of addictions has undergone dramatic changes in recent years. In 2001, Constance Holden wrote an article for *Science* discussing the concept of ‘behavioral addictions’<sup>1</sup>, and since that time, the issue of how best to conceptualize addictions and what to include under the umbrella of addiction has been the focus of considerable research attention.<sup>2–5</sup> Not surprisingly, both the Diagnostic and Statistical Manual, 5<sup>th</sup> Edition (DSM-5) and International Classification of Disease, 11<sup>th</sup> Edition (ICD-11) have attempted to address the nosological issue of whether ‘addiction’ should be enlarged to include not just psychoactive substances, but also types of behavior; and if so, what types of behavior should be included. This opinion article will review the DSM-5 and proposed ICD-11 changes to the category of substance use disorders and how each has handled the concept of behavioral addictions. In addition, this article will suggest some ideas for future research considerations in this field.

### The 5<sup>th</sup> Edition of the Diagnostic and Statistical Manual (DSM-5)

As compared to DSM-IV, the DSM-5’s chapter on addictions was changed from “Substance-Related Disorders” to “Substance-Related and Addictive Disorders” to reflect developing understandings regarding addictions.<sup>6</sup> The DSM-5 specifically lists nine types of substance

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addictions within this category (alcohol; caffeine; cannabis; hallucinogens; inhalants; opioids; sedatives, hypnotics, and anxiolytics; stimulants; and tobacco). These disorders are presented in separate sections, but they are not fully distinct because all drugs taken in excess activate the brain's reward circuitry, and their co-occurrence is common.

An important departure for DSM-5 from its predecessors was the inclusion of gambling disorder in the chapter on Substance-Related and Addictive Disorders. Gambling disorder was formerly listed as pathological gambling in the section on impulse control disorders not elsewhere classified. Gambling disorder was relocated because of evidence showing similarities in phenomenology and biology to substance use disorders.<sup>5</sup> For example, many people with gambling disorder report an urge or craving state prior to gambling, as do individuals with substance addictions; gambling often decreases anxiety and results in a positive mood state or "high", similar to substance intoxication; and emotional dysregulation often contributes to gambling cravings just as with alcohol or drug cravings. In addition, there are unusually high rates of co-occurrence between gambling disorder and substance use disorders.<sup>5,7–8</sup> In clinical samples, around 50% of participants with gambling disorder report substance abuse, and up to 63% of individuals seeking treatment for gambling disorder screen positive for lifetime substance use disorder. Some evidence from neuroimaging studies supports a shared neurocircuitry of gambling disorder and substance use disorders.<sup>9</sup> For example, abnormal functioning of the ventral medial prefrontal cortex has been associated with gambling and substance addictions, and diminished ventral striatal activation has also been implicated in the cravings associated with gambling and substance addictions.<sup>9–11</sup>

While gambling disorder was included in the addiction realm for DSM-5, other behaviors such as excessive sexual behavior, compulsive buying, Internet use, or stealing, were not included as the research on these behaviors was considered to be insufficient. The rejection of these other putative behavioral addictions in DSM-5 raises two important considerations for future research: first, what is the justification (based on published scientific literature) to characterize a repetitive behavior as a form of addiction, such as in the case of compulsive sexual behavior or problematic Internet use? And second, what is the evidentiary basis for how to categorize disorders in relation to each other? Without enough evidence to answer the first question, the second becomes moot. For example, the DSM-5 rejected its own Sexual and Gender Identity Disorders Work Group's proposal to include "hypersexuality" based on an objection to the implicit normative reference to the "right amount" of sexuality. Due to this rejection, arising from a lack of background research, there was no need to examine where hypersexuality should be categorized.

In the case of kleptomania (compulsive stealing), however, the situation differed. Long included in DSM, kleptomania would appear to have passed the initial threshold for inclusion – i.e. that it qualifies as a mental health disorder.<sup>5</sup> A recent definition of a mental health disorder suggests the defining features are: a behavioral or psychological syndrome or pattern that occurs in an individual; the consequences of which are clinically significant distress or disability; not merely an expectable response to common stressors and losses; reflects an underlying psychobiological dysfunction; is not solely a result of social deviance or conflicts with society; has diagnostic validity using one or more sets of diagnostic

validators; and has clinical utility.<sup>12</sup> Instead of assigning kleptomania to a work group, however, it was summarily categorized in the chapter on Disruptive, Impulse-control, and Conduct Disorders.<sup>6</sup> In fact, and contrary to its current grouping, evidence suggests that stealing in some individuals shares much with substance addiction – a similar clinical presentation with cravings, withdrawal, and tolerance; a similar neurocognitive and personality profile; controlled family studies supporting a shared relationship; and a similar responsiveness to pharmacological treatments, particularly to opioid antagonists.<sup>13</sup> Whereas the data are admittedly quite limited in terms of total number of publications for kleptomania's inclusion as a Substance-Related and Addictive Disorder, there are interestingly few if any data to support its categorization with either conduct disorder or intermittent explosive disorder.

In summary, DSM-5 concluded that of existing disorders, only gambling had enough in common with substance addictions to justify its inclusion with those other disorders. In addition, other disorders that have garnered much research attention around the world – problematic Internet use, compulsive sexual behavior – were deemed to have insufficient evidence for their inclusion as a disorder regardless of category.

### **International Classification of Disease, 11<sup>th</sup> Edition (ICD-11)**

The World Health Organization's ICD-11 Working Group on Obsessive-Compulsive and Related Disorders has proposed a different categorization of these 'behavioral addictions.' Diverging from the approach of DSM-5, the Working Group for ICD-11 has instead proposed that the category of impulse control disorders should be retained and should broadly define these disorders by the repeated failure to resist an impulse, drive, or urge to perform an act that is rewarding to the person (at least in the short-term), despite longer term harm either to the individual or to others.<sup>14</sup> It is suggested that gambling disorder should be included in this category instead of alongside substance addictions, and that the category should be broadened to include compulsive sexual behavior.<sup>14</sup> Other possible impulse control disorders such as problematic Internet use and compulsive buying were examined at length and it was felt that there were insufficient data, at this time, to support their inclusion as independent mental health conditions. For example, one argument (valid in our view) is that we cannot yet address whether excessive Internet represents a conduit for other types of repetitive behavior (e.g. sexual behaviour, or gambling), or constitutes a distinct entity in its own right.

To understand the proposed group of disorders, it is important to remember that the goal of the ICD-11 is not the same as that for DSM-5. Whereas DSM-5's goal is to provide a common research and clinical language for mental health problems, the WHO has emphasized that ICD-11 should pay particular attention to issues of clinical utility in a broad range of settings, global applicability, and scientific validity.<sup>15</sup> Therefore, because of the impact of compulsive sexual behavior on global public health, the Work Group recommended that compulsive sexual behavior be included as a disorder. In addition, because of the focus on clinical utility, the ICD-11 Working Group felt that conceptualizing compulsive sexual behavior disorder as being related to other impulse control disorders that

are characterized by repeated failures to resist impulses, drives, or urges despite longer-term harm would be most clinically useful.

Similarly, these goals underpinned the proposal to retain pathological gambling in the impulsive control disorders category as well. It was felt that categorizing problematic gambling behavior as an addiction was premature based on the scientific evidence and that such a change in categorization lacked clear clinical utility given that treatments other than those for substance addictions may be useful for problematic gambling behavior.<sup>16–17</sup> Although evidence may indicate that problematic gambling behavior clinically resembles substance addictions in many ways, data also support its relationship to other impulse control disorders and further supports its categorization as an impulse control disorder.<sup>5</sup>

In summary, the ICD-11 Work Group recommended, based on the current evidence, that there be a category of impulse control disorders and that this category should include pathological gambling, kleptomania, pyromania, compulsive sexual disorder, and intermittent explosive disorder. Keeping these disorders all together, arguably contrary to the DSM-5 approach, should increase the chance that clinicians, who identify a given impulse control disorder in a patient, then think to screen for the other, related, impulse control disorders. Clinically, this approach should be easier for clinicians to use as it is more continuous with previous classifications and therefore should be more feasible in low-resource settings.<sup>14</sup>

## Future Directions

The differences in approach to ‘behavioral addictions’ in the DSM-5 and the ICD-11 highlight the growing but as yet inconclusive data we currently have regarding these disorders. Several key issues emerge when we compare the approaches of these diagnostic systems, and when we consider the way forward in terms of addressing limitations in the existing corpus of literature. These issues are important because – irrespective of arguments about how we best conceptualize these repetitive behaviors – they result in enormous personal tolls for affected individuals.

Many problematic behaviors such as Internet use, compulsive shopping, sex, stealing, and eating all lack persuasive data regarding their neurobiological (including genetic) underpinnings. A fundamental limitation exists in regard to exploring neurobiological underpinnings of candidate behavioral addictions: whereas substance addiction can readily be observed and modelled in experimental animals, it is difficult to see how this could be the case for the behavioral addictions. While compulsive sexual behavior could theoretically be modelled in animals – at least in simplified form – this would be exceedingly problematic in relation to the other types of behavior. Possibly gambling could be modelled by using a cognitive approach: *viz* using impaired decision-making in animals as a proxy for modelling gambling problems. As well as this fundamental difficulty with translational modelling, there are too few studies of candidate behavioral addictions – reflecting a relative lack of interest (though this is changing), and a lack of funding for such research. In this regard, it is worth noting that behavioral addictions could actually represent a useful model for studying broader addictive processes: repetitive consumption of some psychoactive drugs has

demonstrable negative effects on brain structure and function, whereas, it is argued, this is unlikely to be the case for repetitive behaviors. Thus, the study of how behavioral addictions develop could inform our understanding of substance use disorders, while avoiding the confounding direct toxic effects on the brain that occurs with substances themselves.

Another key issue is that we still need data to understand whether some or any of these behaviors are valid as diagnostic entities.<sup>18–20</sup> This in turn should ultimately allow for a better approach to treating the individual. Although many of the current data suggest some of these behaviors have ‘addictive’ qualities, one must be cautious that the conclusion does not result from over-interpretation. For example, if gamblers are compared (for example, neurobiologically, phenomenologically, etc) to cocaine addicted individuals, one might find many similarities to addictions, and therefore conclude that gambling is an addiction; whereas if one compares gamblers to anxiety disordered individuals, one might again find overlap, but this time conclude that gambling is a type of anxiety disorder. Can both perspectives be valid? Or could it be that both perspectives hold some truth? Of course, if there is substantially more evidence for the former than the latter, then that would provide legitimate grounds to support gambling as an addiction, rather than an anxiety disorder.

If certain behaviors represent ‘addictions’, one would expect them to respond to the same (or similar) treatments as show efficacy in substance use disorders. It is unclear whether this is the case in general terms. The most convincing evidence so far is for gambling disorder, which appears to respond positively to certain opioid medications, and indeed to some glutamate-modulating agents.<sup>21</sup>

Finally, these comparisons between diagnostic systems raise the issue of whether diagnostic categories are too all encompassing and ignore individual differences within disorders, including family history. For example, our recent research found that individuals with hair pulling disorder (trichotillomania, classified as an obsessive-compulsive related disorder in DSM-5 and likely and impulse disorder in ICD-11) who have a first-degree relative with alcoholism respond preferentially in terms of their hair pulling to naltrexone, a medication long used for alcoholism.<sup>22</sup> Thus it makes one question whether impulsive behaviors in some individuals are mediated by different neural substrates (e.g. mesocorticolimbic versus prefrontal) or neurochemicals as compared to the same impulsive behaviors in other individuals. Neither diagnostic system allows for this level of heterogeneity within disorders. Substantial future research, including both human and animal studies, is urgently needed to bring our knowledge of repetitive behaviors to the level of that for substance addictions or other mental health conditions, irrespective of whether those behaviors are ultimately considered addictive, impulsive, or both.

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