

5-10-2018

# Addictions, Behavioral Addictions, and Pathological Internet Use as Internet Addiction - A Literature Review

Vy K. Nguyen  
*CUNY Bernard M Baruch College*

[How does access to this work benefit you? Let us know!](#)

Follow this and additional works at: [https://academicworks.cuny.edu/bb\\_pubs](https://academicworks.cuny.edu/bb_pubs)

 Part of the [Behavioral Neurobiology Commons](#)

---

## Recommended Citation

Nguyen, Vy K., "Addictions, Behavioral Addictions, and Pathological Internet Use as Internet Addiction - A Literature Review" (2018). *CUNY Academic Works*.  
[https://academicworks.cuny.edu/bb\\_pubs/290](https://academicworks.cuny.edu/bb_pubs/290)

This Poster is brought to you for free and open access by the Baruch College at CUNY Academic Works. It has been accepted for inclusion in Publications and Research by an authorized administrator of CUNY Academic Works. For more information, please contact [AcademicWorks@cuny.edu](mailto:AcademicWorks@cuny.edu).

Vy Khanh Nguyen with Dr. Susan Locke for PSY 5000 – Internet-Related Addictions Independent Study – Spring 2018

## Distinguishing Behavioral Symptoms of Addiction

Three signature patterns of behaviors that define clinical addiction: **Abuse, Dependence, and Craving**

The cause of these symptoms are reduced self-control, numbed pleasure response, and addiction-related cues

### ABUSE

- Use of drugs or engagement in the behavior leads to severe social, physical, or mental **consequences**
- Repeated use, overdose, or continued engagement in the behavior happen **despite the consequences and the will to quit**

### DEPENDENCE

- Increasing reliance on the drug or the addicted behavior to feel good leads to **dependence**
- **Tolerance** develops when higher dose or more activities are needed to obtain the same reward
- **Withdrawal syndromes** happen if addicts abstain

### CRAVING

- The **urge** to and **preoccupation** with using the drug or doing the addicted activities happen when the drug or activity are absent
- Craving is **easily triggered** by any stimulus in the environment that resembles and reminds the addict of the drug or behavior

### REDUCED SELF-CONTROL

- Addiction leads to impairment in **prefrontal cortex** that is responsible for inhibiting urges
- **Weaker inhibitory control** makes it harder to overcome urges to use drugs or engage in addictive activities

### NUMBED PLEASURE RESPONSE

- Brain's pleasure center tries to numb its pleasure response to **maintain homeostasis**
- Higher dose of drug or more activities of addicted behavior are needed to get the same effect, which only further numbs the pleasure response

### ADDICTION-RELATED CUES

- Addiction **sensitizes dopamine system** that is associated with wanting and craving
- Trigger of dopamine leads to trigger of **associative learning** when the drug is used or the activity is happening, so neutral stimuli become associated with the addicted drug or behavior



Abuse-Related Pattern of Behaviors	Dependence – Tolerance – Withdrawal Syndrome	Craving and Cue-Induced Behaviors
<ul style="list-style-type: none"> <li>• <b>Prolonged activities</b> on the Internet, including communication, gaming, and cybersex</li> <li>• Internet use transforms from a normative activity into a compulsive and impulsive activity that <b>interferes</b> with everyday functions and personal relationships</li> <li>• Continued, repeated, and excessive use <b>despite negative consequences</b> in physical health or financial security</li> <li>• Use of the Internet continues <b>despite one's wish or will to reduce or stop</b> engaging in the activity</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy <b>reliance</b> on the use of Internet as if the Internet becomes one of the only sources of pleasure and comfort that one might not find elsewhere</li> <li>• One develops the need to pay <b>more attention</b> or engage in the Internet-related activities for <b>longer period of time</b> to gain the same satisfying experience as the first times</li> <li>• Withdrawal syndrome includes <b>autonomic instability, agitation, irritability, anxiety, restlessness</b> that occur when people have to stop or have access to the Internet taken away from them</li> </ul>	<ul style="list-style-type: none"> <li>• People express a <b>strong craving</b> for using or engaging in Internet-related activities such as checking social media and emails, playing online games, and watching explicit contents</li> <li>• Both internal and environmental cues can trigger craving for the use of the Internet, leading to intense urges to have the activity and <b>preoccupation</b> with thoughts about the activity or how to get to it as soon as possible</li> <li>• Craving leads to <b>distraction, productivity loss, and abandonment of responsibilities</b>, but the urge remains hard to overcome</li> </ul>

### Prefrontal Cortex

- Research on online gaming addicts show changes in the white matter and grey matter in the prefrontal cortex area with **grey matter decreases** in volume
- Reduced functional connectivity in prefrontal and parietal cortex found in adolescents with "Internet addiction," which might lead to impair in cognitive function

### Nucleus Accumbens

- When cues of online gaming activities are present to the online gaming dependents, their **nucleus accumbens areas are activated**, suggesting pleasure response being put to work
- This suggest that Internet-related uses can trigger 'liking' and stimulate pleasure response

### Ventral Tegmental Area

- Exposing to Internet-related cues shows a **release in dopamine** in the ventral tegmental area in Internet dependent individuals
- Preliminary results of pharmacological interventions related to dopamine regulation have been promising for treatment of Internet addiction

## DISCUSSION AND CONCLUSION

- There are behavioral and neurobiological evidences that suggest pathological Internet use as a behavioral addiction. This means that it is promising to look for pharmacological or medical treatment for this disorder alongside with psychotherapy and rehabilitation programs
- Thus, more studies on the neurobiology of Internet-related addictions are still needed, especially on the molecular level, the specific neurotransmitters that affect the mechanism of the addictive process
- Consensus on terminologies and understanding of the addictive factors of the activities on the Internet are also important for the explanation of how the addiction develops and what treatment is appropriate

## Neurobiology of Addiction

The three main areas involved in reward processing and addiction:

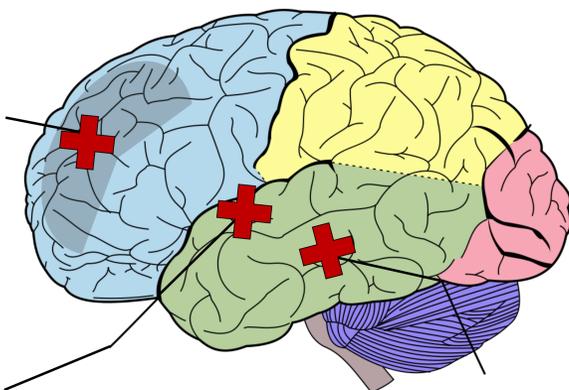
**Nucleus Accumbens**

**Prefrontal Cortex**

**Ventral Tegmental Area (VTA)**

The executive center of the brain responsible for rationality, self-control, and inhibiting primitive urges. In addiction, changes in structure or function of this area lead to extreme difficulty in overcoming craving.

Prefrontal Cortex



Nucleus Accumbens

This pleasure center is associated with 'liking' and enjoyment. When it is overstimulated by drug use or addictive behaviors, it will release CREB molecule that triggers the production of dynorphin to inhibit the stimulation, numbing the pleasure response

Ventral Tegmental Area

This area is associated with 'wanting' in addiction. Despite the diminishing pleasure that addicted drugs or activities bring, the VTA still fires and releases dopamine when people perceive internal or environmental cues. Dopamine creates strong craving that makes people desire the drug or activity