

BEHAVIOURAL ADDICTIONS

Behaviours that:

- Have a potential to produce short-term reward
- Individuals tend to engage these behaviours repetitively and with diminished control
- Persistent pattern of engagement in these behaviours leads to problems and conflicts over time
- Behaviours that have similar symptoms as substance addictions (in Griffiths' model salience, euphoria, tolerance, conflicts, relapse & reinstatement. Questionable presence of withdrawal symptoms).

Similarities with substance addiction

- Both have similar course: they start as ego-syntonic and slowly develop into ego-dystonic (love-hate relationship with the subject of addiction). Ego-syntonic = in harmony with ego (its values, goals, needs) ego-dystonic = opposite to one's needs, values, self. Ego-syntonic nature of these behaviours is the reason why we do not label them as obsessive-compulsive disorders.
- High mutual cooccurrence – gamblers often show pathological use of alcohol, nicotine, or even amphetamines. Pathological gamblers have several times higher chance of being diagnosed as addicts to some substance. Cooccurrence of behavioural addiction and substance addiction predicts increased severity of each
- Similar personality profiles – males of younger age are more susceptible. Increased impulsivity, sensation-seeking, ADHD and decreased harm avoidance (internet based addictions are exception – harm avoidance is increased). Increased comorbidity with depressive symptoms

Similarities with substance addiction

- Similar cognitive deficits - e.g. cues related to addiction are processed faster. Cue-association found in the same brain areas
- Alteration in functioning of mesolimbic dopamine pathways reported – both substance and behavioural addictions are primarily disorder of motivation and learning
- Parkinson patients treated by dopamine agonists found (in some cases) to develop behavioural addictions
- Reward deficiency syndrome (gene-based decreased number of dopamine D2 receptors) found also in gamblers
- Behavioural component is very strong also in substance addictions
- Similar responsiveness to treatment - in most cases, even substance use treatment targets the behavioural/cognitive/psychological component of addiction. No medication for behavioural addictions yet, but promising results in use of opioid antagonists used for alcohol and opioid addictions.

But it may just not exist because

- We know too little. 1) evidence comes mostly from gambling studies- are there any other behavioural addictions at all? 2) no animal studies 3) only few and rather short longitudinal studies 4) low number of family and genetic studies
- Normativity issue – is behavioural addiction just a new label for bad behaviour? Aren't we over-pathologizing certain behaviours? Aren't we spreading unnecessary panic?
- Problems with tolerance and especially withdrawal symptoms – behavioural and substance addiction may be less similar than we think. However, all research in this field was done through optics of substance addictions and thus may be biased from the beginning

diagnostics

- Gambling included in DSM-IV and ICD10 under umbrella of Impulse Control Disorders = disorders characterized by failure in temptation (e.g. kleptomania, pyromania,...). Other potential behavioural addictions could be diagnosed as “impulse control disorder unspecified/other”
- DSM-5 (2013) included gambling as addiction. Internet gaming disorder included only as experimental diagnosis
- ICD11 (2018) included 1) gambling disorder 2) gaming disorder 3) compulsive sexual behaviour disorder (gambling and gaming under umbrella of addictions)
- Other potential behavioural addictions include: eating disorders (overeating, bulimia and anorexia nervosa), excessive exercise, excessive use of social networking sites (that includes excessive use of smartphones), love, shopping,...

GAMBLING



gambling

- Popular entertainment from the beginning of mankind
- “a game o chance”
- Games differ in speed (tempo); size of bet, prize structure; frequency of win/reward; role of skill
- Games of pure chance: lottery, slot-machines
- Games of skill: sport betting, poker

Pathological gambling in ICD 11

- Gambling disorder is characterized by a pattern of persistent or recurrent gambling behaviour, which may be online (i.e., over the internet) or offline, manifested by:
 - 1) impaired control over gambling (e.g., onset, frequency, intensity, duration, termination, context)
 - 2) increasing priority given to gambling to the extent that gambling takes precedence over other life interests and daily activities
 - 3) continuation or escalation of gambling despite the occurrence of negative consequences. The behaviour pattern is of sufficient severity to result in significant impairment in personal, family, social, educational, occupational or other important areas of functioning.
- The pattern of gambling behaviour may be continuous or episodic and recurrent. The gambling behaviour and other features are normally evident over a period of at least 12 months in order for a diagnosis to be assigned, although the required duration may be shortened if all diagnostic requirements are met and symptoms are severe.
- Exclusion criteria: bipolar disorder

DSM-5 Diagnostic Criteria: Gambling Disorder

** For informational purposes only **

- A. Persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress, as indicated by the individual exhibiting four (or more) of the following in a 12-month period:
 - a. Needs to gamble with increasing amounts of money in order to achieve the desired excitement.
 - b. Is restless or irritable when attempting to cut down or stop gambling.
 - c. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
 - d. Is often preoccupied with gambling (e.g., having persistent thoughts of reliving past gambling experiences, handicapping or planning the next venture, thinking of ways to get money with which to gamble).
 - e. Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
 - f. After losing money gambling, often returns another day to get even (“chasing” one’s losses).
 - g. Lies to conceal the extent of involvement with gambling.
 - h. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.
 - i. Relies on others to provide money to relieve desperate financial situations caused by gambling.
- B. The gambling behavior is not better explained by a manic episode.

Mild: 4–5 criteria met.

Moderate: 6–7 criteria met.

Severe: 8–9 criteria met.

From the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (section 312.31).

pathological gambling prevalence

- Prevalence varies in European countries between 0.5-2% (more in Finland 3%)
- Prevalence is several times higher in adolescents – up to 12%
- Huge differences between countries even of similar cultural background suggest strong influence of legal status of gambling (availability)

Risk factors – social & demographic

- Age – usually starts and peaks in older adolescents. Exposure in this age correlates with severity in adulthood
- Gender – males gamble more often and face more severe pathology. Males prefer skill games (betting, poker), females prefer slot machines (for dissociation).
- Social economical status – lower SES correlates with gambling
- Accessibility – close proximity to gambling places highly increases likelihood of the behaviour
- Marital status – singles are more at risk
- Family background – living in one parent family or social modelling – positive attitudes towards gambling in family or peer group
- Experience – winning large sum at the beginning of gambling career predicts more persistent and stronger pattern of behaviour

Risk factors – psychological & psychiatric

- Depressiveness – 50% of gamblers have lifetime mood disorder. Gambling usually precedes depression
- Anxiety – up to 40% of gamblers have lifetime anxiety disorder or obsessive-compulsive disorder
- Substance use – majority use alcohol, up to 40% use other (illegal) drugs. Substance abuse increases risk of relapse, overall pathology, suicidality
- Early childhood trauma – emotional up to 60%; physical 40%; sexual 20%. Presence of trauma correlates with severity of pathology. Abuse was significantly more common condition for women.
- Sensation seeking – under-aroused, prone to boredom, hypomanic

Risk factors – irrational cognition

- Illusion of control – superstition tendency, believe in skill is often magnified (too high self-confidence).
<https://www.youtube.com/watch?v=l0xOoyMeSF8> 3:27-7:20
- Recall bias - wins are overestimated in their strength and frequency while losses are underestimated and forgotten
- Gamblers fallacy – believe that even totally random events are influenced by past events. *If something happens more frequently now, it is going to happen less frequently in future*
- Near miss phenomenon - a failure that is felt to be close to win and thus raising hope for future success. Gives wrong information and produces excitement. Produces illusion of control even in pure games of chance. *It would be foolish to stop when I am so close...*
<https://www.youtube.com/watch?v=uAZu0coArhI>
- <https://www.youtube.com/watch?v=6NZuyfpQTms>

Negative effects

- Crime – majority of pathological gamblers have some experience with theft, fraud, robbery, assault & blackmail
- Bankruptcy and other financial issues
- Deterioration of family situation
- Suicide – some suicidal intention in almost half of pathological gamblers
- Very high comorbidity with substance use – especially alcohol, nicotine, amphetamines – increase all health risks typical for those substances

Pathway – antisocial impulsivist

- Predominantly males
- Highest severity of pathology
- Common personality disorders, substance abuse, suicidality, criminality, low frustration tolerance, higher impulsivity and attention deficits
- Under-stimulated – tendency to experience boredom

Pathway – emotionally vulnerable

- Higher rates of emotional difficulties, anxieties, depressiveness
- Gambling to cope with negative emotions, escape from life troubles (overstimulated)
- Lower rates of criminal activity compared to antisocial impulsivits
- More typical for female gamblers

- Telescopic effect -women start later in life but pathology develops in shorter time.
- However women tend to seek treatment more quickly than men

Pathway – behaviourally conditioned

- Irrational beliefs, poor decision making
- Lower psychological, psychiatric conditions compared to other groups
- Lower severity of pathology – so called sub-pathological population population
- Probably the largest group

Gambling online

- casinos (roulette, slot machines)
- poker
- sport betting & live betting
- lotteries, bingo
- skilful gaming (mahjong, chess, knowledge games)

- Even regular computer games include more and more gambling features

Gambling online

- Even when legal and thus accessible – increase in prevalence of gambling is rather small
- However increase in adolescents who are not allowed to gamble otherwise –online gambling may serve as a gateway for regular gambling or may develop to pathology itself
- Attractive for males, younger, with above average income BUT pathological online gamblers have rather below average income

Gambling online

Pathological offline and online gambling are not necessarily related

- For some online gambling is only a momentary activity when (preferred) offline gambling is not accessible
- Both offline and online venues attract different personalities
- Lower related risks – lower exposure to substance use and criminal environment

Gambling online

Online gambling is potentially riskier because

- Accessible anytime anywhere
- Lower social control when on computer – what one does may not be transparent for long time.
- Anonymity on the internet
- Significantly lower age of most online gamblers
- Online casinos use strategies like *training rooms, play for free* etc. – online gambler may be pre-conditioned even before regular gambling starts
- Electronic money not as real as real money
- Higher illusion of skills involved

GAMING ADDICTION



GAMING DISORDER – does it really exist?

- Computer games is one of the fastest growing entertainment industry (nowadays earning more than all world film industry)
- From “nerd-only” genre it evolved to attract more diverse social groups
- For the vast majority of gamers it is just a free-time activity without any harm – even phenomenon like induced aggressiveness was not proofed
- Computer games suffer from moral panic - similar to situation in film cinemas in 30s, comic books in 50s, TV in 60s – situation is judged by people who grew up without computer games and thus they tend to misinterpret it



Two Fanatic World of Warcraft Gamers Have Died Because Of WoW

Are there more to come?

The recent deaths of two net gamers have once again raised the issue of the impact of addiction on the online gaming community, and the health risks involved.

Silencers, how do they work? Harrison Ford crashes vintage plane on golf course

Gamer dies after playing World of Warcraft for 19 hours straight

Games By James Plafke Mar. 5, 2015 5:10 pm

PROMOTED STORIES
Is it the beginning of the end for Apple?

A California Couple Is In Prison For Neglecting Children While Playing World Of Warcraft

Maya Kosoff Aug. 11, 2014, 10:38 AM 23,103 16

Author of *The Lucifer Effect*
PHILIP ZIMBARDO
& NIKITA COULOMBE

MAN DISCONNECTED

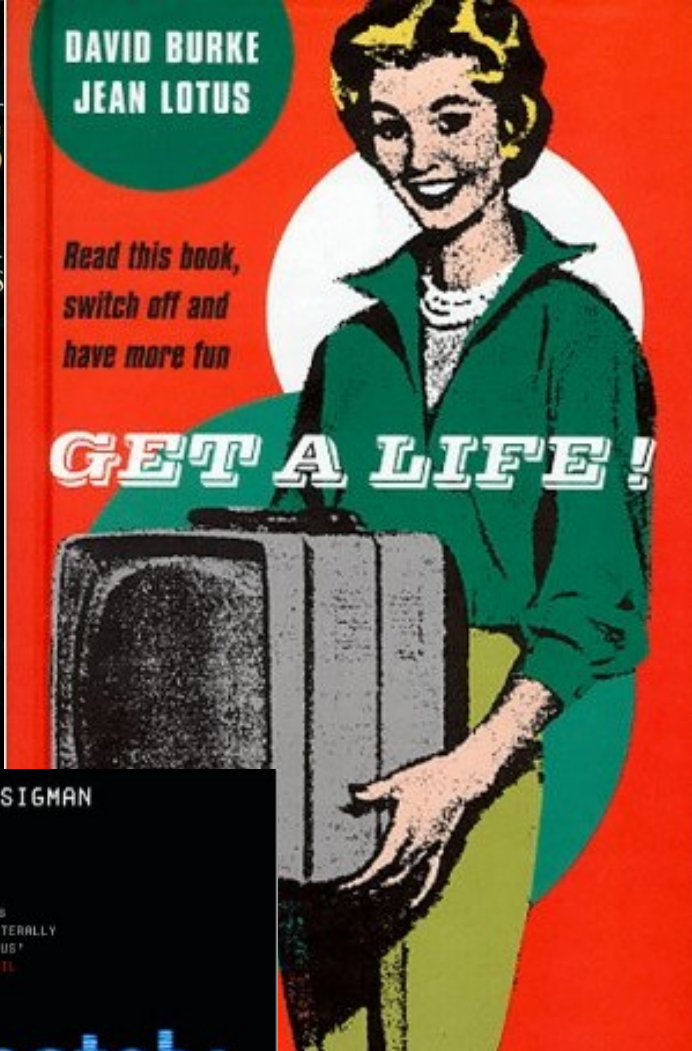
HOW THE DIGITAL AGE IS
CHANGING YOUNG MEN FOREVER





Neil Postman
Author of *The Disappearance of Childhood*
Amusing Ourselves to Death
Public Discourse in the Age of Show Business

FOUR ARGUMENTS FOR THE ELIMINATION OF TELEVISION
by Jerry Mander

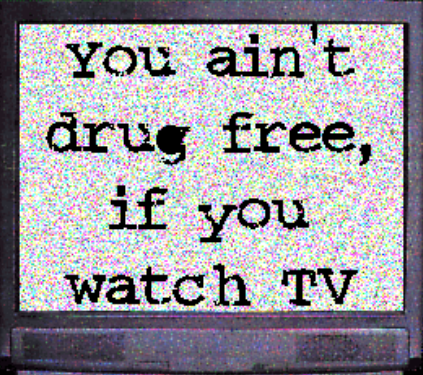


THE PLUG-IN DRUG
Television, Children, and the Family
MARIE WINN

"This comes along at exactly the right moment... We must confront the challenge of his prophetic vision."
—Jonathan Kozol

Fresh Ideas for Enjoying Family Time
What To Do After You Turn Off The TV
by the author of *DIET FOR A SMALL PLANET*
Frances Moore Lappé and Family

DR ARIC SIGMAN
remotely controlled
HOW TELEVISION IS DAMAGING OUR LIVES
"HOW TV IS QUITE LITERALLY KILLING US!"
DAILY MAIL
"COMPELLING"
INDEPENDENT ON SUNDAY





GAMING DISORDER


- Intensity of gaming is much higher than any media usage before – online games are played about 20 hours per week, those with higher addictive potential about 35 hours per week on average
- The most successful games are still those targeting “standard nerds” –90% of gamers are younger men (teenagers and young adults)
- But we still know too little – only few neurological studies (however they support addiction model – intensive gamers have changes in reward pathway and prefrontal cortex similar to cocaine users) and too short longitudinal studies (we have no idea whether gaming disorder persists longer than 2 years)
- Even if the addiction model will not proof, intensive gaming is not healthy due to time devotion, unhealthy physical and social lifestyle: problems in school/work, lack of sleep, problems in social interactions, health problems (repetitive strain injuries,...)

Foundation URI : <http://id.who.int/icd/entity/338347362>

6C51.0 Gaming disorder, predominantly online

Parent

6C51 Gaming disorder

Show all ancestors 

Description

Gaming disorder, predominantly online is characterised by a pattern of persistent or recurrent gaming behaviour ('digital gaming' or 'video-gaming') that is primarily conducted over the internet and is manifested by:

1. impaired control over gaming (e.g., onset, frequency, intensity, duration, termination, context);
2. increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities; and
3. continuation or escalation of gaming despite the occurrence of negative consequences. The behaviour pattern is of sufficient severity to result in significant impairment in personal, family, social, educational, occupational or other important areas of functioning.

The pattern of gaming behaviour may be continuous or episodic and recurrent. The gaming behaviour and other features are normally evident over a period of at least 12 months in order for a diagnosis to be assigned, although the required duration may be shortened if all diagnostic requirements are met and symptoms are severe.

[Release Notes](#)

ICD-11

International Classification of Diseases for
Mortality and Morbidity Statistics

Eleventh Revision

Reference Guide

DRAFT

NOT FOR DISSEMINATION



What games are suspects and why?

- MMO – Massively Multiplayer Online (e.g. World of Warcraft, Ever Online) & MOBA – Multiplayer Online Battle Arena (e.g. League of Legends, World of Tanks)
- Other game genres like Simulation games or First-Person Shooter games do not seem to be the problem. Offline games (traditional computer and video games) are not problem at all
- Important features (structural characteristics increasing addictive potential):

Social dimension – recognition, easy communication

Advancement & permanent rewarding

Permanent feedback – feelings of control

Persistent world – exist even when the person is offline, no-end and blurred time structure

Inclusion of reward mechanisms known from gambling (e.g. near miss, random reward boxes)

Risk factors of addiction

- Males of younger age
- Feelings of loneliness
- Low self-esteem and low self-efficacy
- Social anxiety and generally lower social competence
- Need for control, low flexibility
- Self-control difficulties and hyperactivity (e.g. ADHD) in younger age
- Higher alexithymia (decreased ability to reflect emotions) and mild autism-like personality
- Depressiveness

ADDICTION VS ENGAGEMENT

- Engagement – intensive game play that is not pathological

I feel happy at the thought of playing

I often experience a buzz of excitement while playing

- Addiction – intensive game play that could be labelled as pathological.
General addiction criteria used in most addiction-like behaviours -
conflicts, relapse, loss of control, escapism

I sometimes neglect important things because of an interest in...

I have made unsuccessful attempts to reduce the time I spend playing

I have used game play as a mean to escape from...

Gaming under the influence: An exploratory study

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Background and aims: Association between substance use and excessive play of online games exists both in theory and research. However, no study to date examined playing online games under the influence of licit and illicit drugs. **Methods:** We questioned a convenient online sample of 3,952 Czech online gamers on their experiences and motives of using caffeine, alcohol, tobacco, psychoactive pharmaceuticals, and illicit drugs while playing massive multiplayer online games (MMOGs). **Results:** The results showed low prevalence of illicit drug use while playing online games. Substance use was positively associated with intensity of gaming and both addiction and engagement; psychoactive substances with stimulating effect were linked to higher engagement and gaming intensity, whereas use of sedatives was associated with higher addiction score. Substance use varied slightly with the preference of game genre. **Discussion:** Drug use while playing appears as behavior, which is mostly not related to gaming – it concerns mostly caffeine, tobacco, alcohol, or cannabis. For some users, however, drug use was fueled by motivations toward improving their cognitive enhancement and gaming performance.

Keywords: online gaming, addiction, engagement, substance use

Gaming under the influence

Table 1. Proportion of gamers using the substances while gaming, overall and by genre (%)

	Genres (% of users)					χ^2	(df)	Effect size	
	RPG	MOBA	FPS/TPS	Others	Total			Cramer's <i>V</i>	<i>N</i>
Caffeine	73.5	75.3	76.4	72.1	74.2	4.35	(3)	0.03	3,941
Tobacco	28.3	24.3	24.5	23.2	25.3	8.50	(3)	0.05	3,933
Alcohol	48.6	54.4	45.5	48.3	50.4	16.67	(3)	0.07	3,935
Cannabis/resin	12.9	16.7	15.1	11	14.2	16.41	(3)	0.07	3,930
Amphetamines	0.4	0.5	1.1	0.7	0.6	3.03*	(3)	0.03	3,938
Ecstasy/MDMA	0.9	0.5	0.7	0.2	0.6	3.50*	(3)	0.06	3,933
Cocaine	0.5	0.1	1.3	0.4	0.4	10.16*	(3)	0.02	3,928
Stimulant-type pharmaceuticals	0.4	0.2	0.2	0.2	0.3	1.31*	(3)	0.02	3,943
Hallucinogens (LSD/psilocybin)	1.4	1.2	0.7	0.9	1.1	2.02	(3)	0.04	3,939
Sedatives and tranquilizers	3.5	2.2	1.6	2.6	2.6	6.66	(3)	0.02	3,938
Legal highs	1.8	1.9	1.1	1.8	1.8	1.21	(3)	0.02	3,936

Note. RPG: role-playing games; MOBA: multiplayer online battle arena; FPS/TPS: first/third-person shooter game.

*For tables having the cells with expected values less than 5, the Fisher's exact test is reported.

Those under influence play more intensively: stimulant-type pharmaceuticals (+9.8 hr/week), Ecstasy/MDMA (+9.6), sedatives (+6.9), amphetamines (+6.2), caffeine (+3.8)

Game-related motives were mentioned by 1/3 of respondents: avoiding sleep (25.8%), increased concentration (15.6%), enhanced enjoyment (13.8%), tension management (7.3%), increased courage (4.1%), avoiding hunger, (2.7%), and insomnia management (2.0%).

Higher scores in addiction: sedatives (including alcohol), tobacco, tranquilizers (eliminating anxiety and fear)

Higher scores in engagement: stimulants, caffeine, ecstasy

Dysfunctional impulsivity in online gaming addiction and engagement

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Abstract

Impulsivity has been shown to be related to both substance- and non-substance addictions. In the case of internet gaming addiction, on one hand, higher impulsivity and sensation seeking have been reported in problematic online gamers. On the other hand, problematic online gamers were also identified as introverted, socially anxious, and generally inhibited in behaviour. Our study investigates the role of dysfunctional impulsivity in gaming addiction. A sample of 1,510 Czech and Slovak online gamers completed a questionnaire that was advertised online and targeted the core of the gaming community. Internet gaming addiction was measured using the Addiction-Engagement Questionnaire (Charlton & Danforth, 2010). Dysfunctional impulsivity was measured using the 11 items of Dickman's (1990) sub-scale of the Impulsivity Inventory. Pearson's correlation coefficients were calculated for variables and a regression model was constructed using hierarchical linear regression to determine the association between online gaming addiction and dysfunctional impulsivity, while controlling for age, gender, and the frequency of online gaming. A set of chi-square tests was employed to compare the patterns of addiction criteria among highly impulsive addicted gamers and non-impulsive addicted gamers. Although dysfunctional impulsivity was a good predictor of gaming addiction ($\beta = -.252$), it actually explained only about 7% of the addiction variance. Problematic gamers high on impulsivity had similar patterns of addiction criteria as non-impulsive gamers, with only one exception – they had a significantly higher tendency to relapse. There was no role of impulsivity in gaming engagement. The results suggest that dysfunctional impulsivity is a risk factor for online gaming addiction (similar to other addictions), but it does not have prominent explanatory value in itself. Also, the results show that problematic gamers high on impulsivity are more prone to relapse and reinstatement.

Keywords: Dysfunctional impulsivity; impulsivity; gaming engagement; gaming addiction; internet gaming disorder

Table 2. Linear Regression Models for Online Gaming Addiction.

	Model 1			Model 2			Model 3		
	b	β	Sig.	b	β	Sig.	b	β	Sig.
Constant	1.96		.00	1.63		.00	1.46		.00
Gender (Female=1, Male=2)	0.05	-.03	.26	0.02	.01	.57	0.03	.02	.43
Age	-0.01	-.19	.00	-0.01	-.12	.00	-0.01	-.09	.00
Frequency of gaming				0.01	.32	.00	0.01	.29	.00
Dysfunctional impulsivity							0.51	.25	.00
F	27.23			75.12			88.11		
p	<.00			<.00			<.00		
R Square	.04			.13			.20		

Table 3. Linear Regression Models for High Engagement in Online Gaming.

	Model 1			Model 2			Model 3		
	b	β	Sig.	b	β	Sig.	b	β	Sig.
Constant	3.18		.00	2.98		.00	2.94		.00
Gender (Female=1, Male=2)	-0.15	-.11	.00	-0.17	-.12	.00	-0.16	-.12	.00
Age	0.00	.00	.05	0.00	.00	.10	0.00	.01	.70
Frequency of gaming				0.01	.25	.00	0.01	.24	.00
Dysfunctional impulsivity							0.12	.08	.00
F	11.42			38.91			31.45		
P	<.00			<.00			<.00		
R Square	.01			.07			.08		

Impulsivity – inability to delay gratification, tendency to ignore negative consequences, less behavioural control. Important factor in most (all) addictions

Frequency of gaming: addiction $\beta=.29$, engagement $\beta=.24$
 Impulsivity: addiction $\beta=.25$, explained 7% of variance;
 engagement $\beta=.07$, explained 1% of variance

Plays a role especially in combination with age – adolescents have naturally higher impulsivity (peaks at 17 and then gradually decreases with age)

Impulsivity stays behind relapses to problematic patterns

Alexithymia and gaming

Alexithymia – impaired emotional awareness, decreased sociability and empathy, concrete logic-like thinking (decreased imagination)

Affective dysregulation often leads to high risk of other psychiatric conditions – somatization, anxiety, depression, often found in substance abuse and gambling

Alexithymia explained 30% of variance of addiction while only 2% of variance of engagement
addiction: diff. in describing emotions $\beta = .270$; externally oriented thinking $\beta = .199$

engagement : externally oriented thinking $\beta = -.162$

Need for external rewards. Avoiding coping style

For public and uninformed professionals both addiction and engagement may look similarly – danger of overpathologization

Addiction and engagement are qualitatively distinct concepts – both predicted and associated with different psychological factors

Addiction is associated with those psychological concepts that have been shown to be associated with other addictions and other pathological behaviours

Substances are making their way to media use

Negative consequences are not necessarily caused or related to addiction