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Internet Gaming disorder: An international perspective

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16 November 2018



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Internet Gaming disorder: ~~An international perspective~~ A monolingual Australian male perspective

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16 November 2018



“anything you want”

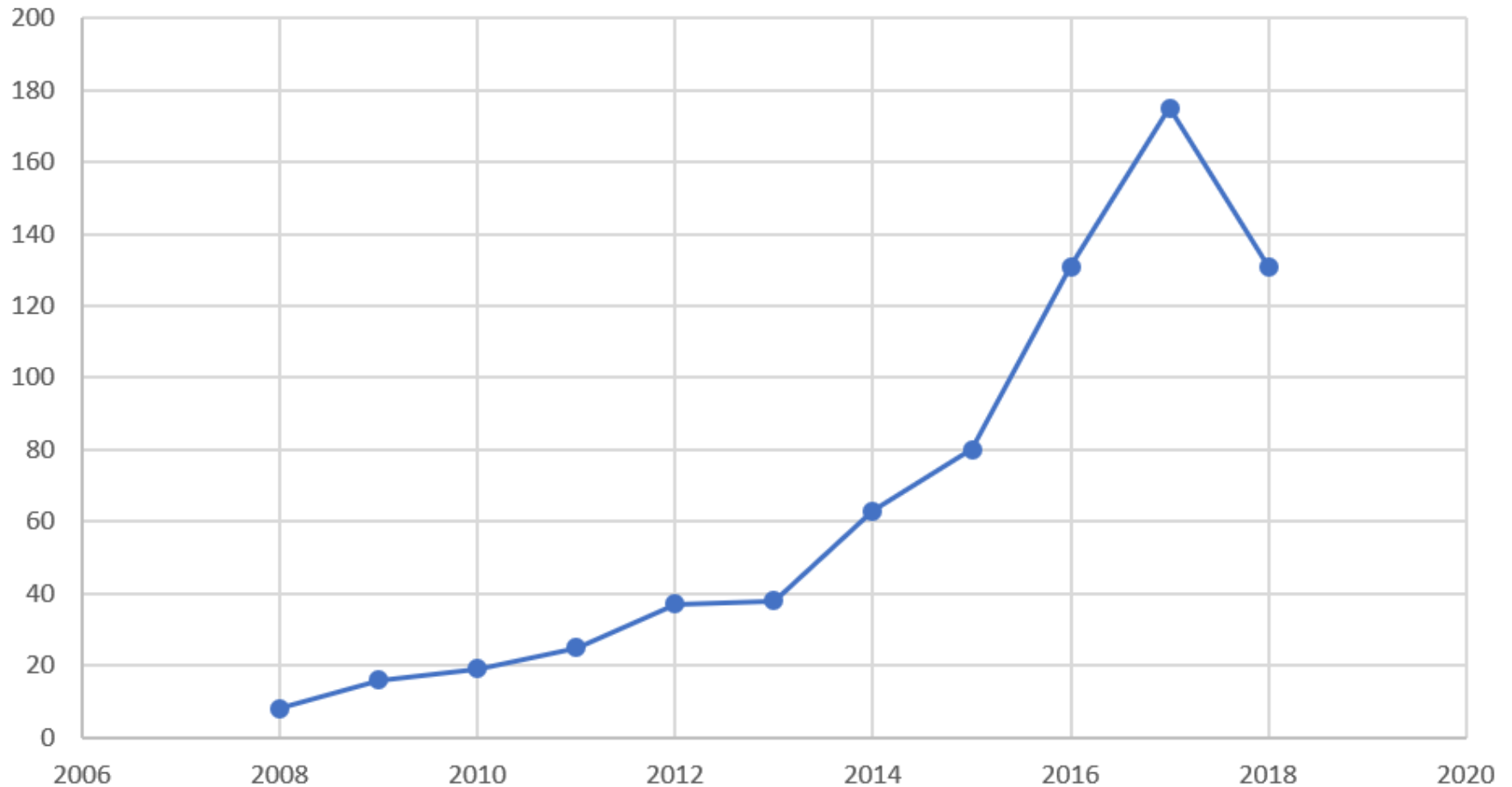


10-year anniversary event

- What has changed in the research base over the last 10 years?
- Are we asking the same questions?
- Using the same methods?
- Have new research priorities emerged?
- Where is the field heading now?
- What future challenges do we face?

Growth in the IGD field

Number of articles specialising in problem gaming



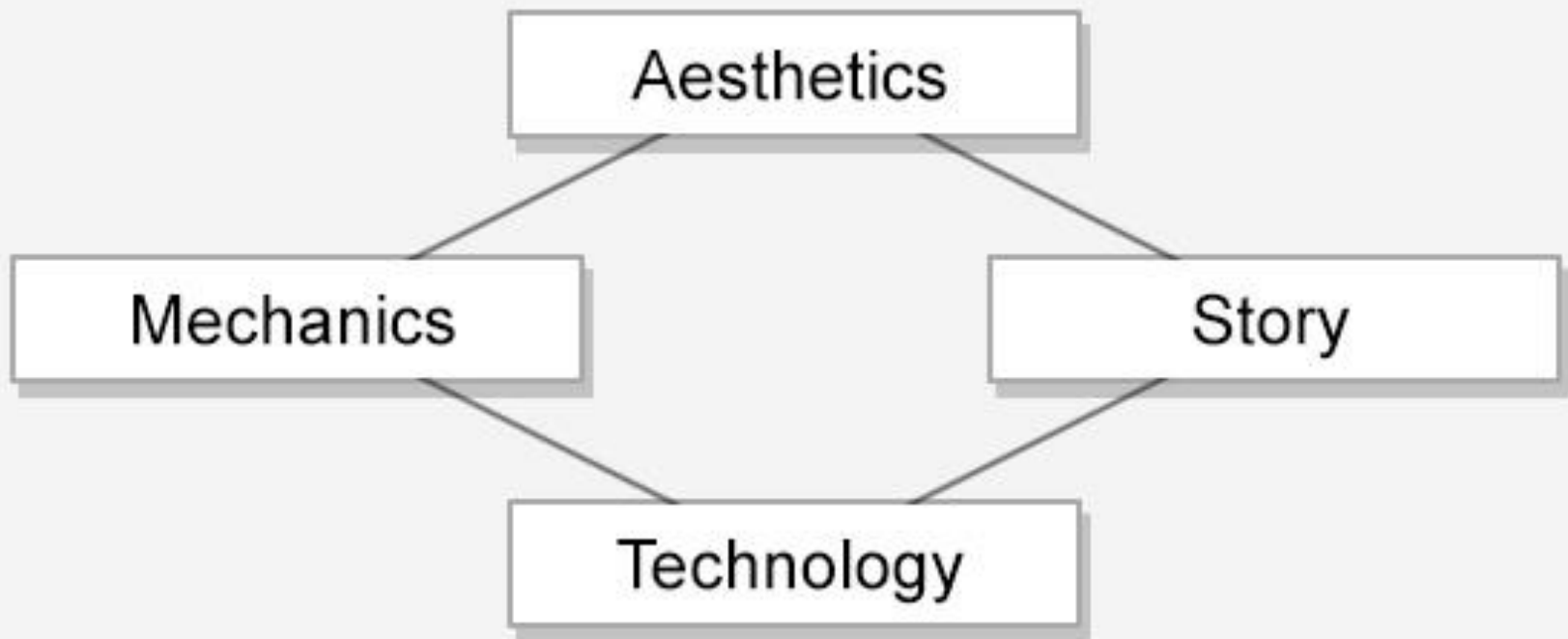
Presentation outline

- 1. PAST:** Research in 2008
- 2. PRESENT:** Research in 2018
- 3. FUTURE:** Research in 2028?

I. 2008



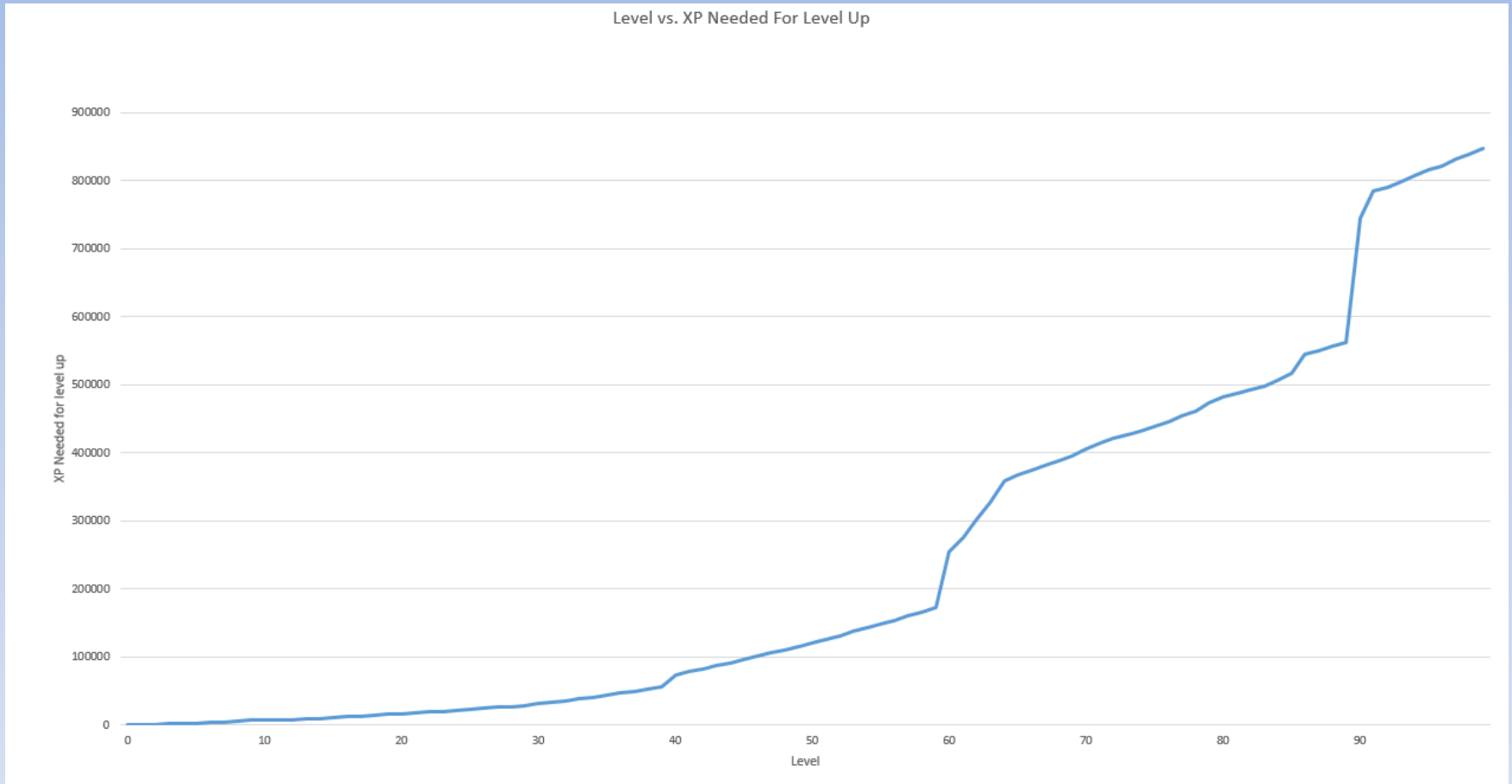
Fundamental elements of video games



Massively Multiplayer Online (MMO) Role Playing Game



XP level requirements in 'WOW'



Raesong 20 points · 2 years ago



I recommend the liberal use of scotch to make going from 58 to 63 palatable.

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Playing MMORPGs: Connections between Addiction and Identifying with a Character

David Smahel, M.Sc., Ph.D., Lukas Blinka, M.A., and Ondrej Ledabyl, M.A.

Abstract

Addiction to online role-playing games is one of the most discussed aspects of recent cyberpsychology, mainly for its potentially negative impact on the social lives of young people. In our study, we focus on some aspects of youth and adolescent addiction to MMORPGs. We investigated connections between players and their game characters and examined if, and in what ways, player relationship to their character affected potential addiction. Players attitude to their characters seems to play a specific role, since players who tend to be addicted view their characters as being superior and more often wish to be like their characters in their real lives. Our research also confirmed that younger players are generally more prone to addiction.

Introduction

MASSIVELY MULTIPLAYER ONLINE ROLE-PLAYING GAMES (MMORPGs) are played for much longer periods of time than other games.¹ At the same time, some players tend to consider social aspects of the game world more important and satisfying than social relationships in their real world,

having a somewhat greater tendency for intensive play.³ There is also a positive correlation between the amount of playtime and the flow phenomenon, which leads to addictive behavior. Time spent on the game however is not, on its own, a clear indicator of addiction; it only correlates with flow. We can thus claim that time spent on the game leads to more frequent flow and this leads to a high potential for

Smahel et al. 2008

- Focus on single game type: MMORPGS
- “Different games, different experiences”
- Attempt to identify maladaptive processes
- Not simply a learning process, but a process whereby players construct an identity
- Addicted players wish that the character would replace themselves and their life
- Shame and conflict

Example study of the neurobiology of gaming self-concept (2015)

Behavioral Neuroscience
2015, Vol. 129, No. 1, 8–17

© 2014 American Psychological Association
0735-7044/15/\$12.00 <http://dx.doi.org/10.1037/bne0000025>

Avatar's Neurobiological Traces in the Self-Concept of Massively Multiplayer Online Role-Playing Game (MMORPG) Addicts

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Holger Hill
Karlsruhe Institute of Technology, Karlsruhe, Germany

Madlen Sell, Iris Reinhard, Sabine Vollstädt-Klein, Falk Kiefer, Karl Mann, and Tagrid Leménager
Heidelberg University

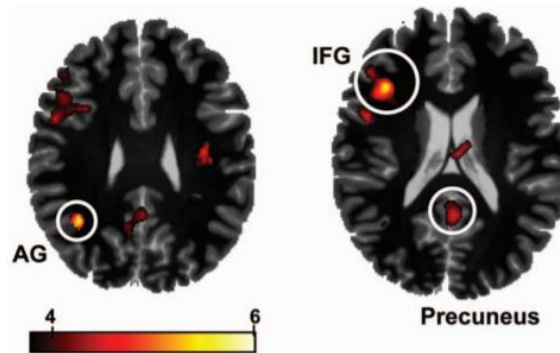


Figure 3. Between-groups comparison for the contrast *avatar > ideal*, showing significantly higher brain activations in addicted MMORPG players during avatar-related reflection relative to ideal in the left AG (left image, $z = 29$), the left IFG (right image) and the precuneus (right image; $z = 20$; among others); brain-extracted χ^2 -square template in MNI space with SPM contrast image-overlay: $p_{\text{uncorr}} < .001$, $T = 3.39$, $\#_{\text{voxel}} \geq 10$. See the online article for the color version of this figure.

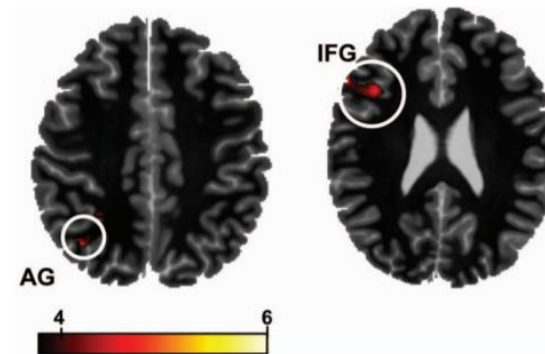


Figure 2. Axial view of brain activations in addicted- relative to nonaddicted MMORPG players for the contrast *avatar > self* in the left IFG (right image, $z = 25$) as well as in the left AG as our ROI (left image, $z = 45$); brain-extracted χ^2 -square template in MNI space with SPM contrast image-overlay: $p_{\text{uncorr}} < .001$, $T = 3.39$, $\#_{\text{voxel}} \geq 10$. See the online article for the color version of this figure.

Wien Klin Wochenschr (2009) 121: 502–509
DOI 10.1007/s00508-009-1198-3
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Wiener klinische Wochenschrift
The Middle European Journal of Medicine

Computerspielverhalten: Klinische Merkmale von Abhängigkeit und Missbrauch bei Jugendlichen

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Eingegangen am 23. Juli 2008, angenommen nach Revision am 3. Juni 2009

Computer Game Playing: Clinical characteristics of dependence and abuse among adolescents

Summary. *Objective and methods:* The aim of the study was to investigate the prevalence of excessive computer game playing behaviour among adolescents with psychopathological tendencies that resemble the classic symptoms of addiction. To address this question, criteria for excessive computer game playing behaviour were developed on the basis of diagnostic criteria for substance-related disorders according to ICD-10.

Results: Excessive computer playing corresponding to addictive behaviour were found in 12.3% of the ado-

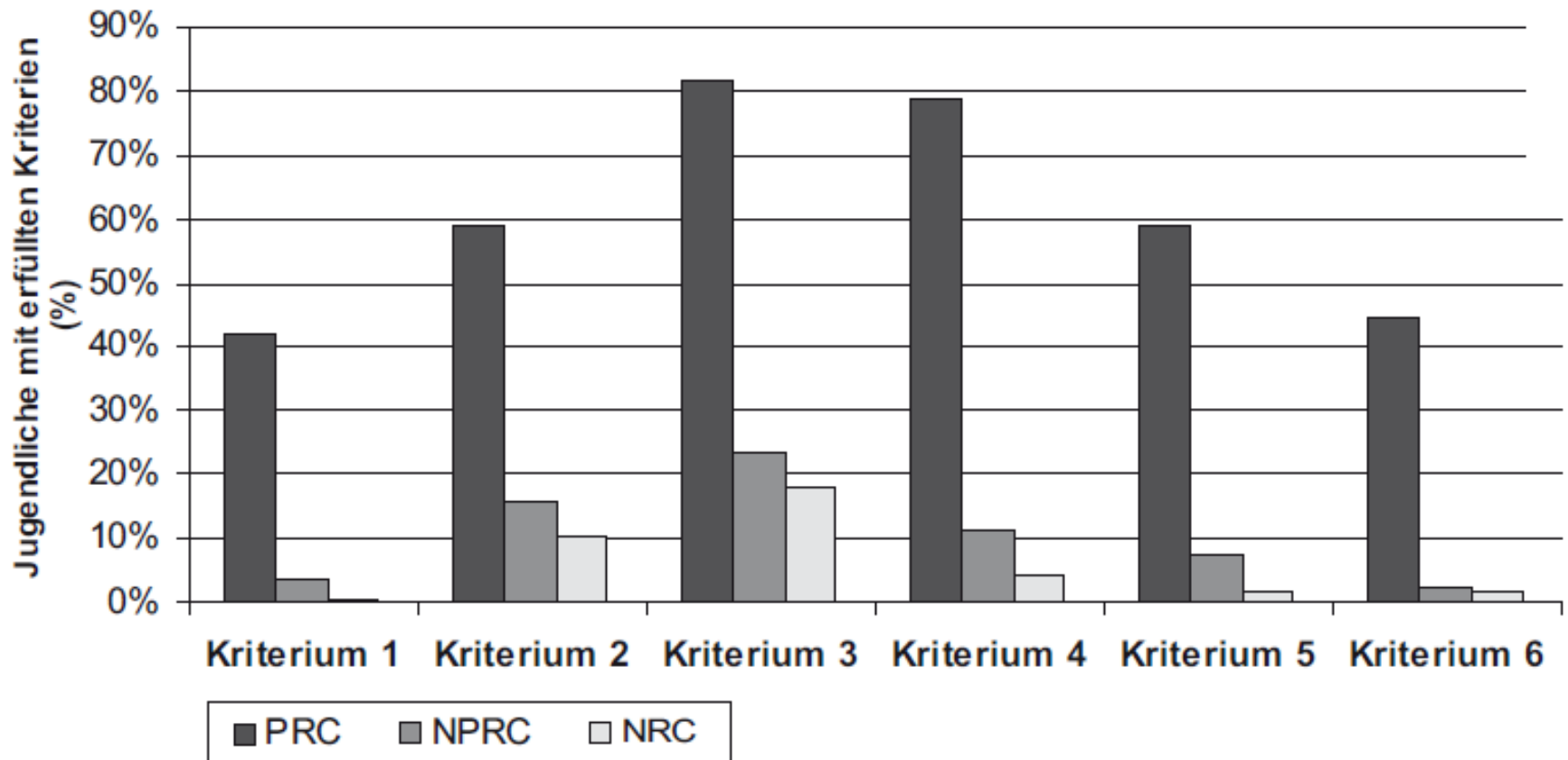
mit psychopathologischen Tendenzen, die den Symptomen einer klassischen Suchterkrankung entsprechen, vorliegt. Dieser Frage wurde unter Verwendung adaptierter Diagnosekriterien, die den substanzbezogenen Störungen aus den ICD 10 entliehen sind, nachgegangen.

Ergebnis: Die untersuchte Stichprobe (n = 1068) weist einen Anteil von 12,3% Jugendlichen mit als suchtartig (9,6% missbräuchliches und 2,7% abhängiges Spielverhalten) einzustufendem Computerspielverhalten auf. Jugendliche mit suchtartigen Spielverhalten weisen zudem substanzuelle Zusammenhänge mit we-

Batthyány et al. 2009

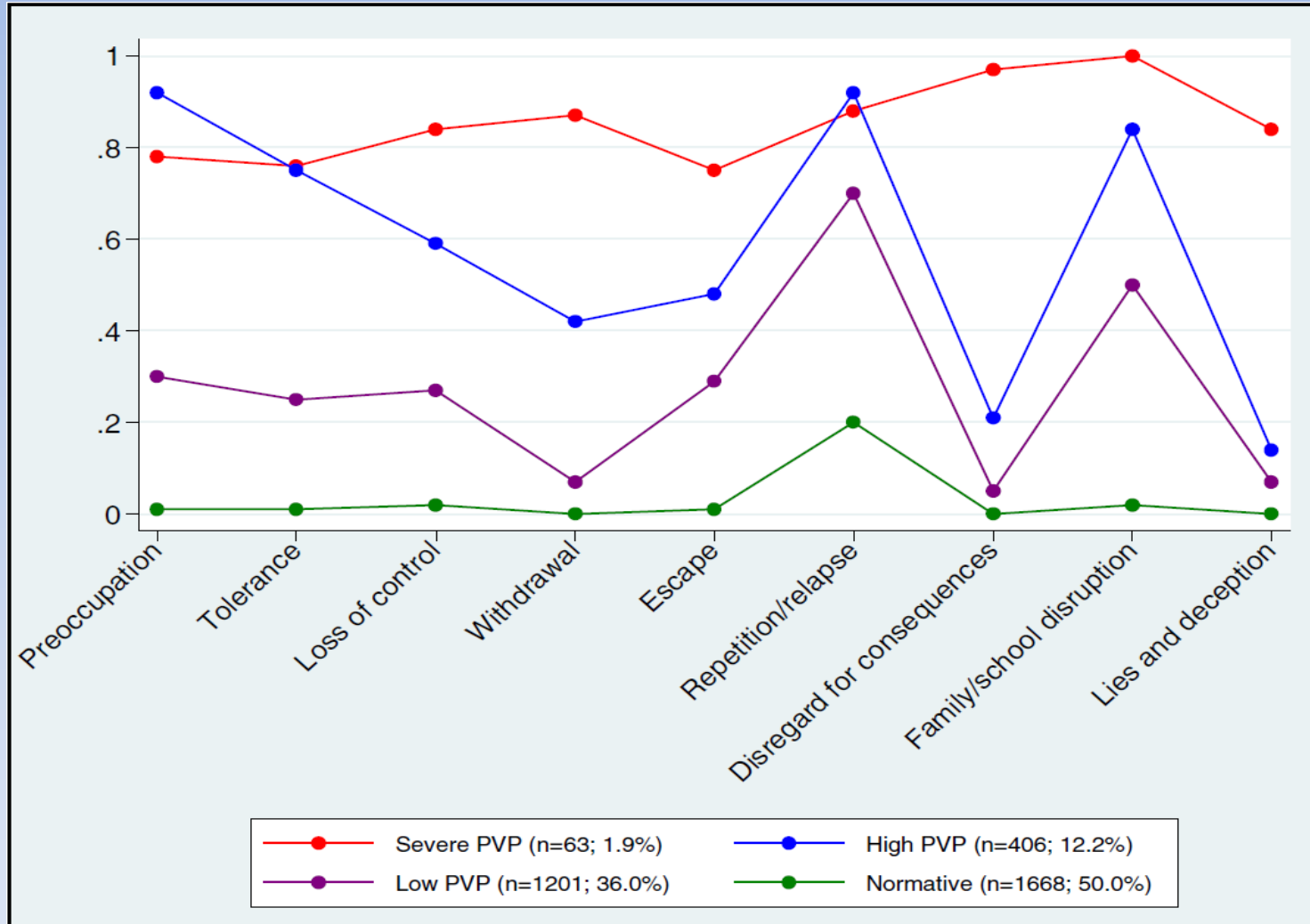
- First prevalence study in Austria
- Adaptation of ICD-10 substance use disorder
 - Many other studies did this too
 - Or used gambling criteria
- Prevalence is quite high (>10%)
- Criteria differ in 'difficulty' or 'sensitivity'

Criterion 3 refers to harm



What does criterion 1 refer to?

A similar study in 2015



Source: Faulkner, Irving, Adlaf, and Turner (2015)

Is it as easy as this?

Internet ~~gaming~~ Gambling Disorder

Diagnostic Criteria

312.31 (F63.0)

- ~~problematic gambling behavior~~ ^{use of the Internet to play games}
- 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:
1. Needs to ~~gamble with~~ ^{spend} increasing amounts of ~~money~~ ^{time playing games} in order to achieve the desired excitement.
 2. Is restless or irritable when attempting to cut down or stop ~~gambling~~. ^{gaming}
 3. Has made repeated unsuccessful efforts to control, cut back, or stop ~~gambling~~. ^{gaming}
 4. Is often preoccupied with ~~gambling~~ ^{gaming} (e.g., having persistent thoughts of reliving past ~~gambling~~ ^{gaming} experiences, handicapping or planning the next venture, thinking of ways ^{to play} to ~~get money with which to gamble~~). ^{Use games to escape or relieve mood}
 5. ~~Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).~~
 6. ~~After losing money gambling, often returns another day to get even ("chasing" one's losses).~~ ^{Continued involvement despite knowledge of problems}
 7. Lies to conceal the extent of involvement with ~~gambling~~. ^{gaming}
 8. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of ~~gambling~~. ^{gaming}
 9. ~~Relies on others to provide money to relieve desperate financial situations caused by gambling.~~ ^{Loss of interests due to gaming}
- ~~B. The gambling behavior is not better explained by a manic episode.~~

Does it work for other disorders?

Internet Gaming ~~Body Dysmorphic Disorder~~

Diagnostic Criteria

300.7 (F45.22)

- Video games**
- A. Preoccupation with ~~one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others.~~
 - B. At some point during the course of the disorder, the individual has performed repetitive behaviors ~~(e.g., mirror checking, excessive grooming, skin picking, reassurance seeking)~~ or mental acts ~~(e.g., comparing his or her appearance with that of others)~~ in response to ~~the appearance concerns.~~ **obsessing about gaming.**
 - C. The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning. **depression or anxiety**
 - D. The ~~appearance~~ preoccupation is not better explained by ~~concerns with body fat or weight in an individual whose symptoms meet diagnostic criteria for an eating disorder.~~

**gaming
at all
times of
the day**

A bibliometric analysis of the scientific literature on Internet, video games, and cell phone addiction^{*†}

Xavier Carbonell, PhD; Elena Guardiola, MD, PhD; Marta Beranuy, BPsy; Ana Bellés, DipLibrSciDocumen

See end of article for authors' affiliations.

DOI: 10.3163/1536-5050.97.2.006

Objectives: The aim of this study was to locate the scientific literature dealing with addiction to the Internet, video games, and cell phones and to characterize the pattern of publications in these areas.

Methods: One hundred seventy-nine valid articles were retrieved from PubMed and PsycINFO between 1996 and 2005 related to pathological Internet, cell phone, or video game use.

Results: The years with the highest numbers of articles published were 2004 (n=42) and 2005 (n=40). The most productive countries, in terms of number of articles published, were the United States (n=52), China (n=23), the United Kingdom (n=17), Taiwan (n=13), and South Korea (n=9). The most commonly used language was English (65.4%), followed by

Chinese (12.8%) and Spanish (4.5%). Articles were published in 96 different journals, of which 22 published 2 or more articles. The journal that published the most articles was *Cyberpsychology & Behavior* (n=41). Addiction to the Internet was the most intensely studied (85.3%), followed by addiction to video games (13.6%) and cell phones (2.1%).

Conclusions: The number of publications in this area is growing, but it is difficult to conduct precise searches due to a lack of clear terminology. To facilitate retrieval, bibliographic databases should include descriptor terms referring specifically to Internet, video games, and cell phone addiction as well as to more general addictions involving communications and information technologies and other behavioral addictions.

Behavioral addictions are an emerging phenomenon whose existence, except for pathological gambling, is questioned by the scientific community [1]. Even gambling has been categorized in the *Diagnostic and*

phones, and video games. The media tend to highlight the negative consequences and addictive properties of these technologies, often on the basis of single cases or opinions that are difficult to

Carbonell et al. 2008

- First major bibliometric analysis
 - 179 articles
 - Field dominated by ‘Internet addiction’
 - Fewer studies on gaming specifically
 - 65% in English
 - *CyberPsychology & Behavior* – leading journal
- Only 9 papers from South Korea
- Highlights problem of inconsistent terminology

Definitional criteria examined in 2013

Table 2
Diagnostic features of psychometric instruments.

Instrument	Cognitive salience	Loss of control	Withdrawal	Tolerance	Escape	Euphoria	Relapse	Dependency on others	Deception	Conflict: Work/School	Conflict: Household	Conflict: Sleep	Conflict: Relationships	Conflict: Financial	Conflict: Illegal acts	Using despite harm
Proposed DSM-V category: Internet Use Disorder ¹	●	●	●	●	○	○	○	○	●	●	○	○	●	○	○	●
Adapted DSM-IV-TR for Pathological Gambling	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	○
Adapted DSM-IV-TR for Substance Dependence	○	●	●	●	○	○	●	○	○	●	○	○	●	○	○	●
Addiction-Engagement Questionnaire	●	○	●	●	○	●	●	○	○	●	○	●	●	○	○	○
Compulsive Internet Use Scale (CIUS)	●	●	●	○	●	○	●	○	○	●	○	●	●	○	○	○
Engagement-Addiction Questionnaire	●	○	●	●	●	●	●	○	○	●	○	●	●	●	○	○
Exercise Addiction Inventory (adapted)	●	○	●	●	○	●	●	○	○	○	○	○	●	○	○	○
Game Addiction Scale (GAS)	●	●	●	●	●	●	●	○	●	●	○	●	●	○	○	○
Korean Internet Addiction Test (KIAS)	●	○	●	●	○	○	○	○	○	○	○	●	●	○	●	○
Online Game Addiction Scale - Adolescents in Taiwan (OAST)	○	●	●	●	○	○	○	○	○	●	○	○	●	●	○	○
Online Game Addiction Index (OGAI)	○	●	●	●	○	○	○	○	○	○	●	●	●	○	○	○
Problem Videogame Playing (PVP) Scale	●	●	●	●	●	○	○	○	●	●	○	○	●	○	○	●
Problematic Internet Use Scale (ISS-20)	○	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○
Problematic Online Game Use Scale (POGU)	●	●	○	●	○	●	●	○	○	●	○	○	●	○	○	○
Problematic Online Gaming Questionnaire (POGQ)	●	●	●	○	●	●	●	○	○	●	●	○	●	○	○	○
Video Game Addiction Test (VAT)	●	●	●	○	●	●	●	○	○	●	○	●	●	○	○	○
Video Game Dependency Scale (KFN-CSAS-II)	●	●	●	●	○	○	○	○	○	●	○	○	●	○	○	○
Young Internet Addiction Scale (YIAS)	●	●	●	●	●	●	○	○	●	●	○	○	●	○	○	○
Young Internet Addiction Test (YIAT)	●	●	●	○	●	●	●	○	●	●	●	●	●	○	○	○

Note: ● assessed; ○ not assessed. ¹Not an instrument, included for comparison only.



Internet Use Disorder

Proposed Revision

Rationale

Severity

DSM-IV

Internet Use Disorder

Updated May 1, 2012

This condition is being recommended for further study in Section III, which is the section of the DSM-5 text in which conditions that require further research will be included.

- A. Preoccupation with Internet gaming
- B. Withdrawal symptoms when internet is taken away
- C. Tolerance: the need to spend increasing amounts of time engaged in Internet gaming
- D. Unsuccessful attempts to control Internet gaming use
- E. Continued excessive Internet use despite knowledge of negative psychosocial problems
- F. Loss of interests, previous hobbies, entertainment as a result of, and with the exception of Internet gaming use
- G. Use of the Internet gaming to escape or relieve a dysphoric mood
- H. Has deceived family members, therapists, or others regarding the amount of Internet gaming
- I. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of Internet gaming use

Development and Validation of a Game Addiction Scale for Adolescents

JEROEN S. LEMMENS, PATTI M. VALKENBURG, and
JOCHEN PETER

*The Amsterdam School of Communications Research (ASCoR), University of Amsterdam,
Amsterdam, The Netherlands*

The aim of this study was to develop and validate a scale to measure computer and videogame addiction. Inspired by earlier theories and research on game addiction, we created 21 items to measure seven underlying criteria (i.e., salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems). The dimensional structure of the scale was investigated in two independent samples of adolescent gamers (N = 352 and N = 369). In both samples, a second-order factor model described our data best. The 21-item scale, as well as a shortened 7-item version, showed high reliabilities. Furthermore, both versions showed good concurrent validity across samples, as indicated by the consistent correlations with usage, loneliness, life satisfaction, social competence, and aggression.

Lemmens et al. 2009

- Among first efforts to develop a scale validated for adolescent gamers
 - 21-item and 7-item versions
 - Still frequently used today
- Based on DSM criteria and components model
- Correlates: Loneliness, social competence, life satisfaction
- Polythetic approach encouraged (all items)



Distinguishing addiction and high engagement in the context of online game playing

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^b *Department of Psychology, Whitman College, 345 Boyer Avenue, Walla Walla, WA 99362, USA*

Available online 19 August 2005

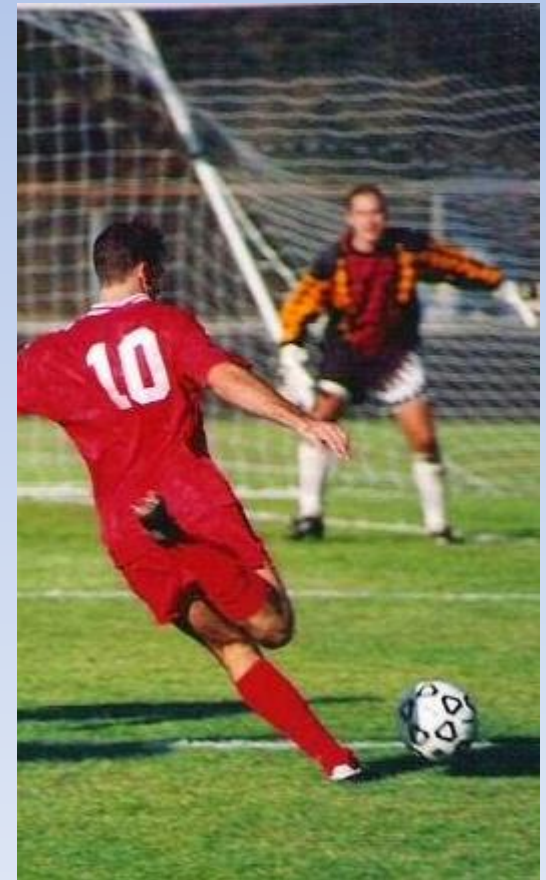
Abstract

This study considered whether the distinction between core and peripheral criteria for behavioral addiction, previously drawn with respect to computing activities in general, applies in the specific area of Massively Multiplayer Online Game playing. Questionnaire items were administered over the Internet to 442 game players. Factor-analysis of the data supported the previous findings for computing in general. An addiction factor loaded on items tapping previously identified core criteria (conflict, withdrawal symptoms, relapse and reinstatement and behavioral salience) and a (non-pathological) engagement factor loaded on items tapping previously identified peripheral criteria (cognitive salience, tolerance and euphoria). Analysis of response frequencies supported the existence of a developmental process whereby peripheral criteria are met before core criteria. Players who might be considered addicted using a mono-

Charlton and Danforth (2009)

- Notion that many people play games at very high levels but do so unproblematically...
...but these people are endorsing addiction criteria too
- Some criteria may be too sensitive for gaming
- Soft items – preoccupation, tolerance, euphoria
- Often identifying ‘highly engaged’ players
- Conclusion suggested the need to move away from adapting criteria from other DSM disorder

- AP1 Tolerance: I tend to want to spend increasing amounts of time playing Asheron's Call
- AP2 Euphoria: I often experience a buzz of excitement while playing Asheron's Call
- AP3 Salience (cognitive): I rarely think about playing Asheron's Call when I am not using a computer



Screening Q for tolerance (Petry et al., 2014)

Do you feel the need to play for **increasing amounts of time**, play **more exciting games**, or use **more powerful equipment** to get the same amount of **excitement** you used to get?



Item	Factor loadings		
	1	2	3
13. I have wanted to spend more money on game software or hardware.	.79	.12	-.02
14. I have been spending more and more money on games.	.76	.15	-.05
1. I have spent increasing amounts of time engaged in games.	.63	.01	-.02
15. I have felt an increasing need for better graphics or technical performance.	.59	.01	-.07
7. I have increasingly felt like I am missing out when I'm not playing.	.52	-.10	-.13
19. I have needed increasingly more competitive or cooperative game activities.	.52	-.37	.10
2. Typical gaming sessions have not felt long enough.	.48	-.01	-.20
16. I have felt an increasing need to be more immersed in a game character or world.	.46	-.28	-.07
10. I have felt a need to play more complex games.	-.16	-.84	-.00
8. I have needed more difficult challenges to feel satisfied.	-.07	-.74	-.12
11. My goals have become increasingly more unique or specific.	.07	-.61	-.17
9. I have taken more risks in the game to get more or better rewards.	.04	-.55	-.29
18. I have needed more stimulation (e.g., calm or excitement) from games.	.39	-.48	.09
17. I have felt an increasing need to expand my knowledge of the game.	.40	-.46	.10
20. I have had increasingly high standards for game completion.	.32	-.42	-.06
4. I have felt the need to accumulate more and more game wealth or currency.	.02	.11	-.87
5. I have needed to obtain more novel or interesting game rewards.	.03	-.11	-.77
3. Gameplay has seemed uninteresting unless I have obtained better or rarer game rewards.	.10	-.00	-.73
12. I have needed to invest more and more game resources when playing.	.29	-.27	-.44
6. Many familiar game rewards have become less important or valuable to me.	.01	-.27	-.43

Note. Component 1 = "Inadequacy", Component 2 = "Achievement", Component 3 = "Wealth".

Factor analysis

- (1) *Wealth*, the need to accumulate in-game rewards of increasing rarity, novelty, or quantity;
- (2) *Achievement*, the need to pursue goal-driven activities of increasing complexity, difficulty, or uniqueness; and
- (3) *Inadequacy*, the need to rectify perceived insufficiencies in gaming capability or progress.

This issue continues to be debated...

INVITED OPINION PAPER

Journal of Behavioral Addictions 4(3), pp. 119–123 (2015)

DOI: 10.1556/2006.4.2015.009

First published online May 27, 2015

Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research

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(Received: February 5, 2015; revised manuscript received: February 13, 2015; accepted: February 14, 2015)

Background: Behavioral addiction research has been particularly flourishing over the last two decades. However, recent publications have suggested that nearly all daily life activities might lead to a genuine addiction. *Methods and aim:* In this article, we discuss how the use of atheoretical and confirmatory research approaches may result in the identification of an unlimited list of “new” behavioral addictions. *Results:* Both methodological and theoretical shortcomings of these studies were discussed. *Conclusions:* We suggested that studies overpathologizing daily life activities are likely to prompt a dismissive appraisal of behavioral addiction research. Consequently, we proposed several roadmaps for future research in the field, centrally highlighting the need for longer tenable behavioral addiction research that shifts from a mere criteria-based approach toward an approach focusing on the psychological processes involved.

The effect of methylphenidate on Internet video game play in children with attention-deficit/hyperactivity disorder

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Abstract

Objective: A number of studies about attention-deficit/hyperactivity disorder (ADHD) and Internet video game play have examined the prefrontal cortex and dopaminergic system. Stimulants such as methylphenidate (MPH), given to treat ADHD, and video game play have been found to increase synaptic dopamine. We hypothesized that MPH treatment would reduce Internet use in subjects with co-occurring ADHD and Internet video game addictions.

Methods: Sixty-two children (52 males and 10 females), drug-naïve, diagnosed with ADHD, and Internet video game players, participated in this study. At the beginning of the study and after 8 weeks of treatment with Concerta (OROS methylphenidate HCl, Seoul, Korea), participants were assessed with Young's Internet Addiction Scale, Korean version (YIAS-K), Korean DuPaul's ADHD Rating Scale, and the Visual Continuous Performance Test. Their Internet usage time was also recorded.

Results: After 8 weeks of treatment, the YIAS-K scores and Internet usage times were significantly reduced. The changes in the YIAS-K scores between the baseline and 8-week assessments were positively correlated with the changes in total and inattention scores from the Korean DuPaul's ADHD Rating Scale, as well as omission errors from the Visual Continuous Performance Test. There was also a significant difference in the number of omission errors among non-Internet-addicted, mildly Internet addicted, and severely Internet addicted participants.

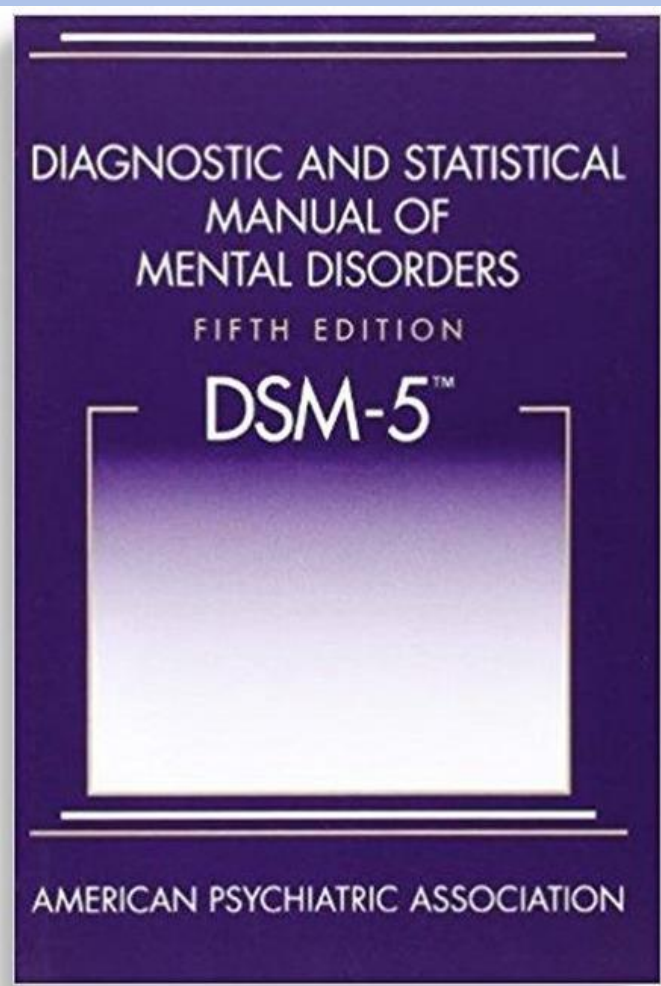
Discussion: We suggest that Internet video game playing might be a means of self-medication for children with ADHD. In addition, we cautiously suggest that MPH might be evaluated as a potential treatment of Internet addiction.

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Han et al. (2009)

- Early treatment study – pharmacology
- Meeting the challenge of comorbidity
- 8 weeks of methylphenidate for children with ADHD
- Some adverse effects – high dropout
- Gaming reduction may have led to increasing substitute Internet-based activities
- “We suggest that video game playing might be a means of self-medication for children with ADHD”

A major development between 2008 and 2018...



Internet Gaming Disorder

Proposed Criteria

Persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the following in a 12-month period:

1. Preoccupation with Internet games. (The individual thinks about previous gaming activity or anticipates playing the next game; Internet gaming becomes the dominant activity in daily life).
Note: This disorder is distinct from Internet gambling, which is included under gambling disorder.
2. Withdrawal symptoms when Internet gaming is taken away. (These symptoms are typically described as irritability, anxiety, or sadness, but there are no physical signs of pharmacological withdrawal.)
3. Tolerance—the need to spend increasing amounts of time engaged in Internet games.
4. Unsuccessful attempts to control the participation in Internet games.
5. Loss of interests in previous hobbies and entertainment as a result of, and with the exception of, Internet games.
6. Continued excessive use of Internet games despite knowledge of psychosocial problems.
7. Has deceived family members, therapists, or others regarding the amount of Internet gaming.
8. Use of Internet games to escape or relieve a negative mood (e.g., feelings of helplessness, guilt, anxiety).
9. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of participation in Internet games.

2008 research summary

- Gaming disorder criteria were constructed from adapting other disorders' criteria
- Tension between clinical sensitivity and specificity
- Many tests/scales were created
- Limited work on understanding etiology
- Much of the field seemed to exist in a silo, both in terms of its disciplinary links and publication outlets – lack of psychiatric input in studies and papers tended to be in specialty journals

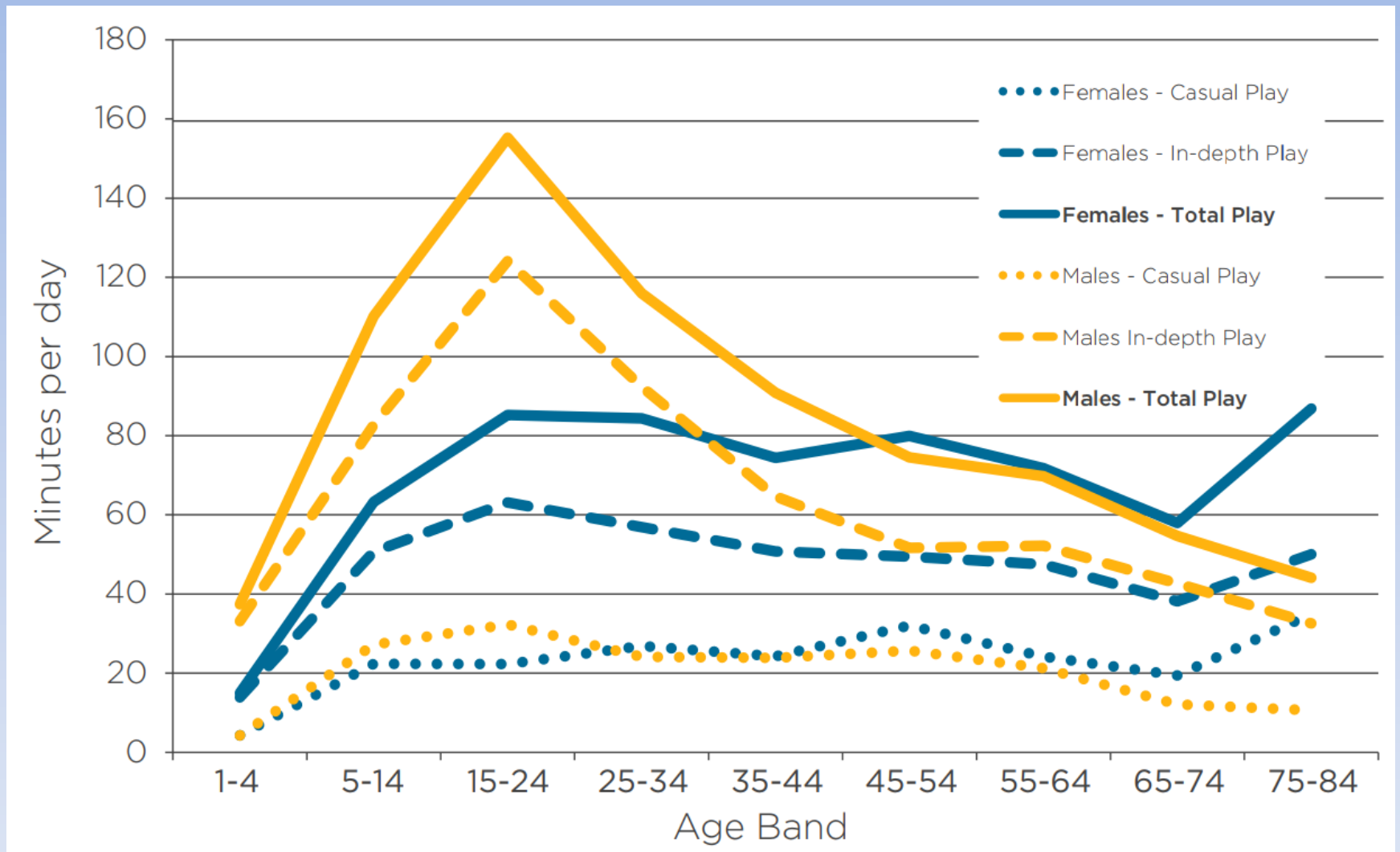
II. 2018



Three noteworthy developments in 2018

1. Gaming popularity and 'battle royale' genre
2. Gaming in ICD-11 and continuing debate
3. Gaming monetization schemes

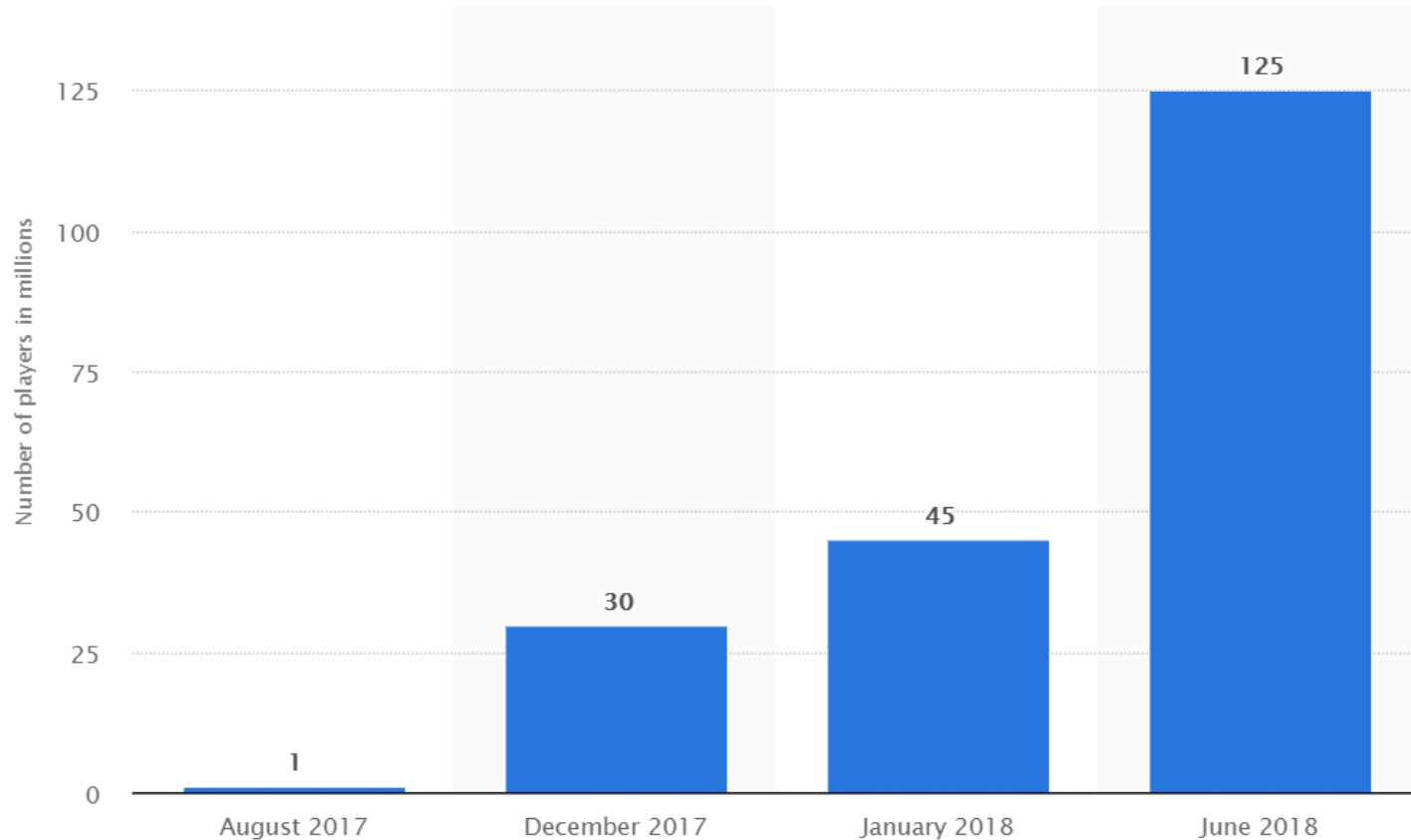
Gaming is only becoming more popular



SOURCE: Interactive Games and Entertainment Association (2018)

Rise of *Fortnite* and similar games

Number of players of Fortnite worldwide from August 2017 to June 2018 (in millions)



Nomenclatural development

ICD-11 for Mortality and Morbidity Statistics (2018)

6C51 Gaming disorder

Description

Gaming disorder is characterized by a pattern of persistent or recurrent gaming behaviour ('digital gaming' or 'video-gaming'), which may be online (i.e., over the internet) or offline, 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.

Exclusions

- Hazardous gaming (QE22)
- Bipolar type I disorder (6A60)
- Bipolar type II disorder (6A61)



STATEMENT ON WHO ICD-11 LIST AND THE INCLUSION OF GAMING

In view of the publication by the WHO of the so-called ICD-11 list, organisations representing video game publishers and developers across the world would like to express their concern:

“Video games across all kinds of genres, devices and platforms are enjoyed safely and sensibly by more than 2 billion people worldwide, with the educational, therapeutic, and recreational value of games being well-founded and widely recognised. **We are therefore concerned to see ‘gaming disorder’ still contained in the latest version of the WHO’s ICD-11 despite significant opposition from the medical and scientific community.**

COMMENT ON THE GLOBAL GAMING INDUSTRY'S STATEMENT ON ICD-11 GAMING DISORDER: A CORPORATE STRATEGY TO DISREGARD HARM AND DEFLECT SOCIAL RESPONSIBILITY?

Daniel T. E. **PhD**, The Hong Kong Polytechnic University
 Oliver Simon, **MD**, Lausanne University Hospital
 David **PhD**, Massey University
 Marouane M. Spadi, **PhD**, London South Bank University
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 Richard Turner, **PhD**, University of Nottingham
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 Anise M. S. Wu, **PhD**, University of Macau
 Hyoun Wook **PhD**, The Catholic University of Korea
 Kyoungjae Young, **PhD**, Soongsil University
 Joseph Zahar, **MD**, Tel Aviv University
 Daniele Zucchi, **MD**, Geneva University Hospitals

Debate on the legitimacy of GD

Debate

ANZJP 50
YEARS
1967-2017

Internet gaming disorder does not qualify as a mental disorder

Pravin Dullur^{1,2} and Vladan Starcevic³

Australian & New Zealand Journal of Psychiatry
1–2

DOI: 10.1177/0004867417741554

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 **SAGE**

Debate

ANZJP

Internet gaming disorder should qualify as a mental disorder

**Daniel L King¹, Paul H Delfabbro¹, Marc N Potenza²,
Zsolt Demetrovics³, Joël Billieux⁴ and Matthias Brand⁵**

Australian & New Zealand Journal of Psychiatry
1–3

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 **SAGE**

What do Australian medical practitioners think about IGD?

Table 2. Attitudes and beliefs of psychiatrists regarding Internet Gaming Disorder (IGD) and Problematic Internet Use (PIU)

	<i>Strongly disagree/ disagree</i>	%	<i>Maybe</i>	%	<i>agree/ strongly agree</i>	%	<i>n</i>
<i>Opinions on Internet Gaming Disorder (IGD)</i>							
IGD is a mental health problem	32.00	12.96%	69.00	27.94%	146.00	59.11%	247
IGD is a significant problem across all ages in the community	114.00	46.15%	64.00	25.91%	69.00	27.94%	247
IGD is likely to be a more significant problem across all ages in the future	30.00	12.15%	42.00	17.00%	175.00	70.85%	247
IGD is a problem more common among children and adolescents than adults	58.00	23.39%	56.00	22.58%	134.00	54.03%	248
It is possible to be 'addicted' to non-gaming content on the internet such as social networking	17.00	6.91%	35.00	14.23%	194.00	78.86%	246

SOURCE: Dullur and Hay (2017)

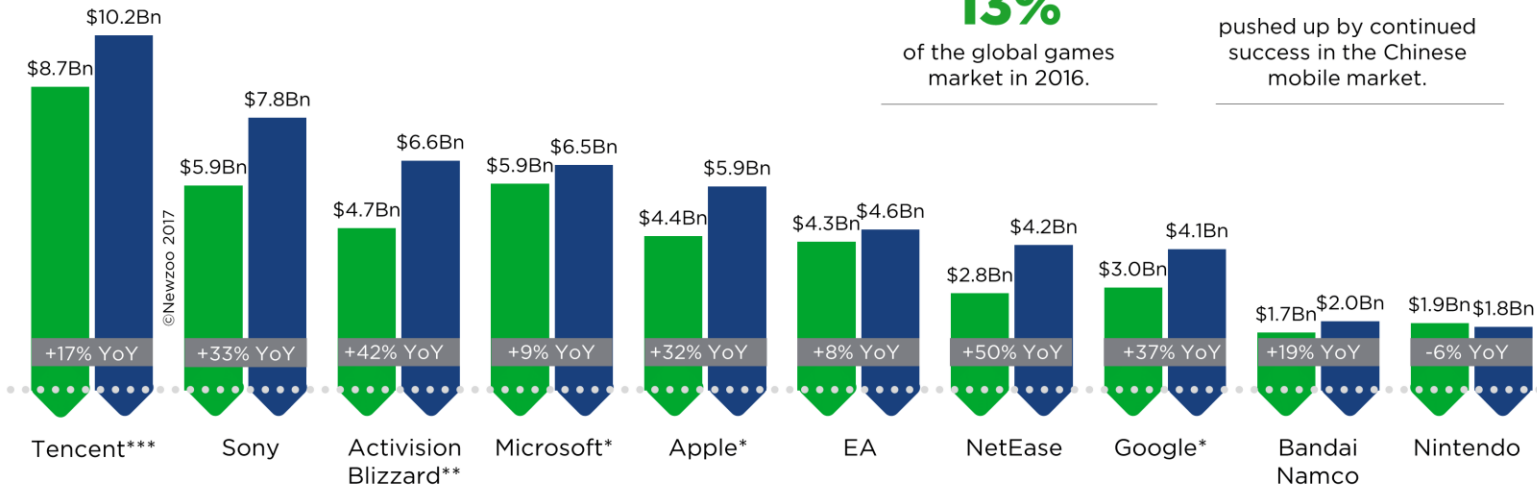
Top gaming companies using new monetisation strategies



TOP 10 PUBLIC COMPANIES BY GAME REVENUES

COMPARISON OF FY 2015 AND FY 2016 REVENUES (\$Bn)

● FY 2015 Revenues (\$Bn) ● FY 2016 Revenues (\$Bn)



Tencent 腾讯 SUPERCELL

Tencent's & Supercell's revenues combined made up

13%

of the global games market in 2016.

网易 NETEASE www.163.com

NetEase revenues grew

+50%

pushed up by continued success in the Chinese mobile market.

*Estimates of public game revenues using quarterly earning reports in which these are not specifically segmented out

**Includes King revenues as of 23 February 2016, the day that King officially became an Activision/Blizzard subsidiary

*** Does not include Supercell revenues

Source: @Newzoo 2017 | Global Games Market Report | newzoo.com/companyrankings/

newzoo
GAMES

The intersection of gaming and gambling via 'Loot boxes'



Video game loot boxes are psychologically akin to gambling

Video games are increasingly exposing young players to randomized in-game reward mechanisms, purchasable for real money — so-called loot boxes. Do loot boxes constitute a form of gambling?

Aaron Drummond and James D. Sauer

Playing video games is a common pastime in industrialized nations, with 65% of US homes including at least one gamer¹. To increase the longevity and profitability of their products, video game developers are, with increasing frequency, incorporating purchasable randomized rewards — commonly referred to as 'loot boxes' — in their games². Consumers and, more recently, policymakers are becoming increasingly concerned that these randomized reward mechanisms may constitute a form of unregulated gambling targeting minors^{3,4}. Here, we examine the structural and psychological features of loot boxes to evaluate similarities to gambling. Whether (and which) loot boxes may be deemed illegal is a matter determined by the laws of individual countries.

'Loot box' is a catch-all term for a digital container of randomized rewards. Essentially, a loot box contains one or more random rewards that alter the game in some way. Rewards may allow players to personalize aspects of the in-game aesthetic (for example, alter their avatar's appearance) or improve their in-game performance (for example, via powerful weapons). Possessing rare game rewards is



Credit: Image courtesy of Aaron Drummond

such as peer pressure and a dilution of monetary value through the exchange of real currency for virtual currency might facilitate migration to monetary forms of gambling⁵. Moreover, adolescents tend to have poorer impulse control than adults, potentially

schedule, and underpins many forms of gambling^{7,8}. Variable ratio reinforcement results in people quickly acquiring behaviours and repeating these behaviours frequently in the hopes of receiving a reward^{7,8}. Research has long shown that

Table 1 | Gambling features in the 22 video games containing loot boxes in 2016-2017

Game	ESRB rating	Exchange of money	Unknown future event	Chance involved	Avoid losses if opt out	Competitive advantage	Can cash out
<i>Assassins Creed Origins</i>	17+	✓	✓	✓	✓	✓ ^a	X
<i>Battlefield 1</i>	17+	✓	✓	✓	✓	X	X
<i>Call of Duty: Infinite Warfare</i>	17+	✓	✓	✓	✓	✓	X
<i>Call of Duty: WWII</i>	17+	✓	✓	✓	✓	X	X
<i>Destiny 2</i>	13+	✓	✓	✓	✓	X	X
<i>FIFA 17</i>	E	✓	✓	✓	✓	✓	✓
<i>FIFA 18</i>	E	✓	✓	✓	✓	✓	✓
<i>For Honor</i>	17+	✓	✓	✓	✓	✓	X
<i>Forza Motorsport 7</i>	E	X ^b	✓	✓	✓	✓	X
<i>Gears of War 4</i>	17+	✓	✓	✓	✓	X	X
<i>Halo Wars 2</i>	13+	✓	✓	✓	✓	✓	X
<i>Injustice 2</i>	13+	X	✓	✓	✓	✓	X
<i>Lawbreakers</i>	17+	✓	✓	✓	✓	X	X
<i>Madden NFL 17</i>	E	✓	✓	✓	✓	✓	✓
<i>Madden NFL 18</i>	E	✓	✓	✓	✓	✓	✓
<i>Mass Effect Andromeda</i>	17+	✓	✓	✓	✓	✓ ^a	X
<i>Middle Earth: Shadow of War</i>	17+	X ^c	✓	✓	✓	✓ ^a	X
<i>NBA 2K18</i>	10+	✓	X	X	✓	X	X
<i>Need for Speed Payback</i>	13+	✓	✓	✓	✓	✓	X
<i>Overwatch</i>	13+	✓	✓	✓	✓	X	X
<i>PlayerUnknown's Battlegrounds</i>	13+	✓	✓	✓	✓	X	✓
<i>Star Wars Battlefront II</i>	13+	X ^c	✓	✓	✓	✓	X

E, everyone. ^aThese games are single player or cooperative, but loot boxes can provide competitive advantage against the game and make players more powerful than friends or team mates. ^bTurn 10 Studios (the publisher of *Forza Motorsport 7*) have announced they will be adding the ability to purchase loot boxes with money soon. ^cOriginally included, but shut down at time of writing due to consumer backlash.

“Predatory” monetisation

Predatory monetisation schemes typically involve in-game purchasing systems that **disguise or withhold the true long-term cost** of the activity until players are already financially and psychologically committed. Such schemes are designed to **encourage repeated player spending using tactics** or elements that may involve, either singularly or in combination:

- limited disclosure of the product;
- false or misleading randomness of outcomes
- intrusive and unavoidable solicitations;
- systems that manipulate reward outcomes to reinforce purchasing behaviors over skilful or strategic play.

Such strategies may exploit **inequalities in information** between purchaser and provider such as when the industry uses knowledge of the player’s game-related preferences, available funds, and/or playing and spending habits, to **present offers predetermined to maximize the likelihood of eliciting player spending**.

ORIGINAL RESEARCH

A longitudinal study of the individual- and group-level problematic gaming and associations with problem gambling among Swedish adolescents

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Abstract

Aim: The aims of this study were to investigate the long-term stability of problematic gaming among adolescents and whether problematic gaming at wave 1 (W1) was associated with problem gambling at wave 2 (W2), three years later.

Methods: Data from the SALVe cohort, including adolescents in Västmanland born in 1997 and 1999, were accessed and analyzed in two waves W2, $N = 1576$; 914 (58% girls). At W1, the adolescents were 13 and 15 years old, and at W2, they were 16 and 18 years old. Adolescents self-rated on the Gaming Addiction Identification Test (GAIT), Problem Gambling Severity Index (PGSI), and gambling frequencies. Stability of gaming was determined using Gamma correlation, Spearman's rho, and McNemar. Logistic regression analysis and general linear model (GLM) analysis were performed and adjusted for sex, age, and ethnicity, frequency of gambling activities and gaming time at W1, with PGSI as the dependent variable, and GAIT as the independent variable, to investigate associations between problematic gaming and problem gambling.

Results: Problematic gaming was relative stable over time, $\gamma = 0.739$, $p \leq .001$, $\rho = 0.555$, $p \leq .001$, and McNemar $p \leq .001$. Furthermore, problematic gaming at W1

Vadlin et al. 2018

- The field had often relied on cross-sectional designs, with convenience samples
- Growing number of longitudinal studies
- N=1500+ adolescents
- Examining links between gaming and gambling
- Study did not find strong association, but did show that problematic gaming was relatively stable
- These data provide support for GD

2017 review of longitudinal studies suggests GD is stable

Review Article

Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: A systematic review of the literature

Satoko Mihara, BA and Susumu Higuchi, MD, PhD*

Department of Psychiatry, National Hospital Organization Kurihama Medical and Addiction Center, Yokosuka, Japan

Aim: The diagnostic criteria of Internet gaming disorder (IGD) have been included in section III of DSM-5. This study aims to systematically review both cross-sectional and longitudinal epidemiological studies of IGD.

Methods: All publications included in PubMed and PsychINFO up to May 2016 were systematically searched to identify cross-sectional studies on prevalence and longitudinal studies of IGD. In the process of identification, articles in non-English languages and studies focusing solely on the use of gaming were excluded, and those meeting the methodological requirements set by this review were included. As

Geographical region made little difference to prevalence. Factors associated with IGD were reported in 28 of 37 cross-sectional studies. These were diverse and covered gaming, demographic and familial factors, interpersonal relations, social and school functioning, personality, psychiatric comorbidity, and physical health conditions. Longitudinal studies identified risk and protective factors, and health and social consequences of IGD. The natural course of IGD was diverse but tended to be more stable among adolescents compared to adults.

Conclusion: Although existing epidemiological studies have provided useful data, differences in meth-



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journal homepage: www.elsevier.com/locate/comphumbeh

Internet gaming disorder in adolescents is linked to delay discounting but not probability discounting

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Delay discounting

Probability discounting

Gain

Loss

ABSTRACT

Internet gaming disorder (IGD) is a behavioral addiction that is gradually becoming a public health problem. We aimed to identify the behavioral characteristics of adolescents with IGD to promote early diagnosis and intervention. As impulsivity and risk taking are the most important traits of addiction, we used several representative methods, including a delay discounting task, a probability discounting task and the Barratt Impulsiveness Scale-11 (BIS-11), to measure the impulsivity and risk-taking tendency of adolescents with IGD and a comparison group. Consistent with previous findings on problematic Internet use (PIU), our results indicated that adolescents with IGD had a larger degree of delay discounting (i.e., more impulsive decision making), regardless of the outcome amount and valence, and higher scores on all three subscales of the BIS-11 than the comparison group. However, there was no intergroup difference in the probability discounting task. In general, the current research posits that impulsive decision making and personality traits, but not risk taking, might co-occur with IGD in adolescents.

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Tian et al. 2018

- Gaming disorder may belong to a group of addictive behaviors but does it share all features?
- Are there different risk factors?
- Research on the GD typical 'profile' increasing
- Found that problem gamers are impulsive but they are less inclined to be risk-taskers
- Study within a larger research context to identify cognitive mechanisms of problem gaming, among many other personal characteristics of GD

Co-Occurrence of Addictive Behaviours: Personality Factors Related to Substance Use, Gambling and Computer Gaming

Birte Walther Matthis Morgenstern Reiner Hanewinkel

Institute for Therapy and Health Research, Kiel, Germany

- Walther et al. (2012) examined the **Big Five personality traits** and other characteristics across **five different addictive disorders**, including gambling, gaming, and use of tobacco, alcohol and cannabis
- Sample of 2,553 people aged 12 to 25 years
- **High impulsivity was the only co-occurring personality factor** present in all five disorders
- Problematic gaming was specifically associated with irritability/aggression, social anxiety, attention deficit issues, and low self-esteem

REGULAR ARTICLE

The Internet Game Use-Elicited Symptom Screen proved to be a valid tool for adolescents aged 10–19 years

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Keywords

Adolescents, Diagnostic accuracy, Internet Game Use-Elicited Symptom Screen, Validity, Young's Internet Addiction Test

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ABSTRACT

Aim: This study tested the diagnostic validity of the nine-item Internet Game Use-Elicited Symptom Screen (IGUESS) tool, which was developed by the authors after the Diagnostic and Statistical Manual of Mental Disorders, fifth edition, identified Internet gaming as a condition that needed further study.

Methods: A self-report screening test comprising IGUESS and Young's Internet Addiction Test was administered to 121 adolescents (74% boys) with a median age of 14 (range 10–19) recruited from school and health settings in Korea. After the screening test, a clinician conducted one-to-one interviews with all of the subjects to set a gold standard for diagnosis.

Results: The sensitivity and specificity of IGUESS were 87.0 and 86.7%, respectively, for a cut-off score of 10 points, with an area under the curve value of 0.93. Its reliability, as determined by Cronbach's alpha, was 0.94, and the correlation coefficient between IGUESS and Young's Internet Addiction Test was $r = 0.902$.

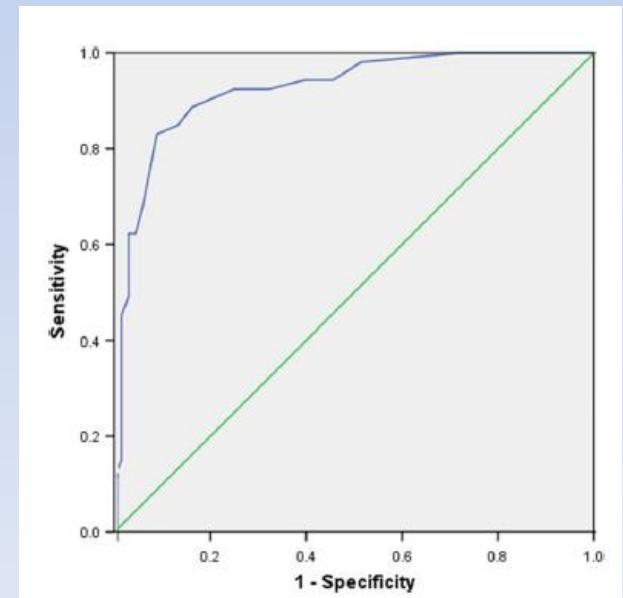
Conclusion: The findings suggest that a cut-off score of 10 is appropriate for administering the IGUESS in various community-based settings, including schools, to screen for potential subjects in need of further assessment for Internet gaming problems.

Jo et al. 2018

- Screening for GD is a growing priority
- Study included clinical interview for comparison
- Screens employed in hospital settings in Asia
- Tests of specificity (ROC)

Table 3 Diagnostic performance of the IGUESS in discriminating the IGD group

IGUESS Score	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	DA (%)	Cohen's kappa
6	95.7	70.7	66.7	96.4	80.2	0.612
7	93.5	74.7	69.4	94.9	81.8	0.639
8	91.3	78.7	72.4	93.7	83.5	0.666
9	89.1	82.7	75.9	92.5	85.1	0.695
10	87.0	86.7	80.0	91.5	86.8	0.724
11	80.4	89.3	82.2	88.2	86.0	0.701



Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades

JIA YUIN FAM 

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Fam, J. Y. (2018). Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades. *Scandinavian Journal of Psychology*, 59, 524–531.

The inclusion of “Internet gaming disorder (IGD)” in the fifth edition of *Diagnostic and statistical manual of mental disorders* (DSM-5) creates a possible line of research. Despite the fact that adolescents are vulnerable to IGD, studies had reported wide array of prevalence estimates in this population. The aim of this paper is to review the published studies on prevalence of IGD among adolescents. Relevant studies prior to March 2017 were identified through databases. A total of 16 studies met the inclusion criteria. The pooled prevalence of IGD among adolescents was 4.6% (95% CI = 3.4%–6.0%). Male adolescents generally reported higher prevalence rate (6.8%, 95% CI = 4.3%–9.7%) than female adolescents (1.3%, 95% CI = 0.6%–2.2%). Subgroup analyses revealed that prevalence estimates were highest when studies were conducted in: (i) 1990s; (ii) use DSM criteria for pathological gambling; (iii) examine gaming disorder; (iv) Asia; and (v) small samples (<1,000). This study confirms the alarming prevalence of IGD among adolescents, especially among males. Given the methodological deficits in past decades (such as reliance on DSM criteria for “pathological gambling,” inclusion of the word “Internet,” and small sample sizes), it is critical for researchers to apply a common methodology for assess this disorder.

Key words: Internet gaming disorder, prevalence, adolescent, DSM-5, meta-analysis.

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INTRODUCTION

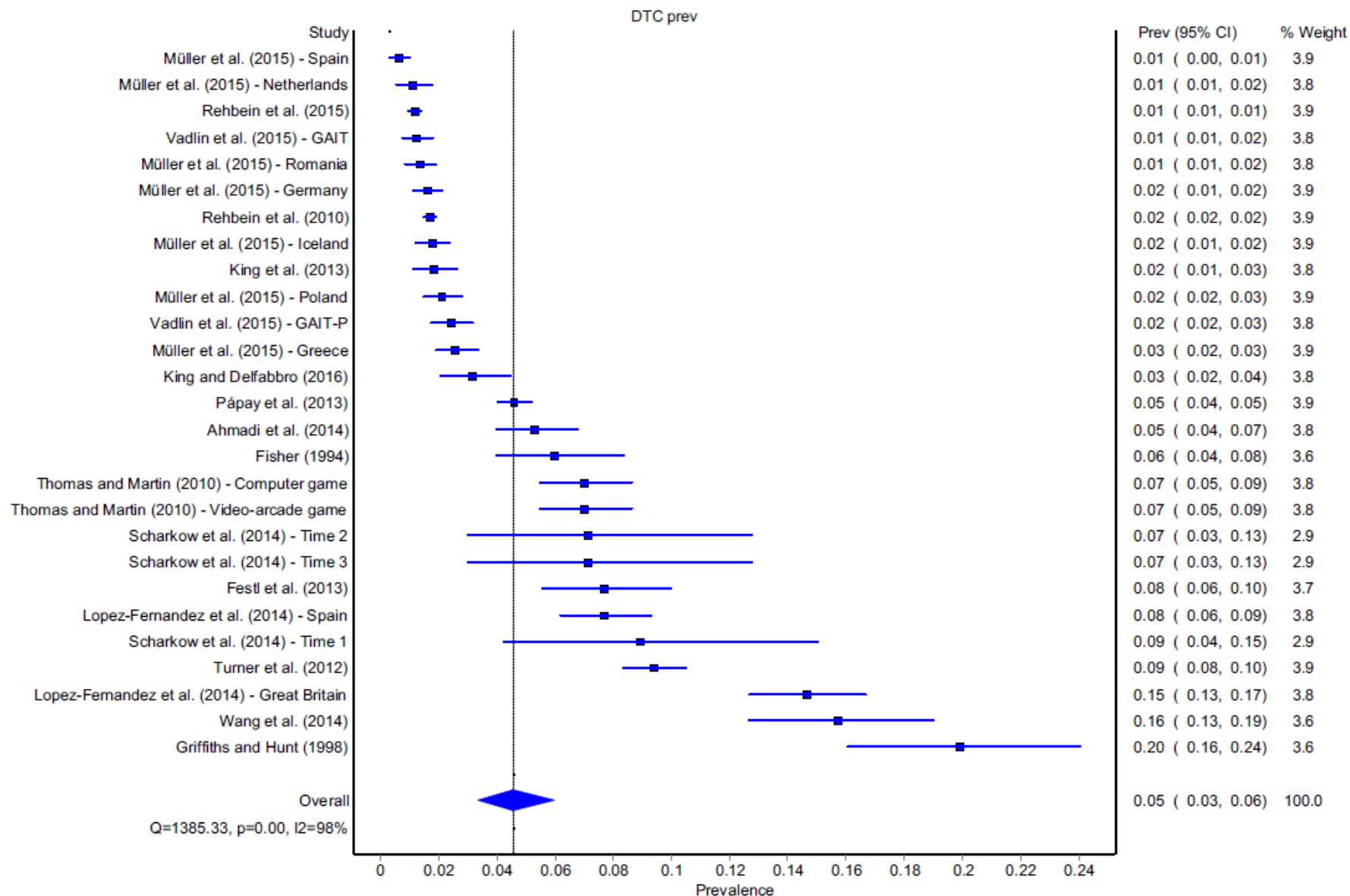
Internet gaming disorder (IGD) has received much research attentions since the release of the first commercial video game in early 1970s, especially after the incident of several high profile cases of violence due to gaming issues (such as the Colorado movie theater massacre conducted by James Holmes in 2012). Various studies had been conducted to investigate different aspects of IGD, which include validation of assessment tools (Lemmens, Valkenburg & Peter, 2009; Tejeiro & Bersabé, 2002; Wölfling, Müller & Beutel, 2011), identification of potential impacts of IGD (Kim, Namkoong, Ku & Kim, 2008; Männikkö, Billieux & Kärräjänen, 2015; Vollmer, Randler, Horzum & Ayas, 2014), the inclusion of new diagnosis criteria in the fifth

common method for assessing internet gaming disorder (Petry, Rehbein, Gentile *et al.*, 2014), in the hope to create an international consensus to assess this disorder.

However, the inclusion of this new diagnosis in DSM-5, as well as the introduction of international consensus for IGD, have led to a number of issues and concerns (Griffiths, Van Rooij, Kardefelt-Winther *et al.*, 2016; Kuss, Griffiths & Pontes, 2017b; Starcevic, 2017). Specifically, the inclusion of the word “Internet” in IGD has been challenged in various studies (Griffiths & Pontes, 2014; King & Delfabbro, 2013; Király, Griffiths & Demetrovics, 2015; Kuss, Griffiths & Pontes, 2017a). This concern is not unexpected, given the DSM-5’s ambiguous description of IGD as “most often involves specific Internet

Fam et al. 2018

- Gaming disorder research in a position to compare prevalence rates over a long period of time
- Conducted a review of 16 studies
- Overall prevalence of 4.6% among adolescents
- HOWEVER – this figure inflated by studies that are older, have $N < 1000$, conducted in Asia, using a measure adapted from the DSM.
- Call for greater consistency in measurement in all future studies



RESEARCH ARTICLE

Development of an effective virtual environment in eliciting craving in adolescents and young adults with internet gaming disorder

Yu-Bin Shin^{1,2}, Jae-Jin Kim^{1,2,3}, Min-Kyeong Kim^{2,3}, Sunghyon Kyeong², Young Hoon Jung^{1,2}, Hyojung Eom^{1,2}, Eunjoo Kim^{2,3*}

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Abstract

Internet gaming disorder (IGD) is a new disorder that warrants further investigation, as recently noted in the research criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Offering controlled environments that increase cue-induced craving, virtual reality cue-exposure therapy has been shown to be effective for some addiction disorders. To assess the feasibility of virtual reality for patients with IGD, this study aimed to develop virtual environments that represent risk situations for inducing craving, and assess the effect of virtual reality in cue reactivity. A total of 64 male adolescents and young adults (34 with IGD and 30 without) were recruited for participation. We developed a virtual internet café environment and the participants were exposed to four different tasks. As the primary feasibility outcome, cravings were measured with a visual analogue scale measuring current urge to play a game after exposure to each task. The virtual internet café induced signifi-

OPEN ACCESS

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Shin et al. 2018

- Gaming disorder treatment research has grown steadily over the past decade
- Mix of methods/therapies trialled
- Study involved a VR simulation of a gaming café for the purpose of exposure therapy
- Enables greater ecological validity for stimulus control and eliciting reactions to cues
- Skills training for managing the social influences on problematic gaming

Internet Café Entrance



Conversation Observation



Gaming Invitation

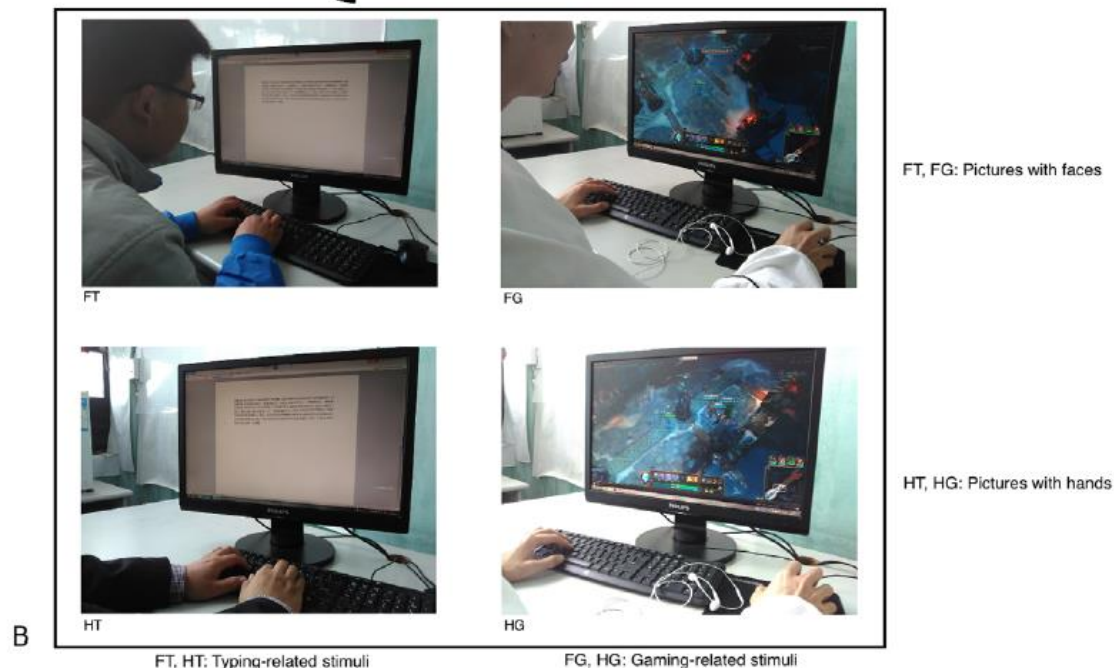
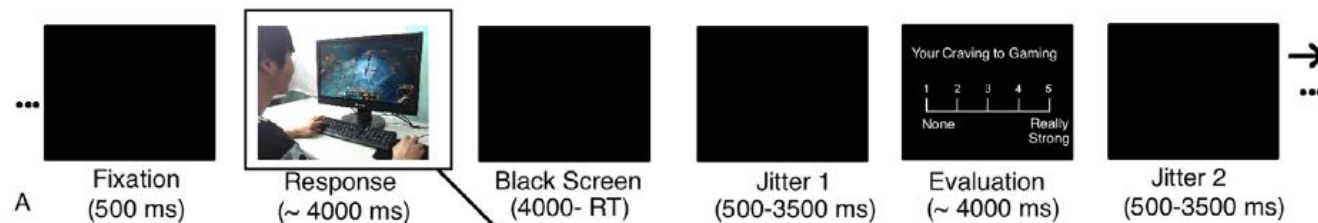


Refusal Skills Practice



Gaming Increases Craving to Gaming-Related Stimuli in Individuals With Internet Gaming Disorder

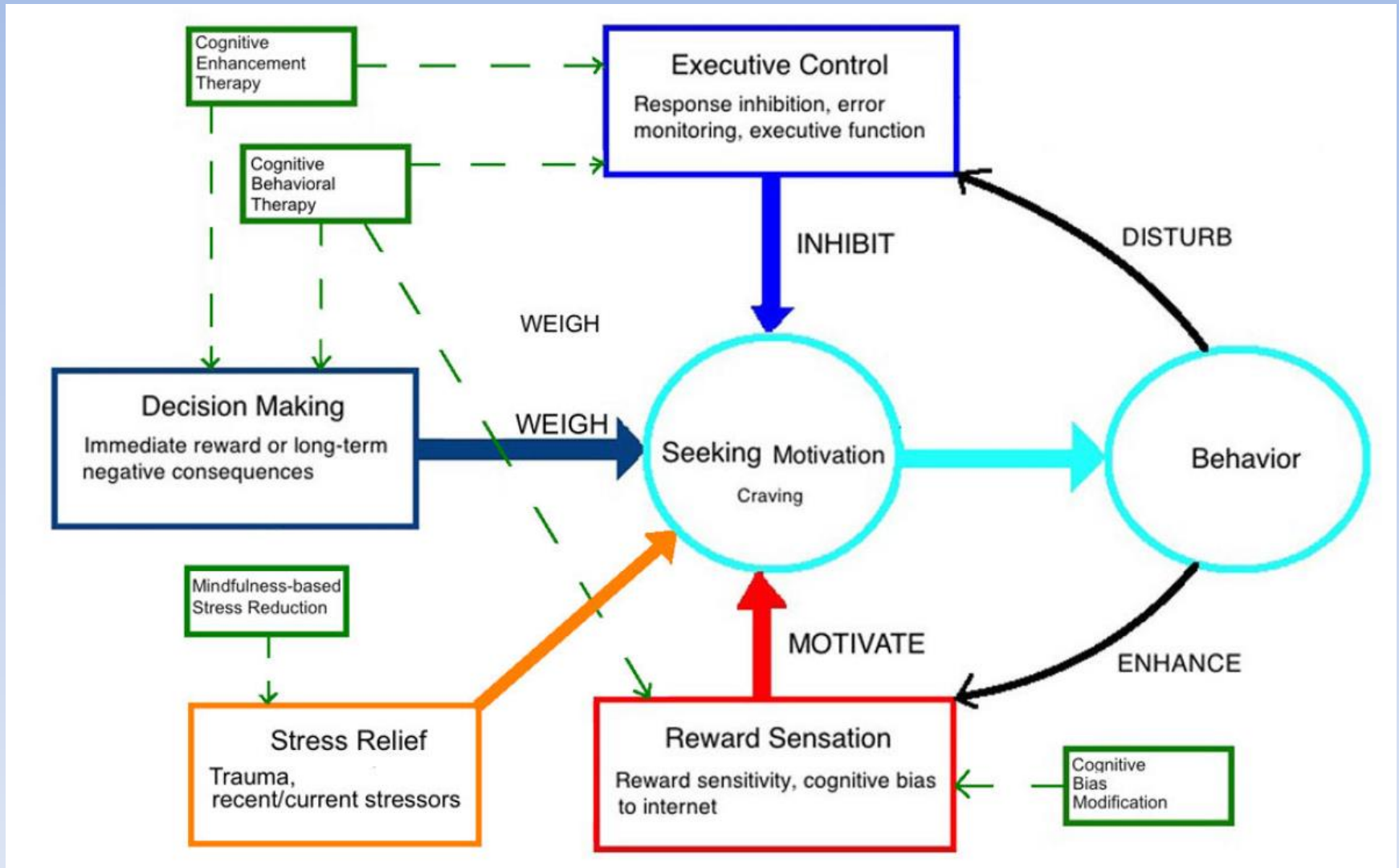
Guangheng Dong, Lingxiao Wang, Xiaoxia Du, and Marc N. Potenza



Social elements of gaming have been less prominent in conceptual models of GD

	Davis (2001)	Dong and Potenza (2014)	Brand et al. (2016)
Theoretical basis	Cognitive-behavioral	Cognitive-behavioral, Neurocognitive	Multidimensional
Target activity	Pathological Internet use: <i>Specific and Generalized</i>	Internet gaming disorder (IGD)	Internet use disorders (IUDs) including subtypes
Vulnerability	Existing psychopathology (e.g., depression, social anxiety)	Neural processes underlying attention, response inhibition, and behavioral flexibility	Neurobiological and psychopathological features, and motives
Core processes	Maladaptive cognitions	Motivational drives Behavioral control Decision-making	Interaction of predisposing factors, affective and cognitive responses, in combination with reduced executive functioning
‘Vicious cycle’	Individual believes that the Internet is only safe place which leads to social withdrawal resulting in less self-worth and strengthening of maladaptive beliefs	Individual has high reward sensations which enhance an unregulated desire to play, resulting in reinforcement of continued use and poor short-term decisions, which maintains desires to play	Individual who is predisposed to addiction seeks gratification from specific activity, which leads to changes in affective and cognitive responses, resulting in greater use to compensate for these changes

2014 cognitive-behavioral model of GD (Dong & Potenza)



CONSORT

Lack of RCTs
over the last
decade

Two RCTs in the
last 3 years

Improvements
may take time

A CONSORT evaluation of treatment studies in chronological order of publication date

	Title/abstract	Background	Participants	Interventions	Outcomes	Sample	Randomization	Allocation	Implementation	Blinding	Statistical	Participant flow	Recruitment	Baseline data	Numbers compared	Outcome estimation	Uncertainty analysis	Adverse events	Interpretation	Generalizability	Overall evidence	Other information
Cao et al. (2007)	●	○	●	●	●	●	●	○	○	○	●	●	○	●	○	○	○	○	○	○	○	○
Wu et al. (2007)	○	●	●	●	○	○	●	○	○	●	●	○	○	●	○	○	○	○	○	○	○	○
Young (2007)	○	●	○	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Dell'Ossa et al. (2008)	●	●	●	●	●	○	●	●	○	●	●	○	●	●	●	●	●	●	●	●	●	●
Kim (2008)	●	●	●	●	●	○	○	○	○	○	●	○	○	●	○	○	●	○	○	○	○	○
Lee & Son (2008)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Han et al. (2009)	○	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Shek et al. (2009)	○	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Du et al. (2010)	●	●	●	●	●	●	●	○	○	●	●	○	○	●	○	○	○	○	○	○	○	○
Han et al. (2010)	○	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Jung et al. (2010)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Ge et al. (2011)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Su et al. (2011)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Han & Renshaw (2012)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Kim et al. (2012)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Jaeng (2012)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Zhu (2012)	●	○	●	○	●	○	●	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Lee et al. (2013)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Li & Wang (2013)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Thornton et al. (2013)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Young (2013)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Wartberg et al. (2014)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Woffling et al. (2014)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Bigata et al. (2015)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Lui et al. (2015)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Shin et al. (2015)	●	○	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Lee et al. (2016)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Park et al. (2016)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Sakuma et al. (2016)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○
Santos et al. (2016)	●	●	●	●	●	○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○

Note: ● present, ○ present, with some limitations, □ not present.

The 'long term' benefits of therapy

Definitions of treatment outcome: Remission and relapse indicators

Study	FU period	Post-test			Follow-up		
		Diagnosis	Symptoms	Internet activity	Diagnosis	Symptoms	Internet activity
Young (2007)	6 months	-	-	-	-	-	-
Lee & Son (2008)	2 months	-	IGAT score	-	-	IGAT score	-
Du et al. (2010)	6 months	-	IOSRC score	-	-	IOSRC score	-
Su et al. (2011)	1 month	-	YDQ score	Weekly use	-	YDQ score	Weekly use
Han & Renshaw (2012)	1 month	-	YIAS score	Weekly use	-	YIAS score	Weekly use
Kim et al. (2012)	1 month	-	YIAS score	Weekly use	-	-	-
Jeong (2012)	2 months	-	K-IAS score	-	-	K-IAS score	-
Young (2013)	1,3,6 months	-	IADQ items	-	-	IADQ items	-
Bipeta et al. (2013)	12 months	IAT	IAT score	-	IAT	IAT score	-
Lui et al. (2015)	3 months	APIUS	APIUS	Weekly use	APIUS	APIUS	Weekly use
Sakuma et al. (2016)	3 months	-	-	Daily, weekly use, days of use	-	-	Daily, weekly use, days of use

FU: Follow up. See Table 1 for other acronyms.

Meta-analysis of CBT for IGD

Author (year)	Outcome variables	pre-post				pre-follow-up			
		<i>g</i>	95% CI	<i>p</i> -Value	1-B	<i>g</i>	CI	<i>p</i> -Value	1-B
Cao et al. (2007)	IGD status	1.24 ^a	[0.66,1.82]	<.001**	1.00	NA	-	-	-
	Anxiety	.78	[0.43,1.13]	<.001**	1.00	NA	-	-	-
Young (2007)	IGD status	1.19	[1.01,1.37]	<.001**	1.00 ^s	.90	[0.72,1.08]	<.001**	1.00 ^s
	Time	2.38	[2.10,2.66]	<.001**	1.00 ^s	2.65	[2.35,2.95]	<.001**	1.00 ^s
Lee & Son (2008)	IGD status	.89 ^a	[0.09,1.69]	.023*	.48 ^s	.08 ^a	[-0.68,0.84]	.846	.03 ^s
	Depression	.85 ^a	[0.05,1.65]	.029*	.44 ^s	.13 ^a	[-0.63,0.89]	.734	.03 ^s
Du et al. (2010)	IGD status	.14 ^a	[-0.40,0.68]	.619	.04 ^s	.10 ^a	[-0.44,0.64]	.721	.03 ^s
	Anxiety	.44 ^a	[-0.10,0.98]	.104	.26 ^s	.46 ^a	[-0.08,1.00]	.090	.28 ^s
Jing et al. (2010)	IGD status	.83 ^a	[0.35,1.31]	.001**	.94	NA	-	-	-
Kim et al. (2012)	IGD status	.70 ^a	[0.20,1.20]	.005**	.70 ^s	.21 ^a	[-0.29,0.71]	.397	.08 ^s
	Anxiety	1.12 ^a	[0.60,1.64]	<.001**	.99 ^s	.63 ^a	[0.13,1.13]	.012*	.60 ^s
	Depression	.61 ^a	[0.11,1.11]	.015*	.57 ^s	.26 ^a	[-0.24,0.76]	.294	.11 ^s
	Time	.84 ^a	[0.32,1.36]	.002**	.86 ^s	.39 ^a	[-0.11,0.89]	.112	.24 ^s
Li & Wang (2013)	IGD status	.20 ^a	[-0.56,0.96]	.599	.17	NA	-	-	-
	Anxiety	.54 ^a	[-0.22,1.30]	.149	.79	NA	-	-	-
	Depression	.61	[-0.17,1.39]	.104	.87	NA	-	-	-
Young (2013)	IGD status	4.20 ^b	[3.79,4.62]	<.001**	1.00 ^s	3.36 ^b	[3.00,3.72]	<.001**	1.00 ^s
Wartberg et al. (2014)	IGD status	.43	[0.05,0.81]	.018*	.39	NA	-	-	-
	Anxiety	.07 ^a	[-0.29,0.43]	.700	.06	NA	-	-	-
	Depression	.07 ^c	[-0.29,0.43]	.700	.06	NA	-	-	-
	Time	.47	[0.09,0.85]	.011**	.47	NA	-	-	-
Wolfling et al. (2014)	IGD status	2.08	[1.53,2.64]	<.001**	1.00	NA	-	-	-
	Anxiety	.47	[0.14,0.80]	.003**	.63	NA	-	-	-
	Depression	.90	[0.53,1.27]	<.001**	.99	NA	-	-	-
	Time	1.31	[0.90,1.72]	<.001**	.99	NA	-	-	-
Park et al. (2016)	IGD status	1.40	[0.74,2.06]	<.001**	.99	NA	-	-	-
Santos et al. (2016)	IGD status	3.38 ^b	[2.74,4.03]	<.001**	1.00	NA	-	-	-
	Anxiety	3.32 ^b	[2.67,3.97]	<.001**	1.00	NA	-	-	-
	Depression	1.71	[1.33,2.09]	<.001**	1.00	NA	-	-	-
Sakuma et al. (2017)	Time	NA	NA	NA	-	.81	[0.22,1.40]	.002**	-

NA: not available due to missing data, 1-B: post-hoc power analysis ($\alpha = .05$). ^aBetween-groups comparison. ^bOutlier excluded from further analysis.

^cCombined anxiety/depression measure. ^abonferroni corrected criterion level. * $p < .05$, ** $p < .01$.

2018 research summary

SciVal Topic Prominence ⓘ

Topic: [Internet](#) | [Adolescent](#) | [internet gaming](#)

Prominence percentile: 99.860  ⓘ

- Gaming disorder has gained more acceptance
- The field is a top %1 field for momentum
- While there will always be pilot-quality qualities, there are now many high-quality studies
- Neurobiological research area growing rapidly
- The field has matured in its view of the complexities of gaming, but still has difficulties in keeping up with new technological innovations
- Treatment is still a puzzle, especially for teens

III. 2028



(sorry)

What will the future bring?

In-game purchasing (microtransactions)



System and method for providing in-game pricing relative to player statistics

US 9656175 B1

ABSTRACT

One aspect of the disclosure relates to providing players pricing of in-game virtual items associated with their experience and their progress in the game. For example, the first player and the second player may have similar triggers, similar in-game events, and actually have different prices and currencies inside each story depending on each player's progress in the game, thus creating an individualized experience that may alter from player to player.

Impact:

Prices are individually tailored to maximise spending

Price of items depends on how much you have already spent

Publication number	US9656175 B1
Publication type	Grant
Application number	US 14/830,634
Publication date	May 23, 2017
Filing date	Aug 19, 2015
Priority date 	Jun 4, 2013

Also published as [US9138639](#)

Inventors [Tim Ernst](#)

Original Assignee [Kabam, Inc.](#)

Export Citation [BiBTeX](#), [EndNote](#), [RefMan](#)

[Patent Citations](#) (102), [Non-Patent Citations](#) (33), [Classifications](#) (6), [Legal Events](#) (3)

External Links: [USPTO](#), [USPTO Assignment](#), [Espacenet](#)

Mystery boxes that adjust due to past spending behavior

US 20150335995 A1

ZUSAMMENFASSUNG

A system and method for varying the distribution probabilities of individual potential awards associated with probability item bundles depending on a purchase history of a user activating a probability item bundle.

Impact:

Potential to target and exploit big spenders

Game adjusts the likelihood of rewards based on past spending and how much credit the player has stored

Veröffentlichungsnummer	US20150335995 A1
Publikationstyp	Anmeldung
Anmeldenummer	US 14/282,788
Veröffentlichungsdatum	26. Nov. 2015
Eingetragen	20. Mai 2014
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Auch veröffentlicht unter	US9744446
Erfinder	Sam McLellan, Luc Pieron, Dylan SWIFT, Stephanie Schultz
Ursprünglich Bevollmächtigter	Kabam, Inc.
Zitat exportieren	BiBTeX, EndNote, RefMan
Patentzitate (1), Referenziert von (22), Klassifizierungen (8), Juristische Ereignisse (3)	
Externe Links: USPTO , USPTO-Zuordnung , Espacenet	

ATTACHMENT TO DIGITAL VIRTUAL POSSESSIONS IN VIDEOGAMES

Rebecca Watkins and Mike Molesworth

ABSTRACT

Purpose – To extend our understanding of consumers' relationships with their growing collections of digital virtual goods by exploring adult videogamers' attachments to their digital virtual possessions within videogames.

Methodology – Phenomenological interviews with 35 adult videogamers, primarily conducted in participants' homes and lasting on average two hours.

Findings – Our participants were able to possess and form emotional attachments to 'irreplaceable' digital virtual goods within videogames despite the goods' immaterial nature and their own lack of legal ownership. The processes via which these attachments developed mirror our

Top 100 games on Facebook

Computers in Human Behavior 57 (2016) 48–53



Contents lists available at [ScienceDirect](#)

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh



Full length article

Gambling content in Facebook games: A common phenomenon?

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Facebook games
Game developer

ABSTRACT

Some Facebook games are offered by developers who also offer gambling games, possibly indicating that gambling content (GC) could be found in their Facebook games. This study measures the presence of GC in Facebook games and documents their presentation. It verifies whether GC is more present in games offered by developers offering gambling games as well. The 100 most popular Facebook games were played for 10 min and recorded for content analysis purposes. GC was detected and classified into standard gambling simulation, non-standard gambling simulation, and gambling references. The results indicate that 54% of Facebook games present GC. The GC most often used alluded to slot machines (22%). Facebook games which offer GC are not associated with gambling game developers. However, when gambling references are found, they were most often in games offered by gambling developers. GC as a medium for familiarization with gambling is discussed.

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54% of games on Facebook have **gambling elements** and these games tend to be owned by gambling operators



Contents lists available at ScienceDirect

Addictive Behaviors

journal homepage: www.elsevier.com/locate/addictbeh



Free-to-play: About addicted Whales, at risk Dolphins and healthy Minnows. Monetization design and Internet Gaming Disorder



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- Survey of 3,967 children in Germany
- Expenditure on games was associated with IGD
- ‘Whales’ spent 16+ euros per month

Enhancing perceived value of game stimuli

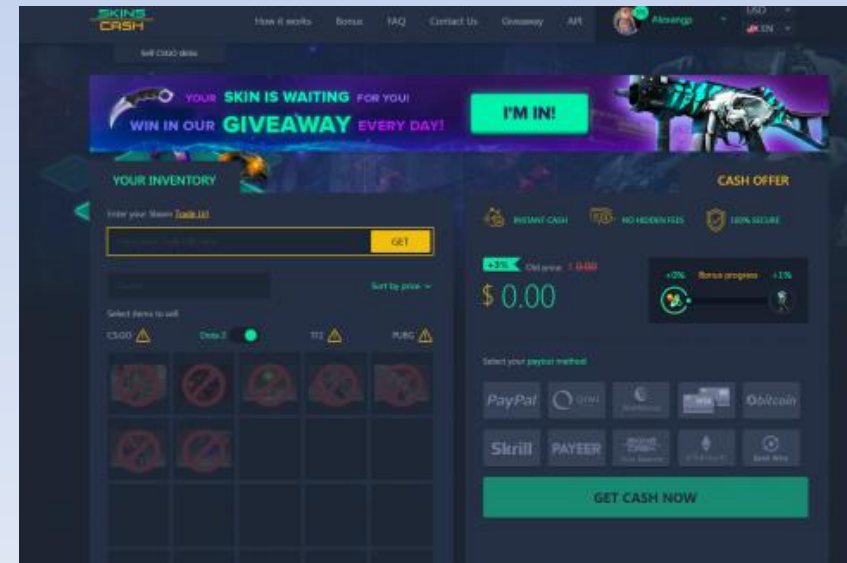
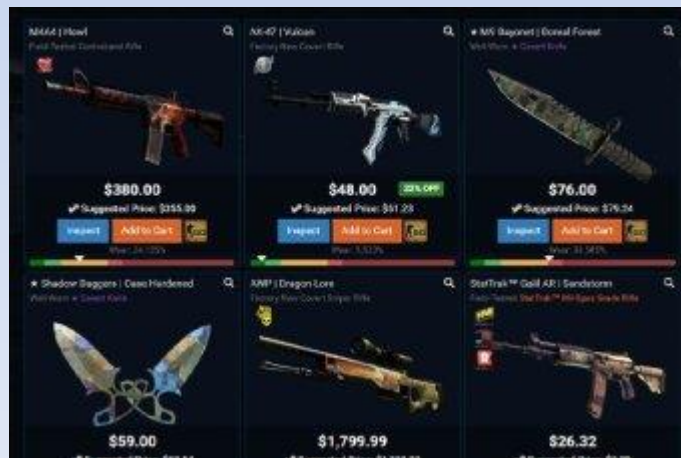
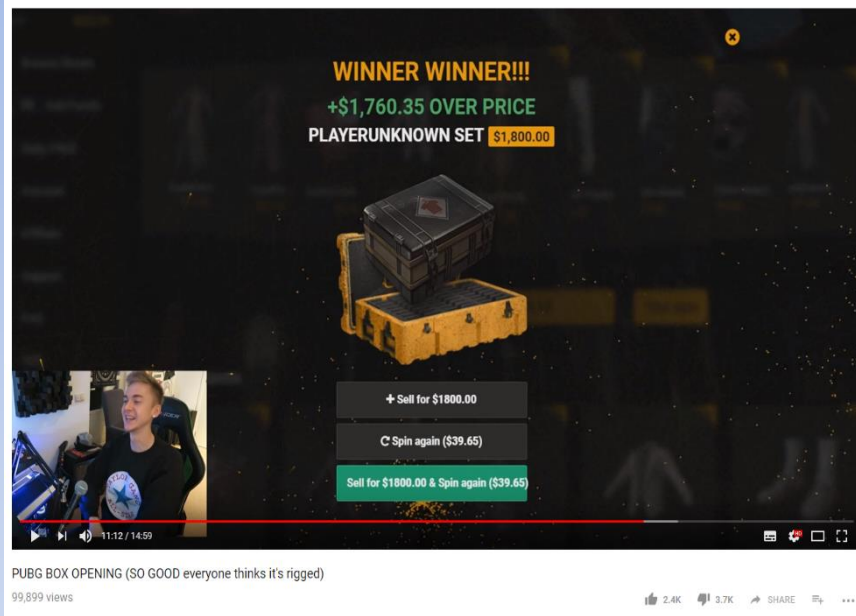
- Systems that **increase time** spent playing
 - (e.g., 'grinding', time-based goals, cooldowns, loading screens)

COGNITIVE DISSONANCE

- Systems that **require spending** to play
 - (e.g., Option to purchase virtual items, paywalls)

ENDOWMENT EFFECT

Gaming-gambling cross-over (e.g., skins, eSports promotions)



Future directions for the field

- Gold standard assessment tool for GD
- Deeper examination of the maladaptive player-game relationship
- Bridging language gaps and cultural divides
- Access to player data
- Greater funding opportunities
- Addressing problem vs. disordered gaming
- Feasible, accessible and affordable treatment

Final thoughts

- Evolution in games due to streaming and esports, VR and monetisation of virtual goods
- ‘Corporate synergies’ across gaming, esports, streaming channels, and mobile technologies
- Normalisation of 24/7 digital lifestyles
- Youth interest in and aspiration for ‘digital careers’ influenced by the ‘prestige’, glamour, and perceived profits of the online world

Thank you

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INTERNET GAMING DISORDER

THEORY, ASSESSMENT, TREATMENT, AND PREVENTION

DANIEL KING AND PAUL DELFABBRO

