

# “JUST ONE MORE GAME...”

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Science and  
Controversy on  
Internet and  
Gaming  
Addiction

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Our favourites...



**Final Fantasy VIII, Square-Enix**



**Mass Effect, Bioware**

# INTRODUCTION

- Media and Tech Addiction
- Understanding how Addiction Works
- Review of the Science of Tech Addiction
- What are Games Doing Wrong?
- What can Games Do Right?

# MEDIA AND TECHNOLOGY ADDICTION

The  
Noisemakers  
Make Noise...

# Teen collapses after four-day Xbox marathon 12

## Diablo 3 Death: Teen Dies After Playing Game For 40 Hours Straight

QMI AGENCY

FIRST POSTED: W

# KOTAKU

VERY SAD

## 3 Year-Old Killed By Mother For Throwing Away Game Console

On the night of March 30, little Shizuku Tanaka was murdered in Osaka. Her feet and hands were bound by tape, and she was stuffed in a garbage bag. The bag was tied shut, and the three year old is now dead.

Her mother, 26-year-old Yui Tanaka, later told investigators, "Shizuku was being fussy and noisy while we were gaming." According to the Nikkei, Tanaka also said that the little girl threw their game machine and other important possessions

## Chinese couple sells three of their kids to fund online gaming habit



By Jeff Hughes | Digital Trends - Tue, Jul 26, 2011

SEOUL

## Police: Couple nurtured virtual child while real baby starved

March 07, 2010 | From Andrew Salmon for CNN

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Police have arrested a South Korean couple whose toddler starved to death while they were raising a virtual child online, authorities said.

The couple fed their 3-month-old daughter once a day between marathon stretches in a local Internet cafe, where they were raising a virtual child in the fantasy role-playing game Prus Online, police told local reporters Friday.

Prus Online is a 3-D game in which players nurture an online companion, Anima, a young girl with

[http://articles.cnn.com/2010-03-07/world/south.korea.baby.dead\\_1\\_virtual-child-premature-baby-real-baby?\\_s=PM:WORLD](http://articles.cnn.com/2010-03-07/world/south.korea.baby.dead_1_virtual-child-premature-baby-real-baby?_s=PM:WORLD)

<http://news.yahoo.com/chinese-couple-sells-three-kids-fund-online-gaming-025202930.html>

<http://kotaku.com/5787908/3-year-old-killed-by-mother-for-throwing-away-game-console>

[http://www.huffingtonpost.com/2012/07/18/diablo-3-death-chuang-taiwan-\\_n\\_1683036.html](http://www.huffingtonpost.com/2012/07/18/diablo-3-death-chuang-taiwan-_n_1683036.html)

<http://www.torontosun.com/2012/08/08/teen-collapses-after-four-day-xbox-marathon>

## South Korea Cracks Down on Gaming Addiction

By GEOFFREY CAIN / SEOUL Tuesday, Apr. 20, 2010

### (2010) Ministry of Culture, Sports and Tourism

- StarCraft, World of Warcraft, Battlefield
  - block connections of youth <18 years between 00:00 – 08:00
- Internet cafes
  - slow down connections of young players after >3 hours of use
- “several other bills are pending”

# UNDERSTANDING HOW ADDICTION WORKS

Details,  
details,  
details...

# ADDICTIONS

- **Most involve putting something in your body:**
  - Injecting heroin
  - Snorting cocaine
  - Drinking alcohol
- **Some, though, are called “process addictions”**
  - Stealing (kleptomania)
  - Gambling (pathological gambling)
  - Hair Pulling (trichotillomania)



# ADDICTIONS

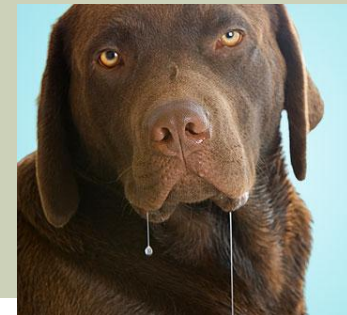
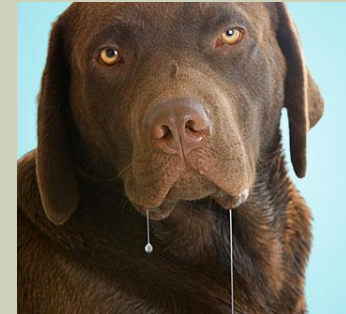
- **Some addictions are being proposed:**
  - Sex addiction
  - Internet addiction
  - Video Game addiction
  
- **For our presentation, we may combine  
“Internet” + “Video Game” addiction  
= “TECH ADDICTION”**

# WHAT MAKES A SUBSTANCE “ADDICTIVE?”

- **Dependence**
  - **Tolerance:** increased resistance to effect
  - **Withdrawal:** negative consequence for stopping
- **Generally, quick euphoria vs. delayed problem**

# PSYCH 101

## CLASSICAL CONDITIONING



# HAVE GAMERS BEEN CLASICALLY CONDITIONED?

**DING!**



© 1999-2012 Sony Online Entertainment LLC.

**Whoooooommm**



© 2004 – 2012 Blizzard Entertainment, Inc.

**Babababa,  
baaa baaa  
Ba – baba!**



© 1990, 2006 SQUARE ENIX CO.LTD.



# PSYCH 101

- Operant Conditioning: Reinforcement
  - Behaviour is modified by consequences



# HAVE GAMERS BEEN OPERANTLY CONDITIONED?



HIGH SCORE  
126560

# PSYCH 101

## Reward Schedules

### Fixed Ratio Schedule

BEHAVIOUR LEADS TO PREDICTABLE AWARD RECEIPT

PSYCHOLOGY	GAMING
Pull lever, get food	Eat pellet, get points
100 gold stars = treat	100 gil = potion
15 more reps = shower	Made level = go to bed

- Tends to lead to self control
- After reward, generally reduced drive
- Best for learning new tasks

# PSYCH 101

## Reward Schedules

### Variable Ratio Schedule

BEHAVIOUR LEADS TO UNPREDICTABLE AWARD RECEIPT

**PSYCHOLOGY**

**GAMING**

Begging = maybe treat

Kill mob = maybe loot

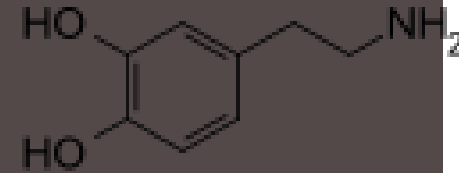
Pull lever = jackpot?

Kill boss = phat loot?

- Highest rate of response
- Tends to lead to lack of self control
- After reward, generally constant drive
- Hardest to extinguish behaviour
- Rarer reward = tougher to extinguish



# CHEMICALS INVOLVED



<b>CHEMICAL</b>	Dopamine
<b>ROLE</b>	Regulates “reward pathway”, sense of reality, muscle movement
<b>TOO MUCH</b>	Impulsive behaviours, hallucinations, psychosis, extra movements
<b>TOO LITTLE</b>	Slowed muscles, reduced motivation, difficulties thinking
<b>Medications</b>	L-Dopa, Risperdal, Ritalin, Adderall
<b>Drugs</b>	Cocaine, Crystal Meth, Ecstasy

## Evidence Currently:

- Low dopamine levels thought to increase desire to seek rewards, take more risks.
- ADHD medications have been used to reduced video game use in children.
- They probably work by increasing the amount of dopamine in the brain.

S

Frontal Lobe,  
Prefrontal Lobe

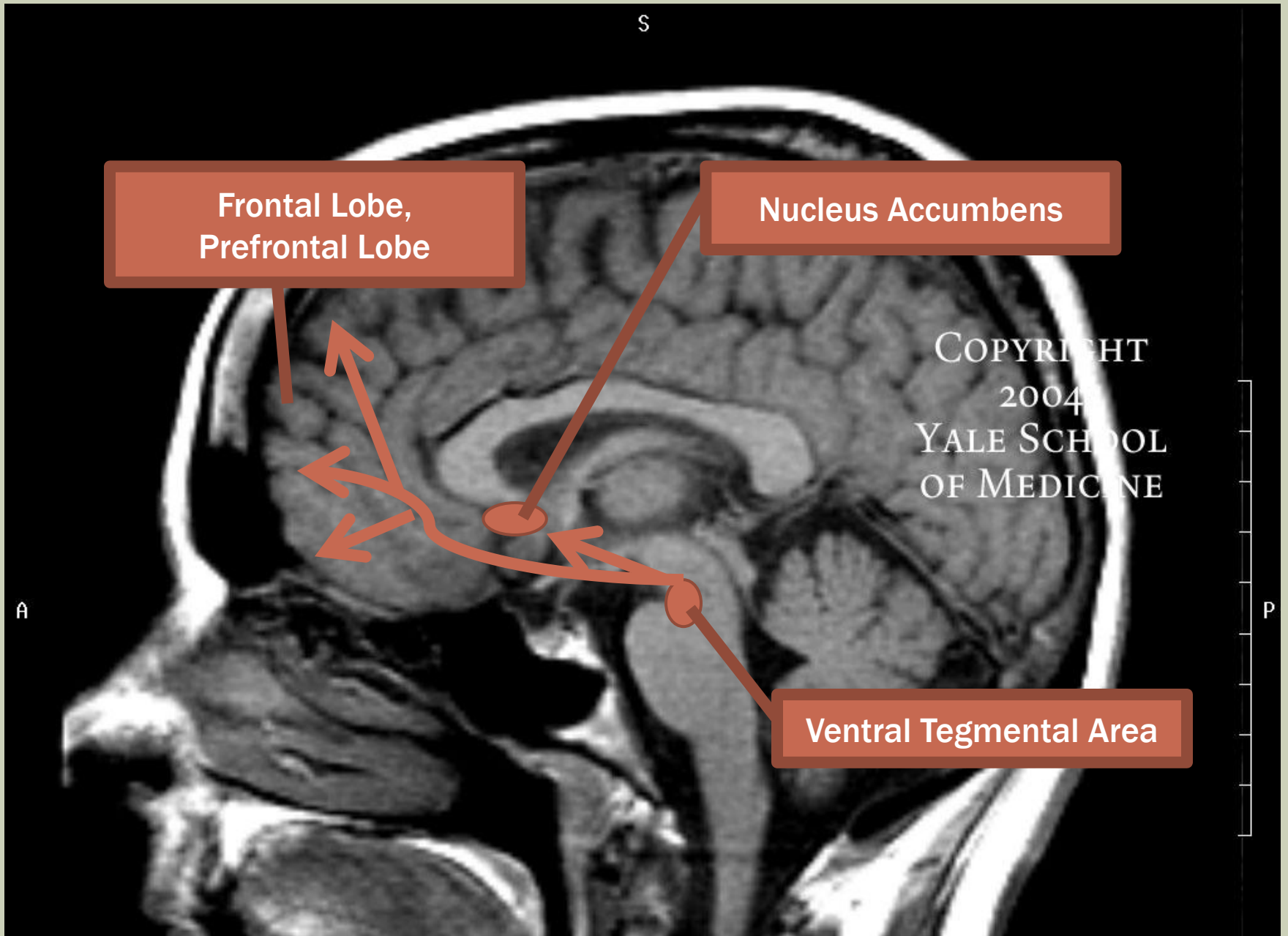
Nucleus Accumbens

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YALE SCHOOL  
OF MEDICINE

A

P

Ventral Tegmental Area



# THE SCIENCE OF INTERNET / GAME ADDICTION

How we  
know what  
we don't  
know...

# GAMBLING VS. GAMING ADDICTION

<b>Pathological Gambling</b>	<b>Gaming Addiction</b>
<b>“Chasing” money</b>	<b>“Chasing” points / items / skills</b>
<b>Players value money</b>	<b>Gamers value points / items / skills</b>
<b>Casinos lack windows Casinos lack clocks</b>	<b>Gaming often in the dark Games often lack realtime clock</b>
<b>Casinos have a tier system (Fixed Ratio Schedule)</b>	<b>Games have a tier system (Fixed Ratio Schedule)</b>
<b>Rewards come randomly (Variable Ratio Schedule)</b>	<b>Games often use random reward (Variable Ratio Schedule)</b>

# PATHOLOGICAL GAMBLING IN DSM

	Idea	Criteria
1	TOLERANCE	needs increasing amounts of gambled \$\$ to achieve excitement
2	WITHDRAWAL	restless or irritable when attempting to cut down gambling
3	CAN'T STOP	repeated unsuccessful efforts to control gambling
4	PREOCCUPATION	often preoccupied with gambling, planning gambling, getting \$\$
5	SOOTHING	gambles often when feeling distressed
6	CHASING	after losing \$\$ gambling, often returns another day to get even
7	SHAME / HIDING	lies to conceal the extent of involvement with gambling
8	CAUSES SIGNIFICANT LOSS	has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
9	BURDENS OTHERS	relies on others to provide \$\$ to relieve desperate financial situations caused by gambling

# PROPOSED “INTERNET/VG ADDICTION”

Brown = Serious Issues in using as criteria...

	Idea	Criteria
1	TOLERANCE	needs increasing amounts of net / gaming to achieve excitement
2	WITHDRAWAL	irritable or restless when internet / game is taken away
3	CAN'T STOP	repeated unsuccessful efforts to control internet/game use
4	PREOCCUPATION	preoccupation with internet / gaming
5	SOOTHING	Uses internet / games often when feeling distressed
	CHASING	(did not translate)
6	SHAME / HIDING	lies to conceal the extent of internet / game use
7	CAUSES SIGNIFICANT LOSS	has jeopardized or lost a significant relationship, job, or educational or career opportunity because of internet / gaming
	BURDENS	(did not translate)
8	AWARENESS	Continued excessive Internet use despite knowledge of negative psychosocial problems
9	Uhhh...	Loss of interests, previous hobbies, entertainment

# LANDMARK STUDY

WHICH MEANS I WON'T LIKE IT...

**January 2007 – Survey by Harris Polls**  
**Solicited 1178 US Residents by e-mail invitation**  
**Age 8-18**  
**On-Line Questionnaire**  
**8% “Addicted” to Video Games**

**Pathological Video-Game Use Among Youth Ages 8 to 18:  
A National Study**  
**Douglas Gentile**

Psychological Science **May 2009** vol. 20 no. 5 **594-602**

**Questionnaire used to develop the results:**



**Over time, have you been spending much more time thinking about playing video games, learning about video-game playing, or planning the next opportunity to play?**

**Do you need to spend more and more time and/or money on video games in order to feel the same amount of excitement?**

**Have you tried to play video games less often or for shorter periods of time, but are unsuccessful?**

**Do you become restless or irritable when attempting to cut down or stop playing video games?**

**Have you played video games as a way of escaping from problems or bad feelings?**

**Have you ever lied to family or friends about how much you play video games?**

**Have you ever stolen a video game from a store or a friend, or have you ever stolen money in order to buy a video game?**

**Do you sometimes skip household chores in order to spend more time playing video games?**

**Do you sometimes skip doing homework in order to spend more time playing video games?**

**Have you ever done poorly on a school assignment or test because you spent too much time playing video games?**

**Have you ever needed friends or family to give you extra money because you spent too much money on video-game equipment, software, or game/Internet fees?**

# WHAT'S WRONG WITH THAT SURVEY

- Did not ask about **SIGNIFICANT** consequences
- “Have you ever lied to family or friends”
  - >> likely to parents (VG negative) than friends (VG neut)
- “Do you sometimes ...”
- “Have you ever done poorly?”
- “Have you ever needed friends or family to give you extra money...” ... to... 8 ... year... olds....

# “CONSTRUCT” PROBLEMS

What if we replaced “played video games” with:

- read a book
- called your S.O.
- hung out with friends
- played sports

Have you \_\_\_\_\_ as a way of escaping from problems or bad feelings?

... this study could just be describing people who like to play video games

# NONETHELESS...

- Over 170 academic citations, Over 1,000 Media articles cite it:

- 8.5% of children are “addicted” to video games

- Other studies:

- Dutch: 1.6% of adolescents

*Addiction*, 106, 205–212

- Norway: 4% of video game players

*Scandinavian Journal of Psychology*, 45(3), 223–229

- China: 10% of “internet addicted youth”

# IS PROBLEM VIDEO GAME PLAYING A PROBLEM?

- Anecdotally, we both believe it can be.
- Most important:
  - Co-morbid psychiatric problems
  - Lack of balance in life
  - Lack of development of other skills
  - Impedes Scholastic Achievement

# BUT WHAT ABOUT THE STUDIES?

- Preliminary studies show a wide range of results
  - Video games activate the “addiction” pathway of the brain
  - Pathological Gamers are more likely to be... (depressed, anxious, etc)
  - Pathological Gamers have less pro-social activities
- Very susceptible to both publication and confirmation bias
- Not using standardized definitions

Our advice:

- Approach these studies with a nuanced, skeptical view

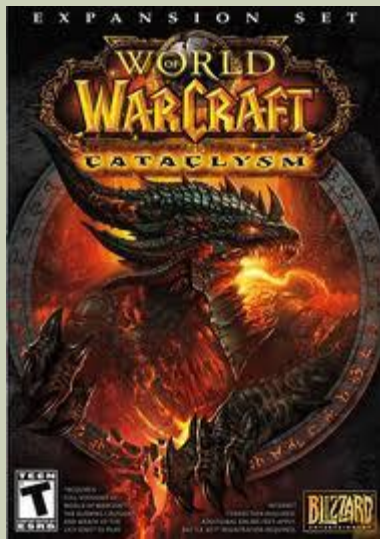
# VIDEO GAME CONCEPTS THAT ENCOURAGE ADDICTION

“/played”  
can be  
depressing  
...



# WHAT ARE GAMES DOING WRONG?

- “Achievements” in games are often rewarding repetitive / compulsive / unhealthy play.



**Achievement:**  
**First warrior to level 85**



**Achievement:**  
**Kill 72,000 Zombies**



**Achievement:**  
**100% Game Completion**

# WHAT ARE GAMES DOING WRONG?

- “Grinding” – rewarding repetitive play
- Valuing time vs. skill
- In-game Economies
- Real-world economic models
  - “buy points”
  - Real-money auction houses
    - DANGEROUSLY CLOSE to On-line Gambling!

# WAYS GAMES CAN REDUCE COMPULSIVE PLAY.

- Token economies
- Diminishing returns
- Dis-incentivizing compulsive gaming hours
- Real-world cueing

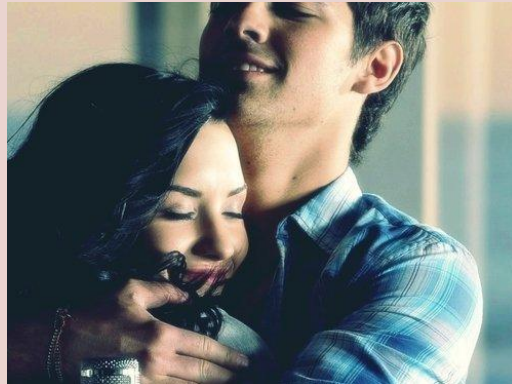
Would a game that doesn't "hook" us be as fun?

# EXTREMES = NOT GOOD

I don't want to play



I want to play



I must play



# SO, ARE VIDEO GAMES ADDICTIVE?

Getting to  
the point...

Games draw us in.

Most gamers have experienced being “hooked.”

But so has:

... golf

... a good TV show

... Gangnam Style

Doing something for enjoyment does not equal addiction.

# THIS FIELD NEEDS NUANCE

**“Accordingly, only when the condition is experienced as significantly impairing can one speak of an addiction, which is clearly not the case for excessive gamers who enjoy themselves while playing their games and for whom their gaming does not result in significant negative consequences.”**

**Internet Gaming Addiction: A Systematic Review of Empirical Research  
Daria Joanna Kuss & Mark D. Griffiths**

# GO ON...

- **Classically, Video Games are not addictive.**
- **Any behaviour can be compulsively overdone.**
  - Children tend to do successful things.
  - Children tend to avoid unsuccessful things.
- **Compulsive play: likely struggling in some other area**
- **Correcting these areas may be most helpful.**
- **No medication treatment at this point.**
- **Video Game creators need to be conscious of the behaviours they are rewarding.**