Technology Addiction

In Children and Adolescents

James Bylund, Psy.D., ABSNP
Owner, Bylund Neuro-Ed Services

About Me

I am the owner of Bylund Neuro-Ed Services, a small agency that provides psychoeducational and neuropsychological evaluations, mental health services, speech and language services, dyslexia tutoring, and other interventions/treatments to support children and adolescents in schools. I'm also a Senior Lecturer at Brandman University in the Department of School Psychology and Counseling, and Adjunct Instructor at Alliant International University. I have previously worked as a School Psychologist, SELPA Program Specialist, and Director of Student Support Services.

A Rising Tide

When asked what they enjoy doing in their free time, the overwhelming majority of students assessed in our clinic say the same thing - video games

Experienced effect of screen time (e.g., inattention, mood dysregulation, defiance, aggression) first hand with oldest son, and nearly complete turn-around with screen fast

Now, work with parents and schools to educate them on the potential negative impact of screens on children and adolescents

What Counts as Screentime?

All screen activities provide unnatural stimulation

> That means TV, computers, video games, smartphones, iPads, tablets, laptops, e-readers, etc.

Content (e.g. violent video games) is not as important as amount (i.e., time in front of a screen) - even scrolling through pictures on a phone can be harmful to a developing nervous system

> Interactive (i.e., interface with the device) screen time causes more dysfunction that passive screen time

The Addictive Nature of Technology

“It’s the medium, not the message” - Dr. Victoria L. Dunckley

Technology is *designed* to be irresistible (e.g. colors, fonts, tones, feedback/rewards, social engagement)

Provides immediate gratification (i.e., release of feel-good chemicals - dopamine)

Addresses deep psychological need in the short-term that outweigh damaging long-term consequences (social, educational/work, physical)

Addiction for Fun and Profit

Facebook and other Silicon Valley companies strive to keep users hooked. Does that make them evil?

By Will Oremus

Weekend magazine technology special

'Our minds can be hijacked': the tech insiders who fear a smartphone dystopia

Google, Twitter and Facebook workers who helped make technology so addictive are disconnecting themselves from the internet. **Paul Lewis** reports on the Silicon Valley refuseniks alarmed by a race for human attention

by Paul Lewis in San Francisco

Neurological Effects

We have the same brains that were geared for hunting and gathering, they're not designed for the hyperstimulation of digital technology

Neural development can be disrupted by both understimulation and overstimulation

Bright lights, supernatural colors, fast movement, loud noises, vividness, screen size all contribute to sensory overload

Neurological changes resulting from video game play associated with rapid recognition and reaction to novel stimuli, but also distractibility and poor impulse control

Neurological Effects - Dopamine Pathways

Neurologically similar to stimulant drugs (i.e., cocaine)

Drugs and addictive behaviors stimulate a pattern of neural firing across the brain that is nearly identical

Screens activate reward circuitry in the brain (i.e., mesolimbic dopamine pathway), resulting in feeling of intense pleasure (most critical element in addiction)

Every virtual gunfire, every text, every tweet is accompanied a squirt of dopamine

Brain develops a tolerance, and greater stimulation is required to achieve the same pleasurable feelings.

Neurological Effects - The Frontal Lobes

Chronic exposure to addictive substances or behaviors reduces capacity of the prefrontal cortex, responsible for impulse control and decision making

Excessive screen time may damage myelination process, atrophying neural pathways (paying attention, experiencing empathy, discerning reality)

As little as one week of violent video game play has been shown to lessen activation of left inferior frontal lobe and ACC (2011 U of Indiana study) - areas involved in regulating emotions and aggressive behaviors (also returned to baseline after a week w/out video game play)

Neurological Effects - Stress Response

The sensory overload, particularly video games, triggers neurological survival mode (i.e., fight or flight responses)

Blood flow shifts away from area related to higher level thinking (i.e., cortex) and towards more primitive areas of the brain (i.e., limbic structures)

The hypothalamic-pituitary-adrenal axis (HPA) is also stimulated, producing an adrenaline rush (blood pressure goes up, palms get sweaty, pupils dilate)

Neurological Effects - Stress Response

When stress response is continuously activated - aggression, hypervigilance, and overactivity result (ie., rapid speech and overexcitement, followed by sleep loss, irritability, and depression)

Game developers hire neuroscientists to measure gamers heart rate, blood pressure, galvanic skin responses

When it happens too often (i.e, chronic stress), or too intensely, the nervous system has difficulty returning to a regulated state

Neurological Effects - Sleep Cycles

The optic nerve transmits input to the pineal gland whose job includes regulating sleep-wake cycles through release of melatonin (triggered by darkness)

The blue light emanating from tech devices reduces production of melatonin

Our brain is tricked into thinking it's daytime!

Poor sleep quality is linked to depression, reduced growth hormone, and impaired brain function (attention, memory, mood regulation, school/work performance)

Even short exposure to screen time before bedtime (e.g., 15 minutes) can have an adverse impact

A Look at the Numbers

97% of American children between the ages 2 - 17 play video games (and the # is rising)

80% of teens check their phone at least once an hour

Average daily smartphone use - 3 hours (over a lifetime this equates to 11 years)

Kaiser Family Foundation (2010) estimated children between 8 and 18 spend 7.5 hours a day in front of screens! (does not include 1.5 hours a day of texting and half hour talking on smartphone.

A Look at the Impact

The more television a child watches between ages 1 and 3 years, the greater likelihood they will have ADHD at age 7 years

Children between the ages of 10 and 15 years who play video games 3 or more hours a day are less satisfied with their lives, feel less empathy towards others, and less likely to deal with emotions appropriately

Is Tech Addiction Real?

Kimberly Young, Ph.D. coined the term “internet addiction” in 1995

- But things changed with the advent of the iPhone and iPad - i.e., internet went mobile

She also developed the Internet Addiction Test (IAT)

China was the first nation to declare internet addiction as a clinical disorder and labelled it as the number 1 public health risk for young people

Video Games and Never Ending Tribal Missions

Massively Multiplayer Online Role Playing Games or MMOs (e.g., World of Warcraft - WoW) are highly addictive

Social - e.g., players band together to form guilds - and the game never stops

Players become emotionally invested in their character and bond with fellow players

Games provide steady dose of small rewards (e.g., sounds, flashing lights, praise) creating dopaminergic effect

Group Membership

Humans are wired to form social bonds

Group membership was an evolutionary necessity (i.e., group members survived)

Being rejected feels like a “social death penalty”

Massively multiplayer online games provide a sense of belonging

Social Effects

Devoid of opportunity to sit face-to-face and engage with another person - even with webcams people do not make eye contact because camera and gaze are not aligned

Without sufficient opportunity to engage socially, children may not sufficiently develop these skills (i.e., “critical periods”)

Humans develop empathy and understanding through face-to-face interactions

Almost (But Never Quite) There

Vygotsky - motivation and development are spurred by working within “zone of proximal development” - i.e., just beyond current abilities

“Ludic loop” - brief thrill from completing a task followed by a new challenge

> A sense of progress (e.g., product of labor, effort, and growing expertise) but never complete

“Near wins” are tremendously addicting

There is no “stop point”, the game never ends. This creates psychological tension because we want to finish what we start

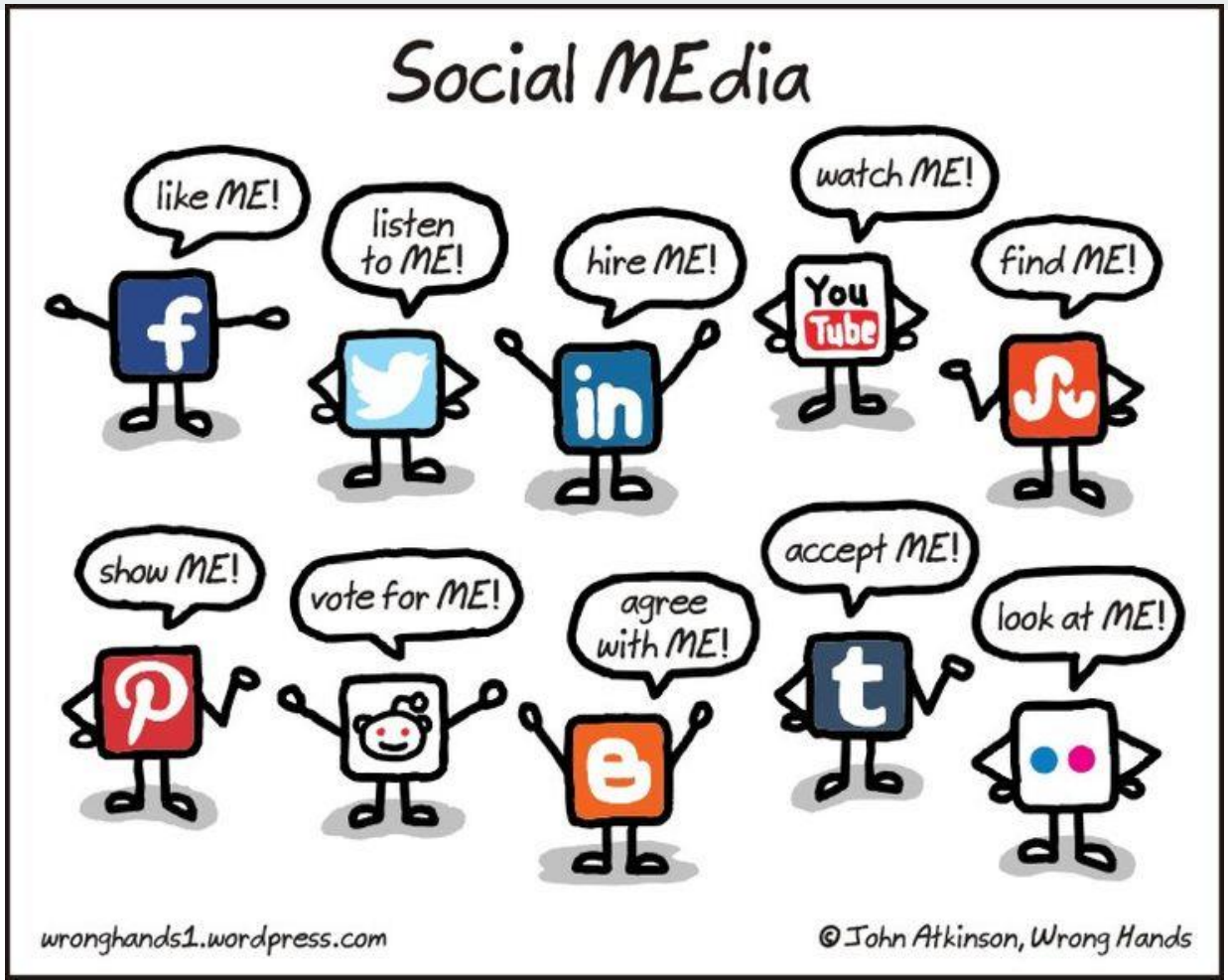
Social Media and the Quest for “Likes”

Our brains release far more dopamine when receiving rewards at unexpected (v. predictable) rate/inconsistent feedback

Slot machines are the perfect example of this

“Likes” make social media unbelievably addictive

Looking for the next big hit (likes, regrams, shares, comments, etc.)


Social MEdia
like ME!
listen to ME!
hire ME!
watch ME!
find ME!
show ME!
vote for ME!
agree with ME!
accept ME!
look at ME!
wronghands1.wordpress.com
© John Atkinson, Wrong Hands

The Mismeasure of Man

We are endlessly driven to compare ourselves to others (i.e., our “self-worth”)

“Social comparison” - the link between social media use and increased depression

> Use of social media is correlated with increased feelings of isolation, mood disorders, and other mental health problems

“Online disinhibition effect” - more likely to “say” something hurtful when you don’t have to look the person in the eye

A Sense of Escape

Escapism is a major factor associated with gaming addiction (i.e., inability to deal with life stressor leads to sense of need to “escape”

Don’t like school

Don’t have friends

Feel empty, alone, depressed

Don’t feel like you fit in

Don’t like the way you look

Don’t get along with your family

So Called “Educational” Games

Not yet conclusive evidence on educational benefits, but increasing evidence of adverse neurological impact

Interaction is a major factor in hyperarousal (e.g., sense of control/choice, immediate gratification, rewards)

Stress related reactions my override any potential benefit

It Develops Spatial Abilities, Right?

Minecraft is the best selling videogame of all time (more than 100 million registered users)

Stimulating, hyperarousing, and hypnotic grip on young children

The child never knows which strike of the pick ax will discover the gold or diamonds (i.e., variable ratio reward schedule)

Produces dopaminergic - i.e., dopamine floods the brain and triggers and addictive cycle (i.e., the more one gets, the more one needs)

How can something so arousing to the nervous system by educational?

Psychological Disorders

Attention Deficit/Hyperactivity Disorder

Autism Spectrum Disorder

Aggression

Mood Dysregulation

Social Anxiety

Depression

Yet screens are often used either as rewards for children with disabilities or to pacify them as raising children with disabilities is exhausting

Rise in Child Disorders

ADHD diagnoses increased nearly 800% between 1980 and 2007, accompanied by a sharp increase in prescription of psychotropic meds to kids

Bipolar disorder increased 40-fold between 1994 and 2003 (in part leading to a new diagnosis - disruptive mood dysregulation disorder)

Developmental Mood Dysregulation Disorder (DMDD) - chronic irritability with frequent and severe temper outbursts

Chronically irritable children are often in a “wired and tired” (hyper aroused by video games yet sleep deprived)

Can Focus for Hours ...In Front of a Screen

“...but he can focus for hours when playing video games”

Sustaining focus when bombarded with rewards v. in the absence of rewards

Neurologically hyper stimulating activity

The ability to focus attention to video games and nowhere else, may in fact be a symptom of ADHD

Why Are More American Teenagers Than Ever Suffering From Severe Anxiety?

Parents, therapists and schools are struggling to figure out whether helping anxious teenagers means protecting them or pushing them to face their fears.

By BENOIT DENIZET-LEWIS OCT. 11, 2017

Internet, Depression, and Anxiety

IA exacerbates depression, hostility, and social anxiety

The more a child hides behind a screen, the more socially awkward they tend to become

Children don't learn how to "read" subtle changes in body language - leads to impaired empathy and ability to establish and build/maintain relationship with others

Correlation between screen addiction and increased suicidal ideation

HEALTH

Rise in Teen Suicide, Social Media Coincide; Is There Link?

By THE ASSOCIATED PRESS NOV. 14, 2017, 2:32 P.M. E.S.T.

CHICAGO — An increase in suicide rates among U.S. teens occurred at the same time social media use surged and a new analysis suggests there may be a link.

Suicide rates for teens rose between 2010 and 2015 after they had declined for nearly two decades, according to data from the federal Centers for Disease Control and Prevention. Why the rates went up isn't known.

The study doesn't answer the question, but it suggests that one factor could be rising social media use. Recent teen suicides have been blamed on cyberbullying, and social media posts depicting "perfect" lives may be taking a toll on teens' mental health, researchers say.

"After hours of scrolling through Instagram feeds, I just feel worse about myself because I feel left out," said Caitlin Hearty, a 17-year-old Littleton, Colorado, high school senior who helped organize an offline campaign last month after several local teen suicides.

"No one posts the bad things they're going through," said Chloe Schilling, also 17, who helped with the campaign, in which hundreds of teens agreed not to use the internet or social media for one month.

Violent Video Games and Aggression

While is it is the media and not the message (alone), violent video games pose a particular risk

Six decades of research has documented connection between violent media content and aggressive behaviors

Poor school performance; aggressive thoughts, feeling, behaviors; increased arousal; decreased empathy and prosocial behavior

Violent Video Games and Aggression

Desensitization - blunting of mental and physiological aversion to violence

Today's video games are more realistic, more vivid graphics, increased feeling of "presence"

Poor sleep also associated with high risk behaviors (truancy, alcohol and other drug use, unprotected sex)

Diagnosed and medicated for bipolar disorder, school suspension/expulsion, charged for criminal activity

Case Closed on Aggression

American Medical Association, American Pediatric Association, American Academy of Pediatrics, the American Psychological Association, the American Academy of Family Physicians, and American Academy of Child and Adolescent Psychiatry agree…

...There is overwhelming evidence of a causal connection between media violence and aggressive behaviors in some children

...The potency of interactive media (e.g., video games) is much stronger than other forms of entertainment (e.g., television, movies)

Case Closed on Aggression

Violent media certainly isn't the only variable, but it may act as an amplifier

...less impulse control, desensitization, dehumanization, repeated firing of neural networks associated with stress and aggressive behaviors

Social Learning Theory - we learn by observing models (our neural networks fire in patterns that "mirror" those we are observing)

With video games, the child is both the actor and the observer

Learning strengthened by dopaminergic effect of video games

Electronic Screen Syndrome (ESS)

Coined by Dr. Victoria Dunckley, child psychiatrist

A disorder of dysregulation (i.e., impaired ability to modulate thoughts, emotions and behaviors meet environmental demands)

Unnaturally stimulating electronics wreck havoc (cognitive, emotional, behavioral) on still developing nervous system.

Shifts nervous system into fight-or-flight mode (i.e, a stress related disorder)

Electronic Screen Syndrome (ESS)

Can create or exacerbate disorders such as ADHD, depression, oppositional defiance, and anxiety

Irritability, inability to focus, general malaise, apathy, restricted interests (i.e., outside of video games), and general state of *wired and tired*

Screens are a stimulant, putting nervous system into a state of hyperarousal and then crash

Electronic Screen Syndrome (ESS)

Irritability and poor attention/executive functioning are core features of the disorder

Irritability, rapid mood swings, excessive tantrums, disorganized behavior, low frustration tolerance, poor self regulation, oppositional defiance, poor self-regulation, immaturity, sleep disturbance, short-term memory deficits.

Because ESS impacts frontal lobe activity and sleep, ESS looks exactly like ADHD and can certainly worsen symptoms of ADHD

Diagnosing ESS

No clear cut point for safe amount of screen time

All children respond differently

There is a dose effect - the more screen time, the more severe the symptoms

Because it is difficult to treat, better to nip in in the bud sooner rather than later

Simply remove the screens and observe to see if symptoms decrease and functioning improves

http://www.gocomics.com/theflyingmccoys

Easier to Stop Before it Starts

We teach our kids about what to eat, when to sleep, and how to care for personal hygiene but less often about healthy tech consumption

Television and other media should be avoided for children under 2 years

Slow paced shows (e.g., Sesame Street) that encourage participation are better than fast past shows (e.g., Sponge Bob)

Active engagement, with an adult facilitator (e.g., discussing connections to real world), is better than passive viewing or unaided interaction

When Kids Are Off Screens

Engaging in activities that nurture synaptic growth...

Playing with Legos

Playing outside/experiencing nature

Playing music

Drawing

Martial arts and other sports

Writing

Cooking

Drama

Being bored is healthy…. Fosters observation, patience, and imagination

Dr. Dunckley's Reset Solution

Victoria Dunckley, M.D. - Expert in assessment and treatment of Electronic Screen Syndrome (ESS)

3-Week Screen Fast to rebalance and reawaken the nervous system (actually, 3 - 6 weeks)

> Complete resolution of symptoms in those w/out psychological disorder
>
> 80% success in those with psychological disorder, reducing symptoms by at least half

If the cure works, you probably have the disease

Screen Detox

In extreme cases, complete detox may be necessary before other treatments can be effective

Complete detox may lead to explosive and aggressive behaviors

Alternative - slowly taper screen time over a week while replacing destructive behaviors with healthy ones (e.g., creative activities/projects, spend time outside, etc.)

e.g., reducing use by 1 hour per day over a week period

Once screen time is gradually reduced, generally recommended a minimum 4 week “detox”

Hitting Reset - A New Normal

Can’t leave in society without any contact with technology (e.g. school, work, communication, paying bills)

Once the child’s nervous system has reset, the parent can monitor and determine how much screen time can be tolerated without return of symptoms

Establish health relationship with technology, differentiating between “digital vegetables” and “digital candy”

Time that would have been spent interacting with technology, must be replaced with other activities

Establishing New Habits

Suppression alone doesn't work, but suppression with distraction does

Not a matter of will power (i.e., looking at the cookie and not touching it) but rather developing good habits (i.e., not having the cookie around in the first place)

The "antecedent" and "consequence" may stay the same, but the "behavior has to chance (i.e., A-B-C model)

A key may be identifying what made the problem behavior so rewarding (e.g., escape, loneliness, power).

It may take weeks or months to establish new habits, so early periods are very fragile


BUT YOU TOLD ME TO GO OUTSIDE AND PLAY!
search ID: mfln8
© Original Artist
Reproduction rights obtainable from
www.CartoonStock.com

Spending Time in Nature

Time in nature effective for grounding self in reality (i.e., “experiential therapy”)

90% of our society lives in densely populated urban areas and biology cannot keep up with our evolving culture

Richard Louv, in his book *Last Child in the Woods*, uses the term “nature deficit disorder”

Improves focus and lowers blood pressure and heart rate (i.e., better able to regulate attention and manage stress)

Mindfulness Training

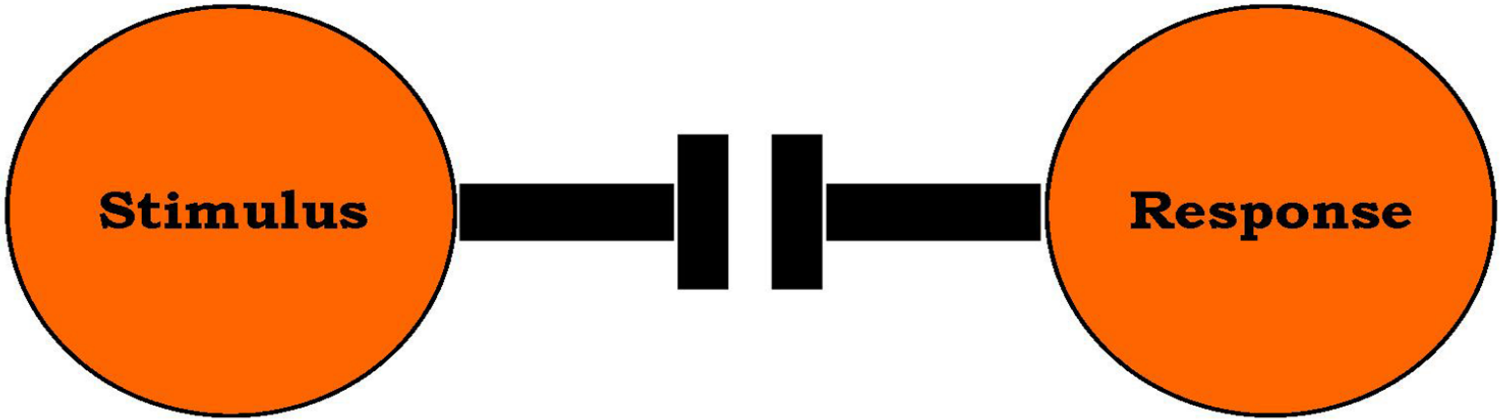
Our mind is often disconnected from our physical and emotional experiences

Help individual ground themselves in present moment awareness

Lessens arousal, balances/integrates nervous system

Mindfulness training is an established evidences based practice for improving memory, immune function, self-control, attention, addiction, and well-being

Between stimulus and response, there is a space. In that space lies our freedom and power to choose our response. In our response lies our growth and freedom" - Victor Frankl, Man's Search for Meaning



Motivational Interviewing

More likely to stick with a goal if intrinsically motivated towards change

Not being told to change by someone else, but voluntarily choosing to make change happen

Two key ingredients for meaningful behavior change….

The *need* for change *now* (i.e., more than a want to hope for things to chance)

The belief that change is possible (i.e., self-efficacy)

Motivational Interviewing

"a client-centered, directive method for enhancing intrinsic motivation to change by ***exploring and resolving ambivalence***" (Miller & Rollnick)

- Ambivalence is a natural part of the change process . Our job in MI is to help the individual sort through ambivalence, and move towards change

Counselor doesn't convince them to change, but rather elicit teir own intrinsic motivations.

- Evoking "Change Talk" (i.e. desire, ability, reasons, need for, and commitment to change)

Self-Determination Theory

Human's have a natural tendency to be proactive in order to meet the following needs

1. The need to feel in command of one's own life (autonomy)
2. The need for solid social bonds with family and friends (relatedness)
3. The need to feel effective in dealing with external world - developing new skills and overcoming challenges (competence)

MI highlights the distance between one's current state and their *needs* in one or more areas

CBT for Internet Addiction

Dr. Kimberly Young, Bradford Regional Medical Center (Pennsylvania)

Help patients recognize that a problem exists

Reframe harmful thoughts that lead to tech overuse (“I can’t make friends offline”)

> Language plays an important role - “I can’t go online” assumes one doesn’t have control, whereas “I don’t go online” empowers the individual

Working with patients to re-engage with outside world

Keys to Success

Changing environment

Limiting temptation as much as possible

Whatever is in close proximity will occupy a greater part of one's mental life

Must create distance between individual and behavioral trigger

Behavioral Architecture (i.e., what gives rise to behavior and reinforces it)

Can't eliminate tech completely, but can compartmentalize it and ballance tech use with other activities