
Digital Technologies: Current Trends, Research Directions, & Tips for Addressing Problematic Usage

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Goals

- Discuss increasing usage of the internet, devices, and new technologies in daily living
- Highlight new technologies pertaining to treatment and risk detection (onset and fluctuating symptoms for individuals with psychosis-spectrum symptoms)
- Define and discuss differences between adaptive and problematic internet/technology usage
- Describe what's happening in the brain when we engage in problematic usage
- Discuss making values-based agreements related to technology use at home

Food for thought...

- Do you think the “digital revolution” is causing us more harm than good?
- How about the time we’re spending online? Or playing video games?
- Do you think these things are inherently good or bad?



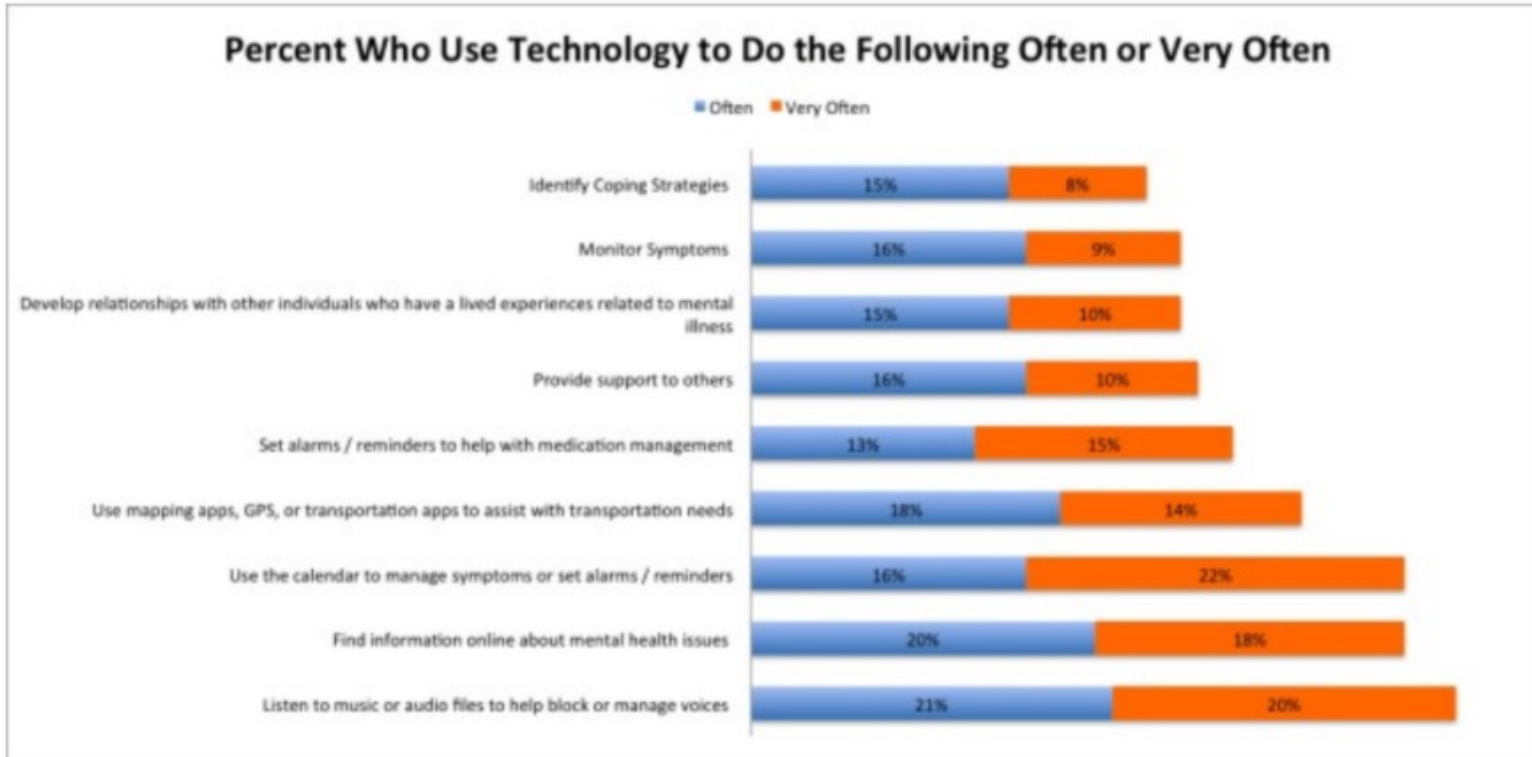
Tech usage among teens and young adults

- Increasing computer and internet usage in recent years, even prior to the pandemic
 - **USA census data:** in 2018, 92% of households had at least one type of computer and 85% had some kind of broadband internet subscription ([U.S. Census Bureau, 2021](#))
 - Current estimates between 93-95% of homes have access
- Pandemic → dramatic shift in dependence on technology for all of us

Usage in people with psychosis

- Online survey study of 457 individuals with psychosis commissioned by the National Alliance on Mental Health (NAMI) ([Gay et al., 2016](#))
 - 90% owned 1 or more devices with internet; 61% had 2+
 - Personal computers: 89% spent more than 1 hour online and 18% spent 10+ hours online per day
 - Phone use: 85% spent 1+ hours online while 48% spent 3+ hours on online using apps and internet
 - 36% reported using technology to help cope with their symptoms

Figure 1



Reported use of technology in coping based on 457 responses to Question 4: Aside from telephone calls, how frequently do you use a computer, tablet, or cell/smartphone to do the following?

(Gay et al., 2016)

Table 2

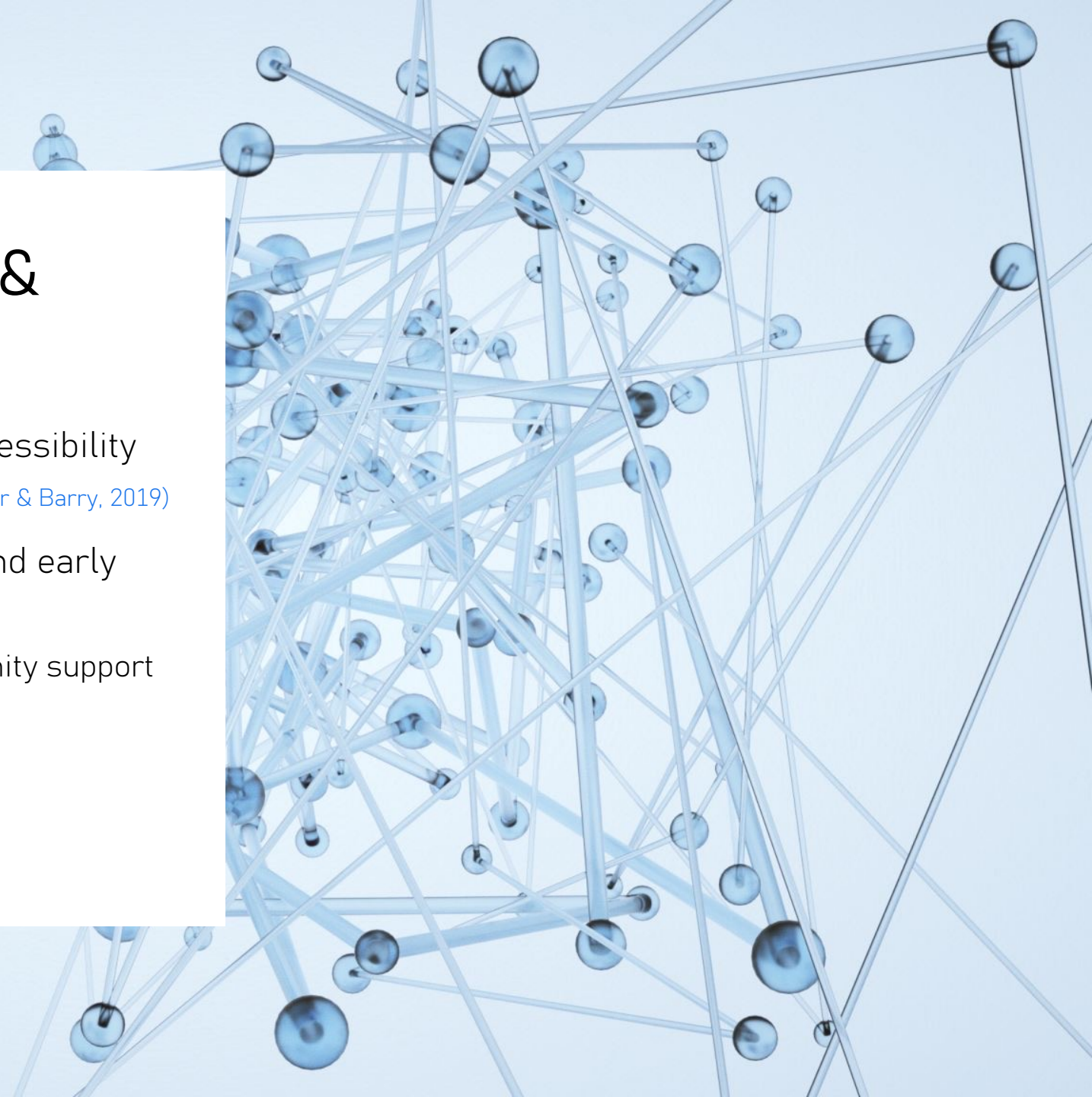
Mean helpfulness ratings (actual vs. perceived) of activities on a scale from 1 to 10, where 10 was the most helpful and 1 was the least helpful.

	Actual	Perceived
Surfing the Internet	6.1	4.2
Talking on the telephone including on a landline, mobile phone, or smartphone	5.8	3.7
Using social networking sites	5.3	2.4
Text messaging	5.3	2.8
Sending personal emails	5.1	3.3
Joining or participating in online chat rooms or discussion groups	5	3.3
Online gaming	5	2.7
Video chatting	4.7	2.9

(Gay et al., 2016)

The digital revolution & mental healthcare

- Technological advances increase accessibility and availability of care ([Bucci, Schwannauer & Barry, 2019](#))
- Advances in tech for the treatment and early identification of psychosis include:
 - Web-based interventions and community support
 - Smartphone technology
 - Wearables
 - Virtual reality and therapeutic gaming



Web-based interventions and community support

- Telehealth at the individual level
- Groups (like this one!)
- **HeadsUp**: hub for mental healthcare advocates, clinicians, and centers in PA with goal of empowering people experiencing early psychosis (www.headsup-pa.org)
- **Students with Psychosis**: nonprofit empowering student leaders and advocates and their families through community-building and collaboration; 5-6 hours of virtual programming each day (www.sws.ngo)



Smartphone technology

- **Mobile apps:** applications for your smartphone
 - **MIND: M-Health Index and Navigation Database:** Database of screened and reviewed mental health and wellness apps curated by the Beth Israel Deaconess Medical Center and the American Psychiatric Association (APA) (mindapps.org)
 - **One Mind Psyber Guide:** curated by nonprofit One Mind – another database of screened and reviewed apps with many filters to help narrow results down (onemindpsyberguide.org/apps)
- **EMA/ESM:** experience sampling methods or assessments (questionnaires/surveys)
- **Passive sensors:** digital phenotyping capabilities
- **Wearables:** devices that pair with your smartphone (or computer) so that biological data can be extracted (e.g., Apple watch, Fitbit, Garmin watches, actigraphs, heart rate monitoring straps)



Digital phenotyping research

- Potential for using these methods in prediction of relapse, treatment response, and other clinical outcomes such as need for hospitalization or increased clinical monitoring
 - Geolocation study with schizophrenia-spectrum, bipolar, and comparison individuals examined feasibility of using physical location (passive GPS) as a measure of negative symptoms and functional outcomes ([Raugh et al., 2020](#))
 - In a study using active and passive data, increased disruption of social rhythms (e.g., more deviation from routines) was associated with higher severity of self-reported symptoms of depression, anxiety, psychosis, and poor sleep ([Henson et al., 2020](#))

Virtual reality and therapeutic gaming

- **CogRem:** Cognitive remediation (group and BrainHQ exercises)
- Virtual reality (VR)
 - Potential for assessment of symptoms/neurocognitive changes, delivery of cognitive remediation, social skills trainings, and virtual reality-assisted therapies in individuals with psychosis ([Rus-Calafell et al., 2018](#))
- Other games backed by research
 - Commercial video games – review of neuroimaging studies found support for modification of similar brain areas in response to playing commercial games as when following specialized cognitive remediation training programs in individuals with psychosis-spectrum symptoms ([Suenderhauf et al., 2016](#))
- Similar technologies and methods in domains of physical therapy and play therapy for other diagnoses/mental health concerns



Stretch break
(return at 5:35pm)

Defining problematic internet/tech use

- Research on appropriate amounts of time to spend online → findings are mixed
 - Same story for video game “addiction”
 - “Internet Gaming Disorder” is recognized by the American Psychiatric Association and listed in the DSM-5 (Conditions for Further Study)
 - General trend towards more time spent online being associated with increased risk for onset and worsening of anxiety and depression symptoms
 - Pandemic has further complicated this picture
 - Online environments as “social life-lines” (*The Perks of Powering Down, 2021*)

Defining problematic internet/tech use continued

- Dr. Lisa Coyne encourages parents and teens/young adults to think of screen time in terms of **whether it is interfering** (*The Perks of Powering Down*, 2021)
 - Are you missing out on opportunities to be with friends or family members in ways that ARE covid-safe?
 - Are you noticing differences in performance at school, work, or in other goal-related activities?
 - Are your real-world relationships suffering?
 - Are you feeling relaxed/rejuvenated after playing? Or are you feeling anxious, depressed, or keyed up?
 - Is your sleep becoming worse, or are you having a harder time falling asleep/waking up in the morning?

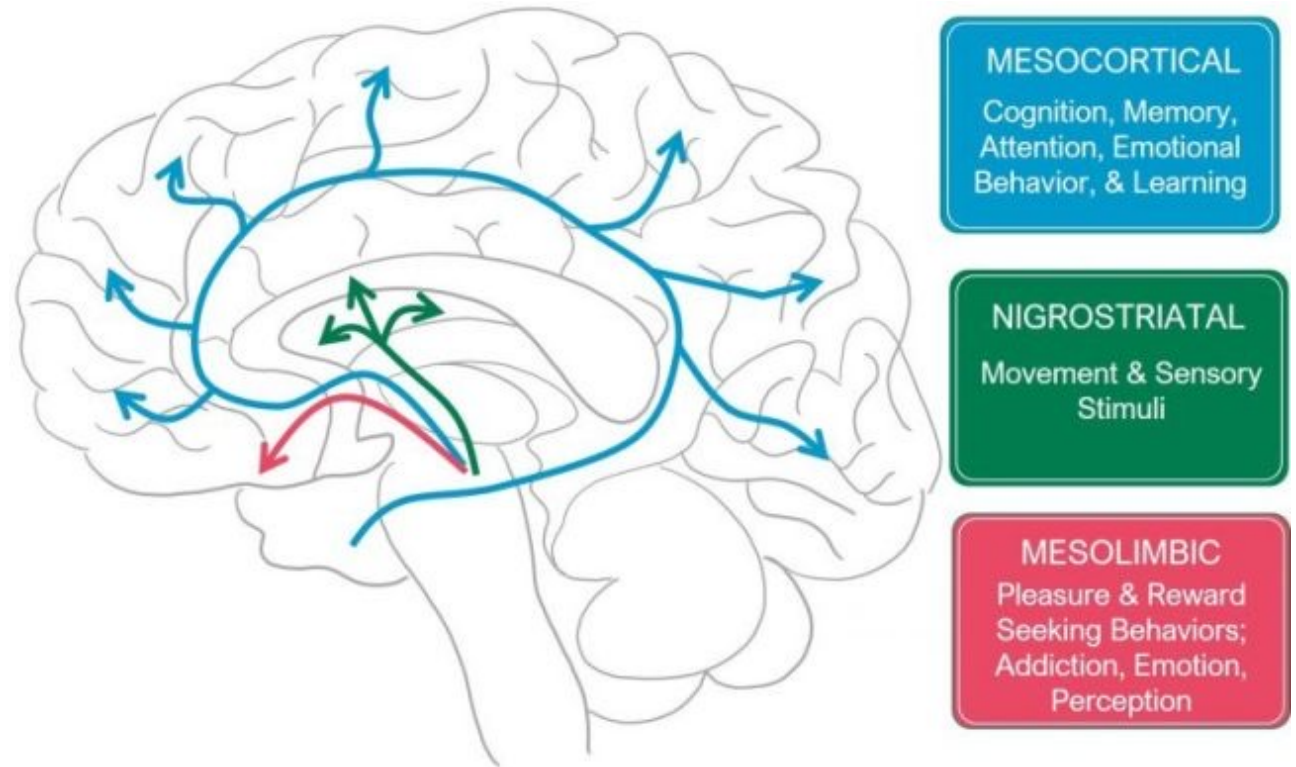
What's happening in the brain?

- Reward circuitry is engaged when we're doing enjoyable things online, either on apps or in virtual environments within video games
- Neurochemicals like dopamine come into play as well

What's happening in the brain when we use mobile apps or play video games?

- When we play video games (or check our phones for social media notifications) and something we like happens, we experience a surging of “happiness” neurotransmitters in the brain, like **dopamine**
- Since we feel good in response to engaging in these behaviors, we learn that repetition will likely produce the same feel-good results – this is how habits can form via reward processing

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- Four major dopamine “pathways” in the brain
 - Three of these pathways are considered “reward” pathways and are responsible for release of dopamine in various parts of the brain, shaping activity in those regions
 - All three activate when anticipating or experiencing rewards
 - Each time rewards are detected, associations strengthen



(Haynes, 2018)

How does this differ for people with psychosis?

- Dopamine Hypothesis of Schizophrenia: positive and negative symptoms relating to irregular dopamine release ([Howes & Nour, 2016](#); [Whitton, Treadway & Pizzagalli, 2015](#))
- Studies suggest there may be links between how individuals with psychosis symptoms experience reward → alterations in reward circuitry may underlie engagement in addictive behaviors

Building awareness of your own screen time

- Consider your own use of technology in daily life
 - Work activities
 - Leisure/hobbies
 - Communicating with family
- To check your own screen time:
 - Settings > Digital wellbeing (Android)
 - Settings > Screen time (Apple iOS)

If tech use feels like it's getting in the way...

- Have frank, open conversations about technology use, gaming, etc. to **increase understanding**
 - Gaming can qualify as time with friends/online space for socializing
 - May be using technology to cope (Gay et al., 2016) or to quiet auditory hallucinations (Orlov et al., 2018)
 - As a first step, or to increase understanding of use, **can also try being online together**
- Discuss **values** within the family
 - Do you value spending time together? May be important for your child to be online with friends, too
 - If it is important for the family to spend time together, work to come to an **agreement** on times to be together screen-free to check in

If tech use feels like it's getting in the way...

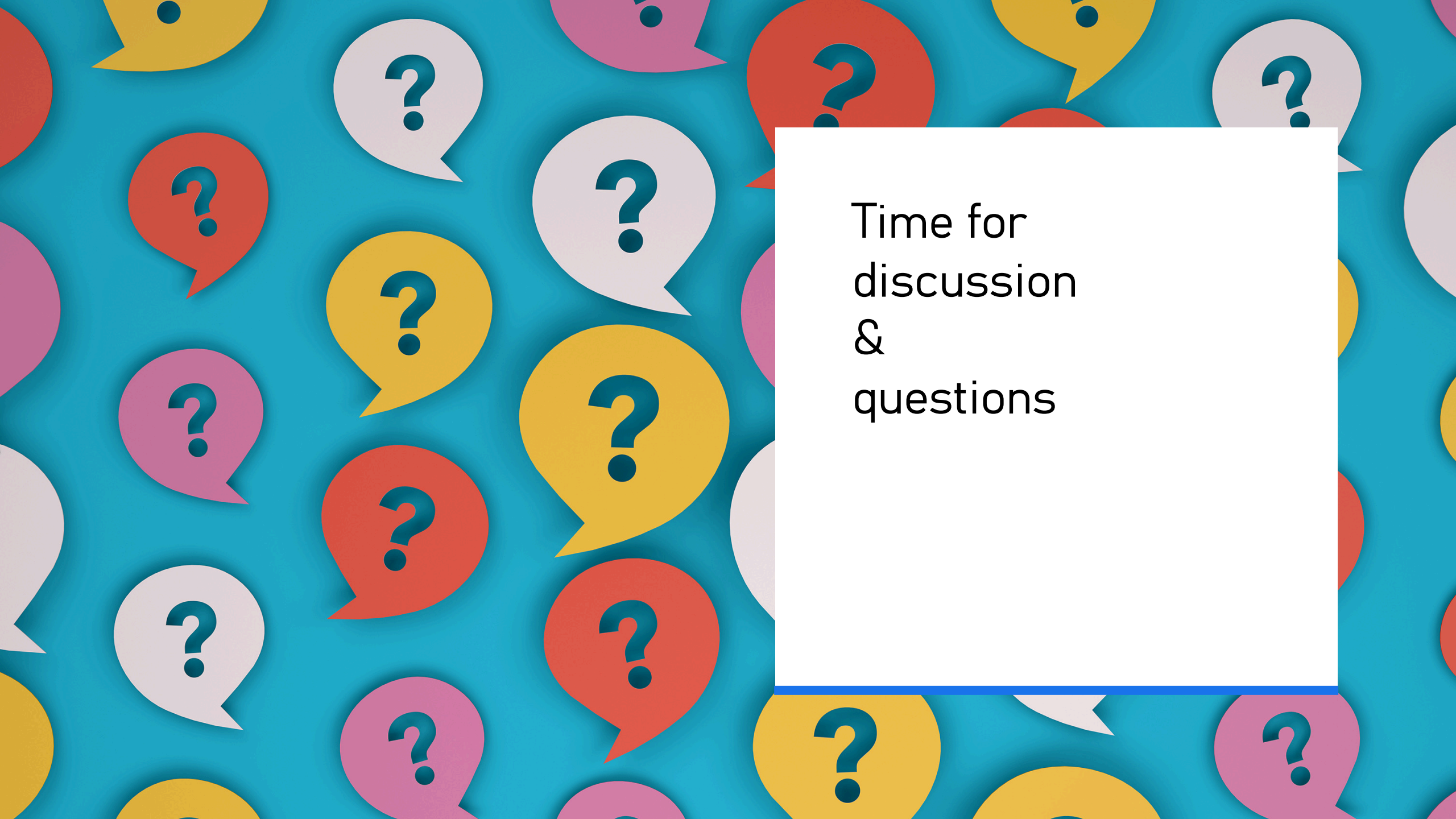
- Aim for usage that is more flexible*
 - **Compromise** on things like screen-free meals, timeframes, or zones in the home
 - "Parking lot method"
 - Turning notifications off to reduce triggers to engage/distractions more broadly
- Oversleeping in the morning could warrant discussion of stricter guidelines/more intervention
 - 3-strikes policy (if you can't break away from a screen when asked, screens may be removed from certain rooms, etc.)
- Celebrate small successes!

Case Example 1

- Harmony is a 17-year-old female with a history of auditory hallucinations. She is a senior in high school, has a good relationship with her parents and younger sister, and has several friends from childhood and school that she hangs out with regularly. One month ago, Harmony began playing a new game online with two of her best friends. They have spent 3-4 hours playing together for a majority of days each week. While playing, they send chat messages to each other in-game and communicate verbally using headsets with microphones. Harmony has also mentioned that she's made several new friends in this online environment, and that playing seems to make her auditory hallucinations quieter and easier to ignore.
- **Would we consider this to be a problematic pattern of technology use? Are there any additional things we'd want to know prior to saying yes or no?**

Case Example 2

- Simon is a 23-year-old male with a history of auditory and visual hallucinations. He lives with his parents, and has a goal to maintain steady work so he can afford to move out. He has had difficulties keeping jobs, but recently started working at a local coffee shop. He spends most of his day either looking at his cell phone or laptop screen, with most of his time spent online engaging in passive activities like scrolling through social media without commenting, or reading news articles. Simon has been late for work once in the past week due to over-sleeping, and has concerns that his screen-time is impacting his ability to fall asleep at night.
- Would we consider this to be a problematic pattern of technology use? Are there any additional things we'd want to know prior to saying yes or no?



Time for
discussion
&
questions



Additional Resources for Families

Mindful Things podcast: <https://www.mcleanhospital.org/mindful-things>

- McLean Hospital's first podcast explores mental health via conversations with clinical psychologists, psychiatrists, and other experts in relevant sub-fields (like Dr. Coyne in "The Perks of Powering Down")

Apps from a previous presentation:

- **Toolbox Coping Cards:** iOS and Google Play (\$6.99)
 - Can play games as a group or complete challenges
- **Mindshift:** iOS and Google Play (free)
 - Tools to address sleep, riding out intense emotions, social anxiety, performance anxiety, worry, panic and conflict
 - Developed by the Anxiety Disorder Association of British Columbia
- **Virtual Hope Box:** iOS and Google Play (free)
 - Developed by the National Center for Telehealth and Technology
 - Tools for coping, relaxation/distraction, and positive thinking
- **Breathe2Relax:** iOS & Google Play (free)
 - Breathing exercises with walk-throughs
- **Hello Mind:** iOS (free with in-app purchases)
 - Relaxation and breathing exercises
- **My Journey:** Google Play (free)
 - Mood monitoring, goal-setting, progress tracking, medication reminders
 - Tips for things like sleep hygiene

Thank you for attending this
virtual family education group

If you have feedback or any questions, please feel
free to contact Stephanie:

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We also extend our best wishes to you
for the upcoming holiday season!



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*All non-logo image files are PowerPoint Version 16.55 stock images unless otherwise specified

*Case examples are fictional and for educational/discussion purposes only