Technology, Social Media, and Adolescent Mental Health

Mitch Prinstein, PhD, ABPP [1,2,3] and Eva H. Telzer, Ph.D. [1,2]

University of North Carolina at Chapel Hill, Department of Psychology and Neuroscience
Winston National Center on Technology Use, Brain, and Psychological Development
Chief Science Officer, American Psychological Association
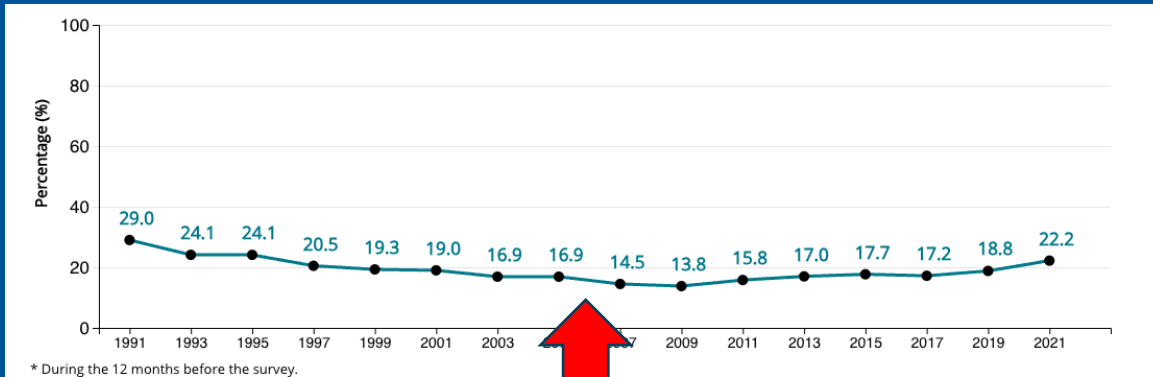
September 2024

Unique features of online peer experiences

1. Asynchronicity
2. Permanence
3. Publicness
4. Availability
5. Cue absence
6. Quantifiability
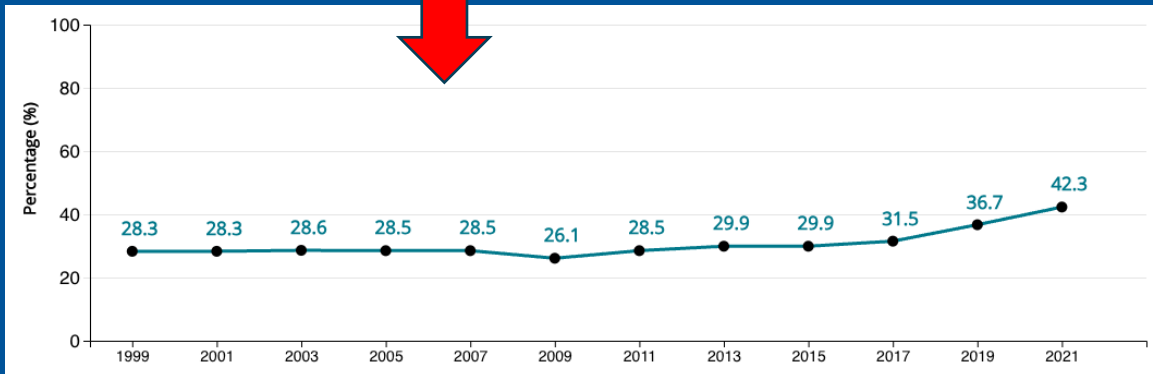7. Visualness
8. Algorithmic

Nesi, Choukas-Bradley, & Prinstein, 2018; Nesi,, Dredge, Maheux,, Roberts, Fox, & Choukas-Bradley, S. (in press)

The problems got worse when social media began?

Suicide attempts

Marijuana Use
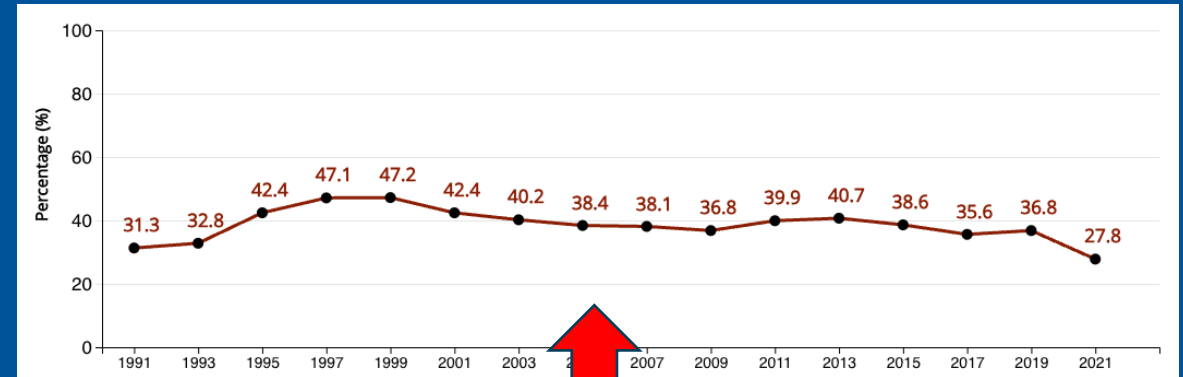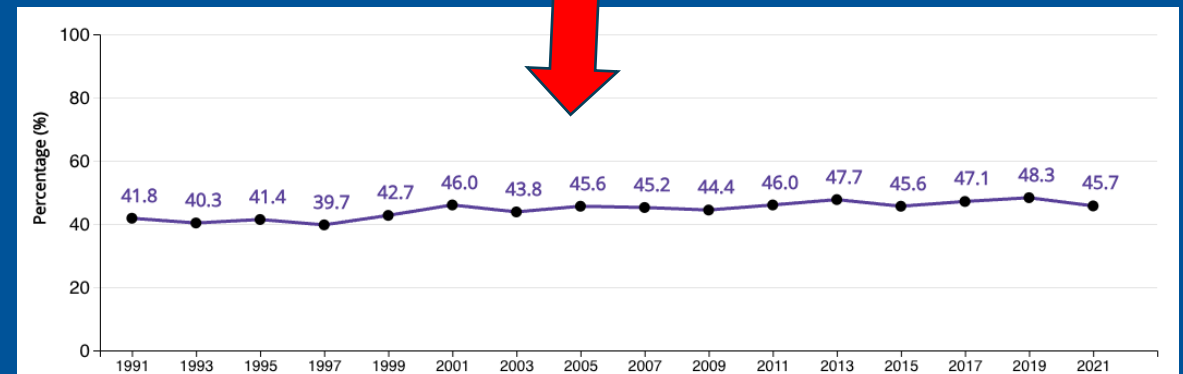
Sad/hopeless

Trying to lose weight

The problems got worse when social media began?

- School shootings

- Exposure to violence and sexual assault

- Unrealistic academic pressures

- Increased polarization

- Climate change

- Leadership critique of underrepresented identities

The Adolescent Brain

- **Starting age 10**: Hypersensitive to peer feedback, attention, or punishments

- **Through age 25…**: Underdeveloped self-control

Key Assumptions

- Social media is not a homogeneous experience
- Social media = content + platform functions (e.g., likes) + AI
- Adolescent development is gradual and continuous
- Racism and bias are built into platforms themselves
- Causal data are largely unavailable
- More complex than you have heard so far

Under **which conditions**, and for **which children** may specific social media **features or content** be *helpful* or *harmful* to youth development?
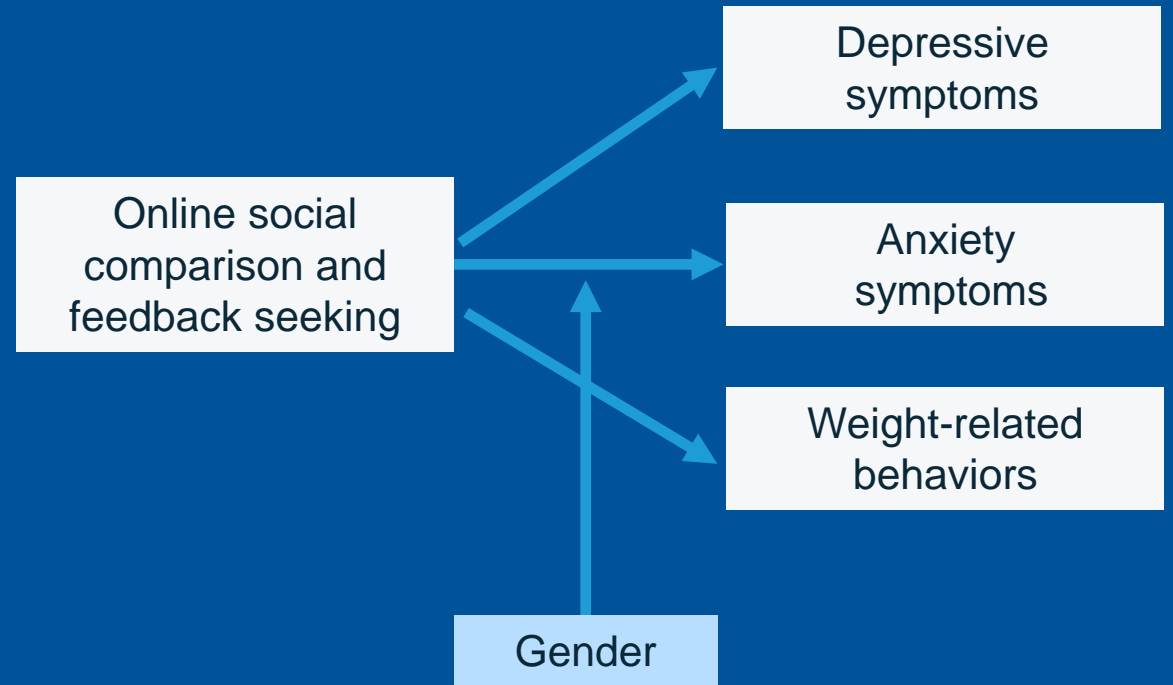
What questions are we asking….

1. What are the <u>potential benefits</u> of technology use?
2. What <u>types of technology use</u> may increase or decrease mental health risk?
3. Who may be <u>most susceptible</u> to potentially negative effects of tech/social media on mental health?
4. How might tech/social media content <u>promote adaptive or maladaptive behavior</u>?
5. Are teens more <u>influenced by peers</u> online?
6. Does digital media cause youth <u>stress</u>?
7. What are teens <u>not doing</u> when using tech/social media?
8. What is <u>"problematic" technology use</u>?
9. Is <u>smartphone use in school</u> related to positive or negative outcomes?
10. Is technology use related to <u>brain development</u>?

1) Positive attributes

- Affinity/identity communities

- Potential for immediate social support/lower threshold

- Online only friends buffer effects of stress on suicidal behavior

- Social companionship during COVID-19 lockdown

- Great diversity among online vs offline peer contacts

- Adolescents <u>report</u> they enjoy interactions online

- Civic engagement and activism

-   (Lenhart, Smith, Anderson, Duggan, & Perrin, 2015; Maheux, Nesi, Galla, Roberts, Choukas-Bradley, 2021; Massing-Schaffer, Nesi, Telzer, Lindquist, & Prinstein, 2020)
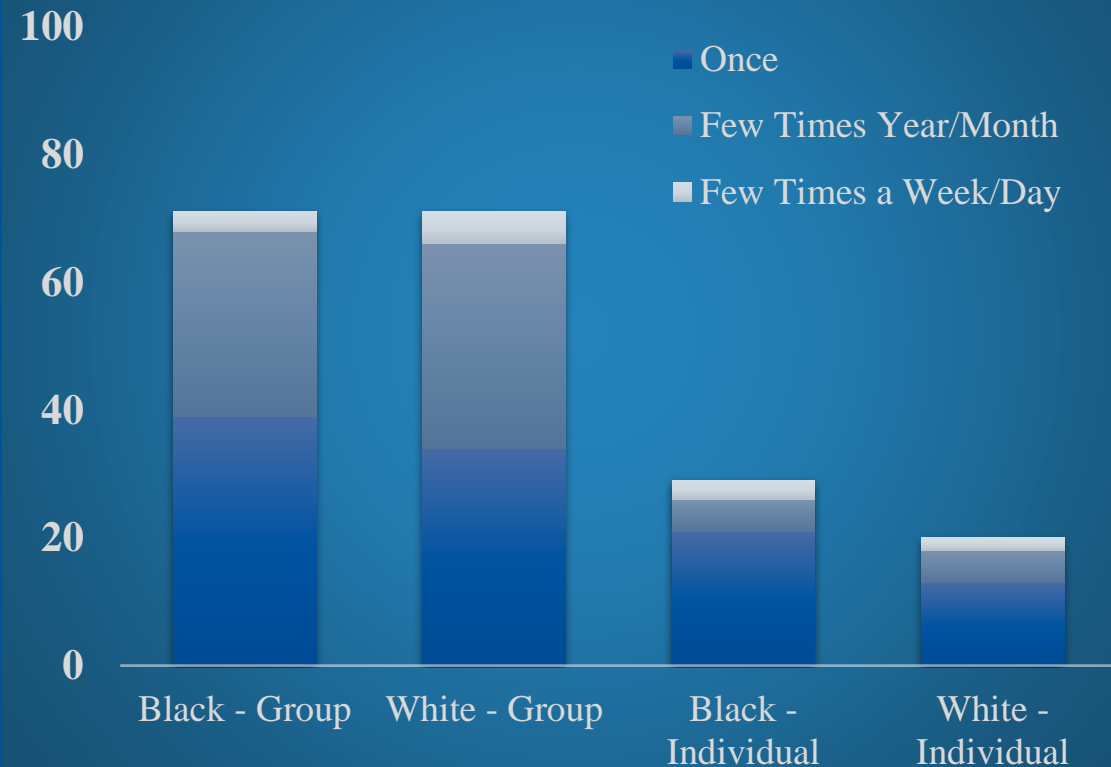
2) *How* teens use technology

Online social comparison and feedback seeking → Depressive symptoms

Online social comparison and feedback seeking → Anxiety symptoms

Online social comparison and feedback seeking → Weight-related behaviors

Gender →

(e.g., Choukas-Bradley, Nesi, Widman, & Higgins, 2019; Nesi & Prinstein, 2015)

3) Most susceptible?

Frequency of Online Racial Discrimination by Racial Group/Individual

Legend:
- Once
- Few Times Year/Month
- Few Times a Week/Day

(Bar chart y-axis: 0, 20, 40, 60, 80, 100)

Categories: Black - Group, White - Group, Black - Individual, White - Individual

Cyber-hate

- Associated with later anxiety and depression, <u>even after accounting for offline discrimination experiences</u>

- Affects victims and bystanders

(Tynes, Giang, Williams, & Thompson, 2008)

Small effect sizes

4) Promoting Maladaptive Behavior

search for "self-injury" and "self-harm"

50 most-viewed character (with a live individual) & 50 most-viewed noncharacter videos examined

Lewis, Heath, St Denis, & Noble, 2011

Variable	Proportion of Videos Present
Trigger warning	
Warning	42
No warning	57
Tone	
Factual or educational	53
Melancholic	51
Encouraging	23
Hopeful	16
Angry	13
Humorous	4
Other	25
Purpose of video	
Neutral	42
Against NSSI	26
Mixed message	23
Pro-NSSI	7

Pro-Anna

Twisted Minds

some look at us and call us crazy
how little they really know
they pass us by and stare
like we're in some sickly show
don't they see?
it is not us who is at fault
they kill their bodies with fats and grease
but we give our bodies nothing at all
so, you see,
we really are the purest of the pure
nothing but skin and bones,
plus a scale to reassure
so think about which one of us is on top
next time you stop and stare
for we float in the realm of nonexistence
where all we need is air . . .

Thinspiration

Main Information
> Anorexia
> Bulimia
> Self Injury
> Recovery

Tools
> BMI calculator
> Food: calories
> Thinspiration

Community
> Forums
> Guestbook

Bones

Models

Celebrities

Athletes

The Thin Commandments

1. If you aren't thin you aren't attractive.
2. Being thin is more important than being healthy.
3. You must buy clothes, cut your hair, take laxatives, starve yourself, do anything to make yourself look thinner.
4. Thou shall not eat without feeling guilty.
5. Thou shall not eat fattening food without punishing oneself afterward.
6. Thou shall count calories and restrict intake accordingly.
7. What the scale says is the most important thing.
8. Losing weight is good/gaining weight is bad.
9. You can never be too thin.
10. Being thin and not eating are signs of true will power and success.

5) Peer influence

Exposure to Alcohol-related Posts → **Perception of Peers' Attitudes** → **Initiation of Heavy Episodic Drinking**

These processes also can promote adaptive behaviors.

Nesi, Rothenberg, Hussong, & Jackson, 2017

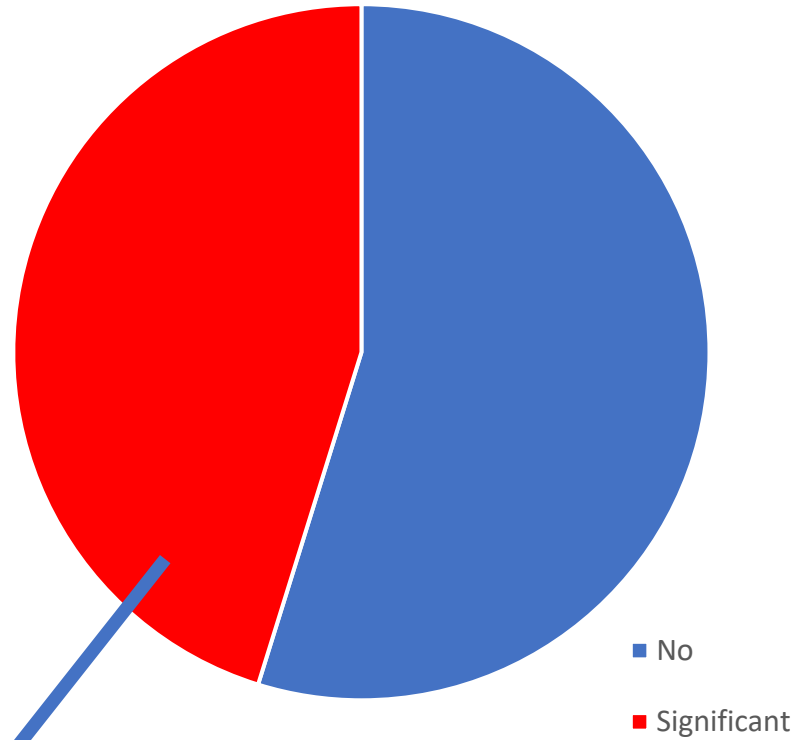# 6) Is digital media use a stressor?

- Connection overload

- Fear of Missing Out (FOMO)

- Availability Stress

- Approval Anxiety

Steele, Hall & Christofferson , 2020

Digital Stress in High School

N = 680, aged 14-15

Predicted increased depression one year later

Experiencing Digital Stress

- No
- Significant

Nick et al., 2021
Small effect sizes

7) Interferes with Sleep

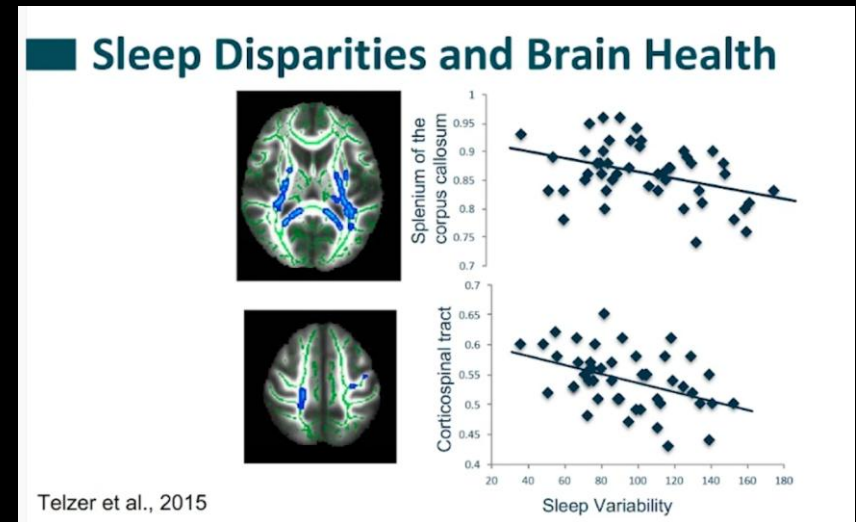**Percent of students who get recommended sleep (8+ hours)**
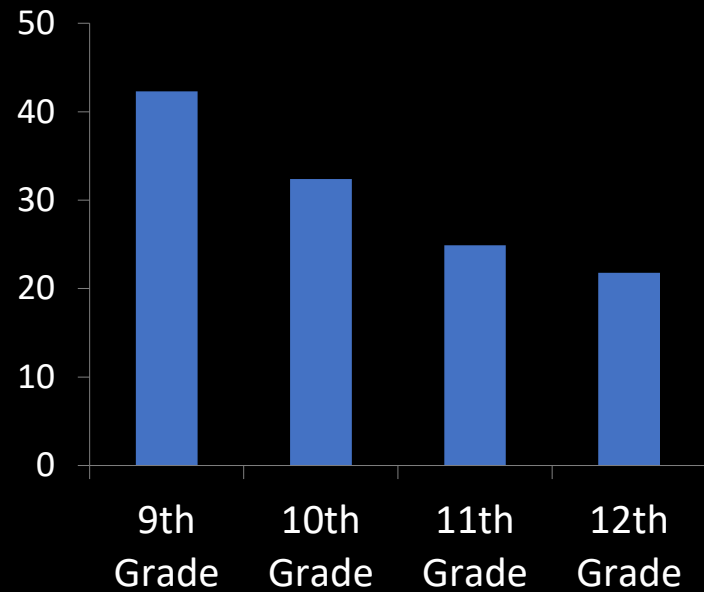
Poor sleep linked to obesity, depression, risky behaviors, poor school performance

Nighttime Screen Use linked to Poor Sleep Health

- Meta-analyses: Nighttime smartphone use associated with poorer sleep health
  - later sleep onset
  - shorter sleep duration
  - more frequent and longer wake events

Sleep Disparities and Brain Health

Telzer et al., 2015

Burnell et al., in press; Garrett et al., in press

8) Problematic Social Media Behaviors

- Do you ever feel like you spend more time on social media than you intended?

- Have you ever tried to spend time away from social media, but couldn't do it?

- Do you ever expend extra effort to make sure you will continue to have access to social media at times when you otherwise may not be able to use it?

- Do you ever have a craving or strong desire to use social media?

- Does social media use ever get in the way of things you are supposed to be doing (e.g., sleep, exercise, schoolwork)?

- Do you ever use social media even after you realized that it was getting in the way of what you thought was best for you?

- Have you ever been away from social media and felt like you were missing it too much to engage in normal day to day activities?

- Do you think you may be addicted to social media?

Results

- Nearly all adolescents report spending more time on social media than they intended

- Half of adolescents report that being away from social media results in experiencing difficulties in engaging with daily life activities

- One-quarter perceive that they are "moderately" or "severely" addicted to social media

Burnell et al., in press

4. Defendants' executives and employees have admitted as much. In candid moments, they have said:

    a. "It's better to have young people as an early adopter, especially the teenagers in the U.S. Why? They [*sic*] got a lot of time."

    b. "Teenagers in the U.S. are a golden audience . . . . If you look at China, the teenage culture doesn't exist — the teens are super busy in school studying for tests, so they don't have the time and luxury to play social media apps."

    c. The "product in itself has baked into it compulsive use."

    d. █████████████████████████████████████

5. Defendants' employees also privately admitted on video that TikTok's business practices conflict with mental health; █████████████████████████████ ████████████████ and that the company's business goals supersede users' safety needs. Excerpts of the videos (including approximate titles for Defendants' employees and with privacy protections for non-TikTok employees) are attached to this Complaint as Exhibit A.

310. Sean Parker, founding president of Meta, explicitly acknowledged this:

The thought process that went into building these applications, Facebook being the first of them . . . was all about: "[h]ow do we consume as much of your time and conscious attention as possible?" That means that we need to sort of *give you a little dopamine hit every once in a while, because someone liked or commented on a photo or a post* or whatever. And that's going to get you to contribute more content and that's going to get you . . . more likes and comments. It's a social-validation feedback loop . . . exactly the kind of thing that a hacker like myself would come up with, because you're exploiting a vulnerability in human psychology. The inventors, creators—me, Mark [Zuckerberg], Kevin Systrom on Instagram, all of these people—understood this consciously. And we did it anyway.

9) Smartphone use in school

- Not much data

- Distraction
  - Users and bystanders
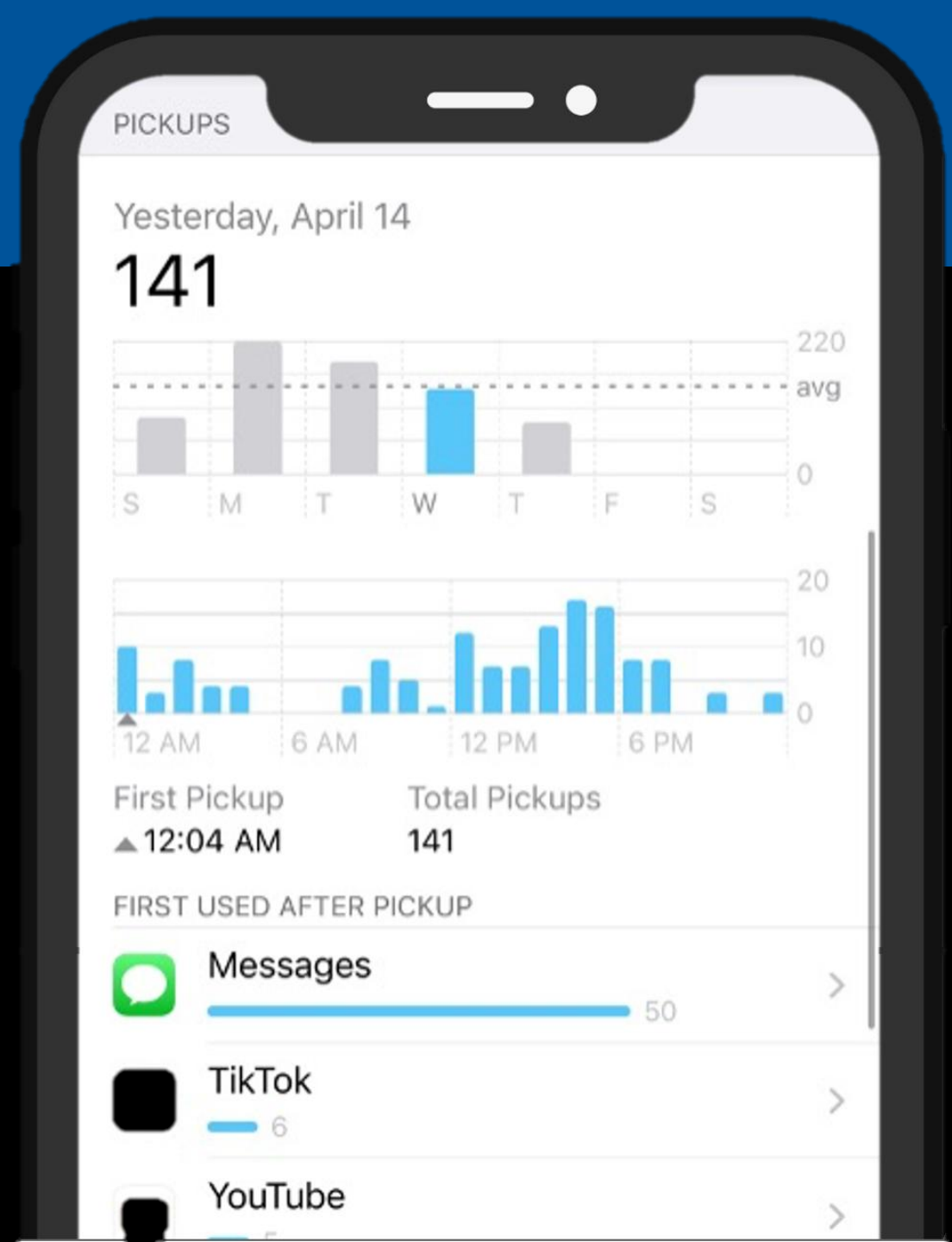- Multitasking vs. task shifting

10) Social Media and Brain Development
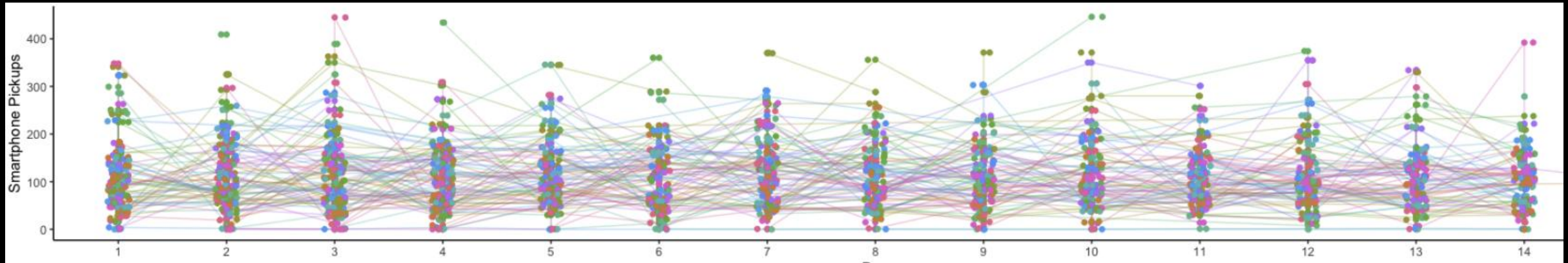
Collecting Smart Phone Data Objectively

Every day for 14 days, teens upload a screenshot of their phone usage
- Objective
- Not retrospective
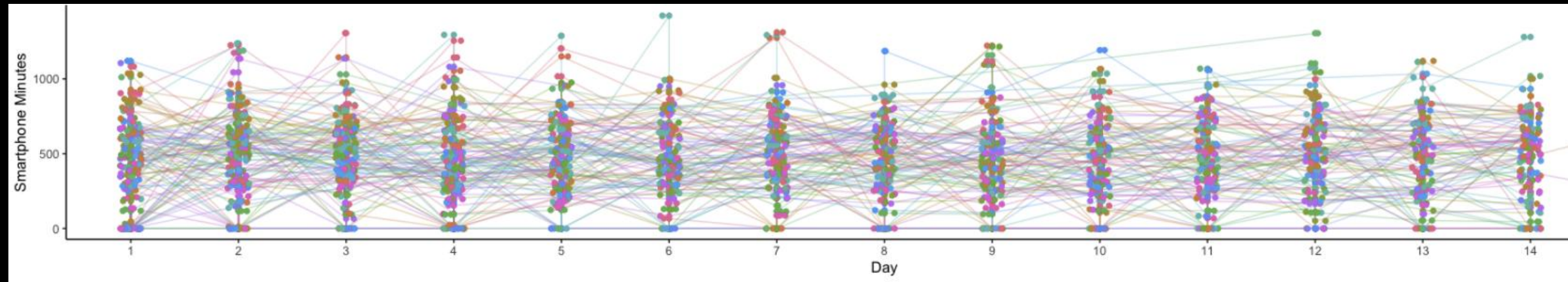- Thousands of data points

Daily Pickups and Time on Smartphones

Average pickups = 100/day

Average time on smart phone = 500min/day (8.3 hours)

Social Media and Reward Seeking

Two-week EMA study (3 x per day)

- In the immediate hour after teens use social media to connect with peers, they feel
    - increased sensation seeking
    - crave more social interactions
- End of day: increased loneiness

Armstrong-Carter et al., Developmental Psychology, 2023

Social Media and Brain Development

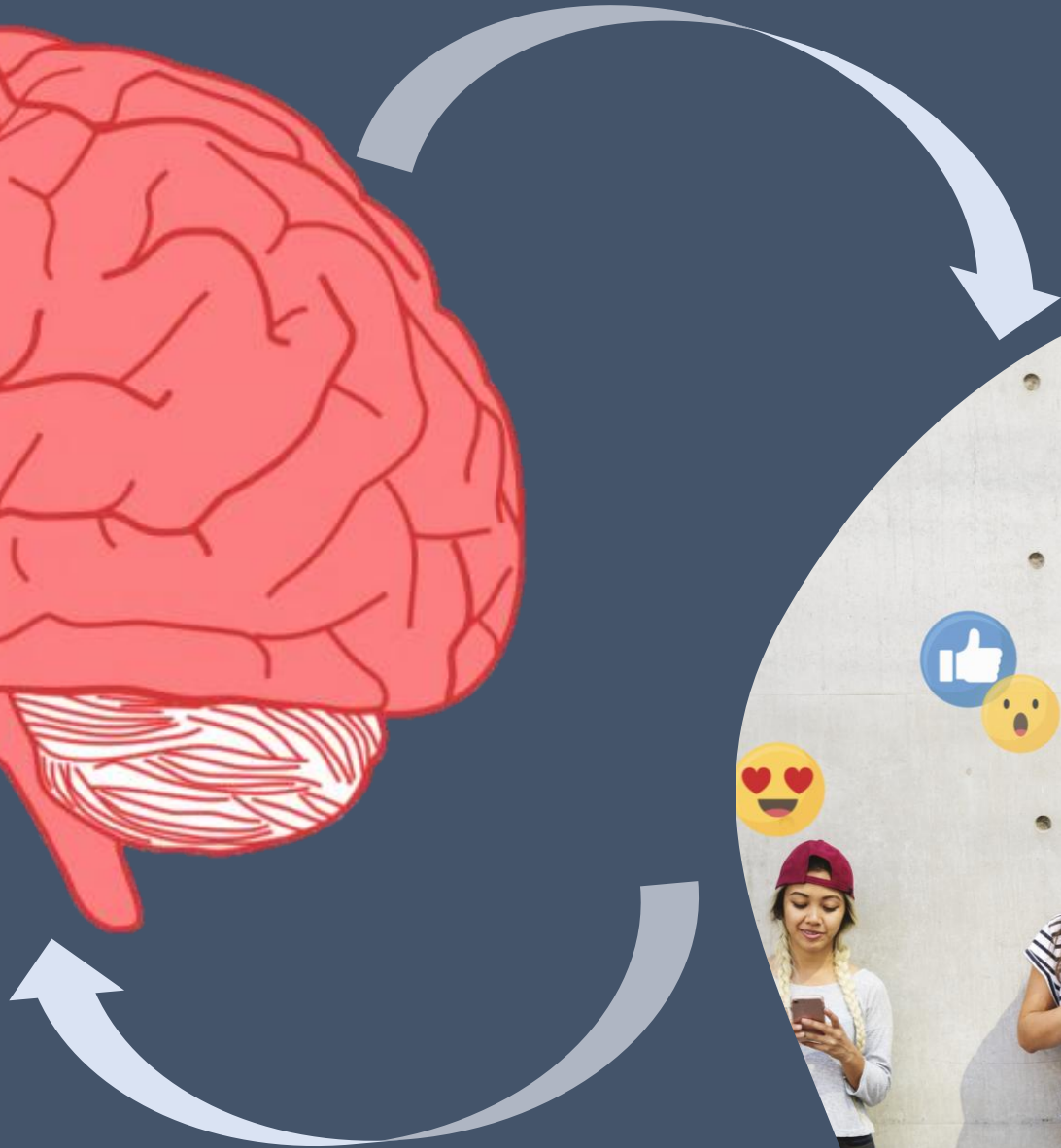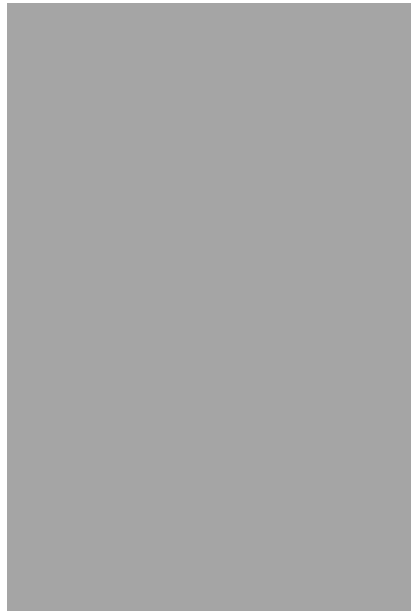Grade 6   Grade 7   Grade 8   Grade 9

Social Media and Brain Development

Left Amygdala/
Posterior Insula/ Ventral
Striatum

Maza, Fox et al., 2023 JAMA Pediatrics
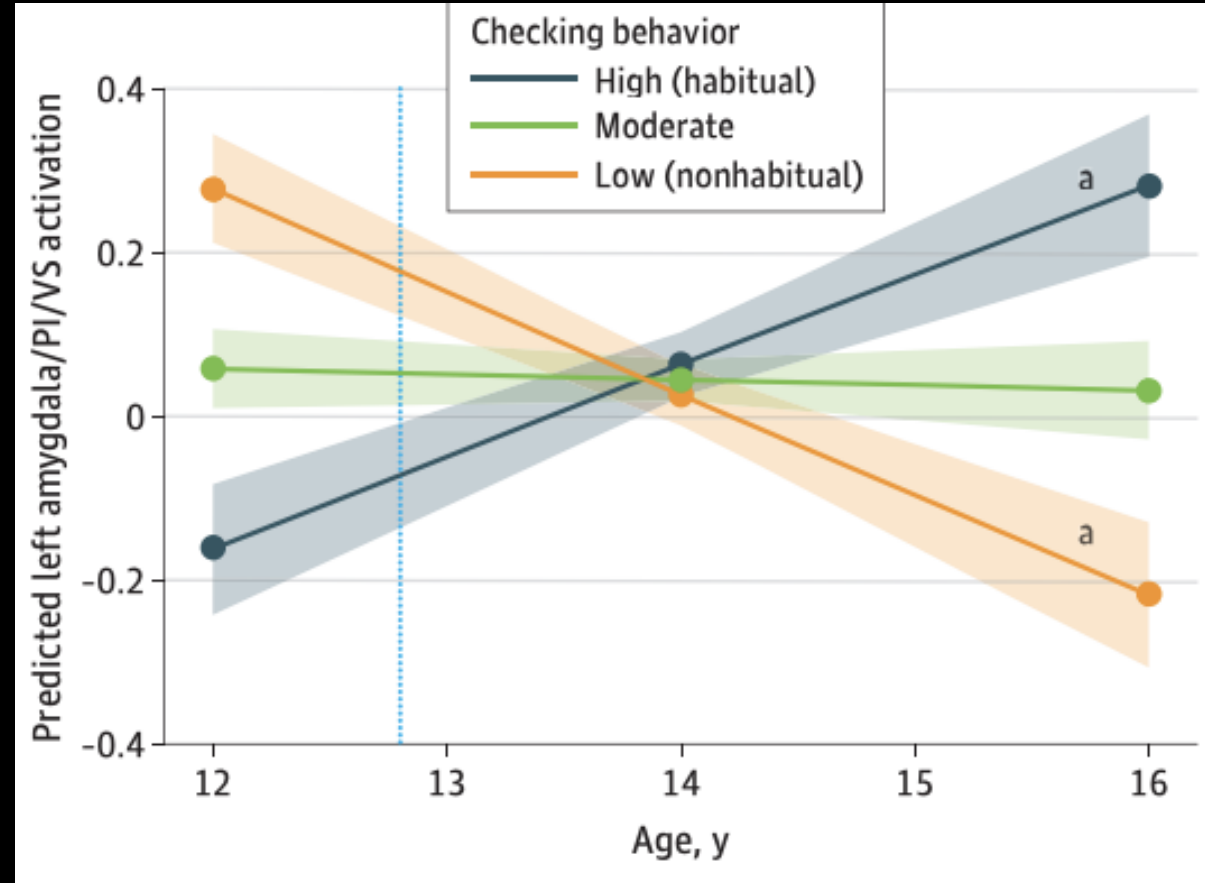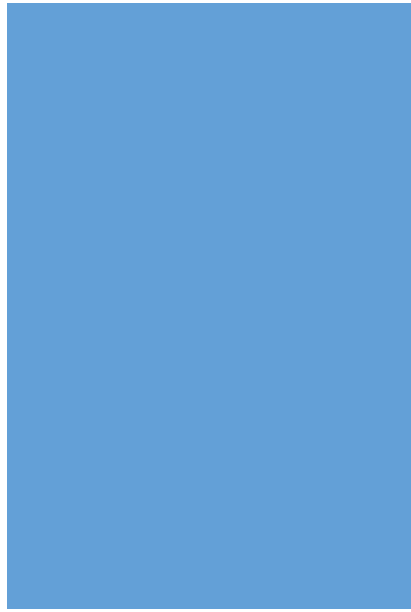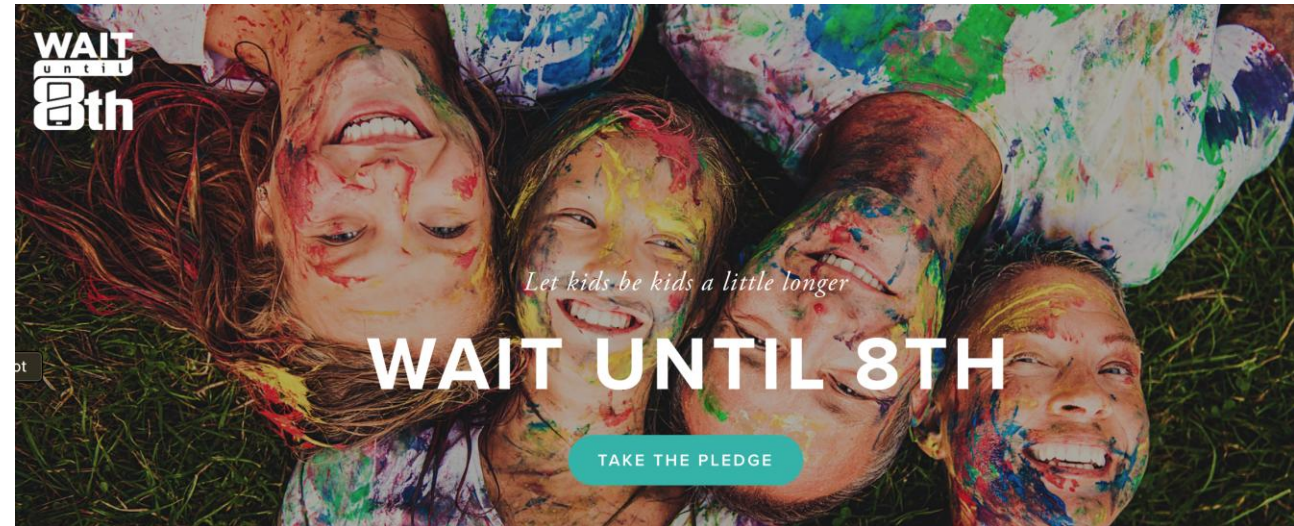
1) Wait for technology

Most parents report they allow tech because they fear their child will be only one not using tech

Let kids be kids a little longer

WAIT UNTIL 8TH

TAKE THE PLEDGE

2) Encourage Functions That Promote Healthy Socialization

- Social support
- Companionship
- Emotional intimacy

3) Discourage Functions that are not suitable for your child's maturity

- Open Chat
- Adult Content
- AI

4) Monitor Use for Early Adolescents

Combination of:

- Restrictive Monitoring
- Active Monitoring

Validate importance of their online lives

5) Minimize Exposure to and Remove Content Depicting Illegal or Psychologically Maladaptive Behavior

- At least 33-50% are exposed to this content
- Discuss it

6) Minimize Exposure to, and Remove Content that Promotes Discrimination, Prejudice, Hate or Cyberbullying

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- Discuss cyberhate and appropriate responses

7) Routinely Screen for Signs of "Problematic Use" that Can Impair Their Ability to Engage in Daily Life and Routines

- Have you tried to reduce your screen time, but can't?

- Have you gone to extreme measures (e.g., lying) to retain access?

- Does screen time interfere with your other roles and responsibilities?

8) Limit Use that Interferes with Sleep and Physical Activity

9) Limit Use that Encourages Social Comparison, Particularly Around Beauty- or Appearance-related Content

10) Precede Use with Training Teens in Digital Media Literacy

1) Question the accuracy/ representativeness of content

2) Understand tactics used to spread mis-/ disinformation

3) Limit "overgeneralization" and "misestimation" errors

4) Know the signs of problematic social media use

5) Learn how to build healthy online relationships

6) Understand how to solve conflicts on social media

7) Refrain from excessive social comparisons online

8) Recognize online structural racism and critique racist messages

9) Communicate safely about mental health online

10) Understand who benefits from kids using social media

Why did people invent social media?

Example - Instagram

Purchases
Purchase History

Financial Info
Other Financial Info

Location
Precise Location
Coarse Location

Contact Info
Physical Address
Email Address
Name
Phone Number
Other User Contact Info

Contacts
Contacts

User Content
Photos or Videos
Gameplay Content
Other User Content

Search History
Search History

Browsing History
Browsing History

Identifiers
User ID
Device ID

Usage Data
Product Interaction
Advertising Data
Other Usage Data

Diagnostics
Crash Data
Performance Data
Other Diagnostic Data

Other Data
Other Data Types

Data Linked to You

The following data may be collected and linked to your identity:

- Health & Fitness
- Purchases
- Financial Info
- Location
- Contact Info
- Contacts
- User Content
- Search History
- Browsing History
- Identifiers
- Usage Data
- Sensitive Info
- Diagnostics
- Other Data

Purchases
Purchase History

Financial Info
Other Financial Info

Location
Precise Location
Coarse Location

Contact Info
Physical Address
Email Address
Name
Phone Number
Other User Contact Info

Contacts
Contacts

User Content
Photos or Videos
Gameplay Content
Other User Content

Search History
Search History

Browsing History
Browsing History

Identifiers
User ID
Device ID

Usage Data
Product Interaction
Advertising Data
Other Usage Data

Diagnostics
Crash Data
Performance Data
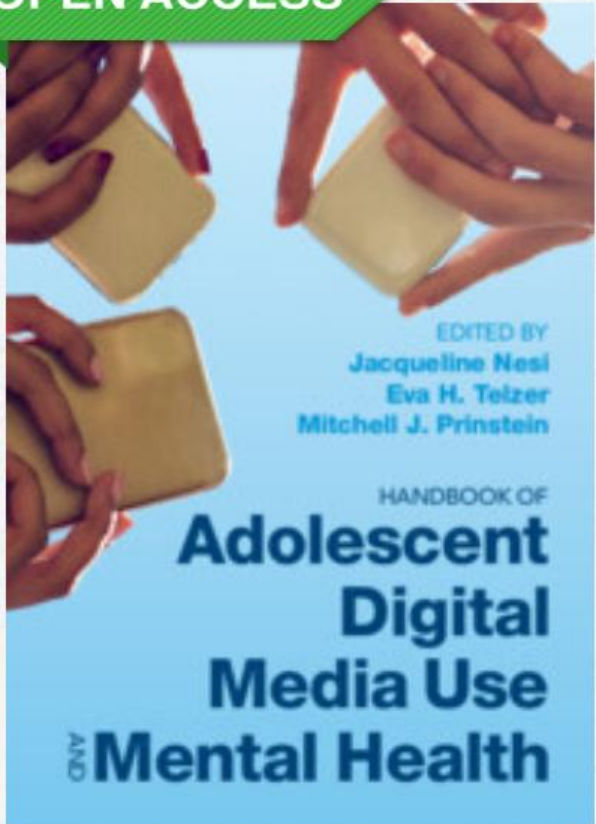Other Diagnostic Data

Other Data
Other Data Types

Thanks!

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https://www.teensandtech.org/