

ABCD-ReproNim: An ABCD Course on Reproducible Data Analyses

ABCD: Novel Technologies Workgroup

Kara Bagot, MD

Department of Psychiatry
Addiction Institute
Icahn School of Medicine at Mount Sinai
kara.bagot@mssm.edu



ABCD-ReproNim

Learning Objectives of this Lecture



- Understand the types of data that can be collected using mobile & digital technologies
- Understand the link between screen exposure and health in youth
- Identify variations in screentime data over study years

- ***Background & Rationale for Novel Technologies in ABCD***
 - ***Mobile & Wearable Technologies***
 - Fitbit
 - Effortless Assessment of Risk States (EARS) app
 - ***Self-Report Data***
 - Background
 - Variations Across Time
- Background
 - Methods of Data Capture
 - Procedures for Protection of Data
 - Preprocessing

Background & Rationale



- Real-time factors that contribute to developmental outcomes
- Within-person, intensive, longitudinal, high-temporal resolution data
- Environmental, physiologic, behavioral, and psychological factors
 - How these interact with each other to influence development & health
- Indices of behaviors in real-time
 - Physical activity
 - Geolocation
 - Sleep
 - Phone use duration
 - Music choice
 - Facial expressions
 - Acoustic vocal quality
 - Natural language use

FITBIT





- ↓ or poor quality sleep associated with...
 - ETOH, cannabis, tobacco + other substance use
 - Depression
 - Suicidality
- ↓ physical activity (PA) associated with...
 - Mortality
 - Obesity
 - Type 2 diabetes
 - Cardiovascular disease
 - Depression
 - Anxiety
- Gold standard =
 - Indirect calorimeters – PA
 - Electrocardiograms – heart rate (HR)
 - Polysomnography - sleep
- ↑ burden & cost
- Neuropsychological + physiological mechanisms = contributors to PA & sleep
- **GOAL = In-vivo PA & sleep → health**

Fitbit Charge 2 – Data Capture



- ACC = triaxial accelerometer
- HR = optical heart rate
- ALT = altimeter
- Continuous measurement at >1 Hz
- Store minute-level data
 - Up to 5 days before requiring recharge
- Validated in children 9-10 yo age

*These minute level data are available in unprocessed form from ABCD DAIC

Measures		Aggregation Level	Sensor Used
Steps		Minute	ACC
Distance Traveled		Kilometer/minute	ACC
Physical Activity Intensity	Intense	Minute	ACC, HR
	Moderate	Minute	ACC, HR
	Light	Minute	ACC, HR
Energy expenditure	Resting calories	Minute	ACC, HR
	Activity calories	Minute	ACC, HR
Sleep	Start time	Minute	ACC, HR
	Time to fall asleep	Minute	ACC
	Asleep	Minute	ACC
	Awake	Minute	ACC
	Number of awakenings	Minute	ACC
	Awake time	Minute	ACC
	Time after awake	Minute	ACC
	Time in bed	Minute	ACC
Heart rate		Second	HR
Stairs		Flights/day	ACC, ALT



- 22 days
 - Day of deployment + 21 full days of data collection
- Youth & parent self-report questionnaires on day 1 & day 22
- Pilot = 147 participants (53-SRI, 50-UCSD, 44-VCU)
 - Exclusions...
 - 6 participants < 21 wear days
 - 8 participants – 0 time with valid HR data
 - Included 2 with < 21 days



PRE-ASSESSMENT

Compared to other boys/girls your age, how much physical activity do you do?

Do you do think the amount of physical activity you do is healthy?

Compared to other boys/girls your age, how many sedentary behaviors do you do?

Do you think the amount of sedentary behaviors you do is healthy?

Compared to other boys/girls your age, how much sleep do you get?

Do you think the amount of sleep you do is healthy?

Do any of your friends wear a Fitbit or other activity tracker?

How long do you think it will take you to learn to use the Fitbit?

How often do you think you will have to remove the Fitbit?

How much do you think you will change your activities while wearing the Fitbit?

How much do you think you will enjoy using the Fitbit?

Do you think wearing the Fitbit will be annoying?

Fitbit Youth Post-Questionnaire



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POST-ASSESSMENT

Compared to other boys/girls your age, how much physical activity do you do?

Do you do think the amount of physical activity you do is healthy?

Compared to other boys/girls your age, how many sedentary behaviors do you do?

Do you think the amount of sedentary behaviors you do is healthy?

Compared to other boys/girls your age, how much sleep do you get?

Do you think the amount of sleep you do is healthy?

How comfortable were you wearing the Fitbit in front of your friends?

How interested were your friends in the Fitbit?

How good or bad were their comments about the Fitbit?

Did you feel encouraged by your friends to wear the Fitbit?

How long did it take you to learn to use the Fitbit?

How often did you have to remove the Fitbit?

When did you take it off (during what activities)?

During what sport did you take it off?

During what other activity did you take it off?

How often did you forget to put it back on after taking it off?

How often did you check the Fitbit to get information about your activity?

Did you use the app and website to see your Fitbit activity?

Would you have liked to use the app and website to see your Fitbit activity?

How much did you change your sleep while wearing the Fitbit?

How much do you think you will/did enjoy using the Fitbit?

I found the Fitbit too complicated

I felt confident using the Fitbit

What were the good things about wearing the Fitbit?

What were the bad things about wearing the Fitbit?

Do you think you will ask your parents to buy a Fitbit or other activity tracker for you to use in the future?

Fitbit Parent Questionnaire



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In your opinion, compared to other boys/girls your son/daughter's age, how much physical activity does your child engage in?

In your opinion, do you think the amount of physical activity your child does is healthy?

In your opinion, compared to other boys/girls your son/daughter's age, how many sedentary behaviors does your child engage in?

In your opinion, do you think the amount of sedentary behaviors your child engages in is healthy?

In your opinion, compared to other boys/girls your son/daughter's age, how much sleep does your child get?

In your opinion, do you think the amount your child sleeps is healthy?

Did he/she change his/her activity or sleep based on the information?

Did you use the app and/or website to see your child's Fitbit activity?

- If Yes, did you encourage your child to change his/her activity or sleep based on the information?

Did your child use the app and/or website to see his/her Fitbit activity?

- If Yes, did he/she change his/her activity or sleep based on the information?

If we asked your child to wear the Fitbit for a longer period of time, would you do it?



- Data at minute level
- Minute level data screened for...
 - Unlikely/apphysiologic $200 > \text{HR} < 50$
 - Strings of repeated values
 - Identical HR in sequential min
 - Identical HR preceding & following a string of missing values
- >599 min/day
- ≥ 4 days/week with ≥ 1 weekend day
- ABCD summary variables:
 - # of steps
 - Resting HR = # of heart beats/min at rest
 - Metabolic equivalent of tasks (METs)
 - Activity intensity classification (min)
 - Sedentary
 - Light activity
 - Fairly active
 - Active

Data Exclusion Based on Aphysiologic Signal (Unlikely Heart Rate Values)			
	Range (Minutes)		
	Low	High	# of individuals affected (%)
Possible Wear Minutes	23040 (16 days)	30240 (21 days)	139
Minutes with HR values (Presumed wear)	566	29482	139 (100%)
Minutes with HR <40	0	45	2 (1.4%)
Minutes with HR <50	0	3430	23 (16.5%)
Minutes with HR <60	0	11469	124 (89.2%)
Minutes with HR >200	0	1	2(1.4%)
*8 participants with 0 minutes of HR excluded from analysis			

Data Exclusion Based on Aphysiologic Signal (Repeated Heart Rate)				
	Total Sample		Per Person	
Repeat Length	Instances	Minutes Excluded (%)	Instances	Minutes Excluded
(min)			Mean (\pm SD)	Mean (\pm SD)
6+	8549	595219 (19.3%)	61.5 (31.7)	4282 (5791)
11+	2942	555847 (18.0%)	21.2 (14.0)	3999 (5842)
16+	2148	545841 (17.7%)	15.5 (11.0)	3926 (5850)
31+	1397	529652 (17.2%)	10.1 (7.7)	3810 (5857)
61+	895	508083 (16.5%)	6.4 (5.4)	3655 (5863)
NOTE: 4 participants contributed less than the expected 21 possible days due to protocol tracking discrepancy				

Data Inclusion Based on Wear Time		
DAILY LEVEL PER PARTICIPANT		
Inclusion Criteria	Valid Days Across Protocol Period Mean (SD)	% of Total Possible Days
>599 min/day	15.2 (5.0)	72.8%
>749 min/day	12.2 (4.9)	58.1%
>899 min/day	4.4 (3.3)	21.1%
WEEKLY LEVEL FOR ENTIRE SAMPLE		
	Total Number of participant weeks (Total possible=417)	% of total possible weeks
Assuming >599 minutes		
≥3 days/week	363	87.1%
≥3 days/week with ≥1 weekend day	356	85.4%
≥4 days/week	340	81.5%
≥4 days/week with ≥1 weekend day	335	80.3%
≥5 days/week	299	71.7%
≥5 days/week with ≥1 weekend day	295	70.7%

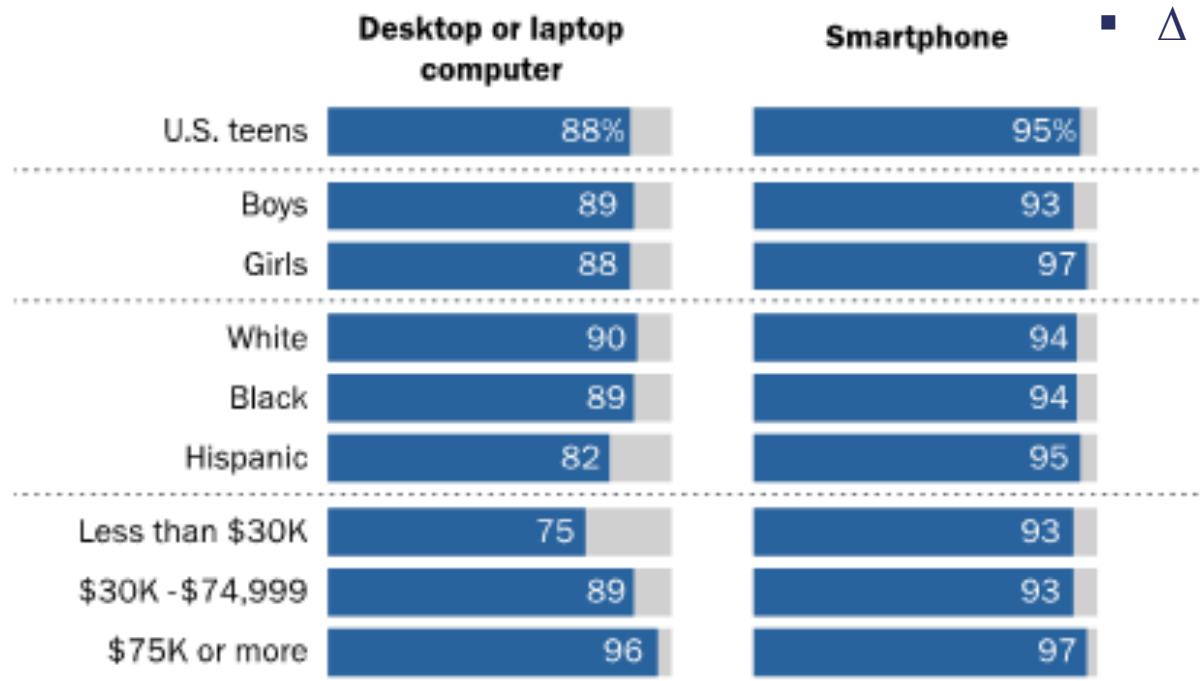
EARS App





- Tweens 8-12 yo age ~ 5 hrs/day engaged in screen media activity (SMA)
 - ~80% on smartphone
- Teens 13-18 yo age ~ 7 hrs/day engaged in SMA
 - ~85% on smartphone

% of U.S. teens who say they have or have access to a ____ at home



GOAL = Longitudinal, objective smartphone data →

- trajectory of smartphone use
- map changes in types of information accessed and behavior
- Δ in behavior, brain development, psychopathology & health



- Android phones
 - iOS operating system Ø passive scraping
- Operating systems 6.0 or newer
- Passive sensing app
- Download from Google Play Store
- Runs constantly in the background
 - Scrapes operating system every 3min
 - Screen on/off
 - Foreground applications
 - Date and time logged for each instance of application use
- Ø participant-app interaction
 - “You are changing the future of health and wellness.”
- Ø data → app push notification to open the app
- Ø data for days → RA call to troubleshoot

- Data encrypted before upload to secure cloud server
- Ø identifiable information (e.g. name, age, phone numbers, or text/voice content)

- 22 days
 - Pilot – average 34 days (SD-22.2)
 - 24 weekdays
 - 10 weekend days
- Youth & parent self-report questionnaires on day 1 & day 22
- Pilot = 67 participants
 - Occurred during Year 2 follow-up
 - Of 6,571 participants total NDA 3.0
 - 37% – Ø smartphone
 - 38% – iPhone
 - 23% - Android



PRE-ASSESSMENT—YOUTH

How much of [time on a weekday] do you spend on a mobile device specifically?

How much of [time on a weekend day] do you spend on a mobile device specifically?

Do your parents limit the amount of time you can use screens?

Do your parents limit the amount of time you can use your mobile device?

Have your parents ever installed or used an app on your device to monitor your phone use?

In your opinion, compared to other boys/girls your age, how much do you use your mobile device?

In your opinion, do you do think the amount of time you spend on your device is healthy?

POST-ASSESSMENT—YOUTH

How much of [time on a weekday] do you spend on a mobile device specifically?

How much of [time on a weekend day] do you spend on a mobile device specifically?

In your opinion, compared to other boys/girls your age, how much do you use your mobile device?

In your opinion, do you do think the amount of time you spend on your device is healthy?

Were there any days during the past 4 weeks that you did not use your mobile device?

[If yes] How many [days did you not use your mobile device]?

How much did you change how you used your mobile device while having the applications on your device?

If we asked you to have the applications on your device longer, would you do it?

If the applications would ask you a few questions every day, would that be okay with you?



PRE-ASSESSMENT

How much of [time on a weekday] does your child spend on their mobile device specifically?

How much of [time on a weekend day] does your child spend on a mobile device specifically?

What are the family rules about screen time for your son/daughter?

Have you ever installed an app on your child's mobile device to monitor their screen use?

POST-ASSESSMENT—PARENT

How much of [time on a weekday] does your child spend on their mobile device specifically?

How much of [time on a weekend day] does your child spend on a mobile device specifically?

Did you monitor your child's use of their device more closely over the past month?

Since your child started participating in this substudy, have you noticed a change in his/her mobile device use?

[If yes] Have they used their phone more or less? [n = 4]

If we asked your child to use a mobile device monitoring application for a longer period of time, would you do it?

EARS – Youth v. Parent Perception of Child Use



Category	Average - Weekday	Average – Weekend
Pre-Assessment—Youth	2 hrs, 30 min	4 hrs, 56 min
Post-Assessment—Youth	3 hrs, 11 min	4 hrs, 10 min
Pre-Assessment—Parent	3 hrs, 40 min	4 hrs, 56 min
Post-Assessment—Parent	4 hrs, 35 min	4 hrs, 35 min

- Google Play Store category summaries available in NDA 3.0
- Summed application use - composite categories
 - Communication (e.g., Discord; Facebook)
 - Gaming (e.g., Temple Run 2; Mario Kart Tour)
 - Music (e.g., Shazam; Google Play Music)
 - News (e.g., Weather Forecast; HuffPost News)
 - Reading (e.g. WebComics; Amazon Kindle)
 - Social media (e.g., Twitter; Facebook)
 - Streaming (e.g., Twitch; Hulu)
 - 2 stand-alone categories created each from one app
 - SMS messages (basic texting)
 - YouTube
 - Not mutually exclusive from composites

EARS – App Use



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Category	Average – Daily	Average – Weekday	Average – Weekend
Total App Use	3 hrs, 45 min	3 hrs, 27 min	4 hrs, 38 min
Total Screen On	3 hrs, 50 min	3 hr, 31 min	4 hrs, 43 min
Communication	48 min	45 min	56 min
Gaming	41 min	36 min	52 min
Music*	2 min	2 min	3 min
News	1 min	<1 min	2 min
Reading	3 min	3 min	3 min
SMS Messages	6 min	5 min	7 min
Social Media	36 min	34 min	42 min
Streaming	1 hr, 57 min	1 hr, 47 min	2 hrs, 23 min
YouTube	1 hr, 18 min	1 hr, 12 min	1 hr, 36 min

Screen time Questionnaires





- SMA is complex and encompasses passive & active, social & isolative activities
- SMA associated with...
 - Attention
 - Memory
 - Reward processing
 - Depression
 - Anxiety
 - Externalizing symptoms

GOAL = Longitudinal screentime data →

- trajectory of screentime exposure
- map changes in types of information accessed and behaviors
- Δ in behavior, brain development, psychopathology & health



- Youth self-report
- Parent report of youth use
- Baseline-Year 4 every 12 months
 - Updated at Year 2, 3 & 4

How often do you play mature-rated video games (e.g., Call of Duty, Grand Theft Auto, Assassin's Creed, etc.)?

Never

Once in a while

Regularly

All the time

How often do you watch R-rated movies?

Never

Once in a while

Regularly

All the time

Self-Report – Youth Questionnaire: **CHANGES** Baseline – Year 2



On a typical WEEKDAY/WEEKEND, how much TIME per day do you:

	Time:	
1) Watch <i>“or stream”</i> TV shows or movies? (<i>such as Hulu, Netflix or Amazon, not including videos on YouTube</i>)	Hours [0-23]	Minutes [0/15/30/45]
2) Watch <i>“or stream”</i> videos (such as YouTube)?	Hours [0-23]	Minutes [0/15/30/45]
3) Play <i>single-player</i> video games on a computer, console, phone or other device (Xbox, Play Station, iPad, <i>AppleTV</i>)?	Hours [0-23]	Minutes [0/15/30/45]
4) <i>Play multiplayer video games on a computer, console, phone or other device (Xbox, Play Station, iPad, AppleTV) where you can interact with others in the game?</i>	<i>Hours [0-23]</i>	<i>Minutes [0/15/30/45]</i>
5) Text on a cell phone, tablet, computer, iPod, or other electronic device (e.g. GChat, Whatsapp, etc.)?	Hours [0-23]	Minutes [0/15/30/45]
6) Visit social networking sites like Facebook, Twitter, Instagram, etc.?	Hours [0-23]	Minutes [0/15/30/45]
7) Video chat (Skype, FaceTime, etc.)	Hours [0-23]	Minutes [0/15/30/45]



On a typical WEEKDAY (Monday-Friday), how much TIME per day do you spend in TOTAL on a computer, cellphone, tablet, iPod, or other electronic device or video game?

Hours [0-23] Minutes [0/15/30/45]

On a typical WEEKEND DAY (Saturday-Sunday), how much TIME per day do you spend in TOTAL on a computer, cellphone, tablet, iPod, or other electronic device or video game?

Hours [0-23] Minutes [0/15/30/45]

CELL PHONE QUESTIONS

Do you have your own cell phone?

☐ No

☐ Yes

IF YES TO CELL PHONE: ***On a scale of 1-10 (with 1=barely check it/can go days without it, and 10=check at least hourly when awake), how attached are you to your smartphone? _____***

Self-Report – Youth Questionnaire: *ADDITIONS* Year 2...Mobile Phone

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The Mobile Phone Involvement Questionnaire:

How much do you agree with the following statements in relation to your mobile phone use?	Strongly disagree	Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
1. I interrupt whatever else I am doing when I am contacted on my mobile phone	1	2	3	4	5	6	7
2. I often use my mobile phone for no particular reason	1	2	3	4	5	6	7
3. I feel connected to others when I am using my mobile phone	1	2	3	4	5	6	7
4. Arguments have arisen with others because of my mobile phone use	1	2	3	4	5	6	7
5. I lose track of how much I am using my mobile phone	1	2	3	4	5	6	7
6. I often think about my mobile phone when I am not using it	1	2	3	4	5	6	7
7. I have been unable to reduce my mobile phone use	1	2	3	4	5	6	7
8. The thought of being without my mobile phone makes me feel distressed	1	2	3	4	5	6	7

Self-Report – Youth Questionnaire: *ADDITIONS* Year 2...Social Media

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SOCIAL MEDIA QUESTIONS

List the # of social media sites you have an account on (0-10)?

- ☐ Facebook
- ☐ Instagram
- ☐ Snapchat
- ☐ Twitter
- ☐ YouTube
- ☐ Pinterest
- ☐ Tumblr
- ☐ Reddit
- ☐ Multiplayer Videogame Online Chatting
- ☐ Other (please fill in name): _____

Which social media site do you use the most? (CHECK ONE OPTION)

- ☐ Facebook
- ☐ Instagram
- ☐ Snapchat
- ☐ Twitter
- ☐ YouTube
- ☐ Pinterest
- ☐ Tumblr
- ☐ Reddit
- ☐ Multiplayer Videogame Online Chatting
- ☐ Other (please fill in name): _____

[based on what they click to the left]

On the social media site you use the most, is your account public or private?

Public

Private

On the social media site you use the most, how many followers do you have?

Not applicable (e.g., Facebook, Snapchat)

On the social media site you use the most, how many people or groups are you following?

Not applicable (e.g., Facebook, Snapchat)

How much TIME per day do you spend on social media accounts?

Hours [0-23] Minutes [0/15/30/45]

Self-Report – Youth Questionnaire: *ADDITIONS* Year 2...Social Media

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<i>SOCIAL MEDIA ADDICTION</i>	Very rarely	Rarely	Sometimes	Often	Very often
1. I spend a lot of time thinking about social media sites/apps or planning my use of social media sites/apps.	1	2	3	4	5
2. I feel the need to use social media sites/apps more and more.					
3. I use social media sites/apps so I can forget about my problems.					
4. I've tried to use my social media sites/apps less but I can't.					
5. I've become stressed or upset if I am not allowed to use my social media sites/apps.					
6. I use social media sites/apps so much that it has had a bad effect on my schoolwork or job.					

Self-Report – Youth Questionnaire: *ADDITIONS* Year 2...Sleep



Is there a TV set or an Internet connected electronic device in your bedroom?

Yes No

What do you usually do with your cell phone when you are ready to go to sleep? Do you...

- A) Turn the phone off
- B) Put the ringer on silent or vibrate
- C) Leave the ringer on?

In the past year, how often have you had phone calls, text messages or emails that wake you after trying to go to sleep?

- A) Never
- B) Rarely
- C) Sometimes
- D) Very often
- E) Always

In the past year, when you woke up during the night, how often have you used your phone or other device to send messages/play games/surf the internet/use social media/read or write emails?

- A) Never
- B) Rarely
- C) Sometimes
- D) Very often
- E) Always

Self-Report – Youth Questionnaire: *ADDITIONS* Year 2...Sleep



In the past year, how often did you do the following activities while already in bed before going to sleep?

	Never	Rarely	Sometimes	Very often	Every Night
1. Watch TV or movies	1	2	3	4	5
2. Play video games					
3. Play music					
4. Talk on the phone or text					
5. Spend time online on social media (e.g. Facebook)					
6. Spend time in chat rooms					
7. Surf the Internet					
8. Use a computer/laptop for studying					
9. Reading					

Self-Report – Youth Questionnaire: **Changes** Year 2 – Year 3



Watch or stream videos *or live stream* (such as YouTube, *Twitch*)

Hours [0-23] Minutes [0/15/30/45]

Video chat (Skype, FaceTime, *VRchat*, etc.)

Hours [0-23] Minutes [0/15/30/45]

Visit *social media apps* (e.g. Snapchat, Facebook, Twitter, Instagram, *Musical.ly*, etc.)? (Do not include time spent editing photos or videos to post on social media.)

Hours [0-23] Minutes [0/15/30/45]

Do you have your own *mobile phone* or *smart watch*?

☐ No

☐ Yes

SOCIAL MEDIA QUESTIONS

TikTok (added to the list of social media platforms)



Edit photos or videos to post on social media

Hours [0-23] Minutes [0/15/30/45]

Searching or browsing the internet (e.g., using Google) that is NOT for school

Hours [0-23] Minutes [0/15/30/45]

Self-Report – Youth Questionnaire: *ADDITIONS* Year 3...Video Gaming

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VIDEO GAME ADDICTION	Very rarely	Rarely	Sometimes	Often	Very often
1. I spend a lot of time thinking about playing video games.	1	2	3	4	5
2. I feel the need to play video games more and more.					
3. I play video games so I can forget about my problems.					
4. I've tried to play video games less but I can't.					
5. I've become stressed or upset if I am not allowed to play video games.					
6. I play video games so much that it has had a bad effect on my schoolwork or job.					

Self-Report – Youth Questionnaire: *ADDITIONS* Year 3...Online Dating

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Have you ever used a dating app?

- ☐ Yes
- ☐ No
- ☐ I don't know what that is
- ☐ Refuse to answer

Are you currently using a dating app?

- ☐ Yes
- ☐ No
- ☐ Refuse to answer

How much time per week do you spend on online dating apps?

- ☐ None
- ☐ < 30 minutes
- ☐ 1 hour
- ☐ 2 hours
- ☐ 3 hours
- ☐ 4+ hours
- ☐ Refuse to answer

Have you arranged an in-person meeting with someone you met only a dating app?

- ☐ Yes
- ☐ No
- ☐ Refuse to answer



On a typical WEEKDAY (Monday- Friday), how much TIME per day does your child spend in TOTAL on a computer, cellphone, tablet, iPod, or other electronic device?

Hours [0-23] Minutes [0/15/30/45]

On a typical WEEKEND DAY (Saturday-Sunday), how much TIME per day does your child spend in TOTAL on a computer, cellphone, tablet, iPod, or other electronic device?

Hours [0-23] Minutes [0/15/30/45]

Please do NOT include time spent on school related work, but do include watching TV, shows or videos, texting or chatting, playing games, or visiting social networking sites (Facebook, Twitter, Instagram).

Self-Report – Parent Questionnaire: *ADDITIONS* Year 2...Device Use



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Does your child have their own device? CHECK ALL THAT APPLY.

- ☐ Cell phone
- ☐ Tablet
- ☐ Laptop
- ☐ iPod or similar device

IF YES to any: ***Do they have internet or WiFi capabilities on any of these devices?***

YES NO

IF YES TO CELL PHONE: ***What kind of cell phone does your child have?***

- ☐ Apple/iPhone
- ☐ Android
- ☐ Other:

IF YES TO CELL PHONE: ***How old was you child when he/she got their own cell phone?***

IF NO TO CELL PHONE: ***If your child does not have their own cell phone, do you allow them to use yours?***

YES SOMETIMES NO

Are you following, or friends with, your child on any social media sites (e.g., Facebook, Instagram, Snapchat)?

YES NO

Do you suspect that your child has social media accounts that you are unaware of?

YES NO

Self-Report – Parent Questionnaire: *ADDITIONS* Year 2...Online



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I feel like my child spends too much time online:

1. Strongly disagree
2. Somewhat disagree
3. Neither disagree nor agree
4. Somewhat agree
5. Strongly agree

I worry that my child will view inappropriate (foul language, promiscuous content, post condoning violence, etc.) things online?

1. Strongly disagree
2. Somewhat disagree
3. Neither disagree nor agree
4. Somewhat agree
5. Strongly agree

I worry that my child will post inappropriate things (language, promiscuous content, post condoning violence, etc.) online?

1. Strongly disagree
2. Somewhat disagree
3. Neither disagree nor agree
4. Somewhat agree
5. Strongly agree



Self-Report – Parent Questionnaire: *ADDITIONS* Year 2...SMA

We want to know about how your child uses screen media and your experiences with your child's media use. When we say screen media, we mean any type of media that your child uses that has a screen, such as:

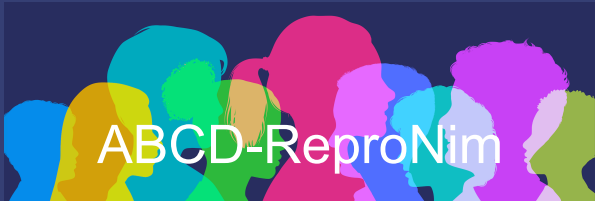
- television
- video games
- tablets
- smartphones
- handheld video games
- laptops
- computers

We will use the shortened term “SCREEN MEDIA” to refer to ANY screen media device or format that your child uses. When you see the term “SCREEN MEDIA” in the following questions, think of ANY type of screen media or devices that your child uses.

What types of SCREEN MEDIA does your child use the most (not including screen media used for school or homework)?

- ☐ Television
- ☐ Video games
- ☐ Mobile phone
- ☐ Tablet
- ☐ Handheld video game device
- ☐ Computer/laptop

Other (please list):



Self-Report – Parent Questionnaire: *ADDITIONS* Year 2...SMA

For each statement, please select (circle) the option that is true for your child in the past month:

	Never	Rarely	Some times	Very Often	Always
1. My child sneaks using screen media.	1	2	3	4	5
2. Screen media is all that my child seems to think about.	1	2	3	4	5
3. It is hard for my child to stop using screen media.	1	2	3	4	5
4. When my child has had a bad day, screen media seems to be the only thing that helps him/her feel better.	1	2	3	4	5
5. My child’s screen media use causes problems for the family.	1	2	3	4	5
6. The amount of time my child wants to use screen media keeps increasing.	1	2	3	4	5
7. Screen media is the only thing that seems to motivate my child.	1	2	3	4	5
8. My child becomes frustrated when he/she cannot use screen media.	1	2	3	4	5
9. My child’s screen media use interferes with family activities.	1	2	3	4	5



- ***Background & Rationale for Novel Technologies in ABCD***
 - ***Mobile & Wearable Technologies***
 - Fitbit
 - Effortless Assessment of Risk States (EARS) app
 - ***Self-Report Data***
 - Background
 - Variations Across Time
- Background
 - Methods of Data Capture
 - Procedures for Protection of Data
 - Preprocessing