

# Parenting the “Always Connected” Generation

## *Research Findings from NIST Youth Security & Privacy Research*

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# Disclaimer

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# OUTLINE



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## Digital Natives & the Tech World

2

## NIST Youth Security & Privacy Research

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### Three Studies:

- Survey–Children (3<sup>rd</sup> to 12<sup>th</sup> grades)
- Survey–Parents of digital natives (K to 12<sup>th</sup> grades)
- Dyadic Interviews–parent/child pairs

4

## Takeaways & Resources





# More Tech Savvy than Older Generations?



## Consumers vs Producers

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- Unaware of the inner workings of the Internet
- No more knowledgeable about the underlying structure of the web



## Singular Approach

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- Web-first for finding and processing information
- Very trusting of web sources



## Skills not Expanding

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Skills that emerge from constant digital practice may not extend beyond basic emailing, texting, social media use and surfing the web

# NIST Youth Security & Privacy Research – Why?



## Transition to Workforce

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Digital natives are transitioning into the workforce or just starting their professional careers.



## Lack of Security Research on Children

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Near future, the world's cyber posture and culture will be dependent on the cybersecurity and privacy knowledge and practice of today's youth.

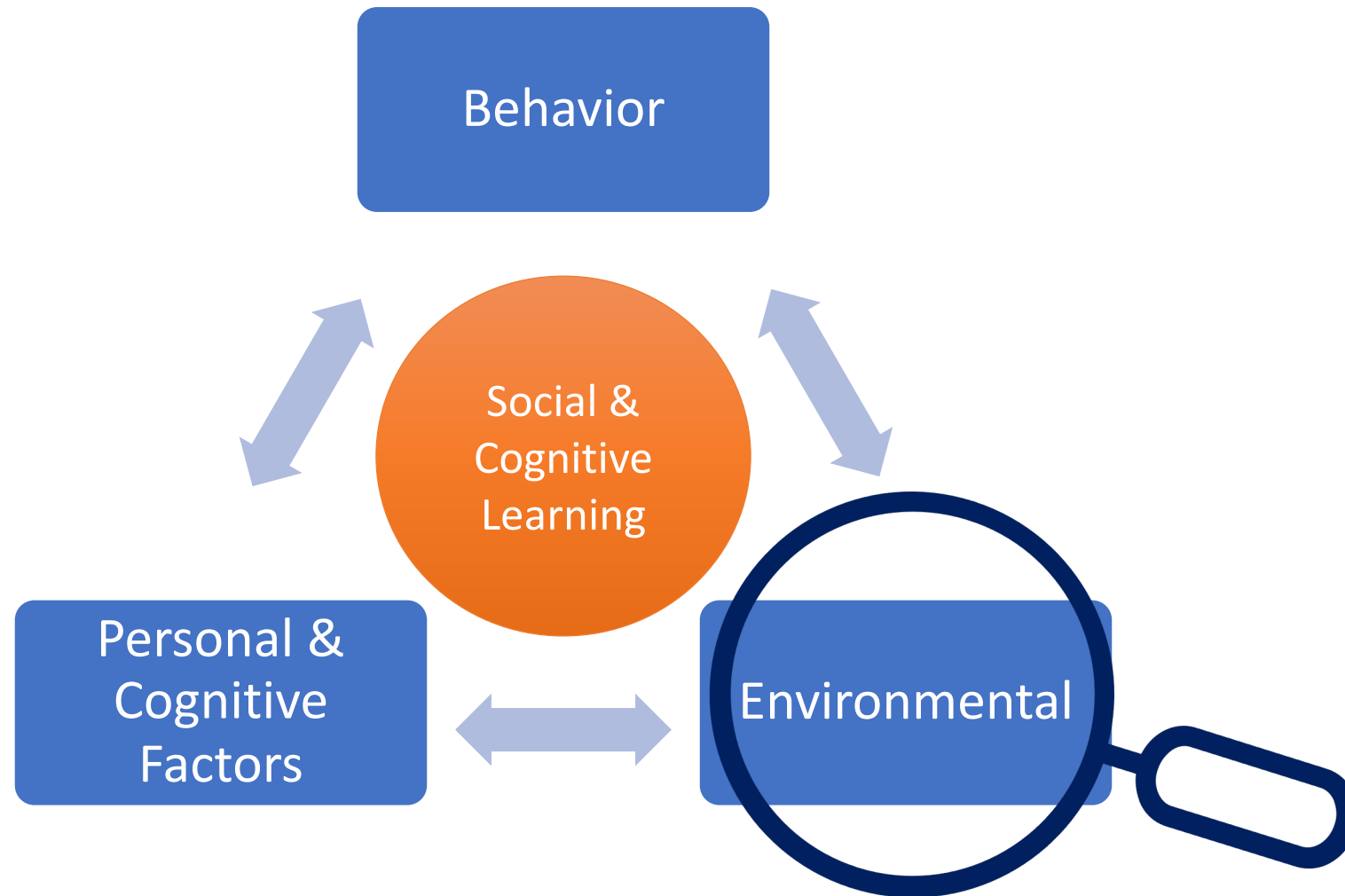


## NIST Youth Security Research

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- Youth perceptions, understandings, and behavior surrounding online security and privacy
- Social influencers– family, school, etc.

## Youth Security & Privacy: Perceptions, Understandings, and Behaviors



# Study 1 – Youth Password Survey Study

Y

## Youth Password Survey

Children's practice, perceptions, and knowledge regarding passwords



## Password Understandings

- What do children know about passwords?
- Why do they think they need passwords?
- What are children's passwords practice?



Y

# Survey – 1,505 Children

## Elementary (ES)

3<sup>rd</sup>-5<sup>th</sup> grade

40 %

52 %

8 %



n=425

## Middle School (MS)

6<sup>th</sup>-8<sup>th</sup> grade

45 %

50 %

5 %



n=357

## High School (HS)

9<sup>th</sup>-12<sup>th</sup> grade

45 %

51 %

4 %



n=723

# Parents and School Play Important Roles



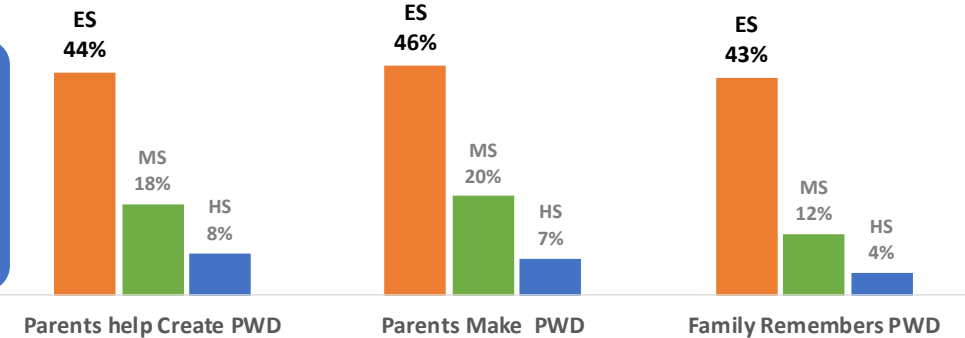
Parents and School – guidance on “good” password (PWD) practice



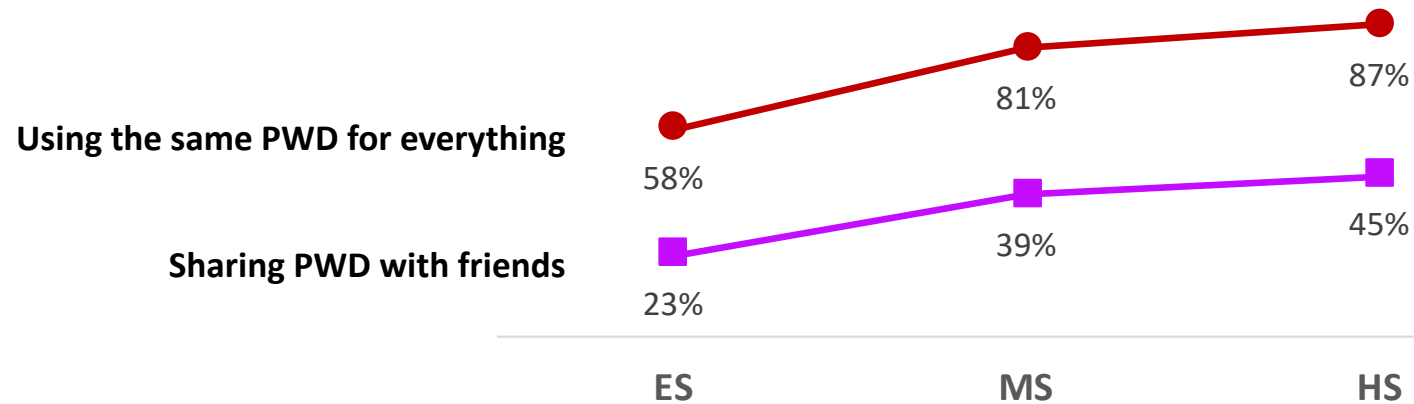
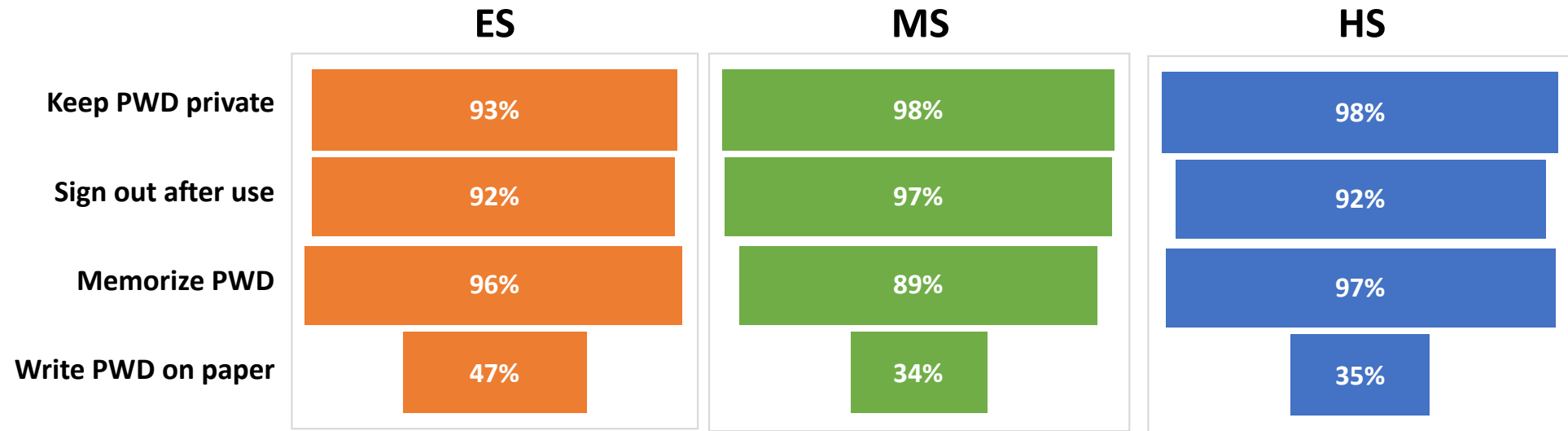
Younger children rely on family more to help create and remember PWDs



Older children assist family with PWDs



# Password Practice – the Good & Bad



# Why Passwords?

## Access



*To keep  
unwanted  
people off  
your device*  
(P1392, HS 11<sup>th</sup>)



## Privacy



*To keep stuff  
private*  
(P2918, MS 8<sup>th</sup>)



## Protection



*To protect  
information*  
(P2719, HS 12<sup>th</sup>)




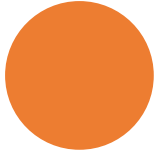
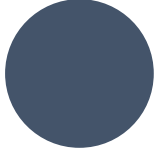
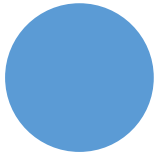
## Safety



*To keep us safe*  
(P1131, ES 4<sup>th</sup>)





-  Children have reasonably accurate perceptions and knowledge of passwords and authentication
-  Younger children need more support on managing passwords from family and school
-  Children discuss the significance of passwords very generally and vaguely, and do not always put their password knowledge into practice
-  Many children exhibit password behaviors that do not align with their stated understanding of passwords

# Study 2 – Parent Password Survey Study

P

## Parent Password Survey

Parents' password behavior and their involvement in their children's password usage



## Parents' Password Behavior

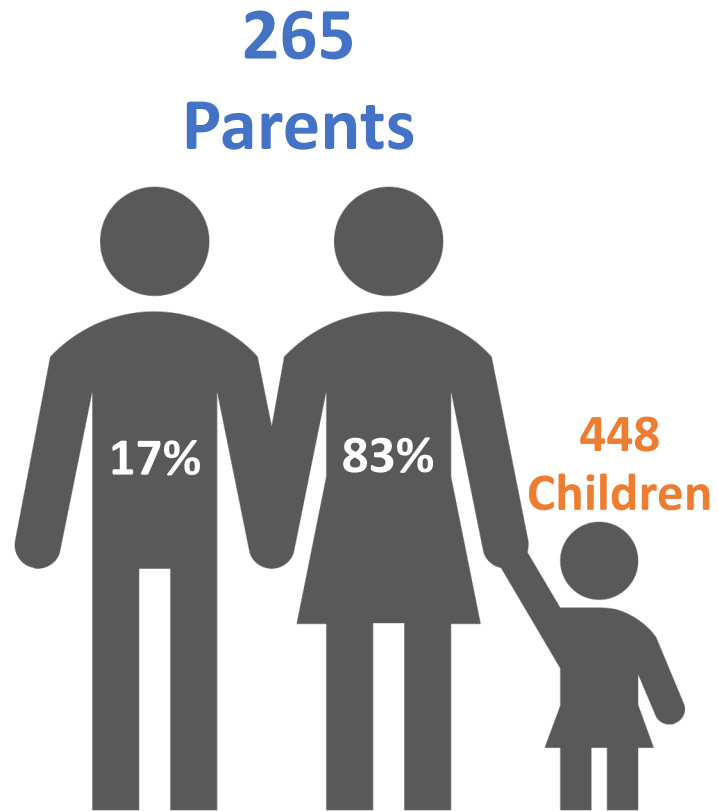
- What are parents' own password practice?

## Parents' Involvement

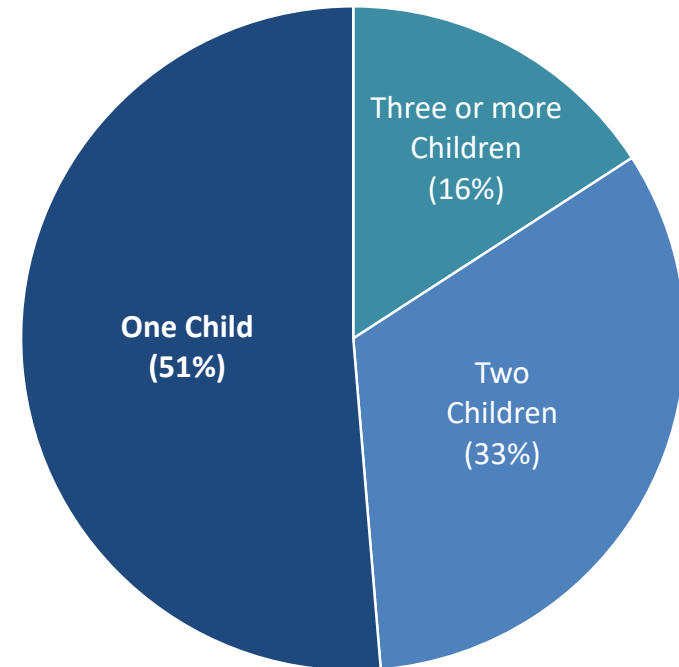
- How are parents involved in their children's password practice?



# Survey – 265 Parents



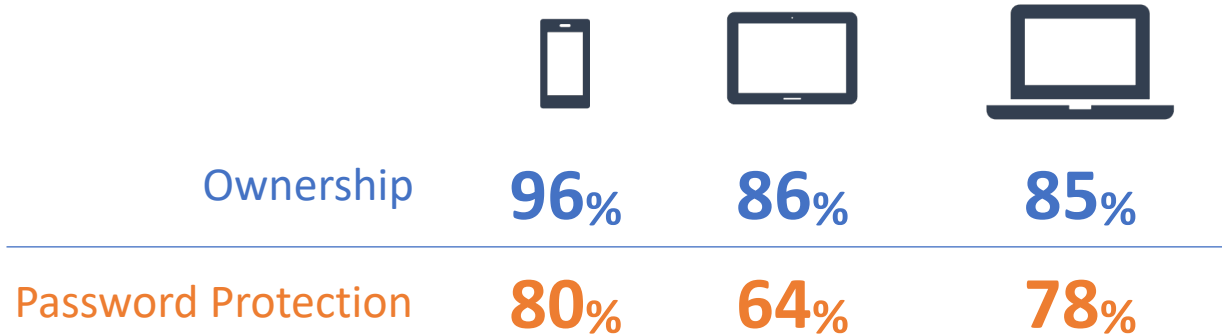
*Number of Children in K-12*





# Parents' Password Practice

## Password Protection lower % of protection than ownership



## Password Reuse fewer passwords than # of accounts



## Password Management

Create

80% easy to remember  
75% strong, hard to crack

Track

77% memorize  
40% saved & auto-filled  
40% write on paper

Change

53% only change when needed  
12% depending on account types



# Involvement in Child's Password Creation

## 74% Help Child with Password Creation

### *How do they help?*



**47%** create together



**30%** parents create



**25%** guidance only

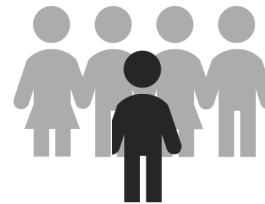
NOTE: multiple choice—percentages don't add up to 100%.

## Age of Children & Number of Children



**47%** parents with elementary kids always help

**13%** parents with high schoolers always help



**38%** parents with 1 kid always help

**27%** parents with 2 or more kids always help

# Involvement in Child's Password Tracking

## 79% Help Child with Password Tracking

### *How do they help?*



**48%** parents memorize



**43%** parents have list



**15%** guidance only



**14%** help kids create list

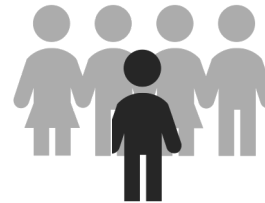
NOTE: multiple choice—percentages don't add up to 100%.

## Age of Children & Number of Children



**58%** parents with elementary kids always help

**22%** parents with high schoolers always help



**44%** parents with 1 kid always help

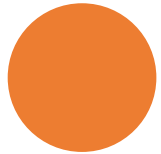
**37%** parents with 2 or more kids always help



# Parents Password Study – *what we learned*



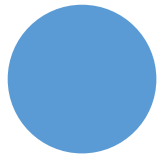
Parents have many personal accounts and show evidence of password reuse



Parents assume an active approach towards tracking their personal passwords – about 77% reported memorizing their passwords



Parents are generally passive about password maintenance, for example, they only change passwords when it is necessary



Over 70% are involved in helping their children create passwords and track passwords, especially younger children



Developmental awareness, tailoring involvement depending on children's age

# Study 3 – Parent/Child Pairs Study

D

## Dyad Interviews

youth and their parents' understandings of online privacy and risk



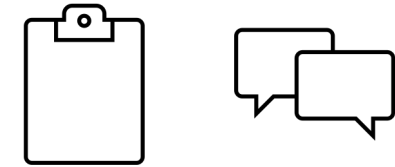
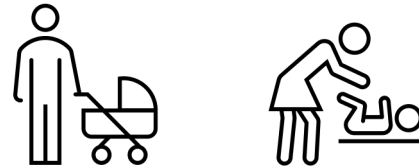
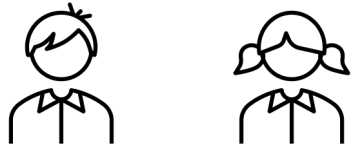
## Research Questions

- How do youth define and understand online privacy and risk?
- How do parents understand their children's knowledge of online privacy and risk?
- How, if at all, do parents influence their children's online privacy and risk knowledge?



# D

# Interviews – 40 Parent/Child Pairs



## Youth Participants

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- 3<sup>rd</sup> – 12<sup>th</sup> graders
  - 12 elementary school
  - 12 middle school
  - 16 high school
- 21 boys, 19 girls

## Parent Participants

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- Aged 31-52
- 35 moms, 5 dads

## Data Collection

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- Questionnaire prior to interview
- Virtual Interviews with both participants in a dyad

## D

## Preliminary Findings

## Youth

## Understandings

*“If it's like a big game, my special game that if someone hacks into I'm in trouble, I say never save [my password] and I try to remember in my head. But if it's a game and there's nothing really going to happen if they hack into it because I can always just delete the account, make a new password, everything, I'll save the password” (Y07, ES).*

Privacy & risk are *agentive* and *contextual*

## Parent

## Perceptions

*“I think they could do it, I think out of naïveté or ignorance at this point. In a year or two, or maybe three, they get more curious and they're more, not malicious but more intent on looking at that stuff. So I think that risky behavior kind of changes as they become interactive differently” (P33, MS).*

Younger youth don't know better, and older youth don't care

## Parental

## Influence

*“I just took his headphones and said, ‘You can't play. Just turn it off.’...I still monitor everything.” (P26, ES)*

*“We've had all those conversations, but it's been years. I honestly don't know what he knows at this point.” (P11, HS).*

Monitoring & conversations



## Knowledge and interest disconnect

- Parents underestimate youth knowledge and interest
- Disconnect may have downstream effects in how parents attempt to influence youth knowledge



## What do youth need to know and when?

- If younger youth are “too young” and older youth are “too old”, when is the right time?
- What do kids need to know?
- Interpersonal vs. commercial/institutional-level privacy and risk

# Implications and Future Directions



Talk about talking!



Understand more about when, what, and how parents teach their children about online security, privacy and risks



More research on social influences



More supportive guidance and resources for parents

# Parenting the “Always Connected” Generation

***What can we do?***



# Youth Cybersecurity and Privacy Education



## **Reinforce positive perceptions and practices early on**

children have reasonably accurate perceptions and knowledge of passwords and authentication

## **Promote concrete understanding**

children discuss the significance of passwords very generally and vaguely

## **Bridge gap between knowledge and behavior**

children exhibit password behaviors that do not align with their stated understanding of passwords, such as sharing passwords with friends

# Parenting Digital Natives



- Stay current, informed, educated and be aware of online risks and dangers
- Keep a readily available collection of reputable resources of online security and privacy for the entire family
- Make sure you as a parent have a good understanding and behaviors of online security and privacy yourself



# Parenting Digital Natives *(continued)*



- Start early by establishing strategies for online experiences for your children to follow and practice – make good online behavior second nature to them
- Be proactive and open-minded, discuss the tech world with your children about the good (educational, entertainment, friendships) and the bad (online threats, risks)
- Teach children and yourself to become discriminating and critical users of materials found online and of information provided via direct contact services, such as email, chat and social media

# Apps parents should know about

**PASCO COUNTY SHERIFF'S OFFICE**  
We Fight As One  
PASCO SHERIFF

## APPS PARENTS SHOULD KNOW

**ASK.FM**  
ASK.FM is known for cyber bullying. The app encourages users to allow anonymous people to ask them questions.

**DISCORD**  
DISCORD is an app that allows users to talk to friends or strangers in real-time via voice, text, or video chat while playing video games. Reviewers say they have been confronted with racial slurs, explicit content, cyberbullying, and more.

**KIK**  
KIK allows anyone to contact and direct message your child. Kids can bypass traditional text messaging features. KIK gives users unlimited access to anyone, anywhere, anytime.

**SKOUT**  
SKOUT is a location-based dating app and website. While users under 17 years old are unable to share private photos, kids can easily create an account using a different age.

**LIVE.ME**  
LIVE.ME is a live-streaming video app that uses geolocation to share videos so users can find out a broadcaster's exact location. Users can earn "coins" as a way to "pay" minors for photos.

**SNAPCHAT**  
SNAPCHAT is one of the most popular apps in recent years. While the app promises users can take a photo/video and it will disappear, new features including "stories" allows users to view content for up to 24 hours. Snapchat also allows users to see your location.

**BADOO**  
BADOO is a dating and social networking app where users can chat, share photos and videos and connect based on location. While the app is intended for adults only, teens are known to create profiles.

**GRINDR**  
GRINDR is a dating app geared towards LGBTQ+ people. The app gives users options to chat, share photos and meet up based on a smart phone's GPS location.

**MEETME**  
MEETME is a dating social media app that allows users to connect with people based on geographic proximity. As the app's name suggests, users are encouraged to meet each other in person.

**TIKTOK**  
TIKTOK is a mobile device app popular with kids used for creating and sharing short videos. With very limited privacy controls, users are very vulnerable to cyber bullying and explicit content.

**BUMBLE**  
BUMBLE is similar to the popular dating app "Tinder" however, it requires women to make the first contact. Kids have been known to use BUMBLE to create fake accounts and falsify their age.

**HOLLA**  
HOLLA is a self-proclaimed "addicting" video chat app that allows users to meet people all over the world in just seconds. Reviewers say they have been confronted with racial slurs, explicit content, and more.

**OMEGLE**  
OMEGLE is a chat app that connects users with strangers. Criminals use the app to exploit children, often recording the video chat and using it to blackmail for additional content.

**WHATSAPP**  
WHATSAPP is a popular messaging app that allows users to send texts, photos, voicemail, make calls, and video chats worldwide. WHATSAPP uses an internet connection on smartphones and computers.

**CALCULATOR%**  
CALCULATOR% is only one of SEVERAL secret apps used to hide photos, videos, files, and browser history.

**HOT OR NOT**  
HOT OR NOT encourages users to rate your profile, check out people in their area, and chat with strangers. The goal of this app is to hook up.

**REDDIT**  
REDDIT is a chat/discussion board app. Users can post whatever they want and there is no identity verification. Reviewers say they have been confronted with racial slurs, explicit content, cyberbullying, and more.

**WHISPER**  
WHISPER is an anonymous social network that promotes sharing secrets with strangers. It also reveals a user's location so people can meet up.

UPDATED AUGUST 2022

**Social Networking, Messaging & Video Chat**  
ASK.FM, DISCORD, HOLLA , HOT OR NOT, KIK, OMEGLE, REDDIT, WHATSAPP

**Content Sharing**  
LIVE.ME, SNAPCHAT, TIKTOK

**Secret Apps**  
CALCULATOR%, WHISPER

**Dating Apps**  
BADOO, BUMBLE, GRINDR, MEETME, SKOUT



# Resources

## ConnectSafely

<https://www.connectsafely.org>

- dedicated to educating people about safety, privacy, security and digital wellness
- offers in-depth guides and quick-guides for parents, educators, youth and policymakers

## Family Online Safety Institute

<https://www.fosi.org>

- brings a unique, international perspective to the potential risks, harms as well as the rewards of our online lives
- work encompasses public policy, industry best practice, and good digital parenting

## iKeepSafe

<https://ikeepSAFE.org>

- provides a safe digital landscape for children, schools, and families
- It provides data privacy certifications to technology companies, educational resources to schools, and information to the community

## StaySafeOnline

<https://staysafeonline.org>

- powered by The National Cyber Security Alliance (NCSA)
- builds strong public/private partnerships to create and implement broad-reaching education and awareness efforts to empower users at home, work and school

# Questions?



[yee-yin.choong@nist.gov](mailto:yee-yin.choong@nist.gov)



<https://csrc.nist.gov/usable-cybersecurity>



- [Challenges to Building Youth's Online Safety Knowledge from a Family Perspective: Results from a Youth/Parent Dyad Study](#) Olivia Murphy, Yee-Yin Choong, & Kerrianne Buchanan. Workshop on Kids' Online Privacy and Safety (2022).
- [Investigating Youths' Learning of Online Safety and Privacy from Others: A Discussion of Study Design and Statistical Analysis Considerations](#) Kerrianne Buchanan, Yee-Yin Choong, and Olivia Murphy. Workshop on Kids' Online Privacy and Safety (2022).
- ["Passwords Keep Me Safe" – Understanding What Children Think about Passwords](#) Mary Theofanos, Yee-Yin Choong, & Olivia Murphy. USENIX Security Symposium (2021).
- ["Passwords protect my stuff" — A Study of Children's Password Practices](#) Yee-Yin Choong, Mary F. Theofanos, Karen Renaud, & Suzanne Prior. Journal of Cybersecurity (2019).
- [Case Study – Exploring Children's Password Knowledge and Practices](#) Yee-Yin Choong, Mary F. Theofanos, Karen Renaud, & Suzanne Prior. Proceedings of the Workshop on Usable Security (USEC) at the Network and Distributed Systems Security (NDSS) Symposium (2019).