Parenting the “Always Connected” Generation

Research Findings from
NIST Youth Security & Privacy Research

Yee-Yin Choong, PhD
Visualization & Usability Group
Information Access Division
Information Technology Laboratory
• The National Institute of Standards and Technology Institutional Review Board reviewed and approved the protocol for this project and all subjects provided informed consent in accordance with 15 CFR 27, the Common Rule for the Protection of Human Subjects.

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Digital Natives & the Tech World

NIST Youth Security & Privacy Research

Three Studies:
- Survey–Children (3rd to 12th grades)
- Survey–Parents of digital natives (K to 12th grades)
- Dyadic Interviews–parent/child pairs

Takeaways & Resources
Digital Natives – Gen Z

Born from around 2000 to 2012

Raised in a digital, media-saturated world

Grew up with technology in their lives since birth

Are more sophisticated in usages of the Internet and mobile devices

“RIGHT NOW” culture: everything is at their fingertips
More Tech Savvy than Older Generations?

Consumers vs Producers

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

Singular Approach

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

Skills not Expanding

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**

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

**Lack of Security Research on Children**

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**

- 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

**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?
### Survey – 1,505 Children

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Percentage</th>
<th>Gender Distribution</th>
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</thead>
<tbody>
<tr>
<td><strong>Elementary (ES)</strong></td>
<td></td>
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<tr>
<td>3rd-5th grade</td>
<td>40%</td>
<td>52% boys, 8% girls</td>
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<tr>
<td>n=425</td>
<td></td>
<td></td>
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<tr>
<td><strong>Middle School (MS)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th-8th grade</td>
<td>45%</td>
<td>50% boys, 5% girls</td>
</tr>
<tr>
<td>n=357</td>
<td></td>
<td></td>
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<tr>
<td><strong>High School (HS)</strong></td>
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</tr>
<tr>
<td>9th-12th grade</td>
<td>45%</td>
<td>51% boys, 4% girls</td>
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<tr>
<td>n=723</td>
<td></td>
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</table>
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

Keep PWD private
- ES: 93%
- MS: 98%
- HS: 98%

Sign out after use
- ES: 92%
- MS: 97%
- HS: 92%

Memorize PWD
- ES: 96%
- MS: 89%
- HS: 97%

Write PWD on paper
- ES: 47%
- MS: 34%
- HS: 35%

Using the same PWD for everything
- ES: 58%
- MS: 81%
- HS: 87%

Sharing PWD with friends
- ES: 23%
- MS: 39%
- HS: 45%
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.
**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

265 Parents

448 Children

17% 83%

Number of Children in K-12

One Child (51%)

Two Children (33%)

Three or more Children (16%)
## Parents’ Password Practice

### Password Protection
lower % of protection than ownership

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Password Protection</th>
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<tbody>
<tr>
<td>96%</td>
<td>80%</td>
</tr>
<tr>
<td>86%</td>
<td>64%</td>
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<tr>
<td>85%</td>
<td>78%</td>
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</tbody>
</table>

### 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

### Password Reuse
fewer passwords than # of accounts

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<table>
<thead>
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<tbody>
<tr>
<td>16</td>
<td>Password****</td>
</tr>
<tr>
<td>10</td>
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Involvement in Child’s Password Creation

**Help Child with Password Creation**

- **74%**
  - **How do they help?**
    - 47% create together
    - 30% parents create
    - 25% guidance only

**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

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

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

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

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

Parents have many personal accounts and show evidence of password reuse.

Parents Password Study – what we learned
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?
Youth Participants
- 3rd – 12th graders
  - 12 elementary school
  - 12 middle school
  - 16 high school
- 21 boys, 19 girls

Parent Participants
- Aged 31-52
- 35 moms, 5 dads

Data Collection
- Questionnaire prior to interview
- Virtual Interviews with both participants in a dyad
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 naiveté 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
The Challenges Presented

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?
Bright Ideas for 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

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
<table>
<thead>
<tr>
<th><strong>Resources</strong></th>
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<tr>
<td><strong>ConnectSafely</strong></td>
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<td><a href="https://www.connectsafely.org">https://www.connectsafely.org</a></td>
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<tr>
<td>- dedicated to educating people about safety, privacy, security and digital wellness</td>
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<tr>
<td>- offers in-depth guides and quick-guides for parents, educators, youth and policymakers</td>
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<tr>
<td><strong>Family Online Safety Institute</strong></td>
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<tr>
<td><a href="https://www.fosi.org">https://www.fosi.org</a></td>
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<tr>
<td>- brings a unique, international perspective to the potential risks, harms as well as the rewards of our online lives</td>
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<tr>
<td>- work encompasses public policy, industry best practice, and good digital parenting</td>
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<tr>
<td><strong>iKeepSafe</strong></td>
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<tr>
<td><a href="https://ikeepsafe.org">https://ikeepsafe.org</a></td>
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<tr>
<td>- provides a safe digital landscape for children, schools, and families</td>
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<tr>
<td>- It provides data privacy certifications to technology companies, educational resources to schools, and information to the community</td>
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<tr>
<td><strong>StaySafeOnline</strong></td>
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<tr>
<td><a href="https://staysafeonline.org">https://staysafeonline.org</a></td>
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<tr>
<td>- powered by The National Cyber Security Alliance (NCSA)</td>
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<tr>
<td>- builds strong public/private partnerships to create and implement broad-reaching education and awareness efforts to empower users at home, work and school</td>
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Questions?

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).


