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Privacy Perceptions and Norms in Youth and Adults

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Objective: This exploratory study examines privacy perceptions and preferences among adolescent and young adult (AYA) and adult individuals with an emphasis on health-related information. ***Method:*** Participants ($N = 112$) completed surveys including measures of privacy concern, consumer control of information, online privacy concern and behavior, and sensitivity of personal information. ***Results:*** AYAs ($n = 36$) and adults ($n = 76$) showed similar levels of general privacy concern; specifically, their ratings of the sensitivity of non-health-related personal data did not differ. AYAs' ratings of various health information sensitivities were lower than adults' ratings, and AYAs reported less concern on subscales addressing online and consumer data collection. ***Conclusion:*** Discrepancies between AYA and adult responses to different privacy scales suggest contextual integrity at work. That is, AYAs' and adults' privacy perceptions differ based on the type of information being shared, and they draw on different norms to govern information flow. AYAs are more likely to feel they have control over their personal information and feel comfortable employing privacy protecting strategies. AYAs are less likely to see online information collection as a violation of an implied social contract. This study highlights differences in AYA and adult attitudes toward privacy and suggests that AYAs care about privacy but perceive certain types of information collection as less threatening than adults.

Implications for Impact Statement
Adolescents and young adults (AYAs) and adults follow different norms with regards to appropriate information flow. Policymakers, parents, educators, and others who are charged with protecting young people should be aware that AYAs may be more open to information flows that they perceive as appropriate, including health information flows. Healthcare providers who encourage AYAs to use mobile health apps and devices should be mindful of privacy concerns as they work to serve their patients' best interests.

Keywords: privacy, health information, adolescents, online privacy, age differences

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Adolescent and young adult (AYA) individuals today are confronted by a complex privacy environment. Online activities are becoming increasingly integral parts of leisure activities as well as schoolwork, family life, and everyday social interactions. According to a Pew Research report published in spring 2018, 95% of AYAs have access to a smartphone, and 45% of AYAs say they are nearly constantly online (Anderson & Jiang, 2018). While the report outlines positive aspects of new online spaces such as the development of social relationships, it also raises concerns, including data privacy. Indeed, less than 10% of social media users report feeling "very confident that social media companies would protect their data," and in general, "people struggle to understand the nature and scope of the data collected about them" (Rainie, 2018). Meanwhile, technologies for generating and sharing information continue to proliferate in this era of big data, creating a wide array of privacy challenges. In this day and age, psychologists who work with AYAs and youth can play an important role in privacy-related discussions with this age group. The American Psychological Association (APA) recommends that professionals engage in these conversations about online behaviors and privacy-related issues (APA, 2002) as they are pertinent to discuss with AYAs due to increased technology use and the implications of these uses (Anderson & Jiang, 2018). It is critical that professionals be aware of how AYAs think about these topics in order to inform conversations about online behavior.

The ways in which AYAs view privacy and AYA attitudes toward privacy compared with adult attitudes are not new areas of study. Most of the existing research has focused on AYAs' level of privacy concern and their privacy-related behaviors, especially in regard to posting information online. One popular perception that exists claims is that AYAs are careless with or unconcerned about their privacy (Malcom, 2013; University of Southern California, Annenberg, 2013). However, some research suggests that this sentiment is unfounded (Agosto & Abbas, 2017; Madden et al., 2013). AYAs do care about privacy (Pereira, 2017), and their data sharing and privacy protection behaviors are in many ways analogous to those of adults (Greenblatt, 2013). At the same time, AYAs' attitudes about privacy and information-sharing behaviors, as well as their reactions to privacy threats are qualitatively different than those of adults (Henley, 2013; Keller, 2013; Regan, FitzGerald, & Balint, 2013).

According to a 2013 Pew Research Center report, AYAs share more personal information about themselves online than ever before, and many AYAs have an average of three to seven active social media accounts (Madden et al., 2013; Mullen & Hamilton, 2016). AYAs also report using multiple strategies to manage privacy, such as setting accounts to private, deleting unwanted contacts, making calculated disclosures, and employing private channels (e.g., Facebook Messenger and closed Facebook groups) to communicate information deemed more private (Madden et al., 2013; Mullen & Hamilton, 2016). This seemingly paradoxical behavior (Barnes, 2006) has been a large focus of discourse surrounding AYAs and online privacy. Research points to a potential generational difference in privacy concern, such that AYAs may be more concerned with privacy in a social context (e.g., matters related to reputation) rather than in a big data context (e.g., third-party access to personal data; Keller, 2013; Madden et al., 2013; Van Der Velden & El Emam, 2013), whereas parents may be more concerned about a child's online data being collected by third parties (Feng & Xie, 2014). These varying concerns may reflect different experiences with various types of personal information. That is, AYAs may be less concerned with big data breaches due to a lack of electronically accessible sensitive data such as financial or personal health information.

Research has helped advance our understanding beyond conceiving AYAs as apathetic toward privacy. While AYAs and adults show similar levels of privacy concern, differences in the nature of their concerns have received little study. The current exploratory study examines privacy preferences among AYAs and adults, highlighting perceived sensitivity of data, privacy attitudes, and online behaviors, all of which can help inform health care professionals on discussion topics with AYA patients and their parents. This is especially important as clinical psychology and other health-related fields continue to integrate health and mental health apps and devices into research, patient support, and health care.

Method

This research is part of a large multiyear, mixed-methods study of individual attitudes toward privacy with an emphasis on health privacy in the context of emerging health technologies. The larger study aims to develop a new instrument to measure privacy attitudes and preferences. The work presented here explores general privacy attitudes, but places emphasis on two specific contexts. First, most of the metrics employed focus on electronic or online privacy. Understanding how AYAs feel about online privacy is particularly relevant given potential online privacy risks, the emergence of new sources of electronic data (e.g., location data, search history), and the large amount of time that AYAs spend online today. Second, we have included questions that are specific to health privacy. Data include results from a closed-ended, quantitative survey that asked demographic and study-specific questions, and employed existing measures of privacy attitudes. Participants also participated in either focus groups, interviews, or cognitive interviews, however, those data are not presented here. All participants provided written or verbal consent (depending on the modality of their participation), and individuals under 18 years of age provided written parental consent in addition to verbal assent. Data were collected between June 2016 and August, 2017. This study was approved by the University of California San Diego Institutional Review Board (Protocol no. 160156).

Study Sample

AYAs (13–21 years old) and adults (>21 years old) were recruited from a number of sources to provide a broad sample for the study. These groups included several patient cohorts, including a breast health research network, an adult HIV research network, pediatric chronic disease patients from a children's hospital, and members of an online patient social network. We also recruited from community groups including a Pacific Islander community organization, a Spanish-speaking health promotion coalition, a legal advocacy organization for disadvantaged workers, two churches in low-income areas, a charter middle school, and a leadership and academic support organization for disadvantaged adolescents. Inclusion criteria included being over 13 years of age and fluent in English. One-hundred twenty individuals completed the survey. Of the participants who completed the survey, eight did not report their age, making the final sample $N = 112$. AYAs and adults in the sample were not related to one another.

In general, the AYAs in our study are in adolescence, although there is disagreement about how to specify stages of adolescence. The APA generally refers to Ages 10–18 as adolescence, although these outer boundaries are fuzzy (APA, 2002). The World Health Organization (WHO) specifies that late adolescence includes Age 19 (Csikszentmihalyi, n.d.; WHO, 2018). Other sources include up to Age 21 in the definition of adolescence ("Stages of Adolescence," n.d.), including the definition adhered to by the National Institutes of Health (NIH). Our distinction is based only on the reported age of respondents, not on clinical assessment of adolescence, and as such AYAs are defined here as including people Aged 13–21 years old as per the NIH definition.

Survey Measures

Participants were given the option to complete the survey online or via paper copy. All surveys were completed by the actual study participant, including survey questions that assessed covariates such as demographic information (e.g., youth in our study completed these items themselves, as opposed to their parents completing them). The first section of the survey covered demographic characteristics (Table 1). Privacy attitudes were measured with a variety of instruments used in scientific and consumer-based research. The Privacy Segmentation Index (PSI) classifies individuals into privacy fundamentalists, privacy unconcerned, and privacy pragmatists (Westin, 2002). The Privacy Concern Index (PCI) groups people into high, medium, or low privacy concern (Westin, O'Grady, & Sever, 1995). Both of these scales were developed by Westin and colleagues in the 1990s to measure consumer privacy (Kumaraguru & Cranor, 2005). It is important to note the differences between these scales. The PCI is focused on level of concern. Although originally written as a six-item measure, we used a five-item modified version of the PCI (i.e., we

Table 1
Demographic Characterizations of the Sample

Demographic variable	21 years and under (n = 36), (n, %)	22 years and over (n = 76), (n, %)
Age (mean, *SD*)	16.0 (1.87)	47.6 (16.21)
Gender (% female)	16 (44.4)	49 (64.5)
Ethnicity (% Hispanic)[a]	19 (54.3)	11 (14.5)
Race[b]		
American Indian/Alaska Native	4 (17.4)	
Asian	3 (13.0)	7 (9.6)
Black or African American	4 (17.4)	5 (6.8)
Native Hawaiian or Other Pacific Islander	1 (4.3)	7 (9.6)
Caucasian/White	10 (43.5)	53 (72.6)
Mixed/more than one race	1 (4.3)	1 (1.4)
Marital status[a]		
Single	35 (97.2)	29 (38.7)
Married/in a domestic partnership	1 (2.8)	36 (48.0)
Divorced/widowed		10 (13.3)
Highest education[a]		
Completed 11 or fewer years	32 (91.4)	
Graduated from high school or GED completed	3 (8.6)	9 (11.8)
Graduated from 2-year college		13 (17.1)
Graduated from 4-year college		24 (31.6)
Completed some postcollege education		9 (11.8)
Completed master's degree		16 (21.1)
Completed professional degree or PhD		5 (6.6)
Approximate annual household income[c]		
Under $25K	15 (53.6)	16 (22.2)
$25–$49,999K	6 (21.4)	16 (22.2)
$50–$99,999K	4 (14.3)	20 (27.8)
$100–$149,999K	2 (7.1)	10 (13.9)
$150K+	1 (3.6)	10 (13.9)
Health status		
Very good	13 (36.1)	9 (11.8)
Good	12 (33.3)	45 (59.2)
Average	11 (30.6)	16 (21.1)
Poor		6 (7.9)
Very poor		

Note. N = 112. Percentages tabulated based on denominator of those who responded to the questions.
[a] Missing data for one participant. [b] Missing data for 16 participants. [c] Missing data for 12 participants.

removed one item that asked about the government creating a privacy commission [was deemed irrelevant to the study], and changed the year referenced in one item, from "2000" to "2026," as the item was originally designed to ask participants to make a prediction 10 years into the future). Thus, our PCI asks five questions, including whether the respondent believes privacy is important, has been a victim of privacy invasion, believes privacy will be more difficult to achieve in the future, disagrees with online tracking, and feels it is acceptable to use health records for research without advance consent. The PSI asks only three questions, which focus on consumer control of personal information, trust that businesses handle personal information well, and trust that laws and policies provide consumer protection. In the literature, the PSI has largely been used descriptively without explicit reporting of psychometrics. We also asked a question that was not part of these scales but had been used by Westin and Harris Louis & Associates (1998) in their studies: "How concerned are you about threats to your personal privacy in America today?" (Westin & Harris Louis & Associates, 1998).

The Internet Users' Information Privacy Concerns scale (IUIPC; Malhotra, Kim, & Agarwal, 2004) is a 10-question scale with three subscales: (a) Control, which focuses on respondents' beliefs that control is the key issue regarding consumer privacy; (b) Awareness, which captures the importance of disclosure and awareness of information collection; and (c) Collection, which captures how a person feels about the amount of information that is collected by companies. The total scale score provides a metric of general privacy concern. Previous studies have reported varied reliability for the IUIPC with AYA populations (Cronbach's alpha for IUIPC total = .850 (Yang, 2013), Control α = .671–.843 (Kusyanti, Puspitasari, Catherina, & Sari, 2017; Yang, 2013), Awareness α = .778–.860 (Kusyanti et al., 2017; Yang, 2013), Collection α = .902 (Kusyanti et al., 2017), as well as varied evidence of the IUIPC's structural validity. While results from one study of approximately 300 Indonesian high school students provided evidence of a three-factor loading structure for the IUIPC (Kusyanti & Puspitasari, 2016), another study of approximately 400 United States college students questioned the variance accounted for in the factor structure of the Control subscale and total IUIPC (Yang, 2013). Despite the variation in psychometric properties, the IUIPC is one of the measures recommended to researchers interested in studying privacy due to a dearth of reliable and valid privacy measures that are available (Bélanger & Crossler, 2011). We also included two additional behavioral questions that were used by Malhotra et al. (2004). One asked about how often respondents falsified information when registering for websites, and the other asked about exposure to media, as well as use and misuse of information collected on the Internet (Malhotra et al., 2004).

The final section of the survey focused on the perceived sensitivity of different kinds of personal information and is a modified version of the authors' prior work (Bietz et al., 2015). Respondents were asked to rate the sensitivity of 12 different types of personal information on a 10-point scale from 1 (*Not sensitive at all*) to 10 (*Very sensitive*; Figure 1). Because our overall study focuses on health information privacy,

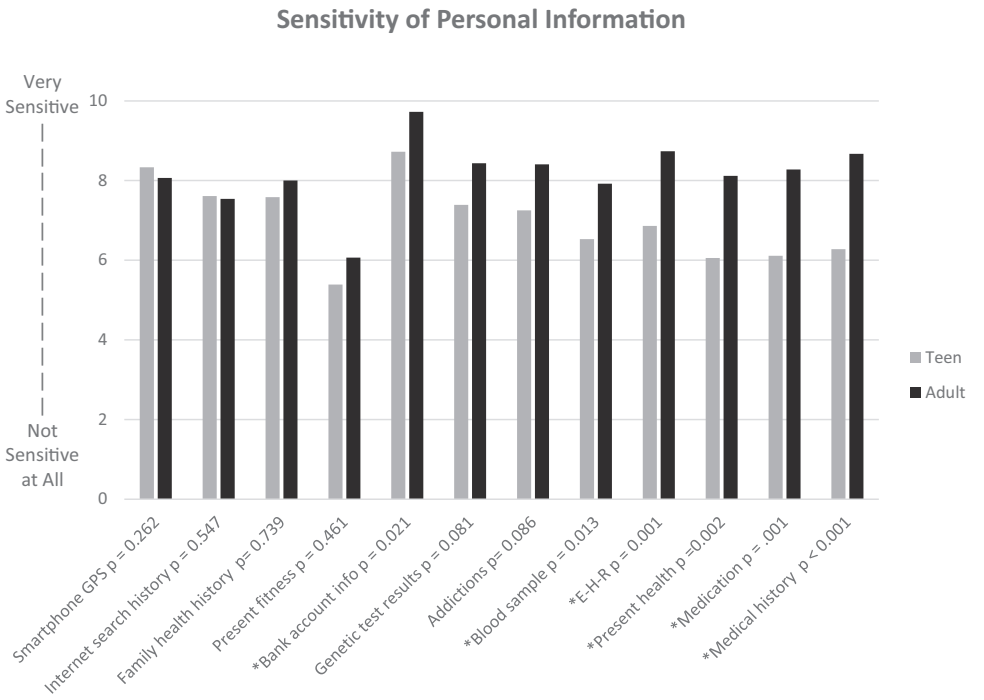

Figure 1. Teen and adult ratings of sensitivity of personal information.

there are more questions at finer granularity about health information (e.g., addictions and medical history) than about other kinds of information (e.g., bank account information).

Data Analysis

Analyses were conducted using SPSS (Versions 24.0 and 25.0). To compare age differences across outcomes, participants were dichotomized into AYAs (Ages 13–21) and adults (Age >21). Statistical analyses included linear regressions for continuous outcomes (sensitivity to personal information items, IUIPC, misuse of data item) and ordinal regressions using the SPSS PLUM procedure for ordered categorical outcomes (Westin Privacy Indices and Malhotra et al.'s, 2004 additional behavioral questions). Analyses were initially run with three candidate covariates: household income, gender, and health status. Household income was not significant in any analyses, thus, it was removed. All statistical models included gender and health status covariates. For linear regressions, *t* test statistics were reported for age. Missing data was less than 1% on any variable in the final sample. Cronbach's alpha was used, where appropriate, to determine measure reliability. For variables modeled as continuous, effect sizes are presented as Cohen's *d,* which represents the proportion of explained variance between the predictors and the outcomes, with values of 0.20, 0.50, and 0.80 indicating small, medium, and large effect sizes, respectively (Knapp, 1990). Ordinal regression results are presented as odds ratios (*OR*s). Significance was set at $p \leq .05$ for all analyses.

Results

Study participants included 112 individuals (36 AYAs and 76 adults). Overall, the sample was 58.0% female and 27.0% Hispanic (see Table 1). The AYA group was 44.4% female and 54.3% Hispanic. Our participants were 58 patients (cohorts: breast health research network, health promotion coalition, HIV research network, chronic disease patients, and online patient social network) and 54 community members (cohorts: Pacific Islander community organization, legal advocacy organization, churches in low-income areas, charter middle school, and teen leadership support organization).

Westin Privacy Indices

The PCI is a cumulative index (the items are not expected to covary, and thus, internal reliability metrics do not apply). Across the sample, almost half of participants (48.2%) reported having medium privacy concern, while 24.1% reported low concern, and 22.3% reported high concern. When assessed by age, AYAs and adults reported much the same, with 48.7% of adults and 47.2% of AYAs reporting medium concern. There were no significant differences between age groups. The PSI is a three-question scale, and its Cronbach's alpha was .59. Given the few number of items on this scale, which directly impacts its Cronbach's alpha potential, the PSI had modest internal reliability. Across the sample, the majority of participants (57.1%) identified as pragmatist, while 14.3% were unconcerned, and 26.8% were fundamentalist. When assessed by age, groups were stratified, with 22.2% of AYAs and 10.5% of adults identifying as unconcerned, 69.4% of AYAs and 51.3% of adults as pragmatist, and 8.3% of AYAs and 35.5% of adults as fundamentalist. AYAs were significantly less likely to have high levels of privacy concern relative to adults (*OR* = 4.20, 95% CI [1.74, 10.14]; Wald $\chi^2(1) = 10.221$, $p = .001$).

When asked how concerned they were with threats to personal privacy in America today, 49.1% of participants reported being "somewhat concerned" and 33.9% reported being "very concerned." Assessed by age, 13.9% of AYAs reported being very concerned while 58.3% reported being somewhat concerned. By comparison, 43.4% of adults reported being very concerned, and 44.7% reported being somewhat concerned. AYAs were significantly less likely to be concerned with threats to personal privacy relative to adults (*OR* = 3.39, 95% CI [1.49, 7.69]; Wald $\chi^2(1) = 8.51$, $p = .004$).

IUIPC

The 10-item IUIPC scale had high total internal consistency (Cronbach's alpha = .90) as well as high internal consistencies within each subscale (Control $\alpha = .73$; Awareness $\alpha = .85$; Collection $\alpha = .93$). Across the sample, partic-

ipants reported a moderate level of Internet privacy concern ($M = 58.31$, $SD = 11.17$). When assessed by age, AYAs reported lower overall levels of Internet privacy concerns, $t(108) = -2.78$, $p = .006$, 95% CI [−10.82, −1.81], $d = -0.54$. AYAs also reported lower levels of concern on the Awareness subscale, $t(108) = -3.56$, $p = .001$, 95% CI [−4.29, −1.22], $d = -0.67$ as well as on the control Subscale, $t(108) = -2.48$, $p = .015$, 95% CI [−3.77, −0.42], $d = -0.48$ compared with adults. There was no significant difference in the Collection subscale, $t(108) = -1.31$, $p = .194$, 95% CI [−3.67, 0.75], $d = -0.28$.

When asked about percentage of time they falsify personal information requested by a website, 60.7% of the sample reported never falsifying information or falsifying less than 25% of the time. AYAs, however, reported falsifying information more often than adults, with 47.2% of AYAs having reported falsifying information over 25% of the time, while only 35.5% of adults reported doing so. The odds of AYAs falsifying information more often was 2.11 (95% CI [1.002, 4.45]) times that of adults, Wald $\chi^2(1) = 3.86$, $p = .049$, suggesting that AYAs are likely to take certain online privacy protective measures more often than adults.

When asked about awareness of potential misuse of the personal information collected from the Internet, the sample reported a mean score of 4.52 ($SD = 1.90$) on a 1 (*Not at All*) to 7 (*Very Much*) scale, suggesting that most have heard or read something about the topic. On average, AYAs' reported level of hearing/reading about the potential misuse of electronic data ($M = 3.81$, $SD = 1.89$) was significantly less than adults' ($M = 4.87$, $SD = 1.65$), $t(107) = -3.09$, $p = .003$, 95% CI [−1.84, −0.40], $d = -0.60$, indicating that AYAs are less aware of the potential misuse of electronic data.

Sensitivity to Personal Information

Participants rated sensitivity of 12 different types of personal information primarily focused on health-related information (see Figure 1). Regardless of age, participants rated bank account information as being the most sensitive, while present fitness status was rated as least sensitive. Compared with adults, AYAs tended to see their personal information as less sensitive overall. AYAs only rated smartphone GPS data and Internet search history as being more sensitive compared with adults, but differences were not significant. AYAs and adults did not significantly differ on ratings of present fitness, genetic test results, family health history, or addictions. Specifically, AYAs rated bank account information, $t(108) = -2.34$, $p = .021$, 95% CI [−1.61, −0.13], $d = -0.48$; blood sample, $t(108) = -2.53$, $p = .013$, 95% CI [−2.54, −0.31], $d = -0.50$; present state of health, $t(107) = -23.15$, $p = .002$, 95% CI [−2.74, −0.53], $d = -0.75$; medication, $t(108) = -2.96$, $p = .001$, 95% CI [−3.06, −0.86], $d = -0.76$; medical history, $t(108) = -3.93$, $p < .001$, 95% CI [−3.23, −1.07], $d = -0.83$; and electronic health records, $t(108) = -3.30$, $p = .001$, 95% CI [−2.68, −0.67], $d = -0.72$, as significantly less sensitive than adults, suggesting that AYAs and adults share qualitatively different views on information sensitivity, specifically, health-related information.

Discussion

These findings provide insight into differences between AYA and adult privacy attitudes. The results are consistent with previous studies that report that AYAs are concerned about privacy (Agosto & Abbas, 2017; Greenblatt, 2013; Pereira et al., 2017). The results also contribute to our understanding of the differences between AYA and adult concerns and how AYAs and adults approach privacy decisions. Specifically, AYAs showed lower privacy concern ratings than adults on the IUIPC, PSI, and some information sensitivity ratings. However, there are inconsistencies between the different scales, with AYAs and adults showing the same level of concern in the PCI and other information sensitivity ratings. We argue that these inconsistencies can be explained by the contextual integrity framework (Nissenbaum, 2011).

Contextual integrity is a conceptualization of privacy as flows of personal information deemed appropriate within a social context. A key aspect that distinguishes contextual integrity from other approaches is that privacy is contextually dependent. Information collection and sharing in one context may be seen as perfectly appropriate, while in another context it is perceived as a violation. Each context is comprised of the type of information in question, the

relationship between the subject, sender, and recipient of the information, and the principles that govern how the information is shared. Informational norms arise relative to these contexts, and it is these norms that determine whether an information flow is appropriate (Nissenbaum, 2009). This framework helps us understand how the same information flow (e.g., posting one's health status on social media) might be perceived as more or less private depending on who is posting, which platform is being used, and who will see it. One of the beneficial consequences of studying privacy in a contextual integrity framework is that behaviors and information flows are understood in the context of attitudes and norms. Accounting for contextual factors and informational norms in survey results provides a more nuanced explanation for differences in privacy attitudes.

One key contextual factor is the type of information being shared. AYAs and adults did not differ in their ratings of the sensitivity of many categories of personal information like Internet search history and smartphone location tracking. However, compared with adults, AYAs tended to see their health information as less sensitive. This should not be surprising as AYAs are less likely to have experienced significant health problems that would need to be kept private, and they may not have experienced employability or insurance challenges in connection with a medical diagnosis. This is consistent with recent findings that young people demonstrate less health information privacy concern than older individuals (Pereira et al., 2017). Furthermore, the age-related findings in our study were significant even when statistically controlling for self-reported health status as a covariate. Thus, age-related differences may be robust to health status.

Results from the three privacy indices disagree on whether AYAs and adults differ in their attitudes toward privacy. AYAs and adults showed the same level of concern in the PCI, yet AYAs showed lower concern in the PSI and the IUIPC scale. This result is especially surprising because both the PCI and PSI were used by Westin et al. (Westin, 2002; Westin et al., 1995), and were purported to measure the same construct (Kumaraguru & Cranor, 2005). From a contextual integrity point of view, however, we see that these indices are likely addressing different contexts. The questions that make up the PCI focus more on privacy as a general concept or value relative to items on the PSI. For example, respondents are asked if privacy is important, and if they believe it will get worse in the future. With this scale, AYAs and adults valued privacy equally.

Both the PSI and the IUIPC, on the contrary, ask questions that relate more to the appropriateness of information flows. On the PSI, AYAs were more likely to be classified as "unconcerned" or "pragmatists" than adults. In other words, AYAs are less likely to agree that they have lost control over their personal information, are more likely to agree that businesses handle their personal information in a proper way, and are more likely to agree that existing regulations provide a reasonable level of consumer protection. AYAs tended to score lower (less private) on the IUIPC scale, specifically on the Awareness subscale. The IUIPC scale is built on a social contract framework and is aimed at understanding "individuals' perceptions of fairness/justice in the context of information privacy" (Malhotra et al., 2004). While AYAs are concerned about the amount of information collected, they seem to be less worried that organizations are breaking an implied social contract when they do so. We also saw that AYAs were less concerned about threats to personal privacy today, but were also more likely to provide false information, which has been identified as a privacy-protecting strategy (Brunton & Nissenbaum, 2015; Marwick, Fontaine, & boyd, 2017) when registering with an online website. New research proposes that navigating privacy issues is a learning process for AYAs, wherein privacy measures are taken retrospectively once an interaction is perceived to have escalated to a point of harm (Wisniewski, 2018).

Our interpretation of these findings is that AYAs care about their privacy, but they do not perceive electronic and consumer-focused information collection to be as much of a privacy threat as do adults. AYAs are more likely to feel that they have adequate control over their personal information. They are more comfortable employing privacy protecting strategies like adjusting privacy settings, blocking others, creating private accounts, or obfuscation through falsifying information (Brunton & Nissenbaum, 2015; Marwick et al., 2017). This suggests that while there is a relatively equal value put on

privacy, the norms and expectations around appropriate information flows may be different for adults and AYAs. The results support the contextual integrity framework and provide insight into the differences between AYA and adult privacy attitudes, and future work should be undertaken to confirm these results.

Implications for Health Care and Clinical Practice

Technology use among AYAs today is nearly ubiquitous (Anderson & Jiang, 2018), and psychologists and other health professionals who work with AYAs should be cognizant of issues surrounding technology use, such as online privacy (APA, 2002). To this end, the APA encourages providers who work with youth to discuss online behaviors, including their associated benefits and risks (APA, 2002). Previous studies highlight privacy-associated benefits (e.g., self-expression and making platonic and romantic connections; Anderson & Jiang, 2018; Rainie, 2018) as well as risks (e.g., online bullying and harassment; Rainie, 2018) that arise from disclosing information online. Recently, online data privacy has become another important discussion point, especially for providers who integrate mobile health apps and other online tools into clinical practice with patients. These apps and tools, especially commercially developed ones, frequently contain convoluted and complex terms of use and privacy policies that are not easily understandable to users yet allow companies to use data in ways they see fit, often without users' full knowledge (Schairer, Rubanovich, & Bloss, 2018). This is problematic, particularly for AYAs who have fewer privacy concerns or who might not perceive as many consequences from information disclosure. Thus, providers who encourage patients to use mobile health apps and devices should be mindful of privacy concerns associated with app and device use as they work to advocate for their patients' best interests. Discussion around privacy-related risks and benefits as well as app and device data privacy concerns should be considered by providers.

Limitations

The results presented here are part of a larger study aimed at developing a new instrument to measure privacy attitudes and preferences. Due to the parameters of the larger study, the sample here is drawn from specific subpopulations and, as such, should not be considered a random or representative sample of a larger population. Nevertheless, our age-related findings were significant even when controlling for self-reported health status as a covariate. Survey items, including questions that assessed our covariates, were completed by the actual study participant. In the case of youth, it is possible the validity of reports about family income may be inaccurate. These results are also based on a relatively small sample, especially for AYAs. Finally, this is an exploratory study based on comparing existing measures of privacy attitudes. The PSI, PCI, and IUIPC focus on consumer and Internet privacy. It is likely that differences may be seen in other privacy contexts (e.g., household, school, among friends). Furthermore, the limited and varied evidence outlining the IUIPC's reliability and validity in AYAs as well as the lack of psychometric testing of the PSI is a limitation for interpretability of our study results. While the IUIPC showed adequate reliability in our study, the PSI had modest internal reliability and should be interpreted cautiously. Researchers and industry stakeholders have discussed the dearth of reliable and valid privacy measures and the difficulty in interpreting privacy attitudes and behavior with them (Bélanger & Crossler, 2011; Woodruff et al., 2014). In this study, we utilized the privacy resources that are currently available to researchers, and emphasize the importance of our larger goal to develop a psychometrically sound privacy measure for future use.

Conclusion

Policymakers, parents, educators, and others charged with protecting children may see these results as a potential source of conflict. We have not assessed whether AYA perceptions of the appropriateness of information flows is a reliable and accurate proxy for actual privacy-related risks. For example, while AYAs may see their health information as being less sensitive now, it is not clear if their perception will change as they age. In other words, just because an information flow does not feel like a privacy violation to the individual at the moment, it still may not be appropriate by community or other

standards. Our findings that AYAs see some kinds of information as less sensitive or some information flows as more appropriate than adults do not imply that privacy concerns should be discounted for AYAs.

In this paper, we interpret results across a variety of privacy scales through a contextual integrity lens, which reveals that the different scales may be addressing different contexts and norms. From this perspective, the results reveal that both adults and AYAs place a high value on personal privacy, but the two groups may have different attitudes about appropriate information flows.

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