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The prevalence and motivations for password sharing practices and intrusive behaviors among early adolescents' best friendships - a mixed-methods study

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Highlights

- This study examines password sharing and intrusive behaviors among early adolescents.
- Around half of the respondents had shared their pin code or password with their best friend.
- 9.6% had accessed their best friend's phone without their consent.
- Adolescents explain password sharing as a token of trust and friendship.
- Girls were more likely to share their passwords than boys.

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Abstract

When adolescents share their passwords with their friends, they are putting themselves at an increased risk for online abuse victimization. Surprisingly, very little empirical research has tried to understand the context and underlying motivations of adolescent password sharing. Using a mixed-methods approach, this study aims to address this gap in the literature by examining the prevalence and context of two related behaviors: 1) password sharing and 2) accessing a best friend's phone without permission. We draw on both quantitative data and responses to open-ended questions that were collected among 2582 adolescents ($n_{girls} = 1432$, 56.6%) with a mean age of 13.45 years old ($SD = .90$) in the Dutch-speaking area of Belgium. Around half of the respondents in our sample had shared a password of a social media account or the PIN code of their mobile phone with their best friend, and 9.6% had accessed their best friend's phone without their consent. When investigating the underlying motivations for password sharing, our study revealed that passwords were mainly shared as a token of trust and friendship. Passwords were often exchanged reciprocally. Girls were significantly more likely to share their passwords or to access their best friend's phone without permission than boys. The respondents justified breaking into a best friend's phone by passing it off as a 'joke' or in order to surprise the best friend. We discuss implications for industry, practice, and we present a research agenda for future work.

Introduction

With 45 percent of teenagers being “almost constantly online” (Pew Research Center, 2018), digital media have transformed how adolescents experience their social relationships. Digital media provide many opportunities for adolescents to reap the benefits of their social capital, to communicate with a wide network of friends, and to maintain friendships that would otherwise be lost (e.g., because of moving to another city, transferring to another school...) (boyd, 2014). With the rich opportunities that social media offer, there are also some associated challenges, such as the risk of becoming a victim of cyberbullying, or other digital forms of peer harassment (Pabian & Vandebosch, 2014). One of the primary risk factors for cyberbullying is the sharing of passwords (Bauman, 2010; Meter & Bauman, 2015; Mishna, Khoury-Kassabri, Gadalla, & Daciuk, 2012; Walrave & Heirman, 2011). A likely explanation for the association between password sharing and cyberbullying is that knowing the password or PIN code to the mobile phone allows access to private and sensitive content, and provides the ability to hack into private accounts. Sensitive information stored on those accounts (e.g., pictures, private conversations...) can then be exposed and abused for bullying, especially after a friendship goes sour. Perpetrators of cyberbullying often have a prior social relationship, making it particularly risky to share passwords with friends (Vandebosch & Van Cleemput, 2009; Wegge, Vandebosch, & Eggermont, 2014).

Despite its potential negative consequences, password sharing appears to be quite common among adolescents. Some of the first studies on this topic have mainly investigated the prevalence of the practice. A PEW study found that 30% of teenagers reported “sharing one of their passwords with a friend, boyfriend, or girlfriend” (Lenhart et al., 2011, p. 8) and a study by Meter and Bauman (2015) found that between 16% and 20% of youth in their US sample had shared passwords with their friends. When asked with whom they felt comfortable sharing passwords, Turkish teenagers were most likely to report close friends, even before family

members (Gogus & Saygin, 2019). Marwick and boyd (2014) also noticed that password sharing was normative among the youth that they had interviewed. They attributed the practice to the fact that many teenagers are required to disclose their passwords to their parents, with some parents framing it as a sign of trust. Marwick and boyd (2014) note that the latter may lead teenagers to perceive password sharing as a normal behavior with individuals whom they trust.

While there is only scarce research on the practice of password sharing among adolescents, multiple studies have found evidence that password sharing is a highly prevalent behavior within adolescents' romantic relationships (Bevan, 2018; Lucero, Weisz, Smith-Darden, & Lucero, 2014; Van Ouytsel, Walrave, Ponnet, Willems, & Van Dam, 2019). Romantic partners share passwords as a token of trust and mutual love, and the behavior is therefore often not considered as problematic by those affected (Baker & Carreño, 2016). Sometimes teenagers share their passwords because they are pressured to do so by their romantic partners, but often teenage couples exchange them voluntarily (Lucero et al., 2014; Van Ouytsel et al., 2019). Knowing each other's passwords may lead to monitoring and controlling behaviors within romantic relationships (Van Ouytsel, Van Gool, Walrave, Ponnet, & Peeters, 2016; Van Ouytsel et al., 2019). For example, in focus group studies, adolescents discussed accessing the romantic partner's e-mails and text messages without permission, along with knowing each other's passwords (Van Ouytsel et al., 2016; Van Ouytsel et al., 2019). In a survey study, 39.4% of adolescents in a romantic relationship indicated that they had accessed their romantic partner's e-mail messages, text messages, or social media accounts without permission (Van Ouytsel, Ponnet, & Walrave, 2017). It is unclear whether knowing the best friend's password is associated with similar monitoring and controlling behaviors within adolescents friendships.

In sum, adolescents' password sharing practices appear to be prevalent and are considered a high-risk behavior. They may lead to the perpetration of hacking and monitoring behaviors within adolescents' friendships. Very little empirical research has tried to understand the context and underlying motivations for why so many adolescents decide to share their passwords with their friends. Likewise, the potential consequences of this practice are also poorly understood. Current examinations of password sharing practices do not go beyond establishing the mere prevalence of the behavior, and it is unclear whether it is associated with subsequent monitoring and controlling behaviors. This study aims to address these crucial gaps in the literature by examining the prevalence and context of password sharing among early adolescents (RQ1). We also examine the prevalence and context of accessing the best friend's phone without permission, which may be facilitated by password sharing and constitutes another risk factor in cyberbullying victimization (RQ2).

Early adolescents are an especially interesting age group for our study, given that they recently transitioned from primary school to secondary school (i.e., middle school or junior high school) and the fact that friendships begin to play an increasingly important role within their developmental process (Bowker, 2004). Friendships with peers become gradually more prevalent and intense during early adolescence (Giordano, 2003). Friendship experiences play an essential role in adolescents' developmental process. Understanding the sharing and privacy behaviors in adolescents' friendships is crucial, as adolescents may take relationship practices and norms (e.g., password sharing) that they have developed in their friendships with them to their later romantic relationships. Thanks to open-ended questions, we can go beyond the quantitative data to generate a deeper insight into the context and motivations in which password sharing and related monitoring behaviors take place. The results of our mixed-method approach are critical for the development of educational initiatives on e-safety and may inform

cyberbullying prevention and intervention. The results of our exploratory study can provide stepping stones for future theory-driven research.

Methods

Sample and procedures

The data are drawn from the second cross-sectional wave of the [NAME REMOVED FOR PEER-REVIEW] study, a large scale study on the Internet use of adolescents. In March and April 2019, 2731 students from 13 schools in the Dutch-speaking area of Belgium took part in a completely anonymous paper-and pencil survey in Dutch language. Participants were asked to return their surveys to the researcher in sealed envelopes. The anonymous surveys were administered during class time in the first three years of secondary education. Passive parental consent and the consent from the school's principal were obtained. The procedures were approved by the Ethical Committee of the author's institution.

All students were between 12 and 17 years old ($M = 13.53$; $SD = .99$). For the purpose of our study we aim to focus on early adolescents exclusively. Therefore, we have removed all respondents who did not disclose their age ($n = 10$) who were older than 15 years old from the analysis ($n = 77$), and who did not have a smartphone ($n = 62$). The final sample for this study therefore consists of 2582 adolescents ($n_{girls} = 1432$, 56.6%; 52 respondents did not disclose their gender) with a mean age of 13.45 years old ($SD = .90$).

Measures

A short definition of "best friend" preceded the measures, in order to make sure that the respondents would report on their experiences with the same friend throughout the survey. These instructions were also repeated verbally at the beginning of the survey: "The questions

in this section are about your best friend. That is the friend who you like the most and with whom you spend a lot of time. It can be someone from your class but also someone from a youth group or your neighborhood. If you have multiple best friends, please pick the one that you have known for the longest period of time. Don't pick your boyfriend or girlfriend as your best friend. Please try to keep the same best friend in mind when answering the following questions". After this introduction, the respondents were asked questions about their password sharing behavior and experiences with intrusive behaviors.

Quantitative measures

Password sharing behavior

To assess whether respondents had shared their passwords with their best friend, they were asked the following question: "Does your best friend know the PIN code/password/swipe of your mobile phone or the password of one of your social media accounts (e.g., Facebook, Instagram, Twitter, TikTok, Snapchat...), or is his/her fingerprint in your device?". The response options included: 1 = *no*, 2 = *I don't have a cell phone or social media*, 3 = *yes, of my cell phone*, 4 = *yes, of my social media*, 5 = *yes, of my cell phone and social media*. A similarly phrased question with similar response options, assessed whether their best friend had their password or PIN code with the respondent, using the same response options. In order to compare the demographic characteristics in the subsequent analysis, we recoded the responses to 0 = no and 1 = "knows password or PIN code". Youth who responded that they neither had a cell phone or social media were removed from the analyses.

Intrusive behavior

Respondents were asked whether they had accessed the mobile phone of their best friend without his/her permission in the past 6 months (yes/no). To illustrate this question, we provided the following example: “for example, by taking their phone out of their hands and scrolling through their phone without them wanting this or by logging on while they were away”. A similarly phrased question asked whether their best friend had accessed their phone without permission.

Open-ended questions

Password sharing behavior. If the respondents selected that their best friend knew the password of the cell phone and/or social media account, they were asked to “explain why you have shared this with him/her”. The respondents were free to write as much text as they wanted in the box that was provided.

Intrusive behavior. When respondents indicated that they had accessed their best friend’s phone without permission, they were asked about the most recent time that they had done this. For both open-ended questions we only inquired about the respondents’ own motivations to share their password or to access their best friend’s phone without permission, as it might be hard or even impossible for the respondents to accurately know the motivations of their friend to do so.

Data analysis

Quantitative data were analyzed using SPSS v.27.0 (IBM, Armonk, NY). We describe gender differences using chi-square tests. Table 1 summarizes the frequencies of our quantitative questions and provides the results of the chi-square tests. The written responses were classified by the researcher using the following steps. First the open-ended responses were read by the researcher to become familiar with the content of the responses. After this first step,

all of the responses were provided with a code that summarized the motivation to share passwords/to log into the best friend's phone without permission. When a single response contained multiple motivations, the response was attributed to several codes. Consequently, there are more motivations coded than respondents in our study, as several respondents provided multiple motivations. In the following step, overlapping or thematically similar codes were merged into overarching categories. After a month, the responses were re-read and it was checked whether all responses were coded correctly. The quotes were added to the tables to illustrate the overarching themes that were identified. The original quotes were translated by the author from Dutch into English. During the translation process, we stayed intentionally as close as possible to the original structure and meaning of the quotations. The quotes were back-translated by a third party to ensure the accuracy of the translation.

Results

Quantitative results

As shown in Table 1, the results indicate that 49.5% of the respondents had shared the password of either their social media or their cell phone with their best friend. More specifically, 36.8% of respondents indicated that they had shared the PIN code of the cell phone, 2.5% had shared the password of social media and 10.2% of the respondents had shared the login credentials of their social media and their cellphone. Conversely, 50.0% of the respondents knew their best friends password or PIN code of the mobile phone, with 36.4% knowing the PIN code of their best friend's cell phone, 3.5% the password of social media and 9.8% of both cell phone and social media.

Adolescent girls were significantly more likely than boys to report both behaviors ($X^2(1) = 237.16; p = .000; X^2(1) = 245.29; p = .000$). Among the respondents that had shared their

password or PIN code with their best friend, 85.8% indicated that their best friend had also shared their password or PIN code with them.

With regard to accessing the best friend's phone without permission, 9.6% of the respondents indicated that they had perpetrated this behavior, while 14% said that their best friend had done this to them. Adolescent girls were significantly more likely than boys to report both behaviors ($X^2(1) = 7.74; p = .005; X^2(1) = 17.11; p = .000$). Among the respondents who reported that they had accessed their best friend's phone without permission, 73.5% reported that their best friend had done the same to them.

Subsequent analyses, that were not included in a table, revealed that, among the adolescents had shared the PIN code of their cell phone with their best friend, 20.2% reported that their best friend had accessed their cell phone without permission. Furthermore, 17.5% of the adolescents that had shared the password of their social media accounts, and 35.7% of respondents who had shared the PIN code/password of their phone and social media indicated that their best friend had accessed their cell phone without permission versus 5.1% among those who did not share their password/PIN code.

Vice versa, 13.6% of the respondents who knew the PIN code of their best friend's phone, had accessed their friend's cell phone without permission. Furthermore, 10.1% of respondents who knew their best friend's social media account had accessed their cell phone without permission, and 31.8% of respondents who knew both the PIN code/passwords of cell phone and social media of their best friend had accessed their cell phone without permission versus 2.7% among those that did not know the password/PIN code. The respective differences were statistically significant, indicating that adolescents who share their PIN code/password with their best friend have a higher chance to become victimized by this behavior ($X^2(1) = 170.97; p = .000; X^2(1) = 145.66; p = .000$).

[PLEASE ADD TABLE 1 ABOUT HERE]

Qualitative results

Password sharing

As shown in Table 2, we coded 1501 elements in the responses and identified 10 overarching motivations for why adolescents had shared their password with their best friend. Quotations for each of the motivations are included in the table. In Table 3, we display the frequency of the categories per type of PIN code or password that was shared.

With 51.83% of the total responses, ‘trust and the mutual sharing of passwords’ was the most prevalent motivation to share passwords. Within this broad overarching category we identified several subcategories such as general expressions of trust (322 occurrences), emphasis on the mutual nature of the sharing passwords (227 occurrences), the belief that the best friend will not abuse the shared password (110 occurrences), the belief that best friends don’t have secrets (108 occurrences), or that they have known each other for a long time (63 occurrences). Related to this notion of trust was the concept of ‘friendship’ (20 occurrences), as respondents indicated that they had shared their password with their best friend as an act of friendship. One respondent wrote: “Because she is my best friend and best friends have each other’s fingerprints in their phones”. In line with sharing passwords being a mutual behavior, 23 respondents noted that they would sometimes read each other’s messages and exchange phones. Whereas 22 respondents (22 occurrences) noted that they trusted that their friends would not use their mobile phone without their knowledge or consent, a similar amount respondents reported that they had shared their password because their best friend had demanded the password or pressured the respondent to provide their password (17 occurrences).

Around 13% of the codes (200 occurrences) cited practical reasons for why the adolescents shared their passwords with their best friends, making it the second most named

motivation. We identified various sub-motivations. The respondents indicated that they sometimes let their best friend borrow their phone, because they had to look something up, make a phone call, or send a message (64 occurrences). This most commonly occurred if the best friend did not have his/her phone or when their own phone ran out of battery. Respondents further mentioned that they wanted to avoid having to enter their PIN code into their phone each time that their friend wanted to use their device, and therefore simply provided the password so that their friend could access their device right away without having to ask each time (49 occurrences). Respondents also indicated that their best friend needed their PIN code to play games (33 occurrences), play music (13 occurrences), or take pictures (34 occurrences) together. Some respondents mentioned that their friends would post silly pictures of themselves as a surprise. A final motivation was that the best friend had to perform some tasks for the respondent on their phone and therefore needed the PIN code to unlock the device because the respondent was engaged in another activity (e.g., one respondent mentioned horseback riding, and another surfing at the beach).

Safety concerns were another motivation to share passwords that was cited by respondents (125 occurrences). Around 8% of the respondents indicated that they had shared their password with their best friend so that he/she could notify their parents or emergency services in case of an accident or another emergency.

In around 6.7% of the total codes (102 occurrences) the respondents mentioned that they did not intentionally share their password/PIN code with their best friend but that the best friend had accidentally seen or guessed it. Some respondents mentioned that they decided not to change their password/PIN code afterwards, citing trust in their friend.

In around 5% of the codes the respondents mentioned that they had shared their password because they wanted to keep their Snapchat streaks. A Snapchat streak happens when users of application Snapchat send each other a picture or a video every 24 hours for at least

three days in a row. A Snapchat streak is signified by a flame emoji that appears next to the respective friend's name in the app, and by a number indicates how long the Snapchat streak has been going on. The flame and number disappear if the Snapchat streak is not maintained within the 24 hour time frame. Our respondents indicated that they would share their passwords with their friends so that they could maintain these Snapchat streaks when they would not have access to the app, for example during family vacations or summer camp. As shown in Table 3, maintaining Snapchat streaks was an especially important motivation for sharing passwords of social media as opposed to sharing the PIN codes of cell phones, given that 37.5% of youth who had shared a password with someone had done this in order to maintain their Snapchat Streaks as opposed to less than one percent among those who had shared the PIN code of their phones.

Some respondents indicated that they did not care whether their best friend knew their password, as they perceived that there was no valuable private information on their phone or in their accounts (13 occurrences). Finally, 72 motivations were not repeated across responses and cited various motivations, such as joking, having a back-up person that know the PIN code in case that the respondent would forget, or having created the password together.

[PLEASE ADD TABLE 2 AND TABLE 3 HERE]

Accessing the best friend's phone without permission

As shown in Table 4, we coded 268 elements in the responses and identified 9 overarching motivations for why adolescents had accessed their best friend's mobile phone without permission.

Around a quarter of the motivations was more practical in nature, and these motivations were similar to the practical motivations that were disclosed for password sharing. Taking pictures was a first motivation. The respondents indicated that it is common for best friends to

'break into each other's phone' in order to take fun pictures of themselves so that the best friend would discover these at a later time when scrolling through his or her pictures. (33 occurrences) This was intended as a surprise for the best friend. The respondents indicated that they used their best friend's phone to play a game (17 occurrences), because they did not have their phone with them or because they ran out of battery (16 occurrences), because they wanted to help their friend (9 occurrences), to play music or change music (7 occurrences), or to send a message to someone (5 occurrences).

Two other motivations that emerged from the data revealed that adolescents claimed to have done so as a "joke" or to play a prank on their best friend (39 occurrences). The nature of the jokes or pranks could range from posting a status update on their social media, messaging their contacts, to adding pictures to their timeline on Instagram or Snapchat.

Around 14% of the coded motivations (40 occurrences) included a form of monitoring and controlling behaviors. The most important sub-dimensions that we identified were to check whether a friend was speaking the truth (17 occurrences), to read the best friend's messages (7 occurrences), and to check with whom they were communicating (5 occurrences). Three respondents cited safety concerns and six respondents framed their behavior as being interested in their best friend.

Around 13% of the codes (35 occurrences) mentioned that accessing each other's phone was a mutual and normal behavior and that the respondents did so because their friend did the same to their phone. Respondents noted that accessing each other's phone was a normal part of their friendship, with one respondent mentioning "I don't have to ask her for permission, she would say yes anyway".

Another motivation was related to viewing images on the best friend's phone (10 occurrences). Four respondents specifically indicated that they had accessed their best friend's

phone because they wanted to delete a picture in which they did not look good. Furthermore, the respondents indicated that they would access social media profiles to which they did not have access, such as friends that had blocked them or that they were not friends with (6 occurrences).

Additionally, just as with the sharing passwords we found that some youth had accessed their best friend's phone in order to take over a streak on Snapchat (4 occurrences). It is unclear from the responses whether the friends were aware of this. Finally, we also identified 12 various answers that did not re-occur with other participants, but were mostly practical in nature (e.g., watching YouTube, looking something up...).

[PLEASE ADD TABLE 4 HERE]

Discussion

Password sharing is a major Internet risk behavior that is associated with abuse victimization, such as cyberbullying victimization (Bauman, 2010; Meter & Bauman, 2015; Mishna et al., 2012; Walrave & Heirman, 2011). Motivations for why adolescents decide to share their passwords with their best friends are poorly understood. Using a mixed-method approach, our study investigates the prevalence and context of adolescents' password sharing behaviors and accessing the best friend's phone accounts without permission. Establishing typologies of the motivations to engage in these behaviors is an essential first step for future theory-driven research, and can also contribute to the development of educational efforts aimed at preventing password sharing and hacking behaviors.

Around half of the youth in our sample indicated that they had shared a password or PIN code with their best friend, which is considerably higher than the prevalence rates in prior

studies which ranged between 16% and 30% (Lenhart et al., 2011; Meter & Bauman, 2015). Regarding password sharing, the main motivation which was provided throughout adolescents' responses was that passwords/PIN codes were shared out of trust in the other person, with respondents specifying that they had known their best friends for a long time, that they did not hold secrets for each other, or that they believed that the best friend would not take advantage of these sensitive data. This study's statistics corroborate the qualitative finding that password sharing is a mutual behavior, as 85.8% of the respondents who had shared their password/PIN code with their best friend had done so reciprocally.

From a theoretical perspective, these findings can be explained as part of adolescents' friendship formation process, in which self-disclosure and the sharing of secrets is a key component of intimate relationship formation (Van Gool, Van Ouytsel, Ponnet, & Walrave, 2015; Way, Gingold, Rotenberg, & Kuriakose, 2005). Indeed, prior ethnographic research established that many early adolescents regarded the ability to share secrets and to talk intimately as the two primary characteristics of a 'best friend' (Way, 2013; Way et al., 2005). Another characteristic of best friendships, identified by Way et al. (2005) was that adolescents could trust each other with holding money without stealing it. Sharing a password, and thus providing the friend with the ability to access a wealth of personal information, may be a digital extension of entrusting a good friend with 'secrets' and 'valuables', and may therefore function as a modern-day material proof of the closeness of a (best) friendship.

Our study found that adolescent girls were more likely to share their passwords with their friends than adolescent boys. These gender differences are in line with prior theoretical work that found that girls are more likely to engage in intimate forms of self-disclosure within their friendships, both offline (Miller, Berg, & Archer, 1983) and online (Schouten, Valkenburg, & Peter, 2007; Van Gool et al., 2015).

Although at a minority (9.6%), it is worth noting that several respondents indicated that they had accessed their best friend's phone without consent. The open-ended questions revealed that some justified breaking into their friend's phone as harmless by motivating it as a "joke", or to surprise their best friend by adding funny pictures to their social media or their picture gallery on their mobile phone. A quarter of the identified motivations were practical, and were in line with the reasons that were cited to share passwords, such as not having access to the mobile phone, or in order to play a game. In a similar way, more than one in ten motivations stated that accessing their best friend's phones is a mutual behavior and that it is normal within a friendship to do so. This echoes the motivations of youth to share passwords within their friendships and is related to the notion that friends do not hold any secrets for each other (Way, 2013; Way et al., 2005). The quantitative measures substantiate these qualitative findings, as 73.5% of the respondents who had accessed their best friend's phone without permission reported that their best friend had done the same to them. Over one in eight of the themes revolved around controlling and monitoring the best friend, and a majority of these focused on checking whether the best friend was speaking the truth. In previous qualitative research it was found that adolescents used secret friendship tests to confirm that their friend was actually trustworthy (Way et al., 2005). These 'trust tests' may involve sharing a secret to see whether the best friend can be trusted with this information. Accessing each other's phones may enable adolescents to perform a variation of such a 'trust test' (Way et al., 2005).

While some respondents admitted to accessing their best friend's phone without consent, a minority of the respondents explicitly mentioned that they sought consent from their best friend before accessing each other's phones or social media accounts (22 occurrences). The open-ended responses also revealed that some respondents believed that consent was implied because best friends 'don't hold any secrets for each other'. It is unclear to which extent the consent is explicitly sought and granted in teen friendships, and to which extent adolescents

perceive that it is implicitly expected that consent to share passwords and access each other's phones/social media accounts is granted by virtue of the best friendship. Additional research is needed to explore adolescents' perceptions and expectations about privacy within their best friendships more deeply and to investigate how consent is negotiated.

Overall, the results of our study show that while the sharing of passwords can come with serious risks for adolescents, teenagers themselves may regard it as a token of friendship and trust. They may not always perceive the practice of sharing passwords or accessing each other's phones as a negative behavior. In this sense, sharing passwords may be analogous to other online risky behaviors such as sexting (Van Ouytsel, Walrave, & Ponnet, 2018). Indeed, exchange of self-made sexually explicit images also often takes place between two consenting partners and can also act as a token of love and trust within a relationship (Lippman & Campbell, 2014). Similar to the sharing of sexts, the exchange of passwords does not automatically lead to any negative consequences and can be without risks for many adolescents. Similar to sexting, the password sharing becomes problematic when the trust is violated and could lead to misuse, privacy breaches, or (cyber)bullying. This is one reason nuanced prevention and educational efforts are warranted.

Implications for education and industry

Our study contains some important implications for educational efforts and industry. For a minority of youth, the practices of password sharing and accessing each other's phones are associated with relationship scripts and the belief that this behavior is normative within "best friendship". Simply telling adolescents to not share their passwords or PIN code may not resonate with youth because they share this sensitive information through the belief that they are an essential token of trust and friendship. Educational efforts may therefore frame a conversation about these practices from the perspective of "healthy relationships" (Wolfe,

Crooks, Chiodo, Hughes, & Ellis, 2011) and reflect with teenagers to which extent having the expectation of knowing their best friends' passwords is necessary and has the potential to become abusive. Discussions can also be framed within the broader context of digital citizenship and mutual trust. Some of our respondents mentioned that they did not change their passwords after their friends had seen them enter their PIN code or password in their phone or on social media accounts. Educational efforts on e-safety may highlight the need to change passwords regularly in order to protect their phone and online accounts, even when adolescents perceive the risk of abuse by their best friends to be low.

Our study also contains some implications for the industry. Some of our respondents shared the PIN codes of their cell phones with their friends because their friends wanted to take pictures, play music or play games on their devices. Developers of mobile operating systems may consider providing users with the ability to select specific applications that can be accessed without the PIN code to unlock all functions of the smartphone. At the time of writing, some operating systems for mobile devices already allow people to access the camera or calling emergency services without entering the PIN code. This feature could be expanded to allow users to choose which applications are behind the lock screen and which applications can be accessed without the PIN code or with special access for guests (e.g., music, pictures, podcast apps, games, navigation system...). It could help adolescents to share their devices safely without having to give up their privacy to their friends. Educational efforts could teach students how to set this up in operation systems that already offer a guest access feature.

One of the main distinct reasons for adolescents to share their social media passwords with their best friends was to maintain a Snapchat streak. Especially during family holidays or summer camps, teenagers do not always have access to their phones to allow them to maintain their Snapchat streaks (i.e., by sending Snapchat messages on daily). Application developers may consider developing features that allow users to pause their ongoing challenges temporarily

if they are on vacation or if they do not have access to the internet for a while (without losing the achievement badges). This would make sure that adolescents are not unnecessarily putting themselves at risk by sharing their passwords with friends just to continue to play a game or maintain an online challenge.

Limitations and suggestions for future research

This study is among the first to investigate password sharing and intrusive behaviors among adolescents. The strengths of our study include the use of both quantitative and qualitative data to approach our research question among a large sample of early adolescents. Some limitations of our study should be acknowledged when interpreting the data. A first limitation is the use of a convenience sample of youth, which may limit the generalizability of our findings. Future studies may use alternative participant recruitment to minimize bias. Sharing passwords may be also very dependent on perceptions of privacy and openness across countries and cultures. A cross-national and cross-cultural approach is also warranted to investigate password sharing behaviors in various cultural settings. Another limitation is the use of self-report data. Our respondents may have rationalized their behavior by providing socially desirable explanations. When being confronted with a question that explicitly asked why they had performed these behaviors, the respondents might have felt the need to rationalize or to defend why they had shared their passwords or had accessed their best friend's phone without permission. Consequently, their responses might not have been entirely truthful or accurate. Finally, our study was part of a larger survey on adolescents' media use and we could not ask follow-up questions. Future studies could use different qualitative techniques, such as focus groups or interviews, to probe deeper into adolescents' motivations to share their passwords and PIN codes in order to get a comprehensive impression of their lived experiences.

Our study highlights several avenues for future research. Based on the typology of motivations that was provided in our study, future research could investigate the social norms surrounding password sharing within early adolescents' friendships. For many adolescents this behavior is based on trust and an (often unspoken) expectation that this is normative within friendships. It may be interesting to investigate the social context surrounding these behaviors more deeply, using established theoretical frameworks such as the social learning theory (Akers, 1998) or the theory of planned behavior (Ajzen, 1991). This study was conducted among a sample of early adolescents. Future research may look at password sharing practices and perceptions of privacy within friendships among middle and late adolescents and the trajectories of these behaviors throughout adolescence. It is unclear whether adolescents may become more protective of their privacy within their friendships as they become older and whether their perceptions of the practice of password sharing change with their age.

Some of our respondents mentioned that they had accessed their best friends' phones to monitor with whom they were communicating and to check whether they were telling the truth. Similarly, password sharing seemed to be often motivated by the notion that best friends should not keep any secrets from each other. Future research may draw on earlier work that has been done on early adolescents' friendship jealousy, in which it was found that early adolescents sometimes might experience jealous emotions out of fear of being replaced by another person (Lavalley & Parker, 2009; Parker, Low, Walker, & Gamm, 2005). Future studies might investigate to which extent feelings of friendship jealousy could lead to subsequent monitoring and controlling behavior. These studies could also investigate individual characteristics of adolescents who engage in password sharing or controlling behaviors, such as personality traits or attachment styles.

Early adolescents' friendships are an important first step in their development of interpersonal skills and subsequent romantic relationships. Password sharing is not only

prevalent within adolescents' friendships but also occurs within adolescents' romantic relationships (Van Ouytsel et al., 2017; Van Ouytsel et al., 2019). Future research may therefore investigate whether the willingness to exchange passwords within adolescents' friendships is associated with a higher acceptance of romantic partners demanding passwords or accessing adolescents' mobile phones. Studying whether early adolescents carry these behaviors into their later romantic relationships may have important implications for the prevention of digital forms of dating violence.

Finally, as with all digital behaviors (Englander, 2019), it may be important for future work in this area to specify the context and the intention in which passwords are shared or accounts are accessed. Our quantitative items merely measured whether passwords had been shared or phones had been accessed without specifying the respondent's intent. Untangling 'harmless' intentions (e.g., the password was shared because my friend forgot his phone, or to change music) from more negative motivations (such as controlling, stalking and the expectation that these behaviors are normative within adolescents' friendships) by using more specific measures may improve the accuracy of future theoretical work in this area.

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Password sharing behavior	<i>n</i> (%) respondents who had engaged/experie nced the behavior	<i>n</i> (%) boys who had engaged in/experienced the behavior	<i>n</i> (%) girls who had engaged/experie nced the behavior	X²
The best friend knows the respondent's social media password/pincode of mobile phone	1271 (49.5%)	349 (32.2%)	901 (63.2%)	237.16***
The respondent knows the best friend's social media password/pincode of mobile phone	1275 (49.9%)	349 (32.2%)	904 (63.8%)	245.30***
The respondent has accessed the best friend's mobile phone without permission	246 (9.6%)	85 (7.9%)	159 (11.2%)	7.74**
The best friend has accessed the respondent's phone without permission	357 (14.0%)	116 (10.8%)	235 (16.6%)	17.11***

Table 1: Absolute values and percentages of respondents who had experienced/engaged in one of the behaviors under study.

* $p < .05$, ** $p < .01$, *** $p < .001$

Category	References in the responses
1) Trust and mutual nature	778 (total)
<i>1.1. General expressions of trust</i>	322
“Because I trust my friends, and I know their passwords as well. This is purely a sign of trust”	
“I trust my best friend with everything and vice versa”	
“Just because we are friends and we trust each other”	
“Because I trust her with all my heart”	
<i>1.2. Because I know his/her password</i>	227
“I also have her password”	
“Because I trust him and I also know his code”	
“Because I also know her password of her phone”	
“Because he also gave me his and we would never share them with other people”	
<i>1.3. My friend is not going to abuse it</i>	110
“She is my best friend and I believe that she will never abuse it”	
“I know she will not do anything wrong with it”	
“Because I know he will use it well”	
“Because I trust her and she would never do anything behind my back”	
<i>1.4. We don't have any secrets</i>	108
“Because I don't have secrets for her”	
“I have nothing to hide”	
“Because I fully trust her and we tell each other everything”	
“Because we don't have secrets for each other. She is my best friend and we never had a fight (I know her since first year of elementary school”	
<i>1.5. We have known each other for a long time</i>	63
“I know him since 12 years and we fully trust each other”	
“I also can access her phone and we have known each other for 9 years, so we trust each other”	
“We have known each other for 10 years and we trust each other”	
<i>1.6. Only with mutual permission</i>	22
“Because I trust her and she never accesses my phone without me being there.”	
“Because she sometimes reads my messages when I grant permission and because I trust her”	
“I trust her very much and we have known each other for over 13 years. She would never access my phone with bad intentions. We are also always together when we're on each other's phone, so if I or she doesn't like that at that time to be on each other's phone, we just tell each other.”	
2) Convenience – practical	200 (total)
<i>2.1 Friend needed phone to send messages, make a call or look something up</i>	64
“She needed to look something up”	
“To check something and to play a game. The send a message to her mom with my phone”	
“To play games and to call someone if he forgot his phone”	
<i>2.2. Convenient so that friend can access the phone right away</i>	49
“Because it is sometimes convenient and I trust her”	
“If she wants to access my Instagram, I don't have to tell her my code all the time”	
“As best friends you can trust each other and if she wants to search something or look at something in my phone, she can do it herself and I don't always have to unlock my phone”	
<i>2.3 To take pictures</i>	34
“To take pictures etc.”	

“Because we trust each other and we love to post pictures of each other on our accounts”
“We were taking pictures and she asked for the code”

2.4. To play a game 33

“She wanted to play a game but didn’t have any on her own phone”
“She was playing games on my cell phone”
“He was playing a game on my phone and it constantly logged out, so I gave him phone”

2.5 To help me when I am busy 20

“So that she can do something on my phone, when I ask her.”
“So that he can do something for me when I am busy (I also know his pin code)”
“It’s convenient when I am busy and I have to do something urgently on my phone, I just ask her”

2.6 To play music 13

“We were listening to music. The box was connected to my phone. She asked for the next songs. So I gave her my code so that she could put on the next song”.
“So that she can change the music”.

3) To notify parents or emergency services in case of an emergency 125

“If something were to happen, they can notify my parents”
“In case of an emergency she can access my cell phone to call my parents”.
“Because I trust him and if he doesn’t have a phone with him, and I am unconscious he can access my cell phone and call the emergency line or my mother”
“In case of an emergency (if we both go skiing together it can come in handy)”

4) Best friend accidentally saw it or guessed it 102

“ She accidentally saw it when I wanted to unlock my phone”
“I didn’t share it, the person guessed it”.
“I didn’t share it, but when I unlock my phone, it’s visible to most. Because you can’t say ‘close your eyes’ to the entire playground”
“She guessed it. I am not changing it because I trust him”
“Het guessed it and he was right. But I trust him with this”.

5) To take over Snapchat streaks 79

“To take over Snapchat streaks when I was on vacation”
“To take over my Snapchat streaks when I was on vacation and he is the only one I completely trust”
“My cell phone was confiscated and he had to take over my Snapchat Streaks & sometimes he has to things on my account when I don’t have time”.
“I am doing streaks on Snapchat and I went on vacation without WiFi, so she had to take over”.

6) To read/answer each other’s messages 23

“Because then we can read each other’s messages”
“If we have a sleepover we look at each other’s cell phone”
“So that we can access each other’s accounts”

7) Friendship 20

“Because he is my friend”
“Just because he is my friend”
“Because she is my best friend and best friends put each other’s fingerprints “
“Because it’s convenient if they ever have to take over my streaks and it goes without saying”

8) Best Friend asked for it 17

“She asked it and I just said it”

“Because she asked me and I trust her”
 “He wanted to put in his fingerprint and I gave permission”
 “No idea, she asked for the code and I gave it to her”

9) I don't care anyway, it doesn't contain any important information	13
<p>“Because I don't care that he does it” “Because it doesn't contain anything important” “Because I don't care that she knows” “Because my phone doesn't contain anything important and I was too lazy to put in the code every time”</p>	
10) Various responses	72
<p>“She sometimes want to look at her ex through my social media” “I sometimes forget [my passwords] that way I always know them” “I sometimes forget them when I am drunk” “As a joke” “Because if there is a time that I need a moment for myself, she can take over my social media accounts.” “I don't have a pincode on my cell phone. She also knows my passwords to take over my streaks” “We created the password together”</p>	
11) No true motivation is given	35
<p>“just because” “I don't really know why he is in my phone” “IDK” “For when he needs to access my phone” “Because she is allowed to know that”</p>	
12) No response provided	37

Table 2: A typology of motivations to share passwords with a best friend

Motivations	Type of password shared			Total <i>Motivations across all groups combined</i> <i>n</i>
	Cell phone only <i>n (%)</i>	Social media only <i>n (%)</i>	Social media and cell phone <i>n (%)</i>	
1) Trust and friendship	581 (53.05%)	17 (23.61%)	180 (53.89%)	778
<i>1.1. Trust (general)</i>	246	9	67	322
<i>1.2. Because I know his/her password</i>	172	3	52	227
<i>1.3. My friend is not going to abuse it</i>	78	2	30	110
<i>1.4. We don't have any secrets</i>	79	2	27	108
<i>1.5. We have known each other for a long time</i>	44	2	17	63
<i>1.6. Only with mutual permission</i>	17	0	5	22
2) Convenience – practical	165 (15.06%)	4 (5.55%)	31 (9.28%)	200
<i>2.1 Friend needed phone to send messages, make a call or look something up</i>	51	3	10	64
<i>2.2. Convenient so that friend can access the phone right away</i>	37	0	12	49
<i>2.3 To take pictures</i>	31	0	3	34
<i>2.4. To play a game</i>	28	1	4	33
<i>2.5 To help me when I am busy</i>	17	0	3	20
<i>2.6 To play music</i>	13	0	0	13
3) To notify parents or emergency services in case of an emergency	105 (9.58%)	0 (0.0%)	20 (5.98%)	125
4) Best friend accidentally saw it or guessed it	94 (8.58%)	1 (1.38%)	7 (2.09%)	102
5) To take over Snapchat streaks	4 (0.36%)	27 (37.5%)	48 (14.37%)	79
6) To read/answer each other's messages	10 (0.91%)	4 (5.55%)	9 (2.69%)	23
7) Friendship	15 (1.37%)	1 (1.38)	4 (1.20%)	20
8) Best friend asked for it	16 (1.46%)	0 (0.0%)	1 (0.30%)	17
9) I don't care anyway, it doesn't contain any important information	9 (0.82%)	0 0 (0.0%)	4 (1.20%)	13
10) Various responses	33 (3.01%)	16 (22.2%)	23 (6.88%)	72
11) No true motivation is given	31 (2.83%)	2 (2.77%)	2 (0.60%)	35
12) No response provided	32 (3.01%)	0 (0.0%)	5 (1.50%)	37

Table 3: A typology of motivations to share passwords with a best friend with frequency information for each type of password shared

Category	References in the responses
1) Convenience – practical	87 (total)
<i>1.1 To take pictures (as a surprise)</i>	33
“To take pictures”	
“The most recent time was last Thursday. I do this (and she does it to me) because we don’t have any secrets for each other or we do ‘break-ins’ on Snapchat. Everyone does that sometime”	
“To take funny pictures and put them in his gallery”	
“Just for picture spam etc. and we just do that, or to put some music on”	
<i>1.2. To play a game</i>	17
“ I wanted to play a game on her cell phone”	
“To play games on the phone”	
<i>1.3. I didn’t have a phone with me or phone was broken</i>	16
“When my cell phone is broken, I log in to hers. Sometimes she knows, sometimes she doesn’t”	
“I didn’t have 4G on my phone”	
“I had forgotten my cell phone”	
<i>1.4 To help out/to show something</i>	9
“To help with something”	
“She wanted me to pick a beautiful picture of her”	
“Something had to be taken care of urgently, and he wasn’t there”	
<i>1.5. To play music</i>	7
“To put on some music”	
“To change the music”	
<i>1.6 To send a message</i>	5
“I wanted to send a message to someone”	
“To send a message to a friend to tell her where we were”	
2) Joke or prank	39
“Just for fun”	
“We were playing the same game and I deleted him as a prank =)”	
“When she is gone, I sometimes take her cell phone and send to her contacts: ‘please add me’. That happens to other people as well and is a joke”	
3) Controlling / monitoring	40 (total)
<i>3.1. To see if the friend tells the truth</i>	17
“To check if he really had girlfriend”	
“I wanted to know if she had secrets for me”	
“I wanted to see what she does in her free time”	
“To check if she really can keep a secret (which turned out not to be the case)”	
<i>3.2. To check with whom the friend is communicating</i>	5
“Because I knew her password and I wanted to know what she sends etc.”	
“I wanted to know with whom she was sending [messages]”	
<i>3.3. Out of “interest” or “curiosity”</i>	6
“Because I wanted to and I was interested”	
“Interested”	

3.4. <i>To read messages</i>	7
“Because I wanted to read a conversation “Just to check the messages she send to a certain person”	
3.5. <i>To get to know something</i>	3
“To get to know something” “To check something”	
3.6. <i>Safety reasons</i>	3
“To check whether nothing bad is on the phone (fights, bullying...)” “Because she was doing things that were inappropriate for her age, I kept an eye out for her (not to do something bad, but as a precaution)”	
4) It’s a mutual/normal/habitual behavior within a friendship	35
“We do it often to each other” “We do this often to each other and we don’t have any secrets for each other. That’s why I did it” “She was doing it on my phone” “If she does it to me, then I will do it to her” “I don’t have to ask her for permission, she would say yes anyway”	
5) To look at pictures or delete pictures	10 (total)
5.1 <i>To look at pictures</i>	6
“Because he is my bro and I wanted to see his gallery” “Just to look at memories on her Snapchat but afterwards I just tell her”	
5.2 <i>To delete pictures</i>	4
“To delete a picture of myself in which I wasn’t looking good” “I wanted to delete a picture of me”	
6) To view social media profiles to which the respondent does not have access	6
“To view other people’s profiles with whom I am not friends” “To look someone up who had blocked me” “Because she follows certain people and I don’t follow them, that way I can use her profile to see if they have posted something”	
7) Streaks on Snapchat	4
“To take over his streaks but I haven’t done anything wrong” “We had a lot of flames on Snapchat and they were gone, so I quickly took over his streaks”	
8) Various responses	12
“To chat with her cousin” “To watch some YouTube” “Just to have a look because I was bored” “To look something up”	
9) No true motivation is given	12
“just because” “A week and a half ago” “I don’t have a reason”	
10) No response provided	23

Table 4: A typology of motivations to break into a best friend’s phone