



Sexual Communication in the Digital Age: Adolescent Sexual Communication with Parents and Friends About Sexting, Pornography, and Starting Relationships Online

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Abstract

Online sexual behaviors like sexting, viewing pornography online, and using the internet to start relationships are increasingly common among adolescents, yet research has struggled to keep pace. This study fills a gap in the sexual communication literature by examining the extent to which a sample of high school adolescents are discussing digital sexual topics with their parents and best friends compared to more traditional sexual topics (pregnancy, STDs, condoms, and abstinence). Participants were 226 U.S. high school students (*M* age = 16.25; 58% girls; 46% White, 25% Latino, 24% Black) who reported their digital sexual behavior and sexual communication in the past year. Rates of sexting, viewing pornography, and starting relationships online were high (89% had engaged in at least one of these behaviors; 35% engaged in all three behaviors); yet communication about these topics was generally low: only 7% of youth had discussed all three digital topics with their parents and 19% had discussed all three with their best friends. This is in contrast to nearly 50% of youth who discussed traditional topics with their parents and best friends. Patterns of communication and digital sexual behavior were similar by gender, with the exception of pornography: boys were more likely to view pornography and discuss it with friends than girls. Implications for adolescent development in the digital age are discussed.

Keywords Sexual communication · Adolescent sexual development · Sexting · Pornography · Digital media

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Introduction

The changing digital landscape has resulted in a changing sexual landscape for adolescents. A key developmental task of adolescence is the exploration of sexual and dating relationships, along with broader identity exploration and negotiation of autonomy with parents and peers (Dahl et al., 2018; Diamond & Savin-Williams, 2009). This sexual exploration is now occurring at a time when over 95% of adolescents have access to a cell phone and nearly half of youth report being online “almost constantly” (Smith & Anderson, 2018). Digital media has fundamentally transformed how adolescents interact with online content and with peers by providing affordances—such as “24/7” availability and absence of social cues—to which adolescents must adapt (Nesi et al., 2018; Subrahmanyam & Smahel, 2011). The accessibility and relative anonymity afforded by digital media have also created a unique environment in which adolescents can explore their emerging sexualities, including consuming sexual media and constructing their own online sexual experiences (Greenfield, 1984; Subrahmanyam & Smahel, 2011). As many as three-quarters of youth have been exposed to online pornography, either intentionally or accidentally (Behun & Owens, 2020; Chen et al., 2013; Peter & Valkenburg, 2016). Additionally, at least a quarter of youth have received a sext (i.e., a sexually explicit photo shared via text or private messaging app), with rates increasing in recent years (Madigan et al., 2018). Further, with the rise of online dating platforms and social media sites, the internet has become fertile ground for flirting, meeting potential partners, and developing relationships (Bryant & Sheldon, 2017; Lykens et al., 2019; Macapagal et al., 2018; Tsai et al., 2018). These digital platforms provide adolescents with new opportunities to explore their sexual interests and desires, express their sexuality, and initiate or expand their sexual relationships.

Sexual exploration in the digital world presents both risks and rewards for adolescents and may be part of learning about sex during this developmental period. For example, the negative consequences of youth sexting can include blackmail, bullying, and sexual exploitation (Setty, 2020; Smith et al., 2014; Van Ouytsel et al., 2017, 2019), but sexting can also allow adolescents to share sexual intimacy without the risk of unplanned pregnancy or sexually transmitted diseases (STDs; Chalfen, 2009). Further, online pornography may be a poor sex educator for youth, in that it can set unrealistic expectations for sexual interactions and normalizes risky sexual behavior (Binnie & Reavey, 2019; Owens et al., 2012; Sun et al., 2016); yet, pornography can also be a way to experience pleasure while exploring and experimenting with sexuality (Böthe et al., 2019; Smith, 2013). Finally, research on the risks or rewards of adolescents’ use of the internet to start new relationships is limited; however, recent work has shown that some adolescents are using dating sites aimed at adults over 18 and engaging in unprotected sex with older partners, but that online spaces can also be a place to meet sexual needs, explore identity, and overcome obstacles to meeting partners, particularly for sexual minority youth (Macapagal et al., 2018, 2021).

If adolescents want to learn more about digital aspects of sexuality, or if they want to discuss their own experiences or concerns related to sexting, viewing

online pornography, or starting relationships online, where do they turn? Adolescence is a unique developmental period, when peer influences become extremely important for sense of self and behavioral decision-making, while parenting processes remain central for adolescents' health and wellbeing (Brechwald & Prinstein, 2011; Dahl et al., 2018). Parents and friends are important sources of information about sex for youth (Bleakley et al., 2018; Flores & Barroso, 2017; Kamke et al., 2020; Secor-Turner et al., 2011). Discussing sexual topics with parents and friends can frame adolescents' sexual perceptions and also impact their sexual decision making. For example, communication about more "traditional" sexual health topics (e.g., condoms, HIV/STDs, pregnancy, relationships) can serve as a buffer against negative sexual health outcomes. Adolescents who talk more frequently about safer sex topics with their parents and friends are more likely to use condoms and contraceptives than teens who do not talk about these issues (Johns et al., 2018; Sutton et al., 2014; Widman et al., 2016; Widman, Choukas-Bradley, et al., 2014). Social learning theory highlights how communication with parents and friends can also serve as a critical model for adolescents' communication with relationship partners (Bandura, 1986). Of importance, sexual communication with relationship partners is associated with better sexual health outcomes (Johns et al., 2018; Rogers, 2017; Widman, Noar, et al., 2014).

Yet, despite an extensive literature on the role of parent and friend communication about traditional sexual topics (Bleakley et al., 2018; Coakley et al., 2017; Flores & Barroso, 2017; Widman et al., 2016), we currently do not know the extent to which adolescents are discussing newer, digital sexual topics with their parents and friends. To date, there are only a handful of studies that have examined adolescent communication about a single digital sexual topic, such as communication with parents about pornography (Rasmussen et al., 2015; Rothman et al., 2017; Wolak et al., 2007; Zurcher, 2017) or communication with friends about sexting (Gewirtz-Meydan et al., 2018). However, we are unaware of any work that has examined the frequency of adolescent communication with parents and friends about sexting, pornography, and starting relationships online in a way that would allow us to understand these communication patterns across topics and among both parents and friends. Further, we are aware of no studies that have explored how communication about sexting, pornography, and meeting partners may be associated with youth's own engagement in these behaviors.

Thus, to address these gaps in the prior research, we sought to answer three research questions in the current study. First, we explore the question: are adolescents discussing pornography, sexting, and starting relationships online with their parents and/or friends? Although past research has shown that parents can guide and influence adolescents' sexual behavior (Bleakley et al., 2018; Widman et al., 2016), parents are often unaware of adolescents' online behavior, including any online risk behavior (Symons et al., 2017), and therefore may be unable to provide adequate guidance and support. Peers, on the other hand, are likely to be communicating about sexual issues and play a key role in adolescents' sexual behavior, as adolescents generally consider their peers' opinions to be most important and influential during this developmental stage (Brechwald & Prinstein, 2011; van de Bongardt et al., 2015). For example, adolescents' perceptions of their peers' engagement

in sexting influence their own attitudes about sexting and intentions to send sexts (Maheux et al., 2020; Walrave et al., 2015). Further, adolescents have been shown to discuss and use pornography within their circle of friends, both of which influence their personal pornography consumption (Weber et al., 2012). Peer norms also influence adolescents' use of online dating platforms and other internet-based sexual communication (Baumgartner et al., 2011; Schreurs et al., 2020). Thus, we expect adolescents will communicate more frequently with their best friends than their parents about digital sexual topics, given the taboo nature of these topics and the fact that these are newer dimensions of sexual expression with which parents may have less experience (Vanwesenbeeck et al., 2018).

The second research question we address is: are there differences in sexual communication patterns and digital sexual behaviors by gender? Feminist scholars have argued that sociocultural factors influence the meaning of sex for girls and boys (Tolman et al., 2003) and create a sexual double standard in which boys are more rewarded for engaging in sexual behavior (Tolman, 2013; Tolman et al., 2003). Gender differences in sexual behavior are complex, as gender socialization beginning in childhood may encourage girls to engage in intimate dyadic communication and to prioritize relationship partners' needs (Rose & Rudolph, 2006; Tolman, 2013). While there is clear evidence that boys report more pornography use than girls (Peter & Valkenburg, 2016), patterns of sexting and starting relationships online are less clear by gender. A few studies have found that adolescent girls are more likely to send sexts than boys (Mitchell et al., 2012), possibly because girls report more direct and indirect pressure to send sexts than boys (Lippman & Campbell, 2014; Rice et al., 2012). Other work has found no gender difference for sending sexts but reported that adolescent boys were more likely to receive sexts than girls (Hinduja & Patchin, 2010), or no gender difference for either sending or receiving sexts (Burén & Lunde, 2018; Rice et al., 2012). Further, while it is generally found that girls engage in more sexual communication with parents and friends than boys do (Gillmore et al., 2011; Widman, Choukas-Bradley, et al., 2014), gender differences in the patterns of sexual communication about newer, digital sexuality topics have not yet been tested and will be explored in this study.

Finally, the last research question we examine is: what is the relationship between communication with parents and best friends and adolescents' own digital sexual behavior—that is, their own sexting, use of pornography, and starting relationships online? Given the paucity of studies in this area, these analyses were exploratory.

Method

Participants and Procedure

In Spring 2018, participants were recruited from a high school in the southeastern United States to take part in a sexual health intervention (Widman et al., 2020). Data for the current project come from the baseline assessment prior to intervention delivery. All 10th and 11th graders ($n=754$) were invited to participate in the study, and the final sample size was determined by the number of students and parents who

granted consent. All students were asked to return a parent permission form regardless of whether their parent gave consent for the study ($n=309$ forms returned). Among youth who returned their forms, 237 parents granted consent for the study and 226 youth agreed to participate, leaving a final sample of 226 youth (132 girls; 90 boys; 4 transgender/gender non-binary students). The age range of participants in this study was 15–18 years old, with an average age of 16.25 years ($SD=0.76$). Regarding race/ethnicity, 45.6% of participants were White, 24.3% were Black/African American, 25.2% were Hispanic/Latino, and 4.9% were another race/ethnicity. In the past year, 49.6% of participants received free or reduced-price lunch. Regarding sexual orientation, 79.2% of participants identified as heterosexual, 7.5% identified as mostly heterosexual, 5.3% identified as bisexual, 1.3% identified as mostly gay or lesbian, 1.8% identified as gay or lesbian, and 4.9% identified as unsure, questioning, or another sexual orientation. Finally, 68.6% of youth reported they had ever engaged in sexual activity, and 50.2% reported having sexual intercourse.

After parental consent and student assent were obtained, baseline data were collected using computerized surveys in a small group classroom setting. Computerized assessments have been shown to reduce social desirability biases and increase validity of self-reports when collecting sensitive data about sexual behavior among youth (Dolezal et al., 2011; Turner et al., 1998). Participants were seated with space between seats, assured that their data would remain confidential, and offered privatizing dividers to encourage honest responding. Participants were compensated \$10 for the baseline assessment. The University Institutional Review Board approved all study procedures.

Measures

Participant Characteristics Participants self-reported their gender, age, race/ethnicity, sexual orientation, and receipt of free or reduced-price lunch (a proxy for socioeconomic status). Participants also responded to two items regarding their sexual activity: one that inquired if participants had ever engaged in any sexual activity, including sexual touching, oral sex, and/or intercourse; and a second that inquired if participants had ever engaged in sexual intercourse.

Sexing Participant sexting behavior was measured with two items: (1) “In the past year, how often have you SENT a sexually explicit message (“sext”)?” and (2) “In the past year, how often have you RECEIVED a sexually explicit message (“sext”)?” Prior studies have used similar wording to address sexting behavior (Beckmeyer et al., 2019; Maheux et al., 2020). Response options were: 0 = *Never*, 1 = *1–2 times*, 2 = *A few times*, and 3 = *Many times*.

Pornography Use Pornography use was measured with the item: “In the past year, how often have you looked at pornography (“porn”)?” Response options were: 0 = *Never*, 1 = *1–2 times*, 2 = *A few times*, and 3 = *Many times*.

Online Flirting/Dating. We assessed frequency of using the internet to flirt or start a new relationship with the following question: “In the past year, how often have you used social media to flirt with people or start a new relationship?”

Response options were: 0=Never, 1=1–2 times, 2=A few times, and 3=Many times.

Sexual Communication with Parents and Best Friend We assessed the frequency that adolescents had discussed a number of sexual topics in the past year with their (a) parents or main caregiver and (b) a “best friend”. Specifically, items inquired about communication about the following topics: (1) sexting; (2) pornography; (3) using social media to flirt with people or start new relationships; (4) risk of pregnancy; (5) HIV/STDs; (6) using condoms; and (7) abstinence/waiting to have sex. Response options were: 0=Never, 1=1–2 times, 2=A few or many times.

Analysis Plan Analyses were conducted in five steps. First, due to the highly skewed nature of the digital sexual behavior and communication items (see Table 1 for descriptive statistics), items were dichotomized into a score of 0=never discussed or engaged in that behavior or 1=discussed or engaged in that behavior one or more times. Next, we conducted a series of descriptive analyses to determine the percentage of youth who had discussed each sexual topic with their parents and best friends as well as the percentage of youth who had engaged in the three digital sexual behaviors: sexting (sending or receiving), viewing pornography, and starting relationships online. Third, to determine whether the percentage of youth communicating about each topic differed across communication partners (i.e., parents versus best friend), we conducted a series of McNemar chi square tests to account for the paired nature of the data and used a Bonferroni correction to maintain a

Table 1 Technology-based sexual behavior and sexual communication about digital and traditional topics in the past year

	Engaged in Behavior <i>n</i> (%)	Communicated with:		Between group comparisons McNemar χ^2
		Parents <i>n</i> (%)	Best friend <i>n</i> (%)	
<i>Digital topics</i>				
Sexting (receiving or sending)	163 (72%) ^a	40 (18%)	87 (39%)	26.79*
Porn	128 (57%)	38 (17%)	83 (38%)	25.14*
Online flirt/date	139 (62%)	57 (25%)	134 (59%)	58.34*
<i>Across digital topics</i>				
At least one topic	200 (89%)	82 (36%)	166 (74%)	68.89*
All three topics	78 (35%)	16 (7%)	43 (19%)	12.76*
<i>Traditional topics</i>				
Risk of pregnancy	–	109 (48%)	128 (57%)	3.72
HIV/STDs	–	90 (34%)	99 (44%)	0.72
Using condoms	–	109 (48%)	141 (62%)	11.17*
Abstinence/waiting	–	124 (55%)	125 (55%)	0.00

n (%) = number and percentage who have engaged in behavior or any sexual communication on that topic in the past year

*Statistically significant difference between groups after applying Bonferroni correction (.05/8 = $p < .006$)

^a24% of youth ($n = 54$) reported receiving a sext but not sending a sext; 48% of youth ($n = 109$) reported sending and receiving a sext; no youth reported sending a sext but not receiving a sext

family-wise Type I error rate of $p < 0.05$. Fourth, we examined differences in digital sexual behaviors and communication patterns by gender, using chi square tests and a Bonferroni correction. Finally, we conducted phi correlations to examine the relationships between sexual communication and digital sexual behavior. Supplemental partial correlations were run to control for gender and sexual activity status to ensure the results were not exclusive to youth of one gender or being driven by sexually active youth.

Results

Descriptive Statistics

Table 1 details the descriptive statistics for digital sexual behavior and communication about each topic. As shown in the table, in the past year, 72% of the youth in our sample sent or received a sext, 57% viewed pornography, and 62% used social media to flirt or start a new relationship. A total of 89% of youth had engaged in at least one of these digital sexual behaviors in the past year and 35% had engaged in all three behaviors.

Research Question 1: Are Adolescents Discussing Pornography, Sexting, and Starting Relationships Online with Their Parents and/or Friends?

While digital sexual behavior was high, rates of communication about these topics were generally low—and even more so for communication with parents than best friends: only 7% of youth had discussed all three digital topics with their parents and 19% had discussed all three digital topics with their best friends in the past year. As can be seen in Table 1, communication about traditional sexual topics was more frequent. About half of youth had discussed topics such as pregnancy and abstinence with their parents and best friends.

Research Question 2: Are There Differences in Sexual Communication Patterns and Digital Sexual Behaviors by Gender?

Table 2 shows the test of gender differences in patterns of digital sexual behavior and communication about digital and traditional topics. Regarding behavior, the use of pornography was significantly more likely among boys (78%) than girls (41%). There were no gender differences in the percentage of adolescents that sexted or used social media to flirt or meet partners. Further, there were no differences in communication with parents about any of the three digital topics or four traditional topics between boys and girls. Regarding best friend communication, girls were significantly less likely than boys to discuss pornography with friends

Table 2 Test of gender differences in patterns of sexual behavior and sexual communication

	Engaged in Behavior			Communicated with Parents			Communicated with Best friend		
	Girls (n = 132)		Boys (n = 90)	Girls (n = 132)		Boys (n = 90)	Girls (n = 132)		Boys (n = 90)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	χ^2
<i>Digital topics</i>									
Sexing (sending or receiving)	96 (73)	64 (71)	0.07	29 (22)	11 (12)	3.44	48 (36)	39 (43)	1.09
Pornography	54 (41)	70 (78)	29.50*	21 (16)	17 (19)	0.36	27 (21)	54 (60)	36.11*
Online flirt/date	81 (64)	56 (62)	0.02	32 (24)	24 (27)	0.17	80 (61)	53 (59)	0.07
<i>Across digital topics</i>									
At least one topic	114 (86)	82 (91)	1.17	45 (34)	36 (40)	0.81	95 (72)	68 (76)	0.35
All three topics	35 (27)	42 (47)	9.59*	13 (10)	3 (3)	3.40	13 (10)	30 (33)	18.90*
<i>Traditional topics</i>									
Risk of pregnancy	-	-	-	63 (48)	45 (50)	.11	80 (61)	46 (51)	1.97
HIV/STDs	-	-	-	53 (40)	35 (39)	.04	62 (47)	35 (39)	1.42
Using condoms	-	-	-	59 (45)	49 (54)	2.04	83 (63)	56 (62)	0.01
Abstinence/awaiting	-	-	-	82 (62)	41 (46)	5.94	95 (72)	29 (32)	34.29*

Sample n = 222 for all analyses. Four transgender/non-binary students were removed from these gender comparisons

*Statistically significant difference between groups after applying Bonferroni correction (.05/23 = p < .002)

(21% vs 60%, respectively), and girls were significantly more likely than boys to discuss abstinence with friends (72% vs 32%, respectively).

Research Question 3: What is the Relationship Between Communication with Parents and Best Friends and Adolescents' Own Digital Sexual Behavior?

Finally, correlations were run to examine the relationship between digital sexual behavior and communication about these topics (see Table 3). Notably, the pattern of correlations between communication and behavior was stronger for best friends than parents. In fact, there were no significant associations between adolescent communication with their parents about sexting and pornography and their engagement in these behaviors, and there was a small positive correlation between communication with parents about using social media to flirt or start a new relationship and engagement in this behavior ($r=0.15$). However, moderate positive correlations were found between best friend communication and engagement in each of the three digital sexual behaviors, with youth who communicated with friends being more likely to engage in sexting ($r=0.33$), pornography use ($r=0.43$), and using social media to flirt or start a new relationship ($r=0.42$). The same pattern of correlations held when we controlled for gender and sexual activity status.

Table 3 Phi correlations: Digital sexual behaviors and sexual communication about digital topics with parents and best friends

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] Behavior: sexting	–								
[2] Behavior: pornography use	.31***	–							
[3] Behavior: online flirt/date	.27***	.24***	–						
[4] Parent com: sexting	.04	.06	.06	–					
[5] Parent com: pornography	.04	.08	.06	.57***	–				
[6] Parent com: online flirt/date	.01	.01	.15*	.35***	.31***	–			
[7] Best friend com: sexting	.33***	.18**	.27***	.21**	.18**	.15*	–		
[8] Best friend com: pornography	.15*	.43***	.13*	.06	.20**	.09	.44***	–	
[9] Best friend com: online flirt/date	.13**	.04	.42***	.03	.11	.25***	.29***	.18**	–

Sample $n=226$ for all analyses. Com=communication. The same pattern of results was found when partial correlations were conducted controlling for gender and again when controlling for sexual activity status

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

Discussion

The rise of digital technologies has created unprecedented opportunities for adolescents to explore and express their sexuality, but research has struggled to keep pace with this rapidly changing landscape. The current study examined three specific digital sexual behaviors: sexting, pornography use, and online flirting/dating, as well as adolescents' reported communication about these topics with their parents and best friends. Rates of digital sexual behaviors were notably high in this sample of middle adolescents—with nearly 90% of youth engaging in at least one digital sexual behavior in the past year. Yet, few adolescents reported openly communicating about these topics with their parents and best friends. This study adds to an emerging literature on communication about increasingly prevalent digital sexual topics.

First, findings suggest that sexting was a common digital sexual behavior among the adolescents we sampled, with 72% of youth receiving a sext and 48% of youth sending a sext in the past year alone. These rates are higher than what has been found in many older studies of adolescents (for review, see Peter & Valkenburg, 2016). This may be due to the broad definition of sexting used in the current study, yet also may be consistent with findings from a recent meta-analysis that has shown rates of sexting to be increasing over time (Madigan et al., 2018). Given the large discrepancy between the number of youth sending versus receiving a sext, it is possible that some of the sexts that were received were unwanted and/or forwarded to others without permission, a practice that is associated with increased depression, anxiety, and stress (Klettke et al., 2019). Also consistent with recent work, we found rates of sexting to be similar among boys and girls (Burén & Lunde, 2018).

Despite the common occurrence of this behavior, less than 20% of adolescents reported talking about sexting with their parents and less than 40% reported talking about sexting with their best friends. In comparison, approximately 50% of youth discussed more “traditional” sexual topics, such as pregnancy and abstinence, with their parents and best friends. Emerging norms around sexting may be complicated among adolescents. While youth may perceive sexting to be common and accepted among their peers (Maheux et al., 2020), there may still be considerable stigma around sharing and receiving sexts, especially for girls (Lippman & Campbell, 2014). These conflicting norms, along with the potential legal ramifications of sexting, may prevent youth from discussing this topic with parents and peers. At present, most sex education programs do not cover sexting, and no U.S. states specifically mandate sexting be taught as part of comprehensive sex education curriculum (Guttmacher Institute, 2021). This leaves a critical gap in the information youth are receiving about sexting. Our findings suggest there is a clear opportunity for better sex education programming around this issue.

With regard to the use of pornography, gender differences were particularly notable: 78% of boys compared to 41% of girls had viewed pornography in the past year. These findings are in line with past studies that have found clear gender differences in pornography use and acceptance, with boys and men having

more exposure and more positive attitudes toward pornography use than girls and women (Carroll et al., 2017; Peter & Valkenburg, 2016; Willoughby et al., 2018). This study adds to prior work on pornography by documenting rates of communication about this behavior, finding few youth are discussing pornography with their parents (less than 20% of boys and girls). Insofar as viewing pornography represents a common means of exploring adolescents' emerging sexualities, these conversations with parents are essential. For example, mainstream pornography frequently depicts men objectifying and perpetrating aggression against women, as well as other potentially problematic ideas about gender and consent (Fritz & Paul, 2017; Klaassen & Peter, 2015; Willis et al., 2020). Without communication with adults, adolescents may internalize these sexual scripts as representing normative human sexuality experiences (Mendoza, 2009; Rothman et al., 2015).

Findings also suggest large gender differences in rates of communication between best friends, with boys being far more likely to talk with their friends about pornography than girls (60% vs. 21%, respectively). Because so many adolescents, particularly boys, are viewing pornography and talking about it with their friends, it may be especially helpful for sex educators to address the impact of unhealthy, inaccurate, and harmful media messages as part of school sex education curricula. In this context, sex educators may be well positioned to teach the media literacy skills—critical media analysis, media deconstruction, media skepticism, etc.—that adolescents likely need to have more productive conversations and less harmful experiences utilizing pornography. Importantly, there are already effective sex education programs for adolescents that teach media and pornography literacy skills. These programs may be excellent resources for sex educators seeking to incorporate more media literacy training into their teaching (Rothman et al., 2020; Scull et al., 2014). Notably, while the majority of boys (60%) reported discussing pornography with their best friends, the content and tone of these conversations was not assessed. Future research will be needed to examine when peer communication about pornography is beneficial for teens, and when it serves to perpetuate negative messages and gender stereotypes, so as to better inform media literacy education.

A similar pattern of findings was noted for using social media to flirt or start a new relationship. Nearly 60% of the youth we sampled engaged in this behavior, but only a quarter of youth had discussed this topic with their parents. While research on adults' use of online platforms to meet romantic and sexual partners is now extensive (Anzani et al., 2018; Griffin et al., 2018; Smith & Duggan, 2013; Tomaszewska & Schuster, 2020), research on the use of online dating platforms among adolescents is extremely sparse (Lykens et al., 2019; Macapagal et al., 2018, 2021). Research is needed regarding the benefits and risks of adolescents starting new relationships online. For example, adolescents may use online platforms to flirt and seek relationships with older partners, and research is needed that evaluates the extent to which parent communication can mitigate these risks. For example, research on traditional sexual health topics suggests that monitoring and open communication may be productive avenues for encouraging safer behavior (Dittus et al., 2015; Widman et al., 2016). Thus, parents may be wise to set limits around online dating for their adolescents, monitor their online activities, and communicate with them about how they can safely use online platforms

to flirt and seek relationships. These conversations can occur with the awareness that flirting or starting new relationships online may also provide a positive avenue for sexual exploration, identity development, and overcoming barriers to meeting partners, especially for sexual and gender minority youth (Macapagal et al., 2018).

Taken together, results suggest that it is quite common for youth to engage in digital sexual behavior but rather uncommon for them to talk about these topics—especially with their parents. Only one third of youth had discussed at least one digital sexual topic with their parents, and a very small minority of youth (7%) had discussed all three topics with their parents. This suggests parents may be missing important opportunities to talk with their children about sexuality in digital spaces. Many parents avoid conversations about sex because they think their teenagers are “not ready” (e.g., Pareiera, 2016), yet in this sample, adolescents’ engagement in these behaviors was high relative to low rates of talking about them. Parents’ avoidance or reluctance to discuss these topics may reflect misunderstanding that their teens are already engaging in these behaviors. Additionally, parents may feel unprepared to have these conversations given that these new forms of sexual expression were not available when they were young. However, adolescents’ knowledge and literacy regarding these digital technologies can lead to improved outcomes if they engage in these behaviors (Vandenbosch & van Oosten, 2017), and parents could be instrumental in contributing to literacy surrounding digital sexual behaviors. While there are a number of promising interventions for parents that work to improve parent–child communication about sex (for reviews, see Akers et al., 2011; Widman et al., 2019; Wight & Fullerton, 2013), parents may benefit from future interventions that provide specific information about *digital* sexual topics and model how to discuss these topics with their children.

A final purpose of this study was to examine whether communication with parents and best friends was associated with adolescents’ digital sexual behavior—that is, their own sexting, use of pornography, and using the internet to flirt or start new relationships. This is the first study, to our knowledge, that has tested this research question. We found no significant associations between communication with parents about sexting or pornography and adolescents’ engagement in these behaviors, but moderate positive associations between communication with best friends and engagement in each of the three digital sexual behaviors we assessed. These results may come as good news to parents who worry that discussing sexual topics with their children will cause them to experiment with that behavior; to the contrary, most evidence, including the findings in this study, suggest that sexual communication between parents and adolescents either has no direct influence on sexual behavior or has a protective influence (Coakley et al., 2017; Flores & Barroso, 2017; Rasmussen et al., 2015; Widman et al., 2016). However, our findings suggest that adolescents who discussed digital sexual topics with peers were more likely to engage in these behaviors. This is consistent with prior work showing that the influence of peers is more likely to promote sexual experimentation (Maheux et al., 2020; Walrave et al., 2015) and may serve to normalize digital sexual behaviors (Gewirtz-Meydan et al., 2018; Walrave et al., 2015). However, given the cross-sectional design of this study, the possibility also remains that adolescents who

were already engaging in higher levels of digital sexual behaviors were simply more likely to discuss these topics with peers.

Limitations and Future Directions

While this study addresses a novel topic with critical relevance to adolescents' sexual health, several study limitations must be considered in interpreting results. First, this study was conducted in an area in the southeastern U.S. and rates of digital sexual expression and sexual communication about these topics may not generalize across other areas of the country or outside the U.S. Our results regarding the frequency of digital sexual communication and expression should be considered preliminary until they can be replicated in larger samples of youth. Second, most of the results are based on single-item, self-report assessments. While we took a number of steps to increase honest reporting, such as using computerized assessments and reminding participants about confidentiality, future work would benefit from expanding the assessment of digital sexual behaviors and communication to multi-item assessments and triangulating data with the reports of parents and friends. Prior work has shown that parents report more frequent sexual communication with their children than children report (Jaccard et al., 1998). Thus, it would be valuable to collect dyadic data around digital sexual topics to directly compare parent and adolescent reports. Additionally, the item designed to capture online flirting and dating was broad and could have been interpreted in many ways to capture a range of experiences, such as the use of social media to flirt with current relationship partners as well as the use of dating or hookup apps to start new relationships. Similarly, our assessment of pornography was broad and did not specify that pornography had to be viewed online. The internet has transformed pornography use and adolescents are now much more likely to consume pornography online as opposed to through traditional means (Hornor, 2020; Owens et al., 2012). There is not currently a standardized assessment tool to capture these newer forms of digital sexual behavior among adolescents, and developing such a tool will be critical for future research. Such an assessment could capture the frequency of sexual communication as well as the context and tone of these conversations.

Another limitation worth noting is that consent rates for this study were lower than in our previous school-based work (Widman et al., 2014, 2018), in part due to delays receiving school approval that restricted our recruitment time. Finally, this was a single-timepoint study which prevents the ability to assess the temporal order of communication and digital sexual behavior or to examine how communication about digital sexual topics might change across time and relationships. Future longitudinal research will be highly valuable to disentangle the directional effects of digital sexual behavior and communication about these topics.

Conclusions

The current study provides evidence that many adolescents are engaging in digital sexual behaviors. However, they are rarely discussing these newer forms of sexual expression with their parents and are discussing them only somewhat more frequently with their best friends. Adolescents are curious about sexuality and may have questions about these newer forms of digital sexual expression (Springate & Omar, 2013). So where, then, are adolescents getting information about sexting, pornography, and online dating? Perhaps from the same place where adolescents turn to answer other health-related questions—the internet (Wartella et al., 2016). While adolescents can find a vast quantity of useful sexual health information that is readily available online, so too may they encounter problematic sexual content and misinformation. Parents are needed to help adolescents navigate this complex digital terrain. As online and mobile platforms are increasingly integrated into adolescents' social, romantic, and sexual experiences, communication about these topics is essential to promote youths' healthy sexual development in the digital age.

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Availability of Data and Materials Data available from the first author with approval from the Institutional Review Board.

Declaration

Conflict of interest No conflicts of interest to declare.

Ethics Approval IRB approval was granted by the North Carolina State University IRB.

Consent to Participate All participants and legal guardians signed informed consent to participate in this study.

Consent for Publication The publisher has permission to publish this work.

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