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Sexting, substance use, and sexual risk behavior in young adults

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Abstract

Purpose—Cell phone use has become more widespread over the past decade. Young adults are frequently early adopters of new technologies, including cell phones. Most prior research examining sexting, the act of sending sexually explicit or suggestive images via text message, has focused on the legal or social consequences of this behavior. The current study focused on the public health implications of sexting by examining associations between sexting, substance use, and sexual risk behavior in youth.

Methods—Young adults (N=763) completed online questionnaires assessing demographics, cell phone use (e.g., texting, sexting), substance use, and sexual risk behaviors.

Results—Sexting was reported by a substantial minority of participants (44%). Compared to their non-sexting counterparts, participants who engaged in sexting were more likely to report recent substance use and high-risk sexual behaviors, including unprotected sex and sex with multiple partners. Of those who engaged in sexting, a considerable percentage (31.8%) reported having sex with a new partner for the first time after sexting with that person. In multivariate analyses, sexting was associated with high-risk sexual behavior after accounting for demographic factors, total texting behaviors, and substance use.

Conclusions—Results suggest that sexting is robustly associated with high-risk sexual behavior. Many individuals exchange explicit or provocative photos with long-term sexual partners, but at least some participants in this study were incurring new sexual risks subsequent to sexting. Additional research is needed to understand the contexts in which sexting occurs, motivations for sexting, and relationship of sexting to risk behavior.

Keywords

Sexting; texting; sexual behavior; substance use; young adults; technology

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Cell phone usage has increased dramatically in the United States, with over 320 million individual subscriber connections as of 2011 [1]. Americans send more than 2 trillion text messages annually and almost 30% of U.S. households use cellular telephone connections exclusively [1]. Young adults and older adolescents are especially likely to be cell phone users. Eighty-three percent of 17 year olds own cell phones and this percentage increases in young adulthood [2–3]. Text-based communication, in particular, is increasingly popular among youth. More than half of cell-owning teenagers text a friend at least daily and around one third report sending over 100 text messages per day [4]. Although cell phone usage is popular and has advantages of convenience and enhanced security, there are disadvantages as well, including accidental injuries and deaths associated with distracted driving and interference with classroom-based learning among students [5–6].

Cell phone use has the potential for other negative outcomes. In recent years, a new trend of sexualized text communication has emerged—"sexting" is typically defined as the act of sending sexually explicit or suggestive photographs via text message [7–9]. Sexting may result in adverse outcomes for those involved, including embarrassment, mental health problems, public dissemination of sexual photos, and legal consequences if the images are of underage individuals [2, 10–12]. Prevalence estimates of sexting vary considerably, depending on the population assessed, the manner in which sexting is defined, and the timing of the survey [10]. In a recent national telephone survey of Internet-using youth (ages 10–17), Mitchell and colleagues found that 2.5% of participants reported appearing in or creating sexually provocative images to be sent to others and 7.1% reported that they had received provocative images from others [10]. Older youth were more likely to engage in each behavior. In a sample of Internet-recruited adolescents and young adults, 19% of teenagers (ages 13–19) and 32% of young adults (ages 20–26) reported sending a nude or semi-nude picture or video of themselves to someone via text or e-mail [13]. In this same study, 31% of teenagers and 46% of young adults reported receiving a nude or semi-nude picture or video from someone else. In a second sample of youth (ages 14–24), 13% of females and 9% of males reported sending a nude photo or video of themselves to someone else [14]. The majority of such images appear to be exchanged between individuals who are already in a relationship, but some individuals report sending or receiving a sexual image when one of the parties was interested in initiating a relationship [2, 10, 15–16].

Most of the limited research on sexting to date examines the social and legal consequences of this behavior [17]. Less research has examined the potential health implications of sexting. Over the past dozen years, there has been increasing documentation of the role technology plays in sexual behavior. In multiple studies with diverse populations, researchers have documented that persons who seek sexual partners via the Internet show a pattern of substantially higher sexual risk behaviors. Persons seeking partners online report more total sexual partners, more unprotected sex acts, higher rates of substance use in conjunction with sexual activity, and more sexually-transmitted infections (STIs) [18–24]. Given the rapidly increasing popularity of cell phones, including the use of smart phones as web platforms, there would appear to exist a potential for cell phone technology to also play a role in sexuality, particularly in youth, the group that reports the greatest use of these devices.

Little research has examined relationships between sexting and sexual risk behavior. In one preliminary study of primarily Hispanic young women, Ferguson found that 20% of participants reported engaging in sexting [25]. In this study, sexting was associated with sex without contraception, perceived pleasure of sexual activity, and histrionic personality traits, but it was not associated with the number of sexual partners or unprotected sex with new partners. The author concluded that sexting was unrelated to most sexual risk behaviors. Although a valuable contribution, this study was limited by a relatively small (N=207) and

homogenous (all female, 96% Hispanic) sample, and a limited assessment of sexual risk behavior. The purpose of the present study was to examine relationships between sexting and a broad array of sexual risk behaviors in a larger, more diverse sample of young adults. We hypothesized that sexting would be reported by a substantial minority of participants and that sexting would be associated with sexual risk behavior. We further hypothesized that sexting would be associated with other risk behaviors such as substance use.

Methods

A brief survey was administered to students enrolled in undergraduate psychology classes at a large public university in the mid-Atlantic region of the United States. All surveys were completed anonymously online via a password-protected, secure survey system. Participants received course credit for participation. The system was set up to award credit automatically while masking participant identities from the researchers. A total of 800 participants completed the survey. Data were collected in September–December 2011. This was one of several studies available for course credit during the Fall 2011 semester. In total, 1545 individuals participated in one or more of these studies. Thus, 800 of the 1545 (51.8%) individuals who participated in research during the semester participated in this study. Four participants (0.5%) were eliminated for random or problematic responding. Because we were specifically interested in the sexting behaviors of young adults, data analyses were restricted to individuals who were 18–25 years of age (N=763), a common age range used for defining "young adults" [26–27]. Participants were told that the survey contained personal questions about the use of cell phones and other technology, substance use, and sexual behavior. All consent procedures were conducted online. All study methods and materials were approved by the Institutional Review Board of Virginia Commonwealth University.

Measures

Participants completed a self-administered anonymous survey that included questions assessing demographic information, cell phone ownership, sexting and other texting behaviors, substance use, and sexual behavior.

Demographics

Participants were asked their gender, age, year in school, race/ethnicity, grade point average (GPA), employment status, student status (full or part-time), and whether they were a member of a fraternity or sorority.

Texting and sexting

Participants reported if they owned a cell phone. Participants were also asked to estimate the number of texts they send or receive in a typical day on a 10-point ordinal scale: 0, 1–15, 16–30, 31–45, 46–60, 61–75, 76–90, 91–105, 106–120, or >120. In addition, participants were asked if they had ever engaged in sexting, which was defined as "sending or receiving sexually explicit or suggestive photos via text message." Participants were then asked to report the total number of sexual images they had sent and the total number they had received. Finally, participants were asked to indicate the total number of times they had sex with someone for the first time after they had engaged in sexting with that person.

Substance use

Participants were asked questions concerning the frequency of use of alcohol, marijuana, ecstasy, cocaine, and "other" recreational drugs in the previous three months. This measure is similar to measures employed in our previous research [27].

Sexual behavior

Participants reported their total number of male and female sexual partners over the past three months, as well as their total number of unprotected vaginal or anal sex acts in the past three months. Participants also indicated how many times they had sex after having "too much" to drink and while under the influence of drugs in the past three months. Finally, participants reported their total number of lifetime sexual partners and indicated if they had ever been diagnosed with an STI. Measures similar to these have been shown to be reliable indicators of self-reported sexual behavior and to yield cumulative indices of HIV risk that are similar to those obtained by partner-by-partner sexual behavior assessments [28–29].

Data Quality Assurances and Statistical Analyses

All records were examined for inconsistencies and invalid responses. Missing data were excluded from analyses, resulting in slightly different ns for different statistical tests. Because distributions of sexual behavior and texting were highly skewed, nonparametric analyses were used [30]. Two-tailed significance levels were used for all tests.

Results

Sample demographic information is listed in Table 1. The sample largely consisted of female and white participants. Although each college class was represented, most participants were in their freshmen or sophomore year. The overrepresentation from students in their first two years of college is likely due to the majority of participants being recruited from Introductory Psychology, a course typically taken early in the college career.

Cell Phone ownership, texting, and sexting

Most participants (99%) reported owning a cell phone and 96% reported texting in a typical day. The median number of texts sent and received per day was 46–60; 16% of participants indicated they send or receive more than 120 texts per day. Overall, 44% of participants reported engaging in sexting. There was a strong association between sending and receiving sexts, χ^2, (1, N = 733) = 411.04, p <.001, but the groups were not completely overlapping: among participants who had engaged in sexting, 62% had both received and sent at least one sexual image, 32% had received a sexual image only, and 6% had sent a sexual image only. Among those who reported sexting, the mean number of sexual images sent (lifetime) was 9.84 (SD = 55.49; Median = 3), and the mean number of sexual images received (lifetime) was 16.99 (SD = 69.63; Median = 5). Individuals with a history of sexting reported significantly more texting in a typical day (Median = 61–75) than individuals who reported no history of sexting (Median = 31–45 day), Mann-Whitney Z =6.58, p <.001.

Sexting and demographic variables

Men (43.8%) reported sexting at rates comparable to women (44.7%), χ^2 (1, N=763) = 0.063, *ns.* White participants reported significantly higher rates of sexting (50.5%) than non-white participants (37.6%), χ^2 (1, N=763) = 12.85, p <.001. Sexting was unrelated to age, year in school, GPA, employment status, full-time versus part-time student status, or fraternity/sorority membership.

Sexting and substance use

As seen in Table 2, individuals who reported sexting were significantly more likely to report recent use of several recreational drugs, including alcohol, marijuana, ecstasy, and cocaine.

Sexting and sexual risk behavior

Among the subset of participants who reported engaging in sexting (n=339), most (68.2%) reported never having sex with a new partner after sexting with them first. Among the 31.8% who reported having sex with someone for the first time after sexting with them, 48.6% reported one partner with whom this occurred, 26.2% reported two partners, 14.0% reported three partners, and 11.2% reported 4 or more partners. As seen in Table 3, individuals with a history of sexting also reported higher total rates of sexual risk behavior. Individuals who reported sexting were significantly more likely to report multiple sexual partners over the last three months, were significantly more likely to report unprotected sex in the last three months, and were significantly more likely to report sex after drinking and after using drugs in the last three months. Participants who reported sexting also reported more total sexual partners in the past three months and more total partners in their lifetimes than individuals who reported not engaging in sexting. In addition, participants who reported sexting reported more unprotected vaginal and anal sex acts over the past three months than individuals with no history of sexting. Finally, individuals who reported engaging in sexting were more likely to report a history of an STI, relative to individuals who did not report sexting.

Given prior research that suggests multiple factors influence high-risk sexual behavior, we performed two sequential (hierarchical) logistic regression analyses in order to determine the independent relationship between sexting and risk, after controlling for demographic factors, total texting behavior, and substance use, a factor previously associated with high-risk sexual practices [31–33]. The first logistic regression analysis predicted membership in one of two groups: those who reported unprotected sex in the previous three months (n=286) and those who had not (n=447). Results are shown in Table 4. Demographic variables were entered on the first step, and significantly predicted unprotected sex, relative to a constant only model, χ^2 (5, N=733) = 22.42, p < .001. Female, white, and older participants were more likely to report unprotected sex. The ordinal variable that indicated the number of texts in a typical day was entered on the second step, and significantly added to the predictive utility of the model, χ^2 (1, N=733) = 41.55, p < .001. Substance use was entered on the third step and significantly added to the prediction of unprotected sex, χ^2 (5, N=733) = 39.93, p < .001. As seen in Table 4, alcohol and marijuana use were associated with unprotected sex. Sexting was entered on the final step, and significantly increased the predictive utility of the model, χ^2 (1, N=733) = 41.22, p < .001, indicating that sexting was associated with unprotected sexual activity in the previous three months, after accounting for the influence of demographic factors, texting behavior, and substance use.

The second logistic regression analysis predicted membership in one of two groups: those who reported multiple sex partners in the previous three months (n=116) and those who reported 0 or 1 partner in the previous three months (n=619). Results are shown in Table 5. Demographic variables were entered on the first step, and did not, as a block of variables, significantly predict multiple partners, relative to a constant only model, χ^2 (5, N=735) = 7.51, p < .20. However, this step was retained as a control and to insure consistency with the first analysis. As seen in Table 5, sorority/fraternity membership was associated with a greater likelihood of having multiple partners. Texting frequency was entered on the second step, and significantly increased prediction of multiple partners, χ^2 (1, N=735) = 10.97, p < .01. Substance use was entered on the third step, and improved the prediction of multiple partners, χ^2 (5, N=735) = 30.80, p < .001. As seen in Table 5, alcohol and marijuana use were associated with having multiple sexual partners. Sexting was entered on the final step, and significantly increased the predictive utility of the model, χ^2 (1, N=735) = 18.82, p < .001, indicating that sexting was associated with having multiple sexual partners in the previous three months, after accounting for the influence of demographic factors, texting behavior, and substance use.

Receiving versus sending a sexual image via text message

To examine potential differences in receiving versus sending a sext, the analyses presented in Tables 2–5 were repeated first to compare individuals who had sent a sext versus those who had not and then to compare individuals who had received a sext versus those who had not. For sending a sext, all of the analyses showing significant differences in Tables 2–5 were also significant—individuals who had sent a sext were significantly more likely to report the use of all of the substances listed in Table 2 and to report higher rates of the sexual risk behaviors reported in Tables 3–5. For receiving a sext, most differences in substance use and sexual behavior remained significant. The only exceptions were that participants who had received a sext were not more likely to report ecstasy use than those who had not received a sext and participants who had received a sext were not more likely to report a lifetime STI than those who had not received a sext.

Discussion

Much of the literature on sexting has focused on the legal and social ramifications of this behavior [9, 11, 12]. In contrast to sexting among minors, sexting in young adults does not carry the same legal risks of possessing explicit or provocative photographs of underage individuals (i.e., potentially child pornography) but our results suggest it is associated with health-jeopardizing behaviors, including substance use, sex with multiple partners, unprotected sex, and STIs. In this study, a substantial minority of participants (44%) reported sexting and these same individuals were more than twice as likely to report multiple partners and unprotected sex. The relationship between sexting and high-risk sexual behavior remained after accounting for demographic factors, texting behavior, and substance use. Close to one third of our participants who had sexted (14% of the entire sample) reported having sex with a new partner for the first time after sexting with them. This finding suggests that sexting may be a sort of technology-mediated flirtation strategy. Prior work suggests that most explicit photo exchange occurs between long-term partners [10, 16]. Our findings suggest that some individuals who engage in sexting incur new sexual risks.

In the present study, white participants were more likely to report sexting than minority participants despite no differences in cell phone ownership or overall texting behavior. Prior work has suggested that white individuals in the United States are less likely to perceive risk in a variety of activities, relative to minority individuals [34]; it may be that white participants in the present study were less concerned about the potential adverse consequences of sexting. While it would be premature to attribute too much weight to this finding in this initial study of predominantly white young adults, future research should examine racial differences in sexting, and if differences exist, attempt to determine if differences in risk perceptions account for racial/ethnic differences in sexting. Regardless of the relationship between race and sexting, in the present study sexting was related to high-risk sexual behavior after accounting for race/ethnicity and other demographic factors.

Limitations and implications for future research

The data for this study were collected from a convenience sample of college students in the mid-Atlantic region; generalization to other populations and geographic areas may not be justified. The majority of our participants were white; future research on sexting should collect data from a variety of youth populations. Our methods relied on self-reported behavior and participants may have over or under-reported sexting, substance use, or sexual risk behaviors. In addition, the use of a cross-sectional study design prevents drawing causal conclusions concerning the association between sexting and risk behaviors.

Our findings suggest a robust association between sexting and global sexual risk behavior; however, we did not assess the specific behaviors our participants engaged in with those whom they had exchanged sexual images. In this preliminary study of the public health implications of sexting, we focused on whether participants had engaged in sexting or not. We did not assess who participants exchanged sexual images with or the context in which they were exchanged. Future research should use finer-grained assessment strategies to determine the specific contexts in which sexting occurs and the precise risk associated with sexual behavior with sexting partners. Event-level analyses in which participants provide information about the specific sexual risk behaviors they engaged in with sexting partners (especially partners they had sex with the first time after sexting) would clarify the relationship between sexting and sexual risk. Future work should also attempt to assess the nature of the relationship between individuals who exchanged sexual images (e.g., long-term partner, new acquaintance). In addition, the present initial study focused primarily on behaviors. Future research should examine motivations for engaging in sexting and attempt to identify mechanisms that may explain the relationships between sexting and risk. For example, it may be that sexting behavior establishes sexual norms that are related to risk or that underlying personality factors such as sexual sensation seeking account for both sexting and sexual risk behavior. Finally, future work should examine if engaging in sexting is associated with any positive outcomes, such as greater sexual satisfaction or increased closeness in personal relationships.

Despite these limitations, this study corroborates other work documenting sexting in young adults [13, 25] and is among the first to document associations between sexting, substance use, and high-risk sexual behavior. Researchers and clinicians that focus on the sexual health of young adults may benefit from adding questions about sexting to sexual risk assessments. Our findings also point to the critical need to regularly follow new technology trends in youth, as they continue to offer the potential to amplify risk.

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List of abbreviations

STI	Sexually-transmitted infection
HIV	Human immunodeficiency virus
GPA	Grade Point Average

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Implications and Contribution

The present study found relatively high rates of "sexting" (sending explicit photographs via text message) in young adults. Sexting was robustly associated with substance use and high-risk sexual behavior, including having multiple sexual partners, unprotected sex, and higher rates of sexually-transmitted infections.

Table 1

Sample demographic characteristics

Age:	Mean = 18.9 (SD = 1.35)
Grade Point Average:	Mean = 3.22 (SD = 0.49)
Gender:	
Male:	34% (n=258)
Female:	66% (n=505)
Race/Ethnicity:	
Caucasian/White:	52.9% (n=404)
African American/Black:	19.3% (n=147)
Asian American/Asian:	12.3% (n=94)
Latino/a:	5.6% (n=43)
Native American:	0.1% (n=1)
Other/Mixed Racial or Ethnic Heritage:	9.7% (n=74)
Year in School:	
Freshmen:	65% (n=495)
Sophomore:	20% (n=151)
Junior:	10% (n=80)
Senior:	4% (n=30)
Other:	1% (n=7)
Greek Membership:	
Member of Fraternity/Sorority:	20% (n=150)

N = 763

Table 2

Sexting and recreational drug use in the past 3 months

	Individuals reporting engaging in sexting (n=339)	Individuals NOT reporting engaging in sexting (n=424)	χ^2
Substance	**% reporting use of (n):**	**% reporting use of (n):**	
Alcohol	58.1 (n=197)	42.2 (n=179)	19.12***
Marijuana	39.5 (n=134)	24.8 (n=105)	19.04***
Ecstasy	6.8 (n=23)	3.3 (n=14)	4.93*
Cocaine	4.7 (n=16)	2.1 (n=9)	4.00*
Other recreational drugs	7.7 (n=26)	3.1 (n=13)	8.23**
Use of any illicit drug	41.0 (n=139)	25.0 (n=106)	22.09***

N = 763.

* p<.05,

** p<.01,

*** p<.001

Table 3

Sexting and sexual behavior.

	Individuals reporting engaging in sexting (n=339)	Individuals NOT reporting engaging in sexting (n=424)	χ^2
Behavior	**% reporting (n):**	**% reporting (n):**	
Multiple sexual partners, past 3 months	23.6 (n=80)	9.0 (n=38)	30.96***
Any unprotected (no condom used) vaginal or anal sex, past 3 months	56.6 (n=192)	24.9 (n=105)	80.55***
Sex after having “too much” to drink, past 3 months	33.9 (n=115)	16.7 (n=71)	30.11***
Sex after using drugs, past 3 months	18.6 (n=63)	7.5 (n=32)	21.06***
Diagnosed with sexually-transmitted infection, lifetime	4.7 (n=16)	1.4 (n=6)	7.44**
	Mean (SD)	**Mean (SD)**	Z†
Total number of sexual partners, past 3 months	1.22 (SD = 1.29)	0.79 (SD = 2.55)	10.31***
Total male partners, past 3 months	0.75 (SD = 1.03)	0.45 (SD = 1.41)	6.59**
Total female partners, past 3 months	0.47 (SD = 0.96)	0.34 (SD = 2.14)	5.55**
Total unprotected vaginal and anal sex acts, past 3 months	7.97 (SD = 16.87)	2.92 (SD = 10.99)	8.99***
Lifetime sexual partners	4.73 (SD = 7.18)	2.41 (SD = 14.81)	11.38***

N = 763.

** p<.01,

*** p<.001

† Mann-Whitney test.

Table 4

Sequential logistic regression analysis predicting unprotected sex, past 3 months

Variable and Step		OR	CI	B	S.E.	p
1.	Gender (Reference category = male)	1.60	(1.15, 2.23)	.471	.168	<.01
	Age	1.15	(1.03, 1.29)	.143	.057	<.05
	Race (Reference category = white)	0.68	(0.50, 0.92)	−.386	.156	<.05
	GPA	0.86	(0.63, 1.17)	−.156	.159	*ns*
	Fraternity/sorority membership (Reference category = non-member)	1.33	(0.91, 1.95)	.284	.195	*ns*
2.	Typical texts per day	1.20	(1.13, 1.27)	.179	.028	<.001
3.	Alcohol use	1.24	(1.06, 1.46)	.215	.082	<.01
	Marijuana use	1.32	(1.09, 1.59)	.276	.097	<.01
	Cocaine use	2.29	(0.93, 5.64)	.826	.461	*ns*
	Ecstasy use	0.87	(0.41, 1.81)	−.144	.377	*ns*
	“Other” drug use	1.41	(0.61, 3.24)	.342	.426	*ns*
4.	Sexting (Reference category = had not engaged in sexting)	2.97	(2.12, 4.16)	1.09	.171	<.001

Note. N = 733. *ns* = not significant.

Table 5

Sequential logistic regression analysis predicting multiple partners, past 3 months

Variable and Step		OR	CI	B	S.E.	p
1.	Gender (Reference category = male)	0.92	(0.61, 1.41)	−.079	.215	*ns*
	Age	0.98	(0.45, 1.14)	−.017	.077	*ns*
	Race (Reference category = white)	0.96	(0.64, 1.44)	−.038	.206	*ns*
	GPA	0.82	(0.55, 1.24)	−.194	.208	*ns*
	Fraternity/sorority membership (Reference category = non-member)	1.85	(1.17, 2.94)	.617	.235	<.01
2.	Typical texts per day	1.13	(1.05, 1.21)	.119	.036	<.01
3.	Alcohol use	1.27	(1.04, 1.55)	.236	.102	<.05
	Marijuana use	1.30	(1.03, 1.63)	.262	.114	<.05
	Cocaine use	0.94	(0.42, 2.10)	−.064	.410	*ns*
	Ecstasy use	1.96	(0.94, 4.08)	.674	.374	*ns*
	“Other” drug use	1.03	(0.41, 2.57)	.031	.466	*ns*
4.	Sexting (Reference category = had not engaged in sexting)	2.67	(1.69, 4.20)	.981	.232	<.001

Note. N = 735. *ns* = not significant.