

# Sexting and Sexual Behavior Among Middle School Students

**AUTHORS:** Eric Rice, PhD,<sup>a</sup> Jeremy Gibbs, MSW,<sup>a</sup> Hailey Winetrobe, MPH,<sup>a</sup> Harmony Rhoades, PhD,<sup>a</sup> Aaron Plant, MPH,<sup>b</sup> Jorge Montoya, PhD,<sup>b</sup> and Timothy Kordic, MA<sup>c</sup>

<sup>a</sup>*School of Social Work, University of Southern California, Los Angeles, California;* <sup>b</sup>*Sentient Research, Los Angeles, California;* and <sup>c</sup>*Los Angeles Unified School District, Los Angeles, California*

## KEY WORDS

sexting, sexual risk, middle school, adolescents, cell phone

## ABBREVIATIONS

CI—confidence interval

LAUSD—Los Angeles Unified School District

OR—odds ratio

YRBS—Youth Risk Behavior Survey

Dr Rice conceptualized the manuscript, wrote the first draft, and oversaw the creation of the final manuscript; Mr Gibbs conducted the analyses and drafted the Results section; Ms Winetrobe and Dr Rhoades assisted in creating the survey questions, drafting the manuscript, and editing the manuscript; Mr Plant and Dr Montoya helped to create the survey items and develop and write the policy implications; Mr Kordic conceptualized the overarching study and survey questions and assisted with the implications and editing of the manuscript; all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; and all authors approved the final manuscript as submitted.

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Address correspondence to Eric Rice, PhD, 1150 S Olive St, 14th floor, Los Angeles, CA 90015. E-mail: [ericr@usc.edu](mailto:ericr@usc.edu)

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**WHAT'S KNOWN ON THIS SUBJECT:** Sending and receiving sexually explicit picture and text messages (sexting) is related to sexual activity and risk behavior among some high school populations, yet little is known about sexting associations with sexual activity and risk behavior among middle school students.



**WHAT THIS STUDY ADDS:** This study is the first to examine sexting among a probability sample of middle school students and found that middle school students who text excessively and send and receive sexts are more likely to report being sexually active.

## abstract

FREE

**OBJECTIVE:** It is unknown if “sexting” (ie, sending/receiving sexually explicit cell phone text or picture messages) is associated with sexual activity and sexual risk behavior among early adolescents, as has been found for high school students. To date, no published data have examined these relationships exclusively among a probability sample of middle school students.

**METHODS:** A probability sample of 1285 students was collected alongside the 2012 Youth Risk Behavior Survey in Los Angeles middle schools. Logistic regressions assessed the correlates of sexting behavior and associations between sexting and sexual activity and risk behavior (ie, unprotected sex).

**RESULTS:** Twenty percent of students with text-capable cell phone access reported receiving a sext and 5% reported sending a sext. Students who text at least 100 times per day were more likely to report both receiving (odds ratio [OR]: 2.4) and sending (OR: 4.5) sexts and to be sexually active (OR: 4.1). Students who sent sexts (OR: 3.2) and students who received sexts (OR: 7.0) were more likely to report sexual activity. Compared with not being sexually active, excessive texting and receiving sexts were associated with both unprotected sex (ORs: 4.7 and 12.1, respectively) and with condom use (ORs: 3.7 and 5.5, respectively).

**CONCLUSIONS:** Because early sexual debut is correlated with higher rates of sexually transmitted infections and teen pregnancies, pediatricians should discuss sexting with young adolescents because this may facilitate conversations about sexually transmitted infection and pregnancy prevention. Sexting and associated risks should be considered for inclusion in middle school sex education curricula. *Pediatrics* 2014;134:e21–e28

“Sexing,” defined as the sending and receiving of sexually explicit cell phone text or photo messages, has received increasing public attention over the past several years. The sexting behavior of adolescents has received special scrutiny because of the complexity of the legal, social, emotional, and behavioral consequences of this new form of sexual expression.<sup>1–4</sup> The rates of teen sexting have varied on the basis of the sampling strategies and operational definitions of sexting used by various researchers.<sup>1,5,6</sup> The 1 national probability sample of adolescents assessing sexting reported that 4% of adolescents sent a sext and 15% received a sext.<sup>1</sup> A probability sample from the Midwest reported 17% engaged in sexting,<sup>7</sup> and a probability sample from Los Angeles County reported 15% of high school students sent a sext.<sup>8</sup> Two adolescent sexting studies that included respondents from middle schools found, unsurprisingly, that rates of sexting were lower for middle school students relative to high school students.<sup>1,7</sup> Both of these studies included middle school students and high school students together in analyses, making it difficult to understand how middle school students, who are at an earlier developmental stage, engage in sexting.

Whether sexting among early adolescents (eg, middle school students) is a health concern depends on how sexting relates to sexual behaviors more broadly. Currently, there is a debate among researchers as to the exact relationship between sexting and sexual behavior.<sup>8–13</sup> This debate has 2 related, but subtly different, foci. The first revolves around whether sexting is an alternative to physical sexual behaviors (especially among early adolescents) or whether sexting is a part of contemporary adolescent sexual behavior. The second focuses on whether sexting is a “risk” behavior or

a part of the “normal” adolescent sexual landscape.

The answers to these critical debates may lie, in part, in what age group and stage of adolescent development is being discussed. Among middle adolescents and young adults, it is clear that sexting is correlated with being sexually active.<sup>7,8,10,11,14,15</sup> It is less clear if sexting is related to other sexual risk-taking. Gordon-Messer et al<sup>11</sup> found no relationship between sexting and number of sexual partners, unprotected sex, or mental health for young adults, whereas Benotsch et al<sup>10</sup> found that young adults who sexted were more likely to report unprotected sex and multiple sex partners. Temple et al<sup>15</sup> reported an increase in unprotected sex behaviors among high school girls, but not boys. Among middle and high school students, Dake et al<sup>7</sup> reported a host of risk behaviors associated with sexting, including being forced to have sex, not using contraception at last sexual encounter, binge drinking, marijuana use, and suicide attempts, although they did not explicitly assess condom use during last sexual encounter.

Among middle school students, who are primarily in early adolescence, the research is even less conclusive, primarily because less attention has been given to this age group. Whereas Dake et al’s Midwestern data included middle school students in their analyses, the associations between sexting and sexual activity among the younger sample were not specifically examined, although they reported the unsurprising finding that younger adolescents were less likely to report sexting.<sup>7</sup> In recent work by Houck et al<sup>16</sup> in a “high-risk” population of middle school students, adolescents who sexted were more likely to report a wide range of sexual behaviors than were nonsexters. This sample, however, may not be generalizable to all middle school students,

because participants were identified by counselors, nurses, and administrators as having behavioral or emotional difficulties<sup>16</sup>; as such, it remains unclear what relationship sexting has to sexual behavior among younger students in the general population. The qualitative work of Lenhart<sup>1</sup> suggests that some adolescents perceived sexting as an alternative to physical sexual behaviors during early adolescence. As 1 participant stated, “I think it was more common in middle school, because kids are afraid to do face-to-face contact sexually.”<sup>1</sup> The relationship between sexting and sexual behavior is particularly important to look at in early adolescence, because research has clearly shown that early sexual debut is associated with involvement in delinquent activities (eg, graffiti, property damage, stealing, selling drugs),<sup>17</sup> having more sex partners, engaging in sex under the influence of drugs or alcohol,<sup>18–20</sup> inconsistently using condoms, teenage pregnancy, experiencing forced sex,<sup>19</sup> lack of perceived risk for contracting HIV, and acquisition of sexually transmitted infections.<sup>20</sup>

Access to technology may play an important role in sexting behavior. Research suggests that simply spending more time texting is associated with increased sexting.<sup>1,7</sup> Again, although middle school students were included in both studies that found this association, it is unclear how technology access affects middle school students in particular.

The purpose of this study is to understand the relationship between sexting and sexual behavior with respect to middle school students. In particular, we report on the rates of sexting (both sending and receiving sexts) among middle school students, how texting behaviors relate to sexting, and how sexting relates to sexual activity and sexual risk behavior (ie, unprotected sex) among a probability sample of middle school students in Los Angeles County.

## METHODS

A 27-item supplemental questionnaire was distributed to middle schools in the Los Angeles Unified School District (LAUSD), in conjunction with the 2012 administration of the Centers for Disease Control and Prevention's Youth Risk Behavior Survey (YRBS). Although the supplemental questionnaire was administered concurrently with the YRBS, we are unable to link the 2 because there was no identifier between the supplemental questionnaire and the YRBS itself. Aside from 4 demographic items (because the questionnaire and YRBS were not linked), the questionnaire served as a brief needs assessment of students' HIV risk behaviors and social media use. This study was approved by the LAUSD Health Education Programs Unit. Additionally, the University of Southern California Institutional Review Board granted exemption for review of the data analysis.

The YRBS in LAUSD is conducted in a 2-step process. First, middle schools within the school district are selected on the basis of a probability proportion determined by their student enrollment. Second, classes within schools are selected with equal probability. All students in grades 6 through 8 are eligible, including students in special education classes and those who have a low English-language proficiency. Of the sampled 1320 students, 1285 students completed the supplemental survey, yielding a response rate of 97.35%. Of the 1285 respondents, 99 were excluded from analysis for marking "transgender" in the sexual identity item as "jokester" responses,<sup>21</sup> 12 were excluded for providing conflicting cell phone access responses, and 1 was excluded because of a reported age of 17 years old. In total, 1173 respondents made up the sample used for the current analysis. Students' ages ranged from 10 to 15 years old. Sam-

pling weights were applied to these data on the basis of the district's race/ethnicity distribution (Fig 1).

## Measurement

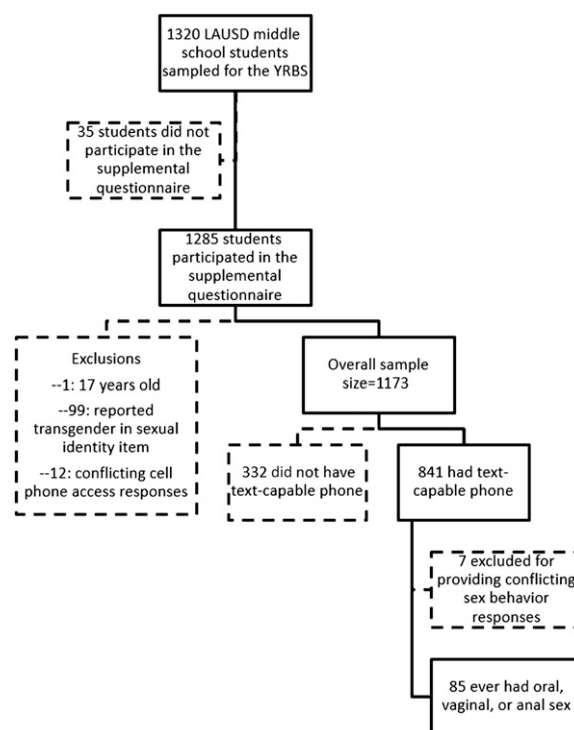
### Demographic Characteristics

Respondents were asked to report several demographic details, including gender, age, race, and sexual identity. Gender was indicated with the response "male" or "female" to the question: "What is your sex?" Respondents reported their age in the open-ended question "How old are you?" Students were also asked "what race or ethnic background do you most closely identify with?" with instructions to mark all appropriate responses; response options are listed in Table 1. For purposes of analysis, race categories were collapsed into Hispanic/Latino, white, black/African American, and other/mixed race. Participants were asked: "What do you consider your sexual orientation?" Responses included homosexual

(gay or lesbian), bisexual, heterosexual (straight), transgender, and questioning/unsure. Transgender was erroneously included in the sexual identity question rather than the gender item; as such, respondents who selected transgender in this question were excluded from analyses. These responses were then dichotomized to be lesbian, gay, bisexual, or questioning/unsure versus not (ie, heterosexual/straight).

### Mobile Technology and Sexting Behaviors

Participants were also asked to respond to questions regarding their technology access, use, and sexting behaviors. For exact item wording and response options, see Table 2. Because sexting literature is relatively new, there are no validated instruments as of yet. In a recent systematic review,<sup>22</sup> there were 2 typical strategies for assessing sexting: (1) as sexually suggestive text and/or photo content or (2) only photo content. All studies using



**FIGURE 1**  
Study flowchart.

**TABLE 1** Characteristics of LAUSD Middle School Students, Los Angeles, CA, 2012

|  | Weighted % | Unweighted <i>n</i> |
|--|------------|---------------------|
| Gender                                 |            |                     |
| Male                                   | 51.52      | 580                 |
| Female                                 | 48.48      | 581                 |
| Missing                                | —          | 12                  |
| Race/ethnicity                         |            |                     |
| American Indian/Alaska Native          | 0.43       | 17                  |
| Asian                                  | 3.45       | 56                  |
| Black/African American                 | 17.57      | 78                  |
| Hispanic/Latino                        | 60.47      | 727                 |
| Native Hawaiian/other Pacific Islander | 1.81       | 16                  |
| White                                  | 15.07      | 116                 |
| Mixed race                             | 1.29       | 84                  |
| Missing                                | —          | 79                  |
| Age                                    |            |                     |
| 10 years                               | 1.04       | 10                  |
| 11 years                               | 17.14      | 190                 |
| 12 years                               | 41.47      | 494                 |
| 13 years                               | 34.46      | 409                 |
| 14 years                               | 5.45       | 59                  |
| 15 years                               | 0.52       | 4                   |
| Missing                                | —          | 7                   |
| Sexual identity                        |            |                     |
| Homosexual (gay or lesbian)            | 1.44       | 19                  |
| Bisexual                               | 2.71       | 31                  |
| Heterosexual (straight)                | 95.67      | 1041                |
| Questioning/unsure                     | 0.09       | 1                   |
| Missing                                | —          | 81                  |

*N* = 1173.

probability-based sampling methods to date have used text and/or photo content in their definitions of sexting. Texting frequency was dichotomized to reflect “sending 100 or more texts a day” versus less. Receiving and sending sexts items were dichotomized to be “yes” or “no.”

### Sexual Behaviors

Sexual activity was assessed with a dichotomous measure: “Have you ever had sexual intercourse (vaginal, oral, or anal sex)?” Unprotected sex at last sexual encounter was determined by using the following measure: “The last time you had sexual intercourse, did you or your partner use a condom?” For analysis, this dichotomous item was restricted to those who reported being sexually active (7 individuals were excluded because of conflicting responses between the sexual activity item and unprotected sex item).

### Analysis

Logistic regression models examined the demographic, texting, and sexting behavior correlates of having ever received a sext, ever sent a sext, being sexually active, and having unprotected sex at last sexual intercourse (among those who are sexually active). All models were restricted to respondents who indicated having a text-capable cell phone (ie, those who own or can borrow a phone that can send and receive text messages). Forty-nine participants were removed from the inferential analyses (Tables 3 and 4) because of inconsistent responses to the sexual behavior items. The unprotected sex model was then further restricted to participants who reported sexual activity. Last, a multinomial logistic regression was conducted by using 3 sexual activity groups (not sexually active, sexually active and used a condom at last sexual encounter, and sexually active and engaged in un-

protected sex at last sexual encounter) with not sexually active as the contrast group. Analyses were conducted by using SPSS 21 (IBM Corporation, Armonk, NY) and SAS 9.2 (SAS Institute, Cary, NC) software.

### RESULTS

Table 1 presents demographic descriptive statistics. Study participants had a mean age of 12.3 years (range: 10 to 15 years). Boys and girls were about equally represented (51.5% boys and 48.5% girls). Although the sample was largely Hispanic/Latino (60.5%), the student population was also racially diverse, with 17.6% identifying as black/African American, 15.1% as white, and 7.0% as another race including Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native, or mixed race. The majority of respondents identified as heterosexual (95.7%).

As shown in Table 2, more than two-thirds (68.0%) of the sample owned their own cell phone and used it daily. Three-quarters (74.0%) of the sample had access to a text-capable cell phone. Thirty-nine percent of those with text-capable cell phones reported texting  $\geq 100$  times a day. Of those with a text-capable cell phone, 20.1% indicated having ever received a sext and 4.6% reported having ever sent a sext. Approximately 11% of respondents were sexually active, and of those, ~30% had unprotected sex at last sexual encounter.

Results of the multivariable logistic regression models are detailed in Table 3. As expected, sending and receiving sexts were statistically significantly associated with one another. In the multivariable models, those who reported receiving a sext were 23 times more likely to have also sent a sext (odds ratio [OR]: 22.7; 95% confidence interval [CI]: 7.9–65.2), and students who reported sending a sext were 23 times as likely to also report receiving a sext (OR: 22.8;

**TABLE 2** Cell Phone Use, Sexting Behaviors, and Sexual Behaviors of LAUSD Middle School Students, Los Angeles, CA, 2012

|   | Weighted % | Unweighted <i>n</i> |
|---|------------|---------------------|
| Pick the sentence that best describes your cell phone access  |            |                     |
| I have my own cell phone and use it every day   | 67.97      | 776                 |
| I have my own cell phone but no minutes   | 4.44       | 50                  |
| I share a cell phone with a friend  | 0.70       | 7                   |
| I don't have my own cell phone, but I can borrow one from a friend or other people  | 18.97      | 220                 |
| I don't have a cell phone and I cannot borrow one   | 8.01       | 98                  |
| Missing   | —          | 22                  |
| Pick the sentence that best describes the type of cell phone you have   |            |                     |
| On my cell phone I can surf the Web, send and receive text messages, and make calls   | 52.22      | 597                 |
| On my cell phone, I can only send and receive text messages and make calls  | 21.88      | 244                 |
| On my cell phone I can only make calls  | 1.31       | 21                  |
| I don't have a cell phone   | 24.59      | 290                 |
| Missing   | —          | 21                  |
| About how many text messages do you send in a day? (Restricted to participants with access to a text-capable phone, <i>N</i> = 841)   |            |                     |
| ≥300  | 19.28      | 160                 |
| 200–299   | 6.75       | 57                  |
| 100–199   | 13.13      | 111                 |
| 50–99   | 17.71      | 140                 |
| 25–49   | 14.46      | 122                 |
| ≤24   | 24.58      | 198                 |
| I don't send text messages  | 4.10       | 31                  |
| Missing   | —          | 22                  |
| Have you ever received a sexually explicit message or photo of someone by cell phone? (Restricted to participants with access to a text-capable phone, <i>N</i> = 841)                      |            |                     |
| Yes   | 20.10      | 156                 |
| No  | 79.90      | 675                 |
| Missing   | —          | 10                  |
| Have you ever sent a sexually explicit message or photo of yourself by cell phone? (Restricted to participants with access to a text-capable phone, <i>N</i> = 841)                         |            |                     |
| Yes   | 4.64       | 39                  |
| No  | 95.24      | 792                 |
| Missing   | —          | 10                  |
| Have you ever had sexual intercourse (vaginal, oral, or anal)? (Restricted to participants with access to a text-capable phone, <i>N</i> = 841)   |            |                     |
| Yes   | 11.10      | 85                  |
| No  | 88.30      | 699                 |
| Missing   | —          | 57                  |
| The last time you had sexual intercourse, did you or your partner use a condom? (Restricted to participants with access to a text-capable phone and who are sexually active, <i>N</i> = 85) |            |                     |
| Yes   | 61.39      | 54                  |
| No  | 29.70      | 30                  |
| Missing   | —          | 1                   |

*N* = 1173.

95% CI: 7.9–65.3). Other correlates of having received a sext included older age (OR: 1.3; 95% CI: 1.1–1.7), identifying as black/African American (OR: 1.8; 95% CI: 1.1–2.9), and sending ≥100 texts per day (OR: 2.4; 95% CI: 1.6–3.7). Statistically significant correlates of having sent

a sext included being male (OR: 4.8; 95% CI: 1.7–13.9), sending ≥100 texts per day (OR: 4.8; 95% CI: 1.7–13.9), and identifying as lesbian, gay, bisexual, or questioning/unsure (LGBQ) (OR: 9.5; 95% CI: 2.1–42.2), which was associated with 9 times the odds of having sent a sext.

Boys were significantly more likely to report being sexually active (OR: 2.6; 95% CI: 1.5–4.7), as were those who sent ≥100 texts per day (OR: 4.1; 95% CI: 2.3–7.4). Sexting behaviors were also significantly associated with being sexually active. Sexual activity was statistically significantly more likely among students who reported ever having received a sext (OR: 7.0; 95% CI: 4.0–12.1) and among those who had ever sent a sext (OR: 3.2; 95% CI: 1.3–8.1). Odds of sexual activity were decreased among white-identifying students (OR: 0.4; 95% CI: 0.1–0.98) compared with those identifying as Hispanic/Latino. We found no statistically significant correlates of unprotected sex at last sexual encounter, which may be attributed in part to a small sample size at this level of analysis (*n* = 79).

Because a small sample reported being sexually active, a multinomial model was used to compare students who engaged in sex with and without a condom at last sexual encounter versus those who were not sexually active. The multinomial model (see Table 4) revealed that boys (OR: 2.8; 95% CI: 1.4–5.5), those sending ≥100 texts per day (OR: 3.7; 95% CI: 1.9–7.2), those who had ever received a sext (OR: 5.5; 95% CI: 2.9–10.6), and those who had ever sent a sext (OR: 3.4; 95% CI: 1.3–9.3) were more likely to report using a condom at last sexual encounter versus reporting no sexual activity. The same model also indicated that those sending ≥100 texts per day (OR: 4.7; 95% CI: 1.8–12.1) and those who had ever received a sext (OR: 12.1; 95% CI: 4.8–30.3) had a higher odds of having engaged in unprotected sex at last sexual encounter versus reporting no sexual activity.

## DISCUSSION

This study is the first, to our knowledge, to examine sexting among a probability sample of middle school students. Several important findings emerged

**TABLE 3** Logistic Regressions of Sexting and Sexual Behaviors Among LAUSD Middle School Students With Text-Capable Cell Phones, Los Angeles, CA, 2012

|                                      | Received Sext ( <i>n</i> = 692) | Sent Sext ( <i>n</i> = 692) | Sexually Active ( <i>n</i> = 663) | Unprotected Sex at Last Sexual Encounter ( <i>n</i> = 79) |
|--------------------------------------|---------------------------------|-----------------------------|-----------------------------------|---|
| Age                                  | 1.34 (1.05–1.69)*               | 1.13 (0.74–1.75)            | 1.09 (0.80–1.48)                  | 0.75 (0.45–1.23)  |
| Male                                 | 1.45 (0.951–2.22)               | 4.83 (1.68–13.93)**         | 2.61 (1.46–4.66)**                | 0.77 (0.27–2.17)  |
| Race/ethnicity (Hispanic/Latino = 0) |                                 |                             |                                   |   |
| White                                | 1.25 (0.69–2.24)                | 0.979 (0.29–3.35)           | 0.36 (0.13–0.98)*                 | 0.85 (0.11–6.54)  |
| Black/African American               | 1.77 (1.07–2.93)*               | 1.38 (0.50–3.78)            | 1.78 (0.96–3.30)                  | 1.06 (0.38–2.98)  |
| Other race/ethnicity                 | 1.27 (0.56–2.89)                | 3.02 (0.68–13.46)           | 0.66 (0.19–2.23)                  | 1.61 (0.17–15.26)   |
| Sexual identity (LGBQ = 1)           | 0.69 (0.25–1.93)                | 9.45 (2.12–42.18)**         | 0.54 (0.13–2.26)                  | 0.09 (0.00–12.75)   |
| Texts per day ( $\geq 100 = 1$ )     | 2.41 (1.59–3.66)***             | 4.49 (1.67–12.10)**         | 4.13 (2.32–7.38)***               | 1.19 (0.41–3.49)  |
| Received sext (yes = 1)              | —                               | 22.77 (7.93–65.32)***       | 6.96 (3.99–12.13)***              | 2.12 (0.71–6.33)  |
| Sent sext (yes = 1)                  | 22.69 (7.90–65.17)***           | —                           | 3.22 (1.28–8.10)*                 | 0.97 (0.29–3.24)  |
| –2 Log                               | 619.71                          | 169.68                      | 374.73                            | 106.70  |
| Nagelkerke $R^2$                     | 0.22                            | 0.42                        | 0.39                              | 0.09  |

Data are ORs (95% CIs) unless otherwise indicated. \* $P < .05$ , \*\* $P < .01$ , \*\*\* $P < .001$ . LGBQ, lesbian, gay, bisexual, or questioning/unsure.

from these data with respect to sexting behaviors among middle school students. First, 20% reported receiving a sext and only 5% reported sending a sext, rates that are very similar to those reported in studies including middle school students.<sup>1,7</sup> Not surprisingly, even in a sample that only included middle school students, older students were more likely to report receiving a sext, although, it is noteworthy that age was not related to sending a sext. It is important to keep in mind that sexting is a 2-way behavior; those who sent sexts in this sample were 23 times more likely to report receiving sexts, and vice versa.

The most important findings from this study pertain to the relationship between sexting and sexual behavior among early adolescents. For middle school students in Los Angeles, who are developmentally in early adolescence, those who reported receiving a sext were 6 times more likely to report being sexually active and those who sent a sext were almost 4 times more likely to report being sexually active. As has been found consistently with young adults and high school-aged adolescents, sexting and sexual activity go hand in hand.<sup>7,8,10,11</sup> The multivariable logistic model for unprotected sex showed that among only sexually active students, those who sext were not

more likely to report unprotected sex. This result may have been partially driven by sample size, because only 85 students with text-capable cell phone access were sexually active, and the models were limited by missing data in other variables. However, the multinomial multivariable logistic regression revealed that students who receive sexts are more likely to engage in sex without a condom relative to those students who are not sexually active. It is important to note, however, that in this same model, students who send and receive sexts are also more likely to engage in sex with a condom relative to those students who are not sexually active. Thus, sex without a condom is associated with sexting behaviors, but so too is sex with a condom. In the context of middle school-aged students (mostly 11- to 13-year-olds), being sexually active (whether condom using or not) may constitute sexual risk, because findings have revealed that early sexual debut is related to delinquent and sex risk behaviors, including an increased likelihood of being forced to have sex, multiple partners, sexually transmitted infections, and teenage pregnancy.<sup>17–20</sup>

Similar to results presented by others,<sup>1,7</sup> youth who text  $\geq 100$  times per day were more than twice as likely to report receiving a sext and almost 4.5

**TABLE 4** Multinomial Logistic Regression of Sexting and Sex Behaviors Among LAUSD Middle School Students With Text-Capable Cell Phones, Los Angeles, CA, 2012

|                                      | Used Condom at Last Sexual Encounter Versus Not Sexually Active | Unprotected Sex at Last Sexual Encounter Versus Not Sexually Active |
|--------------------------------------|---|---|
| Age                                  | 1.26 (0.88–1.78)  | 0.90 (0.58–1.42)  |
| Male                                 | 2.77 (1.40–5.48)**  | 2.05 (0.85–4.97)  |
| Race/ethnicity (Hispanic/Latino = 0) |   |   |
| White                                | 0.41 (0.13–1.26)  | 0.29 (0.05–1.72)  |
| Black/African American               | 1.76 (0.87–3.55)  | 1.97 (0.79–4.91)  |
| Other race/ethnicity                 | 0.49 (0.10–2.38)  | 1.01 (0.20–5.20)  |
| Sexual identity (LGBQ = 1)           | 0.84 (0.19–3.61)  | 0.07 (0.00–8.82)  |
| Texts per day ( $\geq 100 = 1$ )     | 3.65 (1.87–7.16)***   | 4.70 (1.83–12.10)**   |
| Received sext (yes = 1)              | 5.54 (2.91–10.56)***  | 12.10 (4.84–30.29)***   |
| Sent sext (yes = 1)                  | 3.43 (1.26–9.34)*   | 3.19 (0.94–10.77)   |
| –2 Log                               | 2875.32   | —   |
| Nagelkerke $R^2$                     | 0.35  | —   |

Data are ORs (95% CIs) unless otherwise indicated.  $n = 662$ . \* $P < .05$ , \*\* $P < .01$ , \*\*\* $P < .001$ . LGBQ, lesbian, gay, bisexual, or questioning/unsure.

times more likely to report sending a sext relative to youth who text less frequently. Perhaps excessive, unlimited, or unmonitored texting among middle school students enables sexting. Moreover, those who send  $\geq 100$  texts per day were also more likely to report being sexually active, controlling for sexting behaviors. These data cannot disentangle these issues beyond associations with the volume of texting, but these associations suggest a need for more detailed research on how middle school students are engaging with one another via text messaging, and how specifically sexting behaviors relate to sexual behaviors.

There are also a few demographic trends worth noting. Relative to Latino students, African American students were more likely to report receiving sexts, and boys were more likely to report sending a sext than their female peers. Similar to previous results in high school students,<sup>8</sup> sexual minority youth were more likely to report sending a sext. Unlike high school findings, however, sexual minority youth were not more likely to report being sexually active.<sup>9</sup>

Because this was a cross-sectional study, we cannot conclude that these associations are causal. Although these data are anonymous, they are self-reported and subject to social desirability biases in both under- and overreporting of behaviors. Moreover, the sexting items did not differentiate between text- versus picture-based sexts, which may (or may not) affect sexual behaviors. We also did not delineate between types of sex (ie, oral versus vaginal versus anal sex), all of

which could have different associations with sexting and condom use. The sex behavior items included all types of sexual activity, to keep the questionnaire brief, and to match LAUSD's HIV prevention curriculum, which recommends condom use for oral, vaginal, and anal sex. Finally, although we used a probability sample of middle school students, we are limited in the generalizability of the findings in that Los Angeles is an urban area and the majority of the students identify as Hispanic/Latino; results may be different for other communities and student populations, although many other major urban centers, especially in southwestern states, have similar populations. These limitations and findings call for future research regarding sexting behaviors across geographic regions, specifications by sext format (ie, text versus photo), medium (eg, cell phone, social networking Web site, e-mail, smartphone apps, etc) and the relationship of sexting to specific sexual behaviors (ie, oral sex, vaginal sex, and anal sex). Despite these limitations, this study summons attention to the relationship between technology and sexual behaviors among early adolescents.

## CONCLUSIONS

These findings call attention to the need to train health educators on how to best communicate with young adolescents about sexting in relation to sexual behavior. Middle school sexual health curricula should incorporate sexting and its potential legal, social, emotional, and behavioral consequences. These same lessons should extend to pediatrician and

parent discussions with early adolescents. Pediatricians should ask their early adolescent patients about engaging in sexting behaviors and use this question to initiate a conversation about sexual history and motivations for choosing to initiate or delay sexual activity. (See the American Academy of Pediatrics' Committee on Psychosocial Aspects of Child and Family Health and the Committee on Adolescence statement for detailed recommendations about how to talk to early adolescent patients about sex.<sup>23</sup>) Similarly, parents should discuss abstinence, sex, condom use, and sexting with their early adolescents. The American Academy of Pediatrics states that the sexting conversation should occur as soon as the child/adolescent acquires a cell phone, and outlines several suggestions for how to bring up sexting with children. Parents should also inform their children of potential consequences of sexting and role-play ways to dismiss sexting solicitation.<sup>24</sup> Because excessive texting is associated with an increased likelihood of sending/receiving sexts, parents may wish to openly monitor their early adolescents' cell phones, check in with them about who they are communicating with, and perhaps restrict their number of texts allowed per month.

Aside from the association of sexting with sexual risk behavior, sexting may have a negative mental health impact on senders and receivers. Correlates between sexting behavior and mental health should be explored in future studies, because the potential for widespread distribution of a sext may have devastating effects on early adolescents' mental health.

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