Patterns of Sexting and Sexual Behaviors in Youth: A Latent Class Analysis

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Abstract

Introduction: A sizable minority of youth are sexting; however there are likely large individual differences in sexting and sexual behaviors, yet to be captured. A Latent Class Analysis was used to identify subgroups of youth characterized by differential engagement in sexting and sexual behaviors.

Methods: Participants were an ethnically diverse sample of 894 youth (55.8% female; Mage=17.04, SD=0.77) from a longitudinal survey study in southeast Texas. Latent classes were identified through participants' responses to the following indicator variables: sending, receiving, and requesting sexts, sexual activity, contraception use,   three partners, and substance use prior to sexual activity. Gender, ethnicity, impulsivity, and living situation were analyzed as predictors, and depressive symptoms as an outcome, of class membership.

Results: The analysis revealed four distinct classes: No sexting-Low sex (42.2%), Sexting-Low sex (4.5%), No sexting-moderately risky sex (28.3%), and Sexting-Moderately risky sex (24.9%). Gender and ethnicity predicted class membership wherein females and ethnic minority youth were less likely to be in groups displaying higher rates of sexting. Impulsivity and living situation predicted class membership, such that youth reporting higher impulsivity and living in a situation other than with two biological parents were less likely to be in classes displaying low sexting and sexual behaviors. Group membership predicted depressive symptoms.

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Conclusions: Results suggest that not all youth who are sexting are having sex, and not all youth who are having sex are sexting. Evidence of individual differences in youth sexual behaviors should inform educational initiatives aimed at teaching youth about sexual and online health.

Keywords

adolescence; sexting; sexual behaviors; substance use; depressive symptoms; latent class analysis

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Sexting, the exchange of sexual text, images, and videos via technological devices (Drouin, Coupe, & Temple, 2017), is a commonly occurring sexual behavior among youth: one in seven teens send and one in four teens receive sexts (Madigan, Ly, Rash, Van Ouytsel, & Temple, 2018). Sexting is a phenomenon that has incited speculation over the risks it may pose for youth. A meta-analysis of 23 studies (41,723 participants) found that youth who sexted were four times more likely than youth who did not sext to engage in sexual intercourse, five times more likely to have multiple sexual partners, and half as likely to use contraception (Mori, Temple, Browne, & Madigan, 2019). Evidence that sexting is both prevalent and associated with sexually risky behaviors leads to widely held presumptions that youth sexting is universally harmful (Temple, Strasburger, Zimmerman, & Madigan, 2019). However, extant research shows that sexting behaviors do not operate homogeneously across all adolescents (Bianchi, Morelli, Baiocco, & Chirumbolo, 2019a; Delevi & Weisskirch, 2013; Dir et al., 2013), suggesting that assessments of individual differences are crucial to gaining a comprehensive understanding of adolescent online sexual communication.

To date, research on youth sexting and sexual health behaviors has exclusively used variable-centered approaches, which capture broad associations between variables based on population-level data (Howard & Hoffman, 2018). Person-centered methods identify naturally occurring and mutually exclusive subgroups of individuals within a sample that display different patterns of behavior and levels of risk based on participant responses to a set of indicator variables (Choi et al., 2014). Person-centered approaches have historically been used to detect risk profiles and their psychological outcomes in adolescent populations (Jobe-Shields, Andrews, Parra, & Williams, 2015) but, to our knowledge, have not been applied to the sexting literature. Thus, using Latent Class Analysis (LCA), the current study aims to identify subgroups (i.e., latent classes) within a large sample of socio-demographically and ethnically diverse youth, to provide a more nuanced understanding of adolescent sexting, risky sexual behaviors and related depressive symptoms.

Individual Differences in Adolescent Sexual Behaviors

Sexuality has always been a part of adolescent development; however, investigations of developmental variation and complexity have typically been neglected in research on adolescent sexuality (Diamond & Savin-Williams, 2009). Fundamental theories of adolescent psychopathology highlight that the co-occurrence of multiple risk factors is more detrimental to developmental outcomes than any single risk factor (Evans, Li, & Whipple, 2013). Thus, it is critical to investigate potential risk factors, including gender, ethnicity,

impulsivity, and living circumstances, as well as sexting and sexual behaviors, in relation to each other, rather than as standalone variables.

Gender differences have been more conclusively found with respect to sexually risky behaviors (e.g., having multiple sexual partners), with males engaging in these behaviors more frequently than females (Croisant, Iaz, Rahman, & Berenson, 2013; Puente et al., 2011). With regard to sexting, while some studies have found adolescent males sext more often than females (e.g., Dir et al., 2013; Dodaj, Sesar, & Jerini , 2020); meta-analytic findings suggest similar rates of sexting among males and females (Madigan et al., 2018). Social factors may serve to exert gender-based influences on sexting behaviors, as girls have been found to report more negative expectancies of sexting (Dir et al., 2013), negative experiences of sexting (Burén, 2018) and to be the subjects of harsher social judgment if they engage in sexting behavior (Lippman & Campbell, 2014).

With regards to ethnicity, disparities have been found with regard to sexually risky behaviors, including higher prevalence of adolescent sexual activity and greater number of sexual partners among Black and non-immigrant Latinos (Carlson, McNulty, Bellair and Watts, 2014), However, results on the prevalence of adolescent sexting and ethnicity have been inconsistent. For example, Fleschler-Peskin et al., (2013) found that sexting was prevalent among Black and Hispanic youth; their reported prevalence was similar to studies utilizing mixed demographic samples (Norman, 2017). Other studies have reported relatively higher rates of sexting among racial minority youth compared to White youth (Dake et al., 2012; Houck, 2014).

A meta-analysis of 81 studies revealed a significant association between impulsivity and risky sexual behaviors among adolescents (e.g., unprotected sex and sex with multiple partners) (Dir, Coskunpinar, & Cyders, 2014); significant associations also exist between impulsivity and sexting behaviors (Gregg, Somers, Pernice, Hillman, & Kernsmith, 2018; Temple et al., 2014). Finally, familial circumstances, such as living in single parent households, have been identified as a significant correlate of sexual and sexting behavior (Bianchi et al., 2019b; Santelli et al., 2000). In sum, there is a need to understand how the abovementioned risk factors predict individual differences in sexting and sexual behavior. Thus, consistent with LCA methods, we will examine how gender, ethnicity, impulsivity and household arrangement predict latent class membership.

Adolescent Sexting, Sexual Behaviors and Mental Health

To date, the most commonly investigated correlates of youth sexting have been youth sexual behaviors; prior literature has revealed associations between adolescent sexting and risky sexual behaviors such as engaging in sexual intercourse with multiple partners, substance use prior to sexual activity, and failing to use contraception (Mori et al., 2019). While the directionality of the associations are unclear, a proposed reason as to why associations might exist has to do with the clustering of risk, such that youth who engage in certain risky behaviors may be more likely to engage in other risky behaviors (Donovan & Jessor, 1985; Jackson, Sweeting, & Haw, 2012).

In terms of mental health outcomes, previous research has also found associations between sexually risky behaviors, including having unplanned sex when using substances, lack of contraception use, having multiple sexual partners, and risk of depression (Langille, Asbridge, Kisely, & Wilson, 2012). Evidence also suggests that sexting has important psychosocial impacts for youth, with meta-analytic findings suggesting that youth sexting is associated with an increased risk of psychological distress (Mori et al., 2019). Assessing individual differences in sexting concurrently with sexually risky behaviors, may help differentiate behaviors and their associations with various mental health outcomes.

The Current Study

The primary aim of the present study was to examine individual differences with regard to sending, receiving, and asking for sexts, as well as participation in sexual activity, contraception use, number of sexual partners, and drug/alcohol use prior to sex using LCA. As we expect to find heterogeneity within the sample, such that not all youth show only high or low probabilities of engaging in sexting and risky sexual behavior, we hypothesize that individual differences in youth sexting and sexual behaviors will be represented by at least three classes, one representing youth displaying low probability of responding affirmatively to sexting and sexual behavior indicator variables, one representing youth displaying high probability of responding affirmatively to sexting and sexual behavior indicator variables, and one representing youth who display a moderate probability of responding affirmatively to sexting and sexual behavior indicator variables.

The secondary aim of this study was to assess whether gender, ethnicity, impulsivity, and youth living situation predicted latent class membership. We hypothesize that gender and ethnicity will predict class membership; however, given contradictory findings in the literature, the pattern of gender and ethnicity findings with regard to sexting class membership is unspecified. We hypothesize that higher impulsivity and non-traditional living situation will predict membership in higher sexting classes. The final aim was to determine whether certain latent classes (e.g., high sexting behaviors class) are more or less likely than other classes (e.g., low sexting behaviors class) to experience symptoms of depression. Based on prior findings, we hypothesize that groups characterized by overall higher participation in sexting and sexual risk behaviors may be associated with higher symptoms of depression.

Method

Procedure and Participants

Participant data were collected as part of a longitudinal, multi-wave study of adolescent health and risky behaviors. Participants were recruited from seven public high schools throughout southeast Texas. Initial recruitment and data collection occurred in the spring of 2010 during school hours in classes with mandated attendance (*N*=1,042; response rate=62%). Surveys were repeated annually through to 2017. Written parental consent and student assent were collected. The study was approved by the applicable institutional review board.

As relevant sexting items were not asked in Waves 1 and 2, the current LCA uses data from Wave 3. We also use Wave 3 (2012) and Wave 4 (2013) data to examine depressive symptoms as outcomes of the latent classes. Participants with data at both time points were N=894 (85.8% of original sample). At Wave 3, participants were 55.8% female (M = 17.4, SD = 0.77), in either grade 11 (71.0%) or grade 12 (24.6%), and ethnically diverse (32.0% Hispanic, 29.9% White, 26.5% African American, and 11.6% other reported ethnicity). See Table 1 for detailed participant characteristics.

Measures

Indicators of latent class membership.—Seven indicators of latent class membership were used to derive latent classes. Unless otherwise indicated, all items were assessed using a yes (score=1) or no (score=0) format.

Sexting involvement—*Sending sexts* was assessed with the following item: "In the past year, have you sent a naked picture of yourself through text, email, or things like SnapChat?" ***Receiving sexts*** was assessed with the following item: "In the past year, has anyone sent you a naked picture without you asking?" ***Asking for sexts*** was assessed with the following item: "In the past year, have you asked someone to send naked pictures of them to you?"

Sexual behavior—*Participation in sexual activity* was assessed with the following item: "Have you ever had sex (intercourse)?" ***Contraception use*** was assessed with the following item: "In the past year, what methods do you or your partner use to prevent pregnancy and/or sexually transmitted infections?" Responses indicating birth control use, condom use, or no participation in sexual activity were coded as 0. Responses exclusively indicating any other method (i.e., withdrawal/pull-out method, without indicating birth control, condom use, or no participation in sexual activity) or no method were coded as 1. ***Three or more sexual partners*** was assessed with the following item: "In the past year, about how many people have you had sex (intercourse) with?" Those who indicated sex with less than three partners, or no participation in sexual activity, were coded as 0. Those who indicated sex with three or more partners were coded as 1. The cut-off point was chosen as a conservative measure of multiple partners. ***Drug and alcohol use prior to sex*** was assessed with the following item: "In the past year, how often have you drank alcohol or used drugs before having sex (intercourse)? Response options ranged from "never" to "always". "Never" responses were coded as 0, and a "rare" to "always" responses were coded as 1.

Predictors of latent class membership.—Group differences in class membership were examined across participant sex (female, male), ethnicity (Hispanic, White, African American, Other), living condition (living with both biological parents, living without both parents), and impulsivity.

Impulsivity was assessed using a 4-item measure rated on a 5-point likert scale (*never to always*). Items included: "I have a hard time sitting still", "I start things but have a hard time finishing them", "I do things without thinking", "I need to use a lot of self-control to keep

out of trouble". Scores are summed and can range from 4–20, with higher scores indicating higher impulsivity (Cronbach's alpha = .74).

Outcomes of latent class membership.—*Depressive Symptoms* were measured with the Center for Epidemiologic Studies Depression Scale (CES-D-10) at Waves 3 and 4 (Radloff, 1977). The CES-D-10 is a 10-item measure that assesses the frequency of depressive symptoms over the past week on a 4-point scale (*rarely [less than 1 day] to most or all of the time [5–7 days]*). Scores are summed, range from 0–30, and higher scores indicate higher levels of depressive symptoms. The CES-D-10 displayed acceptable internal consistency among the present sample (Wave 3 Cronbach's alpha = 0.77; Wave 4 Cronbach's alpha = 0.71).

Data Analysis

The 3-step LCA was conducted using Mplus 7.4 (Graham, Cumsille, & Elek-Fisk, 2003). Classes were modeled based on the seven indicator variables. The model with the optimal number of classes was selected based on the Bayesian information criteria (BIC), entropy, the likelihood ratio test (LRT), and interpretability (McArthur et al., 2018; Nylund, Asparouhov, & Muthén, 2007; Nylund-Gibson & Choi, 2018). See Table 2 for descriptions of fit indices. The latent classes are analytically derived by classifying individuals into the most probable class based on their responses to a set of indicator variables. Thus, the size of the latent classes represents the percentage of participants most likely to be classified in each respective group. The item response probabilities, depicted in Figure 1, indicate the probability of answering affirmatively to each indicator variable, given membership in the respective latent class.

Predictors of class membership were examined using logistic regression with R3STEP Command in Mplus (Nylund-Gibson & Choi, 2018; Vermunt, 2010). Males, White youth, living with both parents, and low impulsivity were used as reference groups. In addition, the Wald test was employed with the BCH command in Mplus to test whether these classes would display different degrees of depressive symptoms. *P*-values were adjusted to .01 in order to account for testing of multiple contrasts.

Results

As detailed in Table 2, an LCA was performed estimating models with one through five classes. Based on the BIC and LRT, which represent the most reliable fit indices, the best fitting model revealed a 4-class solution.

Class Composition

As detailed in Figure 1, the first class, *No sexting-low sex*, consisted of adolescents who displayed a low probability of participating in sexual activity, and virtually no participation in risky sexual behaviors or sending or requesting sexts, (42.2% of the total sample; *n* = 377). The second class, *sexting-low sex*, included participants who displayed a moderate to high probability of sexting, a low probability of participating in sexual activity, and no participation in risky sexual activity (4.5%; *n* = 40). The third class, *no sexting-moderately*

risky sex, included individuals who displayed a low probability of participating in sexting, high probability for participation in sexual intercourse, and moderate probability for participating in risky sexual behavior, including sexual intercourse without contraception, following alcohol or drug use, or with multiple partners (28.3%; $n = 253$). The final class, *sexting-moderately risky sex*, included participants who displayed a moderate to high probability of participating in sexting, a high probability of sexual intercourse, and a moderate probability of engaging in risky sexual behaviors (24.9%; $n = 223$).

Class Membership as a Function of Gender, Ethnicity, Impulsivity, and Living Situation

Gender.—Females (vs. males) were less likely to be in the *sexting-low sex* class compared to both the *no sexting-low sex* class (a$OR = 0.31$, $SE = 0.13$, $p < .001$; see Table 3), and the *no sexting-moderately risky sex* class (a$OR = 0.30$, $SE = 0.13$, $p < .001$). Females were also less likely to be in the *sexting-moderately risky sex* class compared to both the *no sexting-low sex* class (a$OR = 0.45$, $SE = 0.09$, $p < .001$) and the *no sexting-moderately risky sex* class (a$OR = 0.44$, $SE = 0.11$, $p < .001$).

Ethnicity.—Hispanic (vs. White) youth were less likely to be in the *sexting-moderately risky sex* class compared to the both the *no sexting-low sex* class (a$OR = 0.41$, $SE = 0.11$, $p < .001$) and the *no sexting-moderately risky sex* class (a$OR = 0.31$, $SE = 0.11$, $p < .001$). Hispanic youth were also less likely to be in the *sexting-low sex* class compared to *no sexting-moderately risky sex* class (a$OR = 0.37$, $SE = 0.18$, $p = .001$). African American (vs. White) youth, were less likely to be in the *sexting-low sex* class compared to the *no sexting-moderately risky sex* class (a$OR = 0.39$, $SE = 0.21$, $p = .004$). Youth who identified with another minority ethnicity (vs. White youth) were less likely to be in the *sexting-low sex* class compared to both the *no sexting-low sex* class (a$OR = 0.21$, $SE = 0.19$, $p <. 001$) and the *no sexting-moderately risky sex* class (a$OR = 0.21$, $SE = 0.19$, $p <. 001$). They were also less likely to be in the *sexting-moderately risky sex* class compared to both the *no sexting-low sex* class (a$OR = 0.35$, $SE = 0.12$, $p <. 001$) and the *no sexting-moderately risky sex* class (a$OR = 0.34$, $SE = 0.15$, $p <. 001$).

Living Situation.—Youth who were living with a step-parent, a single parent, grandparents, or other caregivers (vs. youth living in a two-parent household with their biological parents) were less likely to be in the *no sexting-low sex* class compared to both the *no sexting-moderately risky sex* class (a$OR = .60$, $SE = .14$, $p = .005$) and the *sexting-moderately risky sex* class (a$OR = .47$, $SE = .10$, $p < .001$).

Impulsivity.—Adolescents who scored higher on a measure of impulsivity were more likely than adolescents with lower impulsivity scores to be in the *sexting-moderately risky sex* class compared to the *no sexting-low sex* class (a$OR = 1.67$, $SE = .20$, $p = .001$).

Depressive Symptoms as an Outcome of Class Membership

Comparisons between classes were conducted based on depressive symptom scores measured at Wave 3, and again based on depressive symptom scores measured one year later, at Wave 4. Figure 2 displays a significant difference between the *no sexting-low sex* class and the *sexting-moderately risky sex* class at Wave 3 ($X^2 (1) = 8.16$, $p = .004$).

Specifically, the *no sexting-low sex* class reported significantly fewer depressive symptoms ($M = 18.10$, $SE = 0.30$) than the *sexting-moderately risky sex* class ($M = 19.55$, $SE = .42$). After correcting for multiple contrasts, no significant differences in depressive symptoms were found between classes at Wave 4.

Discussion

While person-centered approaches have been used to detect risk profiles and their psychological outcomes in adolescent populations (Jobe-Shields et al., 2015), to our knowledge, this is the first study to employ a person-centered approach to detect adolescent sexting profiles and their relation to depressive symptoms. The resulting four latent classes, as well as predictors and outcomes of these classes, followed by study limitations and implications, are described below.

Almost half of youth in the sample (42.2%) were members of the low-risk class, characterized by low participation in sexting and sexual activity, and displayed an absence of risky sexual behaviors. Thus, while sexting and participation in risky behavior is not uncommon among youth, it is also not ubiquitous. The alarm-fueled messaging surrounding adolescent sexting can be tempered by the knowledge that the associations found between sexting and risk factors are not universally applicable to all youth, given that distinct variations in risk-taking exist within adolescent populations.

A quarter of the sample (24.9%) represented a subgroup of youth characterized by higher probabilities of sexting and sexual activity, and higher probabilities of sexually risky behavior. Thus, it is possible that risky sexual behaviors cluster together; if a youth is engaging in one risky sexual behavior, they may be more likely to participate in other risky behaviors (Jessor, 1991). Accordingly, despite considerable heterogeneity within a population of youth, this group characterized by sexting and moderately risky sex, may be driving the majority of associations found between adolescent sexting and risky sexual behavior.

A third identified class comprising 28% of adolescent participants represent a group who reported sexual activity, as well as sexually risky behavior, but reported low levels of participation in sexting. One possibility is that some youth may intentionally abstain from sending sexual images over technological devices for fear of repercussions, even if they are not abstaining from in-person sexual activity. Youth are generally aware that negative consequences, such as reputational damages, bullying, punishment, and legal ramifications could result from sexting (Cooper, Quayle, Jonsson, & Svedin, 2016; Jørgensen, Weckesser, Turner, & Wade, 2019).

Finally, the results of the current study demonstrate that a subgroup of youth (4.5%) are sexting without engaging in sexual activity. Importantly, this group of youth displayed the highest probability of *requesting* sexts. The observed pattern of sexting and sexual behavior within this latent class aligns with results of a longitudinal study conducted by Temple and Choi (2014), which differentiated between requesting sexts (i.e., passive sexting) and sending sexts (i.e., active sexting). They found that passive rather than active sexting was

weakly associated with engaging in sexual activity one year later. Thus, while sexting has been found to be linked with sexual activity, this finding may apply mainly to sending, as opposed to other types of sexting. Additional motivations for requesting sexts may be considered in light of Bianchi et al.'s (2019a) findings that the most common motivations for sexting were sexual motivations, followed by body image reinforcement and instrumental/aggravated reasons

Predictors and Outcomes of Latent Classes

With respect to gender, we found that females were overall less likely to be members of classes characterized by higher probability of sexting, regardless of their participation in sexual activity. This is in contrast to research suggesting no prominent gender differences in the prevalence of, or risks associated with, sexting (Madigan et al., 2018; Mori et al., 2019). However, gendered cultural messaging may exert an influence on the rate at which females participate in sexting, or their willingness to self-report sexting behaviors, as research has shown that females experience more shame and negative social repercussions in relation to sexting (Cooper et al., 2016; Lippman & Campbell, 2014).

When assessing ethnicity as a predictor, our results indicate that, compared to White youth, Hispanic, African American, and other minority youth were less likely to be members of groups characterized by higher participation in sexting. It is difficult to discern whether ethnicity, or other factors found to be related to ethnic and cultural identity, such as socioeconomic status (Stevens, Gilliard-Matthews, Dunaev, Woods, & Brawner, 2017), geographical location, or culture-based values (Baumgartner, Sumter, Peter, Valkenburg, & Livingstone, 2014; Meston & Ahrold, 2010) may be driving this pattern of findings. Findings from Gewirtz-Meydan, Mitchell, and Rothman (2018) provide one potential explanation for the differences found in the present study. Specifically, results of their analysis revealed that Black youth were more likely to think sexting would result in punitive consequences by police authorities. Given that messages on sexting are often relayed to youth via police officers, it is important to consider how such tactics may differentially impact groups of youth who, historically and currently, may feel unprotected and unsafe around such institutional figures (Stewart, Baumer, Brunson, & Simons, 2009). Future research should be devoted to furthering understanding of cultural influences on both sexual and digital behaviors in order to elucidate mechanisms behind the ethnicity findings herein.

Present findings indicate teenagers with higher impulsivity were more likely to be members of latent classes that engaged in sexting behaviors and displayed higher levels of sexually risky behaviors. These results support previous findings, which link impulsivity to adolescent sexting behaviors (Gregg et al., 2018; Temple et al., 2014). Interpreting the latent classes provides further insight, as we can assess impulsivity as a predictor not only of sexting behaviors, but of sexting and sexual behavior concurrently. Given this interpretative scope, results indicate that impulsivity is a predictor for both in-person and digital sexual behaviors.

Results showed that, compared to teenagers who lived in a traditional two-parent household, teenagers who lived without both parents (e.g., with a step parent, single parent, grandparents), were less likely to be members of the latent class that displayed no sexting

behaviors, and that displayed low engagement in risky sexual behaviors. This was in comparison to classes that displayed both sexting and moderately risky sexual behaviors. As there would have been a higher proportion of youth with single parents in the comparison group, an explanation for these findings is that decreased supervision in households with fewer parental figures could result in more opportunity for in-person and digital sexual encounters among youth (Harris et al., 2006).

Symptoms of depression were significantly higher among youth who occupied the class characterized by higher probability of sexting and sexual activity; however, this was only in comparison to the no sexting-low sex latent class. This could again indicate a clustering of risk such that youth engaging in a range of potentially risky behaviors such as sexting and sexual activity are more likely to experience mental health difficulties, or vice versa. This is in line with previous research that shows associations between various sexual behaviors and depressive symptoms among youth (Langille et al., 2012; Mori et al., 2019; Ybarra & Mitchell, 2014). No differences were observed between the sexting-low sex class and either of the no sexting classes, indicating that symptoms of depression are present or more pronounced when considering a range of risky sexual behaviors, rather than only when observing sexting behavior in isolation. Thus, sexting may be best conceptualized as a relatively normative sexual behavior that may incur risk in context, rather than an inherently risky sexual behavior.

Assessing depressive symptoms one year later revealed no significant differences between classes. Importantly, this provides some evidence that risk profiles are not stagnant, and youth may transition between classes, as was seen in Yu, Putnick, Hendricks, & Bornstein's (2017) longitudinal study of health-risk behavior profiles. Current results may suggest that, while depressive symptoms may be significantly different between classes showing the highest and lowest probabilities of participating in sexting and sexually risky behaviors, individuals' memberships in these classes may be mutable.

As sexting and depression displayed a concurrent, but not long-term association, one proposed explanation of this temporal finding may be the association between impaired decision-making as a result of being in a depressive state, and sexual risk taking behaviors (Wilson, Asbridge, Kisely & Langille, 2010), as well as findings linking depression and smartphone use, suggesting individuals may use their smartphones as an emotion regulation strategy (Elhai, Dvorak, Levine, & Hall, 2017). Popularity emerged as a variable in a study conducted by Alonso and Romero (2019), which found that higher rates of sexting were associated with *decreased* victimization one year later; thus, popularity gained as a result of sexting was proposed to mediate the association between sexting and victimization, with victimization being a common correlate of depressive symptoms among youth (Klomek et al., 2019). These results emphasize the need for additional longitudinal and person-centered research to understand the causal and enduring impacts of sexting on depressive symptoms and mental health.

Limitations

The following limitations should be considered. First, while our sample was ethnically diverse, participants were recruited across the same region in Texas. Moreover, the mean age

of the sample was 17 years, and older adolescents tend to participate in more sexting relative to younger adolescents (Madigan et al., 2018). Thus, conducting similar analyses with other regional populations and age groups are recommended. Second, the years of data collection were 2012–2013, and use and accessibility to technological devices have changed rapidly over the last decade. That said, the prevalence of sexting found herein are consistent with meta-analytic estimates of youth sexting across the full body of research (Madigan et al., 2018).

Measures of sexting and sexual behavior were based on self-report, which may lead to underestimates of these behaviors. Sexting was also measured as the sending or receiving of images, and did not include content other than images (i.e., text only messages or videos). However, sexual images are perhaps the most relevant defining feature of adolescent sexting, as the exchange of images, as opposed to messages or videos, is a definitional constant, whereas text only or video messages are more often excluded from the definition of sexting (Madigan, et al., 2018; Mori et al., 2019). Furthermore, sexually suggestive or explicit images are more often implicated in legal cases of adolescent sexting (Strasburger, Zimmerman, Temple, & Madigan, 2019; Wolak, Finkelhor, & Mitchell, 2012). Nonetheless, future research should measure and differentiate between the contents of sexts.

Our measure of receiving sexts was limited to asking about unwanted sexual images; thus, the number of participants endorsing this item may be an underestimate, as participants who only received sexts consensually may not have endorsed this item. Latent class labels of "sexting" and "no-sexting" may therefore be more representative of active (sending) sexts than passive (receiving) sexts. Our measure of sexual activity was also assessed as a lifetime variable, whereas other sexual behavior variables were measured as past-year variables. Finally, our measure of sexual behavior asked about engaging in sex (intercourse). Different interpretations of what sexual intercourse entails may have resulted in a broader range of sexual behaviors being included in this measurement.

Conclusion

The broader field of youth sexuality research has recently begun recognizing the importance of utilizing integrated frameworks to examine variation and individual differences in adolescent sexual development (Boislard, Van De Bongardt, & Blais, 2016; Cicchetti & Rogosch, 1996; Diamond & Savin-Williams, 2009). In keeping pace with this literature, the present study evidences distinct profiles based on indicator variables representing sexting, sexual behaviors, and risk behaviors among youth, and contributes to an understanding of cumulative risk factors in adolescent sexting and sexual behavior by supporting the theory that risk behaviors may cluster together. In response to current gaps in the literature, future research on youth sexting should continue to recognize the diverse and complex nature of adolescent sexual development and communication, by assessing sexting in relation to broader sexual and relational development using person-centered approaches (Boislard et al., 2016; McGuire & Barber, 2010).

Practically speaking, comprehensive education, which considers natural variations and individual differences in youth sexual behaviors, could be considered given the current findings that a sizeable percentage of youth appear to be abstaining from sexting while still

engaging in sexually risky behavior and that, overall, more youth are having sex than are sexting (Ethier, Kann, & McManus, 2018). To date, the dominant messaging relayed to adolescents through sexting-prevention campaigns is harm-oriented, utilizing scare scenarios to emphasize the risks and illegality of sexting while promoting abstinence-only warnings (Döring, 2014). While young people may be heeding cautionary messages around sexting, researchers have recommended questioning the validity, relevance, and value-orientation of dominant campaign messages aimed at preventing youth sexting (Patchin & Hinduja, 2020). A proposed alternative has been to implement comprehensive educational initiatives that encompass both sexual health and digital citizenship, which includes safe, ethical, and respectful online conduct.

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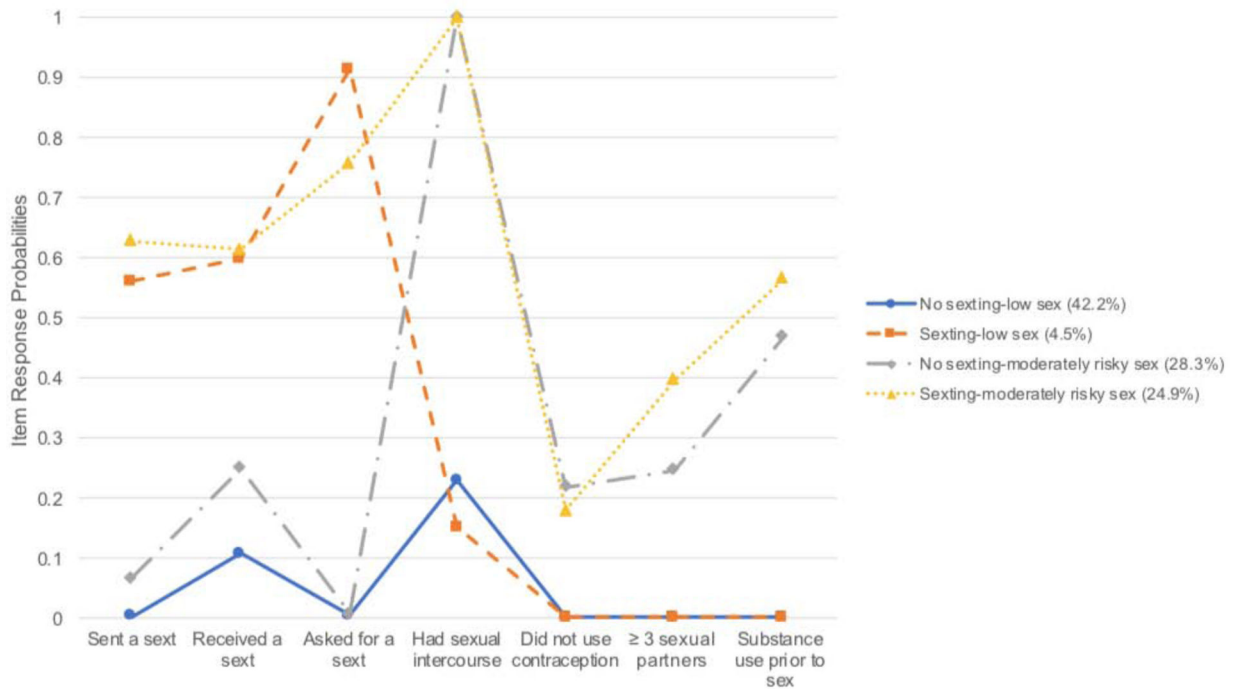**Fig. 1.**

Class compositions for the 4-class model. *No sexting-low sex* class: 42.2% ($n = 377$) of the sample; *sexting-low sex* class: 4.5% ($n = 40$); *no sexting-moderately risky sex* class: 28.3% ($n = 253$); *sexting-moderately risky sex* class: 24.9% ($n = 223$)
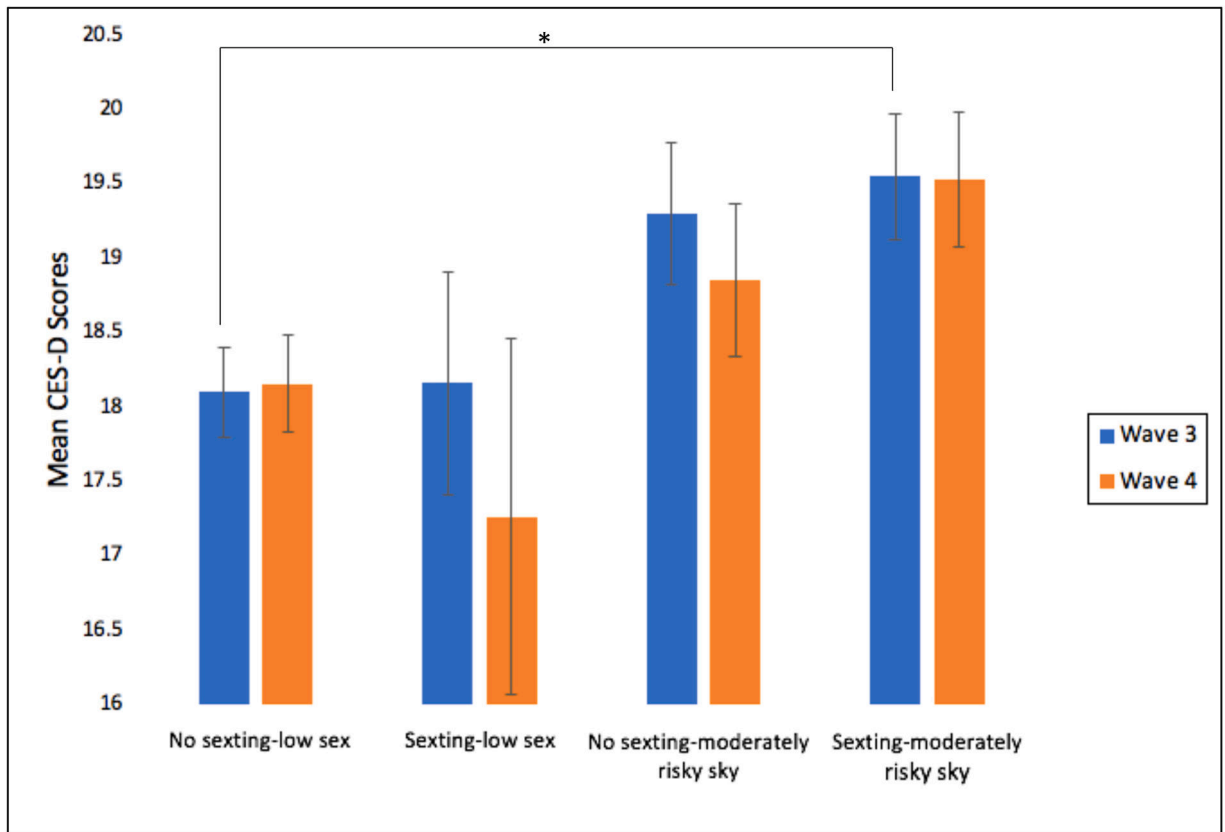
Fig. 2.
Mean CES-D scores for participants in each latent class at Waves 3 and 4. Error bars represent standard errors.

Table 1

Information of the Sample at Wave 3

Sample Demographics (Age: M = 17.04; SD = 0.77)	N	%
Gender		
Female	499	55.82
Male	395	44.18
Ethnicity		
Hispanic	286	31.99
White (White)	267	29.87
African American	237	26.51
Other	104	11.63
Grade		
10	8	0.89
11	635	71.03
12	220	24.61
Other	31	3.47
Living Situation		
Both parents	415	46.42
One parent and one step-parent	158	17.67
Mother or Father	240	26.85
Grandparents and others	81	9.06

Table 2

Fit Indices for Class Model Solutions

Class (*N = 894*)	Log likelihood	AIC	BIC[a]	Adj BIC	LRT[b]	Entropy[c]	*p*-value
1	−3265.46	6544.93	6578.50	6556.27	-	-	-
2	−2858.96	5747.92	5819.85	5772.22	798.33	0.80	<.001
3	−2765.94	5577.87	5688.17	5615.13	182.68	0.77	<.001
4	−2727.33	5516.65	5665.32	5566.87	75.83	0.80	<.001
5	−2715.76	5509.51	5696.55	5572.69	22.72	0.75	0.18

[a]BIC = Bayesian Information Criterion; the class with the lower BIC indicates a better fit; the BIC and LRT are the most reliable fit indices (McArthur et al., 2018; Nylund et al., 2007) and were used to guide class enumeration.

[b]LRT= Likelihood Ratio Test; the LRT compares the fit of the model *k* classes to the model with *k-1* classes. A non-significant *p*-value for the *k* class solution indicates that the *k-1* class solution is a better fit (Nylund-Gibson & Choi, 2018).

[c]Entropy was used to assess class differentiation; entropy values of > .80 are deemed to represent good class differentiation (Nylund-Gibson & Choi, 2018).

Table 3

Adjusted Odds Ratios and Standard Errors for Sex and Ethnicity

Class membership	Reference class							
	1		**2**		**3**		**4**	
	aOR	*SE*	aOR	*SE*	aOR	*SE*	aOR	*SE*
Female								
1. no sexting-low sex	-	-	3.23	1.34	0.97	.23	2.23 [*]	.45
2. sexting-low sex	.31 [**]	.13	-	-	.30 [**]	.13	.69	.30
3. no sexting-moderately risky sex	1.03	.25	3.32	1.42	-	-	2.29	.60
4. sexting-moderately risky sex	.45 [**]	.09	1.45	.62	.44 [**]	.11	-	-
Hispanic								
1. no sexting-low sex	-	-	2.03	.95	.76	.23	2.44	.64
2. sexting-low sex	.49	.23	-	-	.37 [**]	.18	1.20	.60
3. no sexting-moderately risky sex	1.32	.40	2.68	1.32	-	-	3.22	1.10
4. sexting-moderately risky sex	.41 [**]	.11	.83	.42	.31 [**]	.11	-	-
African American								
1. no sexting-low sex	-	-	2.23	1.13	.88	.30	1.44	.38
2. sexting-low sex	.45	.23	-	-	.39 [*]	.21	.65	.34
3. no sexting-moderately risky sex	1.14	.39	2.54	1.36	-	-	1.65	.58
4. sexting-moderately risky sex	.69	.18	1.54	.80	.61	.21	-	-
Other								
1. no sexting-low sex	-	-	4.69	4.24	.98	.38	2.87	.98
2. sexting-low sex	.21 [**]	.19	-	-	.21 [**]	.19	.61	.56
3. no sexting-moderately risky sex	1.03	.40	4.81	4.43	-	-	2.94	1.30
4. sexting-moderately risky sex	.35 [**]	.12	1.64	1.51	.34 [**]	.15	-	-
High Impulsivity								
1. no sexting-low sex	-	-	.95	.22	.81	.11	.60 [**]	.07
2. sexting-low sex	1.05	.24	-	-	.85	.21	.63	.15
3. no sexting-moderately risky sex	1.23	.71	1.18	.29	-	-	.74	.12
4. sexting-moderately risky sex	1.67 [**]	.20	1.59	.39	1.35	.22	-	-
Living without both parents								
1. no sexting-low sex	-	-	.57	.22	.60 [*]	.14	47 [**]	.10
2. sexting-low sex	1.76	.69	-	-	1.06	.43	.82	.34
3. no sexting-moderately risky sex	1.66	.39	.94	.38	-	-	.77	.21
4. sexting-moderately risky sex	2.15	.46	1.22	.50	1.30	.35	-	-

Note.

[*] *p* < .01.

[**] *p* .001.