

Depressive Symptoms as a Longitudinal Predictor of Sexual Risk Behaviors Among African-American Adolescents

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Objective: Understanding individual level factors associated with sexual risk behaviors among African-American adolescents remains an important public health priority. The current secondary data analysis examined the longitudinal association between a baseline assessment of depressive symptoms and sexual risk behaviors reported 6 months later; the purpose was to determine whether the association of depressive symptoms to risky sex varies as a function of gender. A secondary aim was to examine self-efficacy for sex refusal and condom use assessed at a 3-month follow-up as mediators of the depressive symptoms–sexual risk relationship. **Methods:** The sample consisted of 782 sexually active African-American adolescents ($M_{\text{age}} = 15.3$ years, $SD = 1.08$; 54% female) recruited to participate in a sexual health intervention trial. Data analyses focused on vaginal sex, and outcomes included: (a) sexual activity with 2 or more partners in the previous 3 months; (b) the relative frequency of condom use in the previous 3 months; (c) noncondom use at last occasion of sex; and (d) positive sexually transmitted infection (STI) screening. **Results:** Depressive symptoms predicted sex with 2 more partners for female participants, but no other risk markers for the sample as a whole. However, there was a significant indirect effect of depressive symptoms on condomless sex via decreased condom use self-efficacy for both male and female adolescents. **Conclusions:** These findings have important implications for HIV/STI prevention, in which behavioral interventions may benefit from modules that include a focus on the influence of mood on self-efficacy for safer sex practices.

Keywords: depressive symptoms, sexual risk, self-efficacy, African-American adolescents

African Americans account for nearly 60% of all new HIV infections occurring among adolescents and young adults (aged 13–24 years) living in the United States (Centers for Disease Control & Prevention, 2016). African-American adolescents are also at elevated risk for other sexually transmitted infections (STIs); rates of chla-

mydia, gonorrhea, and syphilis are 5–10 times more prevalent among African Americans compared with their Caucasian counterparts (Centers for Disease Control & Prevention, 2017). Sexual health disparities are attributed, in part, to less access and utilization of HIV/STI prevention and care services (Levy et al., 2004; Parrish & Kent,

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2008). Nonetheless, approximately half of African-American adolescents report sexual activity, exceeding the rate for the general population of youth in high school, while also reporting lower rates of condom protected sex (Kann et al., 2018). Thus, HIV/STI prevention intervention development tailored to African-American adolescents remains a critical area of study.

Behavioral interventions based in Social Cognitive Theory (SCT) have been successful in improving condom use and reducing HIV/STI incidence (Protogerou & Johnson, 2014). According to SCT, an individual must have the behavioral skills (e.g., correct condom use) as well as a sense of self-efficacy (i.e., judgment of one's capacity to perform the behavior successfully) to optimize behavioral health outcomes. Whereas interventions have previously focused on improving self-efficacy through learning and mastery of the identified skill, psychological states are also critical. That is, improving emotional states may ensure that a person is emotionally stable and cognitively engaged prior to attempting a new behavior, which may enhance the likelihood of more successful outcomes (Bandura, 1986).

Consistent with SCT, depressive symptoms have the potential to undermine safer sex behaviors via decrements in self-efficacy among African-American adolescents. Indeed, depressive symptoms may be more prevalent among African-American adolescents and linked to experiences and perceptions of racial discrimination (English, Lambert, & Ialongo, 2014; Seaton & Douglass, 2014) with the population also reporting less engagement in mental health treatment (Olfson, Druss, & Marcus, 2015). Furthermore, there is evidence that depressive symptoms are positively associated with perceived difficulty of, and lower self-efficacy for, safer sex practices among African-American adolescents (Seth, Raiji, DiClemente, Wingood, & Rose, 2009; Wade, Harper, & Bauermeister, 2018) and with sexual risk behaviors among adolescents (e.g., Brawner et al., 2017; Elkington, Bauermeister, & Zimmerman, 2010) and adults (e.g., Coyle et al., 2019; Millar, Starks, Grov, & Parsons, 2017; Miltz et al., 2017). Finally, there is empirical evidence of a positive association between measures of self-efficacy with sex refusal and consistent condom use behaviors in both domestic and international samples of Black/African-American adolescents (Closson et al., 2018; Crosby, 2017; Voisin, Hotton, Tan, & DiClemente, 2013) and adults (Nehl, Klein, Sterk, & Elifson, 2016). However, the majority of studies focus on cross-sectional associations with adult populations.

Only five studies have used a prospective design to explore depressive symptoms as a predictor of sexual risk behaviors among African-American adolescents, and most studies focus on comparing female adolescents with and without depressive symptoms. For instance, DiClemente et al. (2001) found that African-American female adolescents reporting depressive symptoms were more likely to report condomless sex in the past month, fear of the negative consequences associated with condom negotiation, and more perceived barriers to condom-protected sex 6 months later ($N = 522$). Similarly, Seth et al. (2011) reported that African-American female adolescents with depressive symptoms at baseline reported greater incidence of noncondom use at last sex and multiple sexual partners at the 6-month follow-up ($N = 715$). However, a subsequent report with the same participants found that baseline depressive symptoms were not predictive of any instances of noncondom use at the 12-month follow-up (Voisin et al. (2013). Finally, Jackson, Seth, DiClemente, and Lin (2015) reported that both depressive symptoms and substance use (alcohol, marijuana, or ecstasy) were independently predictive of

noncondom use at last sex over the 36-month follow-up period ($N = 701$).

Only one study to date has included both male and female adolescents to examine the association between depressive symptoms and sexual risk behaviors (Brown et al. (2006). At a baseline assessment, males reporting high levels of depressive symptoms were also more likely to report noncondom use at last sex compared with males with few depressive symptoms. Risk did not vary as a function of depressive symptoms among female participants. In contrast, longitudinal analyses confirmed that baseline depressive symptoms were associated with noncondom use at last sex at the 6-month follow-up among both male and female participants ($N = 415$). The authors did not examine gender as a moderator of the longitudinal association of depression to sexual risk, despite the emergence of gender differences in the cross-sectional analysis of baseline data.

In summary, empirical evidence points to significant associations among depressive symptoms, self-efficacy, and sexual risk behaviors but the literature on African-American adolescents has focused almost exclusively on females. Past research has provided little consideration for gender differences in the relationship between mood and sexual risk taking. Furthermore, few studies include other indices of sexual health risks apart from condom use, such as the occurrence of multiple and/or concurrent sexual partners (e.g., Aral, 2010). Finally, in the literature, there has been no formal testing of potential explanatory variables (i.e., mediators) that may help to clarify how depressive symptoms lead to sexual risk via decrements in self-efficacy among African-American adolescents.

This secondary analysis of data from a randomized clinical trial sought to clarify the longitudinal association of depressive symptoms to sexual risk behaviors and determine whether the association of depressive symptoms to risky sex varied as a function of gender in a large sample of African-American adolescents. We hypothesized that baseline depressive symptoms would predict sexual risk behaviors (i.e., having two or more vaginal sex partners, less frequent condom use during vaginal sex, and noncondom use at the most recent episode of vaginal sex) and a positive STI screen 6 months later. This study extends the literature by examining if self-efficacy (i.e., one's confidence in his or her ability to master a specific skill) would mediate the depressive symptoms-sexual risk relationship. We hypothesized that sex refusal self-efficacy would mediate the longitudinal association between depressive symptoms and sex with two or more partners, whereas condom use self-efficacy would mediate its association with condomless sex and positive STI screening.

Method

Participants

Participants were African-American adolescents recruited to participate in Project iMPPACS,¹ a study that examined the impact of a mass media and small group intervention for HIV/STI risk prevention (Hennessy et al., 2013; Romer et al., 2009). The study was conducted in the United States in two matched northeast cities (Providence, Rhode Island, and Syracuse, New York) and two matched southeast cities (Columbia, South Carolina, and Macon,

¹ An acronym developed for "in Macon, Philadelphia, Providence, Atlanta, Columbia and Syracuse."

Georgia). Youth were eligible if they identified as African American and were aged 14–17 years at the time of recruitment (sample $M = 15$, $SD = 1.05$). We oversampled adolescent girls, who were expected to have higher rates of STIs, which yielded 945 female respondents (60%). The majority of participants (94%) reported that they were living in their family's home or apartment, most often with their mother (85%) and less frequently with their father (23%) or both parents (20%). Most participants (71%) qualified for a free or reduced-price lunch at school; 75% reported that they were in high school. Of the entire sample of 1,616 adolescents, 1,580 (98%) completed the 3-month follow-up and 1,558 (96%) completed the 6-month follow-up. In the restricted sample of 782 sexually active adolescents (i.e., adolescents who endorsed engagement in vaginal sex in the past 3 months), participant ages ranged from 14 to 17 years ($M = 15.3$, $SD = 1.08$), with 420 (54%) female respondents.

Procedures

Recruitment. Institutional review boards of the participating universities (i.e., Brown University, Syracuse University, University of South Carolina, Emory University, and University of Pennsylvania) approved all procedures prior to starting recruitment. Participants were recruited (a) from community-based organizations, such as Boys and Girls Clubs and community centers that provide recreational, social, and educational services for young people; (b) using street outreach; and (c) by referrals from participants or adults in the community. Prior to enrolling in the study, prospective participants and their parents were informed that the study was being conducted to test different approaches to improving health among adolescents. All participants and their parents or guardians provided written, informed assent, and consent. Only 25 of the eligible adolescents (1.5%) refused or were unable to participate in the study. The recruitment procedures in the four cities produced equivalent samples in terms of sexual risk behavior, gender, and age (Romer et al., 2009).

Data collection. Two of the four cities, Syracuse and Macon, were randomly assigned to receive the mass media campaign. The media campaign ran continuously during the 15-month recruitment period in each media city using nine 30-s TV ads and 12 60-s radio ads and included themes to emphasize that condoms can help increase pleasure by reducing stress during sex about STIs and/or unintended pregnancy as well as how waiting to initiate sex shows maturity and respect for one's partner (Romer et al., 2009). There was no formal viewing of the advertisements as part of the study procedures. Prior to enrolling in the study, each youth provided assent and his or her parents or guardians provided informed consent. Subsequently, the adolescents completed a baseline assessment through an audio computer-assisted self-interview. A test-retest study of the audio computer-assisted self-interview was undertaken with a sample of African-American adolescents in preparation for the trial, and the measures were observed to be reliable (Vanable et al., 2009). As part of the baseline, participants also provided a urine sample to assess for gonorrhea, chlamydia, and trichomoniasis. Urine collection occurred in a private room. Specimens were stored in refrigerators until packed in approved biospecimen boxes and shipped by overnight courier to the Emory University Microbiology Laboratory for assay. Youth who tested

positive for any STI were treated and counseled by a medical care provider.

After completing the baseline assessment, participants in all cities were randomized to one of two small group interventions focusing either on safer sex (Stanton et al., 1995) or on general health promotion ("Promoting Health Among Teens;" Jemmott, Jemmott, Braverman, & Fong, 2005). The small group interventions included two intensive sessions. Finally, participants completed the measures (same battery as they completed at baseline) during follow-up assessments at 3, 6, 12, 18, and 36 months. Urine specimen collected occurred at baseline and 6-, 12- and 18-month follow-ups. Youth received \$30 for completing the initial assessment with gradual monetary increases (maximum \$60) for subsequent assessments (see Hennessy et al., 2013; Romer et al., 2009). The current analyses used data from the baseline and the 3- and 6-month assessments.

Measures

Sexual activity with two or more partners. At the 6-month assessment, sex with two or more partners was coded based on responses to the question "With how many people have you had vaginal sex (penis in vagina) in the past 3 months?" (Schroder, Carey, & Vanable, 2003). Participants were dichotomously categorized based on sexual activity with less than two partners (0) versus sexual activity with two or more partners (1) for the previous 3 months.

Relative frequency of condom use. At the 6-month assessment, among sexually active participants, a single item assessed the relative frequency of condom use at the 6-month assessment (Schroder et al., 2003). Using a 6-point scale ranging from 0, *never*, to 5, *every time*, participants were asked: "In the last 3 months, how often would you say that you and your partner or partners used a condom from start to finish when you had vaginal sex?"

Condom use at last sex. At the 6-month assessment, sexually active participants were also asked to recall their most recent episode of sexual activity with the prompt, "Now all of the following questions ask about the LAST TIME you had vaginal sex." Included with this assessment, participants were asked whether they engaged in vaginal sex, and if they responded affirmatively, they were asked to indicate whether they used a condom (Schroder et al., 2003). Participants were dichotomously categorized based on condom use (0) versus noncondom use (1) at the last occasion of vaginal sex.

Depressive symptoms. At baseline, depressive symptoms were assessed using an eight-item version of the Center for Epidemiological Studies Depression Scale (CES-D; Sales, Lang, Hardin, Diclemente, & Wingood, 2010). For each item, participants indicated how often they felt the emotion in the last week using a 4-point scale ranging from 1, *less than 1 day*, to 4, *5-7 days*. Sample items included, "I felt that I could not shake off the blues even with help from my family and friends" and "I thought my life had been a failure." A summary score was derived by adding the scores for each of the eight items with a score ≥ 15 indicative of above-threshold depressive symptoms (Cronbach's $\alpha = .88$).

Sex refusal self-efficacy. At the 3-month assessment, participants rated their confidence level to refuse sex during the next month by responding to the following prompt, "How sure are you

that you would be able to say no to having vaginal sex with someone” using a 4-point scale ranging from 1, *definitely could not say no* to 4, *definitely could say no* (Zimmerman, Sprecher, Langer, & Holloway, 1995). A summary score was derived by averaging the scores on all five items (Cronbach’s alpha = .85).

Condom use self-efficacy. At the 3-month assessment, participants also indicated their self-efficacy to use a condom by responding to the following prompt, “How sure are you that you would use a condom when you have vaginal sex” using a 4-point scale ranging from 1, *not at all sure*, to 4, *extremely sure* (Galavotti et al., 1995). A summary score was derived by averaging the scores on all five items (Cronbach’s alpha = .81).

Data Analyses

Descriptive analyses characterized the prevalence of depressive symptoms at the baseline assessment as well as self-efficacy measures and sexual risk behaviors at the 3- and 6- month follow-up assessments, respectively. Subsequently, the bivariate (i.e., unadjusted) association between predictor, outcome, and potential covariate variables were examined. Potential covariates included, age, group intervention condition, and mass media intervention condition. Age at baseline was controlled for in the analyses because sexual activity increases as adolescents age (Eaton et al., 2010). Group intervention condition (HIV prevention vs. general health) and mass media intervention condition (no campaign vs. HIV prevention campaign) were included to control for intervention effects. Finally, hierarchical regression models were used to determine gender differences in the association between depressive symptoms, self-efficacy measures, and sexual risk indices to inform direct and indirect effect models.

Mediation path models were conducted using the SPSS macro PROCESS (Hayes, 2013; Preacher & Hayes, 2008). PROCESS was designed to examine direct and indirect effect path models using bootstrapping statistical methods. The macro provided estimates of the unstandardized path coefficients in the mediation model and a bootstrap 95% confidence interval (CI) based on 10,000 resamples for the indirect/mediated effect. The 95% CI that did not include zero indicated a significant mediation effect.

Results

Descriptive Analyses

Summary statistics for depressive symptoms, sexual risk behaviors, and other key study variables are shown in Table 1. At baseline, 24% of participants reported above-threshold levels of depressive symptoms (defined as a CES-D score ≥ 15 ; $M = 12.56$, $SD = 5.26$). At the 6-month assessment, 44% of participants ($N = 346$) reported vaginal sexual activity with two or more partners in the previous 3 months. Participants indicated that they used condoms “most of the time” when engaging in vaginal sex in the previous 3-months ($M = 4.18$, $SD = 1.95$ on a 1–6 scale). Nevertheless, 36% ($N = 279$) reported noncondom use at the last occasion of vaginal sex. Lastly, 7% of participants ($N = 58$) screened positive for at least one STI at the 6-month follow-up.

Bivariate Analyses

Age was not a significant predictor of depressive symptoms ($b = .10$, $SE = .17$, $p = .54$), sex refusal self-efficacy ($b = .02$, $SE = .03$, $p = .60$), condom use self-efficacy ($b = -.03$, $SE =$

Table 1
Participant Demographics and Descriptive Statistics for All Study Variables

Variables	%		
	Time 1	Time 2	Time 3
Mean age (<i>SD</i>)	15.31 (1.08)	—	—
Gender			
Male	46	—	—
Female	54		
Free/reduced lunch			
No	16	—	—
Yes	76		
Don’t know	8		
Mean CES-D score	12.56 (5.26)	12.57 (5.15)	12.35 (4.92)
Mean sex refusal self-efficacy score	3.19 (.89)	3.17 (.91)	3.06 (.83)
Mean condom use self-efficacy score	3.08 (.83)	3.06 (.85)	3.14 (.93)
Number of sexual partners			
Less than two	67	70	56
Two or more	33	30	44
Relative frequency of condom use	4.17 (1.94)	4.09 (1.96)	4.18 (1.95)
Noncondom use, last occasion of sex			
No	71	69	64
Yes	29	31	36
Positive STI screen			
No	89	—	93
Yes	11		7

Note. CES-D = Center for Epidemiological Studies Depression Scale; STI = sexually transmitted infection. $N = 782$ sexually active participants with complete data at the 6-month follow-up; Time 1 = baseline assessment; Time 2 = 3-month follow-up; Time 3 = 6-month follow-up. Relative frequency of condom use is assessed using a scale from 0, *never*, to 5, *every time*.

.03, $p = .38$), sexual activity with two or more partners ($b = -.07$, $SE = .07$, $p = .27$), or a positive STI screen ($b = -.11$, $SE = .13$, $p = .40$). However, age was significantly predictive of the relative frequency of condom use for the previous 3 months ($b = -.29$, $SE = .06$, $p < .001$), and noncondom use at last occasion of sex ($b = .27$, $SE = .07$, $p < .001$). Overall, older adolescents were more likely to endorse condomless sex.

Gender was a significant predictor of depressive symptoms ($b = 2.36$, $SE = .35$, $p < .001$), sex refusal self-efficacy ($b = .78$, $SE = .06$, $p < .001$), and condom use self-efficacy ($b = .14$, $SE = .06$, $p = .02$), such that female adolescents reported greater depressive symptoms yet still endorsed higher confidence in their ability to refuse sex and use condoms. Gender was also a significant predictor of sex with two or more partners ($b = -1.45$, $SE = .15$, $p < .001$), the relative frequency of condom use ($b = -.73$, $SE = .14$, $p < .001$), noncondom use at the last occasion of sex ($b = .78$, $SE = .16$, $p < .001$), and the likelihood of a positive STI screen ($b = 1.28$, $SE = .33$, $p < .001$). With regard to sexual risk behavior, male adolescents were more likely to report sex with two or more partners, less consistent condom use overall for the previous 3 months, noncondom use at last sex, and to test positive for a STI at the 6-month follow-up.

In unadjusted regression models, depressive symptoms were not a significant predictor of sex refusal self-efficacy ($b = .008$, $SE = .006$, $p = .19$), sexual activity with two or more partners ($b = .02$, $SE = .01$, $p = .20$), or noncondom use at the last occasion of sex ($b = .02$, $SE = .02$, $p = .25$). Conversely, depressive symptoms predicted less condom use self-efficacy ($b = -.02$, $SE = .006$, $p = .001$) and less frequent condom use ($b = -.04$, $SE = .01$, $p = .01$). Depressive symptoms were also marginally significant for predicting a positive STI screen ($b = .05$, $SE = .02$, $p = .06$). Sex refusal self-efficacy was a significant predictor of sex with two or more partners ($b = -.56$, $SE = .09$, $p < .001$), such that those high in sex refusal self-efficacy were less likely to have two or more partners. Similarly, condom use self-efficacy was a significant predictor of more frequent condom use ($b = .48$, $SE = .08$, $p < .001$) and noncondom use at last sex ($b = -.34$, $SE = .09$, $p < .001$). Neither condom use ($b = .15$, $SE = .17$, $p = .39$) nor sex refusal ($b = .22$, $SE = .17$, $p = .19$) self-efficacy were significant predictors of a positive STI screen.

Moderation Analyses

In hierarchical regression models, the interaction between depressive symptoms and participant gender was a significant predictor of sex refusal self-efficacy ($b = -.03$, $SE = .01$, $p = .01$). When stratified by gender, depressive symptoms predicted less sex refusal self-efficacy for females ($b = -.02$, $SE = .006$, $p = .001$) but not males ($b = .01$, $SE = .01$, $p = .31$). The interaction between depressive symptoms and gender was nonsignificant for sex with two or more partners ($b = .05$, $SE = .03$, $p = .16$). Depressive symptoms predicted a higher likelihood of sex with two or more partners for female ($b = .02$, $SE = .004$, $p < .001$) but not male adolescents ($b = .007$, $SE = .006$, $p = .26$). Therefore, direct and indirect effect models were restricted to female adolescents to examine the associations between depressive symptoms, sex refusal self-efficacy, and sex with two or more partners.

The interaction between baseline depressive symptoms and participant gender was nonsignificant for condom use self-efficacy

($b = .005$, $SE = .01$, $p = .69$). The depressive symptoms by gender interaction was also not a significant predictor of the relative frequency of condom use ($b = -.02$, $SE = .03$, $p = .59$), noncondom use at last sex ($b = .03$, $SE = .04$, $p = .47$), or a positive STI screen ($b = -.06$, $SE = .07$, $p = .37$). Therefore, direct and indirect effect models included both male and female adolescents to examine the associations between depressive symptoms, condom use self-efficacy with condom use behaviors, and STI screening data.

Direct Effect Models

All PROCESS models controlled for age, group intervention condition, mass media intervention condition, and the baseline assessment of sexual risk variables. Among female participants, depressive symptoms were a significant predictor of sexual activity with two or more partners ($b = .06$, $SE = .02$, $p < .001$; see Figure 1a). However, for the entire sample, depressive symptoms did not significantly predict the relative frequency of condom use for the last 3 months ($b = .02$, $SE = .02$, $p = .31$; see Figure 1b), noncondom use at the last occasion of sex ($b = -.02$, $SE = .02$, $p = .17$; see Figure 1c), or a positive STI screen ($b = .03$, $SE = .03$, $p = .28$).

Indirect Effect Models

Sex refusal self-efficacy. When the analysis was restricted to female participants, depressive symptoms were a significant predictor of sex refusal self-efficacy ($b = -.02$, $SE = .006$, $p < .001$). The longitudinal association between sex refusal self-efficacy and sex with two or more partners was also significant ($b = -.30$, $SE = .15$, $p = .05$). However, based on 10,000 bootstrap resamples, a test of the indirect effect of depressive symptoms on sex with two or more partners via sex refusal self-efficacy was nonsignificant ($b = .007$; bootstrap 95% CI: $-.0002$, $.02$; see Figure 1a). The longitudinal association between sex refusal self-efficacy and a positive STI screening was nonsignificant ($b = .12$, $SE = .17$, $p = .48$). Based on 10,000 bootstrap resamples, a test of the indirect effect of depressive symptoms on the likelihood of a positive STI screen was also nonsignificant ($b = -.003$; bootstrap 95% CI: $-.01$, $.005$).

Condom use self-efficacy. For the entire sample, depressive symptoms were a significant predictor of less condom use self-efficacy ($b = -.02$, $SE = .007$, $p = .02$). The positive longitudinal association between condom use self-efficacy and the relative frequency of condom use was also significant ($b = .38$, $SE = .09$, $p < .001$). A test of the indirect association between depressive symptoms and condom use via condom use self-efficacy was significant ($b = -.006$; bootstrap 95% CI: $-.01$, $-.0005$; see Figure 1b). Once more, the negative longitudinal association between condom use self-efficacy and noncondom use at the last occasion of sex was significant ($b = -.33$, $SE = .10$, $p < .001$). A test of the indirect effect of depressive symptoms on noncondom use at the last occasion of sex via condom use self-efficacy was also significant ($b = .007$; bootstrap 95% CI: $.002$, $.01$; see Figure 1c). However, the longitudinal association between condom use self-efficacy and a positive STI screening was nonsignificant ($b = .12$, $SE = .17$, $p = .48$). A test of the indirect effect of depressive symptoms on the likelihood of a positive STI screen was also nonsignificant ($b = -.003$; bootstrap 95% CI: $-.01$, $.005$).

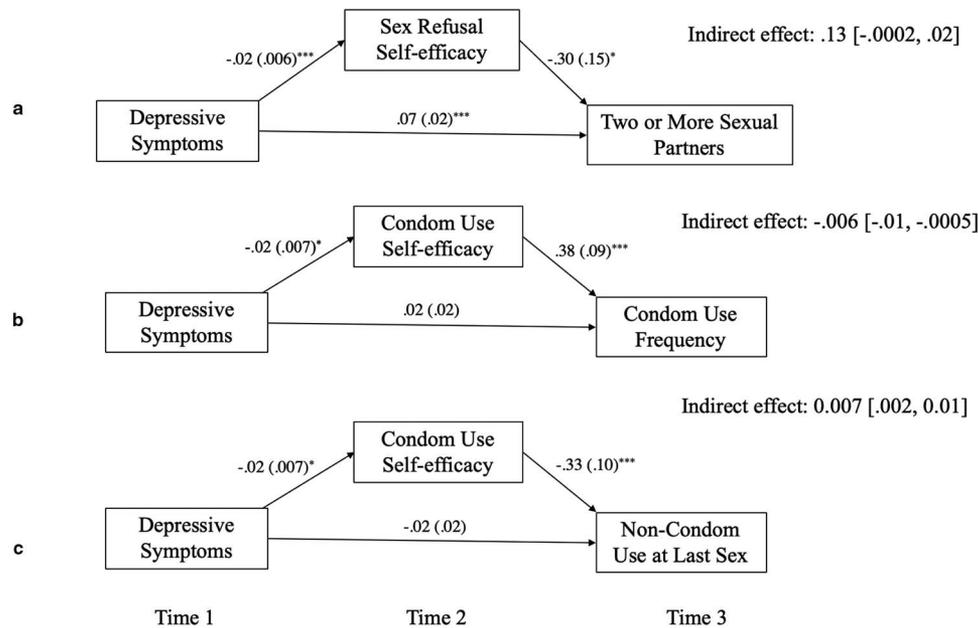


Figure 1. Path model for the association of depressive symptoms to sexual risk variables with the indirect association of self-efficacy modeled. Covariates were not included in the figure for simplicity. Unstandardized path coefficients and standard errors are shown; Time 1 = baseline assessment; Time 2 = 3-month follow-up; Time 3 = 6-month follow-up. Results for the likelihood of screening positive for an STI are not shown; all associations were nonsignificant. * $p < .05$. ** $p < .01$. *** $p < .001$. \diamond Sample was restricted to female participants.

Discussion

The current study is the first to examine the role of self-efficacy as a mediator of the longitudinal association between depressive symptoms and sexual risk behaviors in a sample of African-American adolescents. Depressive symptoms were highly prevalent in the sample of adolescents who reported recent (i.e., previous 3 months) vaginal sex. Baseline depressive symptoms predicted vaginal sex with two or more partners assessed at the 6-month assessment for female participants only, suggesting that mood is differentially associated with sexual activity for male and female adolescents. Depressive symptoms did not directly predict the relative frequency of condom use, noncondom use at the last occasion of vaginal sex, or likelihood of a positive STI screen for the sample as a whole when reported 6 months later. However, baseline depressive symptoms predicted lower self-efficacy for condom use at the 3-month follow-up, which predicted inconsistent condom use and condom nonuse at the 6-month follow-up for the entire sample. Therefore, this study provides the first empirical evidence that condom use self-efficacy may mediate the longitudinal association between depressive symptoms and condomless sex in a sample of African-American male and female adolescents.

Although depressive symptoms predicted sexual activity with two or more sexual partners for females, the indirect effect of depressive symptoms via sex-refusal self-efficacy was not statistically significant. The literature suggests other hypotheses for why female adolescents with depressive symptoms engage in sexual activity. For example, poor self-esteem may explain the association of depressive symptom to engagement in sex (Lopez et al., 2011). Indeed, when African-American adolescents were inter-

viewed about their sexual behaviors, participants reported that they were looking for love, trying to get attention, and seeking someone to comfort them when having sex (Brawner, Davis, Fannin, & Alexander, 2012). Therefore, female adolescents may compensate for their negative self-evaluations with external validation, including sexual contact, with less concern for the potential adverse consequences to their health.

More broadly, our findings also help to clarify equivocal findings for the association of depressive symptoms to sexual risk behavior among African-American adolescents. Specifically, gender may moderate the influence of depressed mood as a risk factor for some but not all behavioral indices of risk among adolescents. Therefore, a lack of consideration for gender differences in the depressive symptoms–sexual risk relationship may account for previous nonsignificant findings. Furthermore, the lack of a direct association between depressive symptoms and condom use may suggest that the longer time duration between the assessment of depressive symptoms and sexual behavior could also be contributing to nonsignificant direct associations (Voisin et al., 2013); that is, one hypothesis to explain the discrepant findings is that depressive symptoms fluctuate over time, making them a poor predictor of long-term sexual behavior. It is also important to note that the sexual risk behaviors that made up the primary focus of this paper only increase one's *susceptibility* to negative health outcomes. Indeed, the associations between depressive symptoms and self-efficacy with predicting a positive STI screen were nonsignificant and likely the result of low power, with only 7% of the sample testing positive for an STI at the 6-month follow-up.

Study Limitations and Future Directions

The current study findings should be considered in the context of its limitations. First, the CES-D scale is a screening tool and not appropriate to diagnose clinical depression or other mood disorders. Nonetheless, cross-sectional studies that have sampled clinically depressed African-American adolescents confirm that depression is an important correlate of inconsistent condom use (Brawner et al., 2012). The sole longitudinal study with a clinical sample also found that clinical depression predicted condomless sex among African-American female adolescents (Starr, Donenberg, & Emerson, 2012). Nonetheless, there is need for further research to establish depressive symptoms as a risk factor for sexual risk taking among clinically depressed male and female adolescents.

Second, the sample included only African-American adolescents; thus, the results may not generalize beyond this population. Existing research supports the longitudinal association of depression to inconsistent condom use among ethnically diverse samples of adolescents (e.g., Lehrer, Shrier, Gortmaker, & Buka, 2006), but further research is needed to replicate the mediational effects of condom use self-efficacy. Among studies that have reported on a negative association between depressive symptoms and condom use among adolescents, only one study examined potential mediators, with alcohol consumption and marijuana use emerging as explanatory variables (Shrier, Harris, Sternberg, & Beardslee, 2001).

Third, we used self-report to assess sexual risk behaviors. Self-report is imperfect and may be influenced by recall biases (Schroder et al., 2003). Thus, a next step will be to confirm the association of depressive symptoms to sexual risk behaviors using ecological momentary assessment that reduces self-report biases by allowing the participants to report on their behavior in real time. Indeed, research has shown that ecological momentary assessment is well suited for studying episodic and transient experiences, such as mood and substance use (Shiffman, 2009). Consequently, future research should focus on intensive longitudinal designs to establish depressive symptoms as a risk factor for HIV/STI transmission among adolescents.

Conclusions

We found a direct longitudinal association between depressive symptoms and sexual activity with two or more partners for female adolescents and an indirect association between depressive symptoms and condom use via decrements in condom use self-efficacy for both males and females. These findings suggest that sexual risk reduction interventions for adolescents may be improved by including modules that address the influence of mood on sexual behaviors. Specifically, alleviating depressive symptoms may facilitate safer sex practices, in part, by increasing self-efficacy, to reduce the likelihood of HIV/STI transmission. Indeed, among African-American adults participating in a safer sex behavioral intervention, decreases in sexual risk taking were optimized when the intervention lead to reductions in depressed mood (Lennon, Huedo-Medina, Gerwien, & Johnson, 2012). Nonetheless, hypotheses have yet to be tested among adolescent samples for whom depression is not uncommon (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Jane Costello, Erkanli, & Angold, 2006). Therefore, there is need for a greater emphasis on depressive symptoms

to promote sexual health and reduce HIV/STI incidence among African-American adolescents.

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