

Syracuse University

**SURFACE**

---

Dissertations - ALL

SURFACE

---

December 2016

## Depressive Symptoms as a Longitudinal Predictor of Sexual Risk Behaviors among African American Adolescents: Findings from Project iMPPACS

Jacklyn Babowitch  
*Syracuse University*

Follow this and additional works at: <https://surface.syr.edu/etd>



Part of the [Social and Behavioral Sciences Commons](#)

---

### Recommended Citation

Babowitch, Jacklyn, "Depressive Symptoms as a Longitudinal Predictor of Sexual Risk Behaviors among African American Adolescents: Findings from Project iMPPACS" (2016). *Dissertations - ALL*. 538.

<https://surface.syr.edu/etd/538>

This Thesis is brought to you for free and open access by the SURFACE at SURFACE. It has been accepted for inclusion in Dissertations - ALL by an authorized administrator of SURFACE. For more information, please contact [surface@syr.edu](mailto:surface@syr.edu).

## Abstract

Research that clarifies individual level factors associated with sexual risk behavior among African American adolescents remains an important public health priority. The current study examined the longitudinal association of depressive symptoms to sexual risk behaviors, and determined whether the association of depressive symptoms to risky sex varies as a function of gender in a sample of African American adolescents. A secondary aim was to examine whether self-efficacy for sex refusal and condom use mediate the depression-sexual risk relationship. Data analyses focused on baseline and three-month assessments of depressive symptoms and sexual behaviors assessed for the previous three-months, including: (a) engagement in vaginal sex; (b) having two or more sexual partners; (c) relative frequency of condom use; and (d) condom use at last sex. Analyses confirmed that depressive symptoms predict sex with two or more partners and both indices of inconsistent condom use. Further, gender moderates the association of depression and sex with two or more partners, such that depressive symptoms are a more powerful risk factor for females relative to males. Lastly, mediation analyses revealed that condom use self-efficacy significantly mediates the effects of depressive symptoms on inconsistent condom use. Depression is not a significant predictor of sexual activity status, nor did sex refusal self-efficacy mediate the association of depressive symptoms to engagement in vaginal sex or having two or more sexual partners. Nonetheless, current study findings have important implications for HIV/STI prevention, where behavioral interventions may benefit from modules that include a focus on the influence of mood on sexual behaviors and self-efficacy for safer sex practices.

*Keywords:* Depressive symptoms, sexual risk, self-efficacy

Depressive Symptoms as a Longitudinal Predictor of Sexual Risk Behaviors among  
African American Adolescents: Findings from Project iMPPACS

by

Jacklyn D. Babowitch

B.S., Brown University, 2012

Master's Thesis

Submitted in partial fulfillment of the requirements for the degree of  
Master of Science in Clinical Psychology

Syracuse University

December, 2016

Copyright © Jacklyn D. Babowitch 2016

All Rights Reserved

## Table of Contents

|                                  | Page |
|----------------------------------|------|
| Table of Contents.....           | iv   |
| List of Tables.....              | v    |
| List of Figures.....             | vi   |
| List of Appendices.....          | vii  |
| Chapter                          |      |
| I. Review of the Literature..... | 1    |
| II. Summary and Hypotheses.....  | 11   |
| III. Method.....                 | 13   |
| IV. Results.....                 | 20   |
| V. Discussion.....               | 25   |
| Tables.....                      | 33   |
| Figures.....                     | 40   |
| Appendices.....                  | 43   |
| References.....                  | 53   |

## List of Tables

### Table

|   |    |
|---|----|
| 1. Descriptive Statistics for all Study Variables.....  | 33 |
| 2-5. Hierarchical Regression Analyses Modeling the Direct and Interaction Effects of Depressive Symptoms and Gender on:             |    |
| Engagement in Vaginal Sex.....  | 34 |
| Sexual Activity with Two or More Sexual Partners.....   | 35 |
| Relative Frequency of Condom Use.....   | 36 |
| Condom Use at the Most Recent Sexual Episode.....   | 37 |
| 6. Results from Path Model of the Effects of Depressive Symptoms on Condom Use Behaviors, Mediated by Condom Use Self-Efficacy..... | 38 |
| 7. Bootstrap Estimates of the 95% Confidence Intervals for the Mediating Effects of Condom Use Self-Efficacy.....                   | 39 |

## List of Figures

### Figure

1. Two-way depressive symptoms by gender interaction effect on the probability of reporting two or more sexual partners..... 40
2. Conceptual path model for the effect of depressive symptoms on engagement in vaginal sex and two or more sexual partners with sex refusal self-efficacy as a mediator..... 41
3. Conceptual path model for the effect of depressive symptoms on condom use behaviors with condom use self-efficacy as a mediator..... 42

## List of Appendices

| Appendix   | Page |
|--|------|
| A. Demographic Information.....  | 43   |
| B. Center for Epidemiological Studies Depression Scale (CES-D) Short Form..... | 45   |
| C. Sexual Behavior, Last 3 Months.....   | 46   |
| D. Condom Use, Last 3 Months, Relative Frequency Measure.....                  | 48   |
| E. Sexual Behavior – Most Recent Sexual Episode.....                           | 49   |
| F. Condom Use Self-Efficacy.....   | 50   |
| G. Sex Refusal Self-Efficacy.....  | 51   |
| H. Parental Supervision and Approval.....                                      | 52   |

Depressive Symptoms as a Longitudinal Predictor of Sexual Risk Behavior among  
African American Adolescents: Findings from Project iMPPACS

African Americans account for approximately 44% of all new HIV infections among adults and adolescents despite representing only 12% of the U.S. population (CDC, 2016). African Americans are also at elevated risk for sexually transmitted infections (STIs). For example, the prevalence of syphilis is eight times higher among African Americans when compared to Caucasians, and African Americans account for 69% of all reported cases of gonorrhea (Newman & Berman, 2008). Elevated rates of HIV and other STIs are apparent among African American adolescents as well. African Americans are more likely to report involvement in sexual activity at a young age compared to other ethnic subgroups (Biello, Ickovics, Niccolai, Lin, & Kershaw, 2013), and African Americans account for an estimated 59% of all new HIV cases in the U.S. for individuals aged 13-24 (CDC, 2016). In the absence of an effective vaccine, behavior change interventions, as well as improved access to HIV testing and treatment for those who test positive, continue to be central to the prevention of new infections (CDC, 2014a, 2014b).

A research priority to aid with intervention development for African American adolescents is to identify modifiable factors that may enhance the propensity for high-risk sexual behaviors. To date, research has focused primarily on the “rational” processes incorporated in prominent conceptual models, such as Social Cognitive Theory (SCT), to account for elevated rates of sexual risk. These processes include the importance of HIV/STI knowledge, skills for practicing safe sex, peer norms, and self-perceived risk for infection (C. M. Fisher, 2011; J. D. Fisher & Fisher, 1996; Walsh, Senn, Scott-Sheldon, Venable, & Carey, 2011). For instance, studies have linked the optimistic bias, or the misperception that one is less likely than others to

experience negative consequences, to sexual risk-taking among ethnic minorities (e.g. Chapin, 2001).

Mental health factors may also account for increased HIV/STI risk behaviors among African American adolescents. According to SCT, an individual must have the skills, as well as a sense of self-efficacy to use them effectively and consistently in order to optimize behavioral health outcomes. Because self-efficacy is influenced by an individual's physiological and psychological states, depressed mood is likely to lead to poor sexual health outcomes through decrements in self-efficacy (Bandura, 1986). Indeed, there is considerable evidence linking the experience of mood disorders to elevated rates of high-risk sexual behavior (Beidas, Birkett, Newcomb, & Mustanski, 2012; Donenberg, Bryant, Emerson, Wilson, & Pasch, 2003; Donenberg & Pao, 2005). Further, epidemiological studies confirm elevated rates of HIV among adults (Jasuja et al., 2012; Odo, 2003) and adolescents (Brown et al., 2010; M. D. Smith, Seal, & Hartley, 2008) experiencing serious mental illness.

Clarifying the potential role of depressive symptoms in sexual risk-taking is particularly relevant for African American youth. African American adolescents report higher rates of depressive symptoms (Collins et al., 2010; Rushton, Forcier, & Schectman, 2002), and seek mental health services at a lower rate compared to other racial subgroups (Angold et al., 2002; Bains, 2014; Song, Sands, & Wong, 2004). However, most research examining the role of depression in adolescent sexual risk-taking has been cross sectional in nature, and even among longitudinal studies, few have focused specifically on African American adolescents.

The focus of the current study was to clarify the longitudinal association of depressive symptomatology to high-risk sexual behavior and to examine potential moderators and mediators of the depression-sexual risk relationship in a sample of low-income African American

adolescents. Data are from Project iMPPACS<sup>1</sup>, a four-city intervention trial designed to test the combined impact of a mass media campaign and a small group intervention on sexual risk behavior and STI outcomes. In what follows, hypotheses are developed on the basis of a review of past studies examining the depression-sexual risk linkage in adolescent populations. The review of the adolescent literature focuses first on studies involving multi-ethnic samples, followed by a review of studies that focus specifically on African American adolescents.

### **Depression and Sexual Risk in Multi-Ethnic Adolescent Populations**

Overall, the literature on the association of depressive symptoms to sexual risk-taking among adolescents has yielded mixed findings. Shrier, Harris, Sternberg, and Beardslee (2001) examined the association between depressive symptoms and unprotected sex at the most recent sexual episode in sexually active 7<sup>th</sup> through 12<sup>th</sup> graders ( $N = 6,583$ ), recruited from the National Longitudinal Study of Adolescent Health project. When analyses were conducted separately for each gender, depressive symptoms (as measured by the Center for Epidemiologic Studies Depression Scale – CES-D) were associated with non-condom use at last sex among males. In contrast, depressive symptoms were not a significant predictor of unprotected sex in females. Thus, findings suggest that gender may serve as a moderator of the depressed mood-sexual risk relationship among adolescents. Indeed, the authors speculate that condom use is a male-initiated method of STI prevention, and may have little to do with individual factors of the female sexual partner. An important secondary goal of the study was to identify potential mediators that might help to explain why depression is associated with sexual risk behavior. Analyses confirmed that the association of depression to sexual risk among male participants was mediated by both general usage of alcohol and marijuana. However, no event-level analyses

---

<sup>1</sup> iMPPACS is an acronym developed for “in Macon, Providence, Philadelphia, Atlanta, Columbia, and Syracuse.

were conducted to determine if alcohol or marijuana were used proximal to specific occasions of unprotected sexual episodes.

Lehrer, Shrier, Gortmaker, and Buka (2006) investigated depressive symptoms as a longitudinal predictor of sexual risk behaviors among 4,132 middle and high school students. Overall, 63% endorsed a sexual risk behavior of condom or birth control nonuse, substance use at last sex, or having three or more sexual partners. Boys and girls with higher levels of depressive symptom at baseline (measured using the CES-D) were significantly more likely than those with fewer symptoms to report at least one of the measured sexual risk behaviors one year later. Of note, when analyses were stratified by gender, depressive symptoms were predictive of non-condom use and substance use at the most recent sexual episode for males. However, depression was not related to sexual risk when the sample was restricted to females. Once again, findings suggest that gender may serve as a moderator for the association of depression to sexual risk among adolescents.

Khan et al. (2009) prospectively examined the association of depression to sexual risk-taking in a sample of African American and Caucasian adolescents. Analyses focused on wave one (adolescence) and wave three (adulthood) data from the National Longitudinal Study of Adolescent Health. Of the 10,783 participants, 12% met the cutoff for clinically significant depressive symptoms on the CES-D, and depression was more common among African Americans. In the complete sample, depressive symptoms at baseline were significantly associated with having multiple sexual partners, but not with condom use. Depression scores were also associated to a positive STI screen among African American males only. However, the authors did not examine gender as a moderator of the effects of depression on sexual risk-taking.

Shrier et al. (2009) examined the association of depressive symptoms to sexual risk

behaviors in a dyadic study of 130 heterosexual couples (ages 14-24) seeking STI treatment services. Participants completed an assessment that included the Beck Depression Inventory (BDI), as well as measures of past and recent STI-risk behaviors. One-third of couples had at least one depressed partner (score in the top 25% of BDI scores), and dyads reported the most sexual risk when the female partner was depressed. Compared to couples in which the female partner was not depressed, dyads with a depressed female partner were more likely to report a greater number of lifetime sexual partners and substance use proximal to intercourse. However, there were no significant differences between dyads with respect to the number of sexual partners or non-condom use assessed for the past 30 days.

In summary, evidence for the association of depressive symptomatology to risky sex has been highly variable for general population studies involving adolescents. Although some research has supported a positive association of depression to non-condom use, others have shown only a significant association of depressive symptoms to the number of sexual partners or substance use proximal to sex. Further, the literature suggests that there may be gender differences in the association of depression to sexual risk behaviors that have not been fully explored. Lastly, among studies that did find a positive association of depressive symptoms to sexual risk, only one study examined potential mediators, with substance use emerging as a potential explanatory variable for non-condom use.

### **Depression and Sexual Risk among African American Adolescents**

Collectively, findings supporting an association between depressive symptoms and sexual risk behaviors in general population adolescent samples have been inconsistent. Next, the cross-sectional and longitudinal studies that focus on African American adolescent sexual risk-taking are reviewed. African American adolescents are an important group for study because they report

higher rates of depression, elevated HIV/STI risk, and less engagement in healthcare compared to other racial subgroups.

**Cross sectional studies.** Cross-sectional studies on the depression-sexual risk relationship in African American adolescents have yielded equivocal findings and focus primarily on female samples. Rubin, Gold, & Primack (2009) investigated the associations of depressive symptoms and sexual risk outcomes in a predominantly African American sample of 572 females. The authors also tested the hypothesis that locus of control would mediate the association of depression to sexual risk. Individuals with high levels of depressive symptoms (as measured by the CES-D) reported a greater number of sexual partners when compared to those reporting low levels of depressive symptomatology. However, depression scores were not associated with a history of STIs or unintended pregnancy. Further, there was no evidence that locus of control significantly mediated the association of depression to the number of sexual partners.

Seth, Raiji, DiClemente, Wingood, and Rose (2009) examined the cross-sectional association of psychological distress (as measured by the CES-D) with STI-risk behaviors and positive STI screenings among 715 African American female adolescents. Overall, 45% of female adolescents reported high psychological distress, defined by a CES-D score  $\geq$  seven. Psychological distress was a significant correlate of a biologically confirmed STI, reports of inconsistent condom use, and endorsement of unprotected sex at the most recent sexual episode. Further, psychological distress was negatively associated with sex refusal and condom use self-efficacy. Although no mediation analyses were conducted, findings from this study suggest that self-efficacy for safer sex practices may mediate the depression-sexual risk relationship.

Brawner, Davis, Fannin, and Alexander (2012) compared measures of condom use between 64 clinically depressed African American female adolescents and 64 healthy demographically matched controls. The depressed sample was more likely to report unprotected sex at their sexual debut and lower rates of condom use in the previous three-months when compared to their non-depressed counterparts. However, the two groups did not differ in their reporting of non-condom use at the most recent sexual episode. Further, the study showed no support for its proposed mediators, which included condom use intentions, condom use skills, impulse control, and hedonistic intent.

To summarize, cross sectional studies provide some evidence of a positive association between depression and sexual risk-taking among African American adolescents. However, cross-sectional studies limit causal inferences. It is conceivable that engaging in high-risk sexual behavior increases adolescent vulnerability to depression, or a third latent variable might explain the association between depressive symptoms and sexual risk-taking. Moreover, the cross sectional literature on the depression-sexual risk relationship for African American adolescents has primarily focused on female adolescents. Studies are needed to test depression as a predictor of subsequent sexual risk episodes in African American males, and to determine whether the strength of the depression-sexual risk association varies as a function of gender. Finally, few studies have identified mediator variables that could help to clarify the mechanisms through which depressive symptoms impact sexual risk behaviors among African American adolescents. Most promising are findings that suggest self-efficacy for safer sex practices may mediate the depression-sexual risk relationship.

**Prospective studies.** Only five studies used a prospective design to clarify whether depressive symptoms are a risk factor for subsequent sexual risk behaviors among African

American adolescents. DiClemente et al. (2001) found that 48% of African-American female adolescents ( $N = 522$ ), recruited to participate in a HIV prevention program, reported high levels of depressive symptoms on the CES-D. Compared to their non-depressed counterparts, adolescents who had elevated depression scores were more likely to report one or more occasions of unprotected sex in the past month at a six-month follow-up. Although the study did not present mediational analyses, follow-up analyses indicated that depressed adolescents were also more fearful of negotiating condom use and perceived more barriers to engaging in condom-protected sex. Nonetheless, study findings point to the possibility that depression may be associated with high-risk sexual behavior because depressed adolescents experience reduced confidence or self-efficacy to engage in condom-protected sex with their partner.

Brown et al. (2006) measured baseline depressive symptoms (CES-D) and collected data on sexual activity at a six-month follow-up for 415 African American adolescents. Analyses of baseline data revealed that males reporting high levels of depressive symptoms were also more likely to report non-condom use at last sex compared to the non-depressed group. However, there was no association found for female participants. In longitudinal analyses, findings confirmed that depressive symptoms at baseline were associated with non-condom use at last sex reported on at the six-month follow-up in the sample as a whole. Indeed, adolescents who reported high levels of depression at baseline were approximately four times more likely to report non-condom use compared to the non-depressed group. This is the only prospective study to report on findings from a multi-site sample of both male and female African American adolescents to study depression as a predictor of unprotected sex. However, the study did not control for baseline risk behaviors. Further, 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.

Seth et al. (2011) used generalized estimating equation (GEE) models to investigate the impact of depressive symptoms at baseline on sexual risk behaviors at a 6- and 12-month follow-up. Participants were part of a larger study evaluating a sexual risk reduction intervention for African American adolescents. In the sample of 715 African American female adolescents, 52% scored above the cutoff for clinically significant depressive symptoms on the CES-D. Female adolescents that reported high levels of depressive symptoms at baseline were more likely than those reporting low levels to also report non-condom use at their last sexual encounter at the 6-month follow-up. Further, depressed adolescents were more likely to indicate multiple sexual partners and a partner with concurrent sexual partners. The study did not identify an association between depressive symptoms and sexual risk outcomes measured at the 12-month follow-up, however. Consistent with findings reported by DiClemente et al. (2001), depression was predictive of higher fear for negotiating condom use at both the 6- and 12-month follow-up. Although the study is among the first to report on depression as a predictor of sexual risk behaviors assessed at multiple time points, the generalizability of findings is limited because the sample included only female adolescents. Furthermore, the study did not conduct any mediational analyses to help explain *how* depression may be impacting subsequent sexual risk behaviors.

In a second set of analyses using the same data, Voisin, Hotton, Tan, and DiClemente (2013) also used GEE regression models to evaluate the influence of depressive symptoms on future sexual risk-taking for African American female adolescents. Higher baseline measures of depression were not found to be predictive of a dichotomous indicator of non-condom use in the

past 60 days at the 12-month follow-up. Further, greater depressive symptoms were not predictive of having two or more sexual partners or reporting sexual activity with a “casual” partner. Rather, higher baseline levels of depression were only predictive of having sex while under the influence of drugs or alcohol for the past 60 days. An important secondary goal of the study was to identify potential protective factors associated with sexual risk behavior. In this regard, greater sex refusal self-efficacy was found to be protective against endorsement of sexual activity with multiple or casual sexual partners. Nonetheless, the authors found no support for the hypothesized depression-sexual risk relationship nor did they examine the potential association of depression to sex refusal self-efficacy.

More recently, Jackson, Seth, DiClemente, and Lin (2015) used GEE to examine the interaction of depressive symptoms and substance use on sexual risk behaviors for African American female adolescents ( $N = 701$ ). At baseline, 40% of adolescents scored above-threshold for symptoms of depression on the CES-D, and 64% indicated substance use (alcohol, marijuana, or ecstasy) in the last 90 days. Baseline measures of depression and substance use were independently predictive of sexual sensation-seeking, non-condom use at the last occasion of sex and a positive STI screen over the 36-month follow-up period. Further, there was a significant depression by ecstasy interaction effect predicting non-condom use. Despite reporting on the interaction effects of depression and substance use on sexual risk behaviors across multiple time points, the study was limited to African American females recruited from a single U.S. city.

In summary, prospective studies provide some evidence in support of depressive symptomatology as a longitudinal predictor of sexual risk among African American adolescents. However, whereas research involving multi-ethnic samples point to potential gender differences in the association of depression to sexual risk, studies limited to African American youth have

focused primarily on female samples. Thus, additional research is needed to examine the role of depression as a predictor of subsequent sexual risk-taking among African American males, as well as to examine whether there are gender differences in the association of depression to risk in African American samples. Moreover, research is still needed to investigate explanatory mechanisms for the depression-sexual risk relationship.

Of the studies reviewed, self-efficacy associated with engaging in safer sex practices has emerged as a potential explanatory factor that may help to explain any linkages between depressed mood and sexual risk-taking. Indeed, there is an extensive literature on the bidirectional association of depression and self-efficacy (e.g. Muris & Meesters, 2002), and there is evidence to suggest that self-efficacy is associated with having fewer sexual partners (Voisin et al., 2013). Moreover, research consistently points to self-efficacy as a proximal antecedent to condom use (DiIorio et al., 2001; Kirby, 2002; Sieving, Bearinger, Resnick, Pettingell, & Skay, 2007) As such, depression may lead to sexual risk by interfering with a person's confidence to engage in safer sex practices. In the current study, we test the hypothesis that the association of depression and sexual risk behavior will be mediated by differences in self-efficacy for sex refusal and condom use.

### **Summary and Overview of the Current Study**

Research that clarifies individual level factors associated with sexual risk behavior among African American adolescents remains an important public health priority. Extant literature confirms the importance of skills for practicing safe sex, HIV/STI knowledge, and self-perceived risk for infection, but may underestimate the importance of mood as an explanatory variable. A number of cross-sectional and prospective studies have sought to clarify the question of whether depressive symptoms are associated with increased sexual risk-taking in African

American adolescents. However, the literature has yielded decidedly mixed findings and has, to date, focused primarily on females from single geographic regions (e.g. Rubin et al., 2009; Seth et al., 2011; Jackson et al., 2015). Studies with large multi-site samples that include males are needed to determine if there is a general main effect for depression predicting subsequent sexual risk episodes, and whether the strength of the association between depression and sexual risk varies as a function of gender. In addition, research is needed to identify explanatory factors that account for the association between depression and sexual risk-taking.

In the current study, data from a multicity sample of African American adolescents ( $N=1,616$ ) were analyzed to (a) examine the longitudinal association of depressive symptoms to high risk sexual behaviors and (b) clarify whether the association of depressive symptoms to risky sex varies as a function of gender. In accordance with the adolescent literature, it was hypothesized that depressive symptoms are predictive of subsequent sexual risk behaviors. Further, it was predicted that the depression-sexual risk relationship is stronger among African American adolescent males compared to females (see Shrier et al., 2001; Brown et al., 2006; Lehrer et al., 2006; Khan et al., 2009).

To date, only a small handful of studies have tested mediational pathways that could explain the depression-sexual risk relationship. Most promising are findings that suggest individuals who report depressive symptoms may be less confident in their ability to refuse sex and use condoms consistently (DiClemente et al., 2001; Seth et al., 2009; Seth et al., 2011). Therefore, a secondary aim is to examine self-efficacy for sex refusal and condom use as potential mediators of the depression-sexual risk relationship. Clarifying the role of depressive symptoms and self-efficacy in sexual risk-taking could have important implications for HIV/STI prevention, where behavioral interventions may benefit from modules that include a focus on the

influence of mood on sexual behavior outcomes. Further, the present study helps to advance theory development by accounting for one potential explanatory mechanism linking depressed mood to sexual risk behaviors through self-efficacy for safer sex practices.

## **Method**

### **Participants**

Participants were 1,616 African American adolescents recruited from community-based organizations to participate in Project iMPPACS, an NIMH funded study designed to test the impact of a mass media and small group intervention focused on HIV/STI risk prevention. The study was conducted in two matched northeast U.S. cities (Providence, Rhode Island, and Syracuse, New York) and two matched southeast U.S. cities (Columbia, South Carolina, and Macon, Georgia). Across the entire sample, participants' ages ranged from 14 to 17 years ( $M = 15$ ,  $SD = 1.05$ ), with 945 (60%) female respondents. All participants self-identified as African American at the time of recruitment. The majority (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.

### **Procedures**

**Recruitment and study context.** Institutional Review Boards of the participating universities approved all procedures prior to starting recruitment. Participants were recruited directly from community-based organizations, such as Boys and Girls Clubs and community centers that provide recreational, social, and educational services for young people, or from participant referral. However, recruitment of youth using street outreach, and referral from adults in the community was also used. Only 25 (1.5%) of the eligible adolescents refused or were

unable to participate in the study. The recruitment procedures in the four participating cities produced relatively equivalent samples in terms of sexual risk behavior, gender, and age (Vanable et al., 2008). 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.

The study cities, Syracuse and Macon, were randomly assigned to receive the media campaign in the northeast and southeast, respectively. The media campaign ran continuously during the 15-month recruitment period in each media city using three 30-second television ads and eight 60-second radio ads. In addition to the media intervention, all participants were randomized to participate in one of two small group interventions focusing either on safer sex or on general health promotion (Romer et al., 2009).

**Data collection.** After assent by each youth and informed consent by his or her parents or guardians, the participants completed an assessment through an audio computer-assisted self-interview (ACASI). A test-retest study of the audio computer-assisted self-interview was undertaken with a sample of African American adolescents before the trial and outcome measures were observed to have moderate to high levels of reliability (Vanable et al., 2009). Upon completion of the project, the participants completed follow-up assessments at 3-, 6-, 12-, 18- and 36-months. Because depressive symptoms were assessed only at the baseline assessment, the current study analyses focused on the baseline and three-month follow-up data in order to keep the predictor and outcome variables temporally yoked.

## **Measures**

Survey items administered at baseline and at the three-month follow-up are included in Appendix A - H.

**Covariates.** Potential covariates included, age, group intervention condition, media intervention condition, site and parental supervision. Age at baseline was controlled for in the analyses given the evidence in the literature for increases in sexual activity as adolescents mature (Eaton et al., 2010). Additionally, group intervention condition (HIV prevention vs. general health) and media intervention condition (no campaign vs. HIV prevention campaign) were included as covariates to control for intervention effects. Study site was considered as a potential covariate to control for any differences between recruitment cities. Finally, because parental processes, such as parental monitoring, play an important role in adolescent depression (Garthe, Sullivan, & Kliwer, 2015) and sexual risk-taking (DeVore & Ginsburg, 2005; Kalina et al., 2013), parental supervision was included as a potential covariate.

**Parental Supervision.** Three items measured participants' opinions of their parent's supervision and approval of their behavior (Bettinger et al., 2004). For each item, participants indicated their rating of their parent's attempt at supervision using a four-point Likert scale (i.e., "They don't try to know at all," "They try to know some of the time," "They try to know most of the time," "They try to know all of the time"). The items were: How much do your parents or guardians try to know about: where you go at night, what you do in your free time and where you are most afternoons. A summary score was derived by averaging the scores on all three items. Internal consistency for the Parental Supervision and Approval Scale was adequate (Cronbach's  $\alpha = 1.0$ ).

### **Predictor Variables.**

***Depression.*** 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 indicated emotion in the last week using a four-point Likert scale (i.e. “less than 1 day,” “1-2 days,” “3-4 days,” “5-7 days”). The items were: During the past week: I felt that I could not shake off the blues even with help from my family and friends, I felt depressed, I thought my life had been a failure, I felt fearful, my sleep was restless, I felt lonely, I had crying spells and I felt sad. A summary score was derived by adding the scores for each of the eight items. Internal consistency for the brief CES-D measure was adequate (Cronbach’s  $\alpha = .88$ ).

***Sex refusal self-efficacy.*** Five items measured the extent to which participants could refuse vaginal sex under various conditions (Zimmerman, Sprecher, Langer, & Holloway, 1995). For each item, participants rated their confidence level to refuse sex during the next month using a four-point Likert scale (i.e., “definitely could not say no” “probably could not say no,” “probably could say no,” “definitely could say no”). The items were: How sure are you that you would be able to say no to having vaginal sex with someone if: you have known the person for a few days or less, you want to date him or her again, you want the person to fall in love with you have been drinking alcohol or using drugs, and the person is pressuring you to have sex. A summary score was derived by averaging the scores on all five items. Internal consistency for the Sex Refusal Self-Efficacy Scale was adequate (Cronbach’s  $\alpha = .85$ ).

***Condom use self-efficacy.*** Five items measured participants’ self-efficacy to use condoms in different situations (Galavotti et al., 1995). For each situation, participants indicated their self-efficacy to use a condom using a four-point Likert scale (i.e., “Not at all sure,” “Somewhat sure,” “Sure,” “Extremely sure”). If participants had never had sex before, they were

asked to respond by imagining that they were in the hypothetical scenarios. The items were: How sure are you that you would use a condom when you have vaginal sex if you: have been using alcohol or other drugs, are sexually aroused, think your partner might get angry, are already using another method of birth control, and want your partner to know you are committed to your relationship. A summary score was derived by averaging the scores on all five items. Internal consistency for the Condom Use Self-Efficacy Scale was adequate (Cronbach's  $\alpha = .81$ ).

**Dependent variables.** Using items developed in previous research (Venable et al., 2009), sexual behaviors, including indices of oral and vaginal sex, condom use for vaginal sex, and number of sexual partners were assessed at baseline and at the three-month follow-up. For the present study, we focused on four indices of sexual behaviors: (a) engagement in vaginal sex; (b) having two or more sexual partners; (c) relative frequency of condom use; and (d) condom use for the last occasion of sex, all assessed for the previous three-months at the follow-up assessment.

***Sexual activity status and sex with two or more partners.*** Sexual activity status was coded based on responses to the question "With how many people have you had vaginal sex (penis in vagina) in the past three months." Participants were dichotomously categorized based on no sexual activity (0) versus sexual activity (1) for the previous three-months. The same item was used to code for whether participants had had vaginal sex with *two or more partners*. 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 three-months.

***Relative frequency of condom use.*** Among sexually active participants, a single item was used to assess the relative frequency of condom use (Schroder, Carey, & Venable, 2003). Using a six-point Likert scale (i.e., "Never," "Rarely," "Some of the time," "Most of the time," "Nearly

every time,” “Every time”), subjects were asked: “In the last three 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.** Among sexually active participants, additional items were included to assess the last time participants engaged in sexual activity. Participants were asked to recall their most recent episode of sexual activity with prompt stating, “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. Participants were dichotomously categorized based on condom use (0) versus non-condom use (1) at the last occasion of vaginal sex.

### **Data Analyses**

**Participation and attrition.** Of the 1,612 participants at baseline, 1,580 (98%) were retained at the three-month follow-up. Adolescents lost at the three-month follow-up did not differ from those with complete data in regards to depression scores or for any of the sexual health outcome variables. However, individuals who completed the follow-up assessment reported greater parental supervision at baseline compared to those who did not,  $t(1, 1614) = 2.69, p = .01$ .

**Missing data.** Data from one participant were not included in the analysis examining the effects of depression on an adolescent’s sexual activity status due to missing data at the three-month follow-up.

**Outliers.** The data were examined to identify univariate outliers. For predictor variables, covariates and outcome variables, univariate outliers were identified as unstandardized scores

greater than three standard deviations above the mean. There were 31 outliers across the baseline CES-D scores that were used as the predictor in the regression models. There were also 29 outliers across the baseline parental supervision scores that were tested as a potential covariate to be included in the regression models. Outliers were replaced with the unstandardized score for which  $Z = 3$  (Tabachnick & Fidell, 2007).

**Normality.** Univariate normality was assessed via indices of skewness and kurtosis (see Table 1), as well as through visual inspections of histograms. Using cutoff values of  $\pm 2.00$  for measures of skewness and kurtosis indicative of normal distribution (George & Mallery, 2010), the following variables were significantly positively skewed: CES-D scores (measured at baseline) and level of parental supervision (measured at baseline). The outcome variable, number of sexual partners (measured at the three-month follow-up), was also significantly positively skewed; the variable was dichotomized to denote participants who endorsed having two or more sexual partners during the previous three-months.

**Data analytic plan.** Analyses focused on sexual health data reported at the three-month follow-up because they were temporally linked to the evaluation of depressive symptoms collected at the baseline assessment. Descriptive analyses were used to characterize the prevalence of depressive symptoms at the baseline assessment, as well as engagement in sexual activity and high-risk sexual behaviors at the three-month follow-up for the sample. Subsequently bivariate association between predictor and potential covariate variables were examined.

Primary study hypotheses concerning the main effects and interaction of depressive symptoms and gender were tested using hierarchical regression models, with each sexual risk variable serving as the primary outcome variables. Baseline sexual risk variables, as well as other

covariates were entered at Step 1. The main effects of depressive symptoms and gender were entered at Step 2. Finally, the Depression X Gender interaction term was entered at Step 3. Significant interactions were then characterized further through subgroup analyses of the relationship between depressive symptoms and sexual risk, stratified by gender. Analyses were restricted to sexually active adolescents when examining the association of depressive symptoms to the likelihood of having two or more sexual partners, as well as the two indices of condom use.

Lastly, mediation analyses were conducted using an SPSS macro “PROCESS” (Hayes, 2013; Preacher & Hayes, 2008) that was designed to examine mediator 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. Specific to the current study, sex refusal self-efficacy (M1) was tested as a mediator of the effects of depressive symptoms (X) on engagement in vaginal sex [Y1] and having two or more sexual partners [Y2]. Secondly, condom use self-efficacy (M2) was tested as a mediator of the effects of depressive symptom on the relative frequency of condom use [Y3] and non-condom use at the last instance of vaginal sex [Y4]). All analyses controlled for the baseline sexual risk outcome, baseline levels of the proposed mediator and other identified covariates. The conceptual path model for mediation hypotheses are presented in Figures 2 and 3. In such a mediation model, path c refers to the total effect (overall impact of X on Y). The direct effect (path c') refers to the impact of X on Y independent of the mediator. The indirect effect (path a\*b) refers to the impact of X on Y through M.

## **Results**

## Descriptive Findings

Descriptive findings concerning depressive symptoms, sexual activity levels, and other key study variables are shown in Table 1. Of note, 24% of participants reported above-threshold levels of depressive symptomatology at baseline ( $M = 12.37$ ,  $SD = 5.11$ ). Overall, 51% of adolescents reported being sexually active at the three-month follow-up. Among those who endorsed sexual activity, 11% reported having two or more sexual partners in the last three-months. Further, sexually active participants indicated that they used condoms “most of the time” in the previous three-months ( $M = 4.19$ ,  $SD = 1.95$  on a 1-6 scale). Nevertheless, 36% reported non-condom use at the last occasion of vaginal sex.

## Bivariate Associations

Overall, there was no association between age at baseline and depressive symptoms, as assessed by the CES-D ( $r = .04$ ,  $p = .10$ ). Female participants ( $M = 13.15$ ,  $SD = 5.24$ ) endorsed more severe depressive symptoms relative to their male counterparts ( $M = 11.10$ ,  $SD = 4.11$ ),  $t(1, 1614) = -8.45$ ,  $p < .001$ . However, females reported greater self-efficacy with regard to refusing sex ( $M = 3.53$ ,  $SD = .71$  versus  $M = 2.78$ ,  $SD = .91$ ),  $t(1, 1578) = -17.43$ ,  $p < .001$ , and using condoms ( $M = 3.21$ ,  $SD = .80$  versus  $M = 2.96$ ,  $SD = .86$ ),  $t(1, 1578) = -5.89$ ,  $p < .001$ . Neither study site or parental supervision were significantly associated with age, gender, depressive symptoms or the sexual health outcome variables. Therefore, study site and level of parental supervision were not included as a covariate in the subsequent regression models.

## Primary Study Findings

**Hypothesis 1.** It was hypothesized that depressive symptoms are a longitudinal predictor of four distinct measures of sexual behavior for the previous three-months: engagement in

vaginal sex, having two or more sexual partners, the relative frequency of condom use, and non-condom use at the most recent episode of vaginal sex.

In the regression models that tested the effects of depressive symptoms on sexual behaviors for the previous three-months, CES-D scores measured at baseline were not a significant predictor of engagement in vaginal sex reported at the three-month follow-up after controlling for baseline sexual activity status, Wald  $\chi^2$  ( $df = 1$ ) = 1.73,  $p = .19$  (see Table 2). However, baseline CES-D scores were predictive of having two or more sexual partners at the follow-up assessment, Wald  $\chi^2$  ( $df = 1$ ) = 4.01,  $p = .05$  (see Table 3), such that those scoring higher on the CES-D were more likely to report having two or more sexual partners. There was also a significant longitudinal association of baseline CES-D scores to the frequency of condom use for the last three-months ( $b = -.04$ ,  $t = -2.94$ ,  $p = .003$ ; see Table 4), where depressed adolescents reported less consistent condom use. Similarly, depression scores were predictive of non-condom use at the last occasion of vaginal sex, Wald  $\chi^2$  ( $df = 1$ ) = 7.09,  $p = .008$  (see Table 5), such that those scoring high on the CES-D were more likely to report non-condom use. In summary and consistent with the first hypothesis, higher levels of depressive symptomatology, as assessed by the CES-D, were predictive of subsequent sexual risk-taking, including endorsement of sexual activity with two or more partners and two indices of inconsistent condom use.

**Hypothesis 2.** It was hypothesized that that the depression-sexual risk relationship is stronger among African American males relative to females on four distinct measures of sexual behavior for the previous three-months: engagement in vaginal sex, having two or more sexual partners, the relative frequency of condom use, and non-condom use at the most recent episode of vaginal sex.

In the regression models that tested the moderating effects of gender on the depression-sexual risk relationship, the Gender X Depression interaction term did not explain a significant increase in variance in predicting engagement in vaginal sex for the previous three-months ( $\Delta$  Model  $\chi^2 = 1.06, p = .30$ ; see Table 2). Thus, contrary to the second hypothesis, depressive symptoms were not associated with sexual activity status for either males or females in this sample of African American adolescents.

However, the Gender X Depression interaction term did explain a significant increase in the likelihood of having two or more sexual partners in the previous three-months ( $\Delta$  Model  $\chi^2 = 4.26, p = .04$ ; see Table 3). When logistic regressions were estimated separately for each gender, depressive symptoms were a significant predictor of having two or more sexual partners among females, Wald  $\chi^2 (df = 1) = 6.68, p = .01$ , but not among males, Wald  $\chi^2 (df = 1) = .004, p = .64$ . As such, female adolescents scoring higher on the CES-D at baseline were more likely to report two or more sexual partners at the three-month follow-up compared to their non-depressed counterparts (see Figure 1). Contrary to the second hypothesis, the depression-sexual risk relationship was shown to be stronger among African American females relative to males with regard to having two or more sexual partners.

The Gender X Depression interaction term did not explain any variance in predicting the relative frequency of condom use measure ( $\Delta$  Model  $R^2 = .003, p = .14$ ; see Table 4). Further the Gender X Depression interaction was not a significant predictor of the likelihood of non-condom use at the most recent sexual episode ( $\Delta$  Model  $\chi^2 = .45, p = .50$ ; see Table 5). Therefore, contrary to the second hypothesis, gender did not moderate the effect of depressive symptoms on condom use behaviors.

**Hypothesis 3.** It was hypothesized that self-efficacy for safer sex practices mediates the association of depressive symptoms and four distinct measures of sexual behavior for the previous three-months: engagement in vaginal sex, having two or more sexual partners, the relative frequency of condom use, and non-condom use at the most recent episode of vaginal sex.

**H3a:** The effect of depressive symptoms on engagement in vaginal sex and having two or more sexual partners is mediated by an individual's self-efficacy to refuse sex.

Depressive symptoms were not significantly predictive of sex refusal self-efficacy ( $a; b = .003, t = .61, p = .54$ ). Therefore, sex refusal self-efficacy was not tested as a mediator of the relationship of depressive symptoms to engagement in vaginal sex. Contrary to the third hypothesis, African American adolescents did not engage in vaginal intercourse because they are less confident in their ability to refuse sex.

Because gender significantly moderated the effects of depression on reporting sexual activity with two or more partners, moderated mediation analyses were conducted. First, gender was tested as a moderator of the effects of depressive symptoms on sex refusal self-efficacy (path a) because the direct effects of depression on self-efficacy were non-significant. The Gender X Depression interaction term was not predictive of sex refusal self-efficacy ( $a; b = -.01, t = -1.09, p = .26$ ). Therefore, sex refusal self-efficacy was not tested as a mediator of the effects of depressive symptoms on the likelihood of reporting two or more sexual partners. Contrary to the third hypothesis, African American adolescents do not engage in sexual activity with multiple sexual partners because they are less assertive in refusing sex.

**H3b:** The effect of depressive symptoms on the relative frequency of condom use and non-condom use at the last occasion of sex is mediated by an individual's self-efficacy to use condoms.

A series of bivariate regression models established that depressive symptoms were a significant predictor of condom use self-efficacy ( $a$ ;  $b = -.01, t = -2.33, p = .02$ ) and the relative frequency of condom use for the previous three-months ( $c$ ;  $b = -.04, t = -2.64, p = .009$ ). The positive association between condom use self-efficacy and the relative frequency of condom use was also significant ( $b$ ;  $b = .86, t = 8.93, p < .001$ ; See Table 6). Based on 10,000 bootstrap resamples, a test of the indirect effect of depressive symptoms on condom use via condom use self-efficacy was significant ( $b = -.01$ ; bootstrap 95% CI:  $-.02, -.001$ ; see Table 7), indicating that condom use self-efficacy mediated the association between depressive symptoms and the relative frequency of condom use for the previous three-months ( $a*b$ ). Consistent with the second hypothesis, depressed African American adolescents may use condoms inconsistently because they are less confident in their ability to engage in condom protected sex.

Further, depressive symptoms were a significant predictor of condom use self-efficacy ( $a$ ;  $b = -.01, t = -2.87, p = .004$ ), and non-condom use at the most recent episode of vaginal sex ( $c$ ;  $b = .04, Z = 2.52, p = .01$ ). The negative association between condom use self-efficacy and non-condom use at the last occasion of vaginal sex was also significant ( $b$ ;  $b = -.70, Z = -6.50, p < .001$ ; see Table 6). Based on 10,000 bootstrap resamples, a test of the indirect effect of depressive symptoms on condom use at the last instance of vaginal sex via condom use self-efficacy was significant ( $b = .01$ ; bootstrap 95% CI:  $.003, .02$ ; see Table 7). Therefore, condom use self-efficacy mediated the association between depressive symptoms and unprotected sex at the most recent sexual episode. Once more, consistent with the third hypothesis, African American adolescents may engage in unprotected vaginal sex because they are less confident in their ability to use condoms.

## **Discussion**

Previous research examining the hypothesis that depressive symptoms predict subsequent sexual risk-taking among African American adolescents has yielded mixed findings and focused primarily on female samples from single geographic regions (see Rubin et al., 2009; Seth et al., 2011; Voisin et al., 2013; Jackson et al., 2015). To address these gaps in the literature, the present study examined the longitudinal association of depressive symptoms to sexual risk behaviors in a large, multicity, and mixed gender sample of African American adolescents. Secondarily, this study tested the hypothesis that depressive symptoms are a more powerful predictor of sexual risk-taking for adolescent males, relative to females. Lastly, the current study is the first to examine the hypothesis that sex refusal and condom use self-efficacy mediate the depression-sexual risk relationship among African American adolescents.

Results confirmed that depressive symptoms were highly prevalent among the African American adolescents sampled. After controlling for baseline risk behavior, depressed mood emerged as a significant predictor of subsequent sexual risk-taking. Specifically, baseline depressive symptoms predicted engagement in vaginal sex with two or more partners, rates of inconsistent condom use, and non-condom use at the last occasion of sex, all assessed at the three-month follow-up. Analyses also provided partial support for the hypothesis that the association between depression and sexual risk varies as a function of gender. However, the moderation findings were in the opposite direction to what was hypothesized. Depressive symptoms were predictive of having two or more sexual partners among female participants, but not among male participants. Further, the strength of the association between depression and inconsistent condom use was equivalent across both genders.

The moderation findings diverge from other study findings involving multi-ethnic samples, where depression was found to be a more powerful predictor of sexual risk among

adolescent males compared to females (e.g. Shrier et al., 2001; Lehrer et al., 2006). However, such studies identified gender differences for reports of non-condom use, and not for markers of sexual activity with multiple partners. Further, past research on depression and sexual risk among African American adolescent samples has primarily included only female participants (e.g. Diclemente et al., 2001; Seth et al., 2011), complicating direct comparisons with current study findings as they relate to potential gender differences. As such, the present study stands alone as the first to report a longitudinal association of depressive symptoms to having sex with multiple partners among African American females relative to males.

Current study findings also point to one explanatory pathway to account for the depression-sexual risk relationship. Although there was no empirical support for the hypothesis that sex refusal self-efficacy mediates the association between depression and engagement in sex, self-efficacy for condom use did emerge as a significant explanatory variable. Consistent with the extant literature, baseline depressive symptoms were predictive of lower self-efficacy for condom use at the three-month follow-up (DiClemente et al., 2001; Seth et al., 2009; Seth et al., 2011). Condom use self-efficacy was also corroborated to be an important correlate of condom-protected sex at the three-month follow-up (e.g. Bearinger et al., 2007). Moreover, there was a significant indirect effect of depressive symptom on non-condom use through condom use self-efficacy. Thus, the present study provides the first empirical evidence to support the hypothesis that self-efficacy for condom use mediates the association of depressive symptomatology to unprotected sex.

While condom use self-efficacy proved to be an important mediating variable, no such support was found for sex refusal self-efficacy. Indeed, depressive symptoms were not predictive of an adolescent's confidence to refuse sex. The literature suggests other plausible hypotheses for

why depressed adolescents are choosing to engage in sexual activity. For example, negative self-esteem may better explain the association of depression to engagement in sex (Lopez et al., 2011). Indeed, in interviews with African American adolescents about their sexual behaviors, Brawner, Gomes, Jemmott, Deatrick, & Coleman (2012) found that participants reported that they were “looking for love,” trying to “get attention” and seeking someone to “comfort them” when having sex. Therefore, it could be that adolescents are attempting to compensate for their internal negative self-evaluations with external sources of validation, including sexual contact, with less concern for the potential adverse consequences to their health.

### **Public Health and Clinical Implications**

The findings that depressive symptoms are associated with non-condom use among males and females and increased sexual activity among females have important implications for HIV/STI prevention. Specifically, behavioral interventions may benefit from modules that include a focus on the influence of mood on sexual behaviors and self-efficacy for safer sex practices. Relatedly, health promotion interventions could influence behavioral outcomes by helping youth to develop adaptive coping strategies for depressive symptoms. Indeed, a recent meta-analytic review of the literature on HIV/STI risk reduction intervention outcomes for primarily adult African American women showed that decreases in sexual risk-taking for intervention participants were optimized when the intervention lead to reductions in depressed mood (Lennon, Huedo-Medina, Gerwien, & Johnson, 2012). The reviewed interventions included components that addressed information on condom use, HIV testing and counseling, as well as self-management and coping skills for depressive symptoms. Taken together with findings of the current study, it may be beneficial for clinicians to address HIV/STI prevention

skills training, as well as depressive symptoms in order to improve transmission reduction outcomes among adolescents exhibiting high risk sexual behaviors.

Interventions to target depressed mood and sexual risk behaviors among adolescents would need to be distinct and developmentally appropriate because adolescents are presented with challenges beyond those experienced by adults. For instance, adolescents are more likely to have limited sexual experience, which may compound barriers to safer sex negotiation and practice. Further, adolescents differ developmentally from adults in the way they value affiliation and autonomy (Ahammer and Baltes, 1972). Therefore, the impact of risky community and peer norms may lead to less favorable outcome expectancies for protective behaviors in adolescents. Taken together, interventions for adolescents will likely benefit from a focus on enhancing self-efficacy to enable risk reduction, as well as social support to improve mood and maintain low-risk behavior.

More globally, this work highlights the importance of primary intervention strategies to screen for depressive symptoms and to provide sexual health counseling in primary care and other medical settings. Population-based efforts in mental health screening and treatment among African American communities could be a promising start based on the findings of the present study. For instance, the current study sample reported severe depressive symptomatology, consistent with other reports in the literature (e.g. Collins et al., 2010). Further, depressive symptoms were longitudinally associated with poor behavioral health outcomes. As such, prevention efforts will likely need to address the negative attitudes surrounding mental health services that are often reported by ethnic minorities (Alvidrez, 1999; Corrigan, 2004). Specifically, mental health difficulties are commonly stigmatized in African American

communities, leading to low disclosure rates and poor treatment engagement (Angold et al., 2002; Bains, 2014; Song, Sands, & Wong, 2004).

### **Study Limitations and Future Directions**

The current study findings should be considered in the contexts of its limitations that suggest directions for future research. First, the CES-D scale used in this study is a screening tool, and therefore we cannot comment on the relation of syndromal depression or other mood disorders to sexual behaviors. However, for the sake of brevity, depression and depressive symptoms are often used interchangeably in the current study and the extant literature. Future work should highlight the distinction between depression as a clinical disorder and depressed mood as a negative affective state as it relates to sexual risk-taking. Further, studies should seek to replicate the current study findings among individuals with diagnosed depressive and other mood disorders. Studies that have utilized samples of clinically depressed African American adolescents have been primarily cross-sectional. Nevertheless, findings confirm depression to be an important correlate of inconsistent condom use (Brawner, Davis, et al., 2012). Only one study reported on a longitudinal association of clinical depression to unprotected sex among African American female adolescents in its examination of the bidirectional linkages between psychological distress and sexual experiences. However, there was no control group to allow for a comparison of depressed and non-depressed participants' use of condoms or reports of multiple sexual partners (Starr, Donenberg, & Emerson, 2012). Therefore, there is a need for further research to establish depression as a risk factor for sexual risk-taking among clinically depressed adolescents.

Second, study analyses were restricted to the baseline assessment of depressive symptoms and the three-month follow-up data on sexual behaviors and self-efficacy measures.

This approach was used because it provided a temporal linkage of the assessment of depressive symptomatology, tested mediators and the sexual health outcome variables. Nonetheless, this approach precluded causal references. Future research should employ a complete prospective design to test the mediating effects of condom use self-efficacy on the association of depressive symptoms to inconsistent condom use. However, it is important to note that these preliminary findings are the first attempt to test mediation in the literature on African American adolescent sexual risk-taking.

Third, the current study was unable to characterize racial difference in the association of depression to sexual risk because it focused exclusively on African American adolescents. There is research that provides evidence in support of a longitudinal association of depression to inconsistent condom use among ethnically diverse samples of adolescents (e.g. Lehrer et al., 2006). However, further research is needed to compare the effect of depression on sexual risk-taking in African American versus Caucasian adolescents. In addition, studies are needed to replicate the current findings for the mediation effects of condom use self-efficacy in a multi-ethnic sample of adolescents. Among studies that have reported a positive association of depressive symptoms to non-condom use among ethnically diverse adolescent samples, only one study examined potential mediators, with alcohol consumption and marijuana use emerging as a potential explanatory variable (Shrier et al., 2001).

Lastly, current research does little to examine conceptual differences between sexual behavior variables. For example, in the current study, the four indices of sexual “risk” were treated as non-distinct outcomes. However, depressive symptoms were differentially associated with engaging sexually with two or more partners and inconsistent condom use. Future work should seek to disentangle the role of depression symptoms as it relates to different sexual

behaviors. Further, the current study and the literature on adolescent sexual risk-taking more broadly, do not consider how sexual health outcomes are related. Therefore, future research might also consider examining the inter-correlation of different measures of sexual risk.

Limitations notwithstanding, the current study produced several novel findings that have the potential to assist clinicians working with African American adolescents to improve HIV/STI transmission outcomes. Ultimately, advancing this program of research can help providers to better understand and tailor interventions to address depressive symptoms, self-efficacy for safer sex practices, and sexual risk-taking in their work with African American adolescents. Because evidence continues to emerge that multiple psychosocial stressors and mental health difficulties interact to increase risk for HIV/STI transmission and other negative health outcomes among African American adolescents, it may be particularly important to integrate mental health screening into primary care.

Table 1

*Descriptive Statistics for all Study Variables*

| Time |  | <i>N</i> | Mean  | <i>SD</i> | Range | Skewness | Kurtosis | $\alpha$ |
|------|--|----------|-------|-----------|-------|----------|----------|----------|
| T1   | Depressive symptoms                            | 1,616    | 12.37 | 5.11      | 8-32  | 1.62     | 2.46     | .81      |
|      | Parental Supervision                           | 1,616    | 3.55  | .92       | 0-8   | .72      | 6.34     | 1.0      |
| T2   | Sex Refusal Self-efficacy                      | 1,580    | 3.22  | .88       | 1-4   | -1.12    | .22      | .85      |
|      | Condom Use Self-efficacy                       | 1,580    | 3.11  | .83       | 1-4   | -.76     | -.25     | .81      |
|      | Engagement in Vaginal Sex                      | 1,579    | .51   | .50       | 0-1   | -.002    | -2.00    |          |
|      | Number of Sexual Partners                      | 809      | 2.34  | 4.54      | 1-65  | 9.53     | 109.35   |          |
|      | Relative Frequency of Condom Use               | 809      | 4.19  | 1.95      | 1-6   | -.55     | -1.29    |          |
|      | Unprotected Sex, Most Recent Sexual Experience | 809      | .36   | .48       | 0-1   | .57      | -1.68    |          |

*Note.* T1 = time one (baseline assessment); T2 = time two (three-month follow-up).

Table 2

*Hierarchical Regression Analyses Modeling the Direct and Interaction Effects of Depressive Symptoms and Gender on Engagement in Vaginal Sex*

| Predictors              | Step 1   |           | Step 2   |           | Step 3   |           |
|-------------------------|----------|-----------|----------|-----------|----------|-----------|
|                         | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| Media intervention      | .23*     | .11       |          |           |          |           |
| Group intervention      | -.11     | .11       |          |           |          |           |
| Age                     | .25**    | .05       |          |           |          |           |
| Sexual activity (T1)    | 1.65**   | .11       |          |           |          |           |
| CES-D                   |          |           | .02      | .01       |          |           |
| Gender                  |          |           | -.34**   | .12       |          |           |
| CES-D x gender          |          |           |          |           | .03      | .03       |
| Model $\chi^2$          | 289.49** |           | 298.52** |           | 299.58** |           |
| $\Delta$ Model $\chi^2$ |          |           | 9.03*    |           | 1.06     |           |

*Note.* Each column is a regression model that predicts engagement in vaginal sex for the previous three-months. CES-D = Center for Epidemiological Studies-Depression Scale; T1 = time one (baseline assessment).

\*  $p < .05$ , \*\*  $p < .01$ .

Table 3

*Hierarchical Regression Analyses Modeling the Direct and Interaction Effects of Depressive Symptoms and Gender on Sexual Activity with Two or More Sexual Partners*

| Predictors              | Step 1   |           | Step 2   |           | Step 3   |           |
|-------------------------|----------|-----------|----------|-----------|----------|-----------|
|                         | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| Media intervention      | .04      | .15       |          |           |          |           |
| Group intervention      | .16      | .15       |          |           |          |           |
| Age                     | -.08     | .07       |          |           |          |           |
| Sexual partners (T1)    | 1.22**   | .14       |          |           |          |           |
| CES-D                   |          |           | .03*     | .02       |          |           |
| Gender                  |          |           | -1.34**  | .17       |          |           |
| CES-D x gender          |          |           |          |           | .08**    | .03       |
| Model $\chi^2$          | 63.26**  |           | 130.92** |           | 135.19** |           |
| $\Delta$ Model $\chi^2$ |          |           | 67.66**  |           | 4.26*    |           |

*Note.* Each column is a regression model that predicts two or more sexual partners for the previous three-months. CES-D = Center for Epidemiological Studies-Depression Scale; T1 = time one (baseline assessment).

\*  $p < .05$ , \*\*  $p < .01$ .

Table 4

*Hierarchical Regression Analyses Modeling the Direct and Interaction Effects of Depressive Symptoms and Gender on Relative Frequency of Condom Use*

| Predictors                | Step 1   |           | Step 2   |           | Step 3   |           |
|---------------------------|----------|-----------|----------|-----------|----------|-----------|
|                           | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| Media intervention        | -.05     | .16       |          |           |          |           |
| Group intervention        | .09      | .16       |          |           |          |           |
| Age                       | -.20**   | .07       |          |           |          |           |
| Condom use frequency (T1) | .35**    | .04       |          |           |          |           |
| CES-D                     |          |           | -.04**   | .02       |          |           |
| Gender                    |          |           | -.23     | .16       |          |           |
| CES-D x gender            |          |           |          |           | -.05     | .03       |
| $R^2$                     | .14      |           | .16      |           | .16      |           |
| $F$                       | 22.56**  |           | 17.47**  |           | 15.32**  |           |

*Note.* Each column is a regression model that predicts the relative frequency of condom use for the previous three-months. CES-D = Center for Epidemiological Studies-Depression Scale; T1 = time one (baseline assessment).

\*  $p < .05$ , \*\*  $p < .01$ .

Table 5

*Hierarchical Regression Analyses Modeling the Direct and Interaction Effects of Depressive Symptom and Gender on Condom Use at the Most Recent Sexual Episode*

| Predictors                  | Step 1   |           | Step 2   |           | Step 3   |           |
|-----------------------------|----------|-----------|----------|-----------|----------|-----------|
|                             | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| Media intervention          | .11      | .15       |          |           |          |           |
| Group intervention          | -.19     | .15       |          |           |          |           |
| Age                         | .30**    | .07       |          |           |          |           |
| Condom use at last sex (T1) | 1.06**   | .16       |          |           |          |           |
| CES-D                       |          |           | .04**    | .02       |          |           |
| Gender                      |          |           | .34*     | .16       |          |           |
| CES-D x gender              |          |           |          |           | .02      | .03       |
| Model $\chi^2$              | 64.17**  |           | 78.99**  |           | 79.44**  |           |
| $\Delta$ Model $\chi^2$     |          |           | 14.82**  |           | .45      |           |

*Note.* Each column is a regression model that predicts unprotected vaginal sex for the most recent sexual episode. CES-D = Center for Epidemiological Studies-Depression Scale; T1 = time 1 (baseline assessment).

\*  $p < .05$ , \*\*  $p < .01$ .

Table 6

*Results from Path Model of the Effects of Depressive Symptoms on Condom Use Behaviors,  
Mediated by Condom Use Self-Efficacy*

| <b>Model 1</b> Depression → Self-efficacy → Condom use Frequency   | <i>b</i> | <i>SE</i> | <i>t</i> | <i>p</i> value |
|--|----------|-----------|----------|----------------|
| (a) Depression → Self-efficacy <sup>1</sup>                        | -.01     | .006      | -2.33    | .02            |
| (b) Self-efficacy → Condom use frequency                           | .86      | .10       | 8.93     | <.001          |
| (c) Depression → Condom use frequency                              | -.05     | .01       | -3.30    | .001           |
| (c') Depression → Condom use frequency                             | -.04     | .01       | -2.64    | .009           |
| <b>Model 2</b> Depression → Self-efficacy → Condom use at last sex | <i>b</i> | <i>SE</i> | <i>Z</i> | <i>p</i> value |
| (b) Self-efficacy → Condom use at last sex                         | -.70     | .11       | -6.50    | <.001          |
| (c) Depression → Condom use at last sex                            | .05      | .01       | 3.14     | .01            |
| (c') Depression → Condom use at last sex                           | .04      | .02       | 2.52     | .002           |

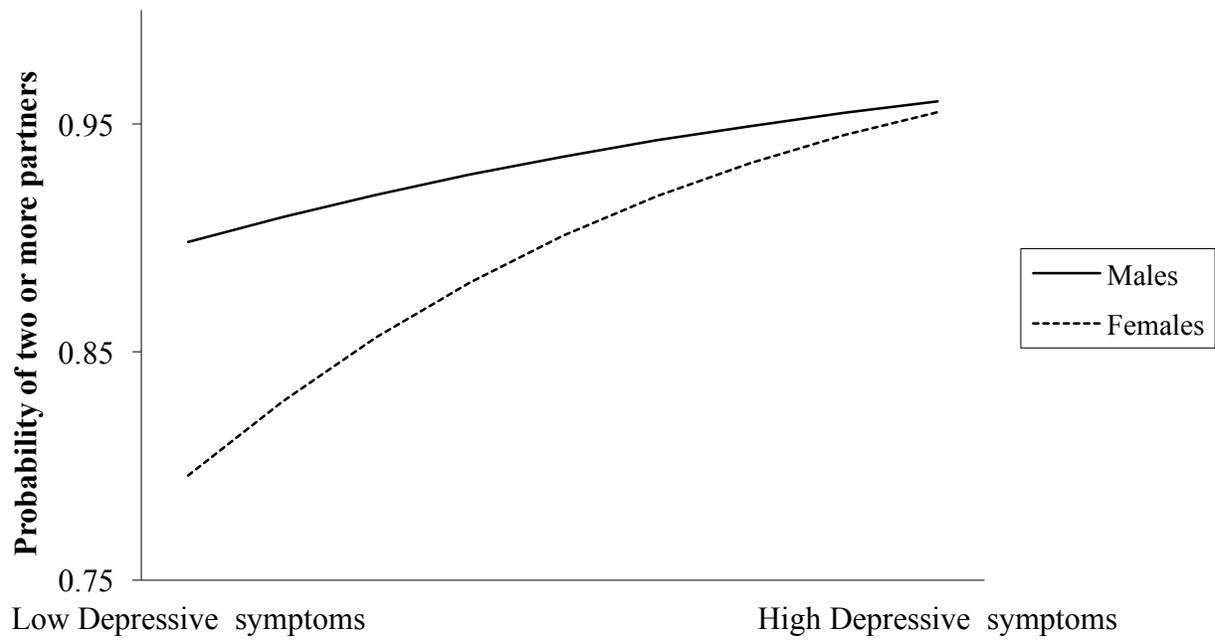
*Note.* <sup>1</sup>The significance of path a does not change across the models. To eliminate redundancy, the path is only presented once. Depressive symptoms (as measured by the Center for Epidemiological Studies-Depression Scale) at time one (baseline assessment) is the predictor variable (*X*), condom use self-efficacy at time two (three-month follow-up) is the mediator. The relative frequency of condom use and condom use at the last instance of vaginal sex at time two (three-month follow-up) are the outcome variables.

Table 7

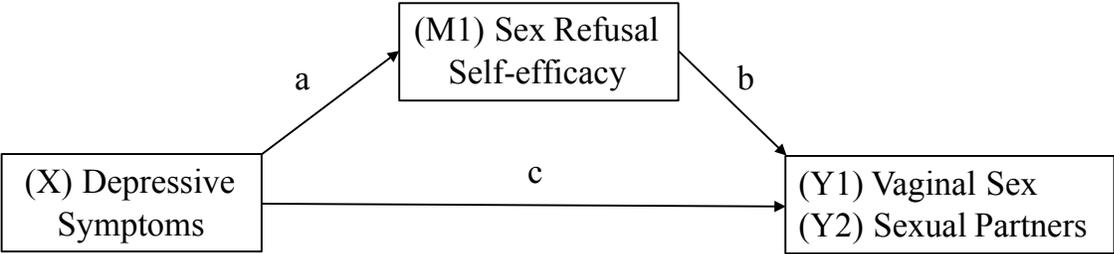
*Bootstrap Estimates of the 95% Confidence Intervals for the Mediating Effects of Condom Use Self-Efficacy*

| Mediation Model                                     | <i>b</i> | <i>SE</i> | 95% CI      |
|---|----------|-----------|-------------|
| Depression → Self-efficacy → Condom use frequency   | -.01     | .006      | -.02, -.001 |
| Depression → Self-efficacy → Condom use at last sex | .01      | .004      | .003, .02   |

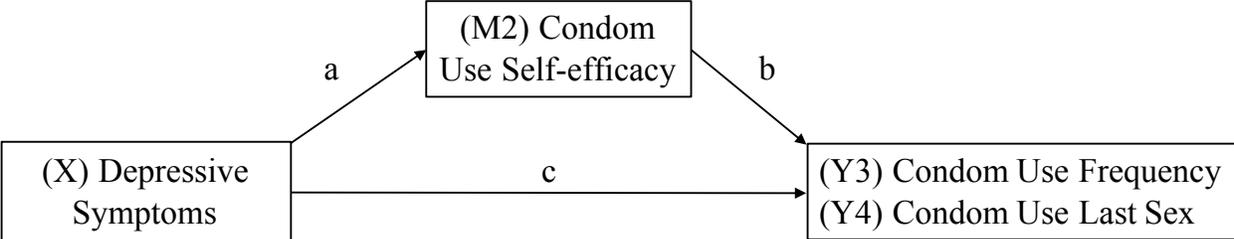
*Note.* Depression was measured by Center for Epidemiological Studies-Depression Scale at time one (baseline assessment), condom use self-efficacy and indicators of condom use behaviors were measured at time two (three-month follow-up). 95% CI = lower and upper bound of a 95% bootstrapped confidence interval of the indirect/mediating effects based on 10,000 resamples.



**Figure 1.** Two-way depressive symptoms by gender interaction effect on the probability of reporting two or more sexual partners.



**Figure 2.** Conceptual path model for the effect of depressive symptoms on engagement in vaginal sex and two or more sexual partners with sex refusal self-efficacy as a mediator.



**Figure 3.** Conceptual path model for the effect of depressive symptoms on condom use behaviors with condom use self-efficacy as a mediator.



4. At least once a week

D15. Regarding your education, which of the following is most likely to happen?

1. To quit before I graduate high school
2. To graduate from high school then stop
3. To graduate from high school and then go to college or trade school
4. To graduate from high school and college, then obtain an advanced degree (e.g., medical or law school)

D16. In what grade are you? (If D16=8 then skip to RDS1)

- |               |                            |
|---------------|----------------------------|
| 1. 7th grade  | 5. 11th grade              |
| 2. 8th grade  | 6. 12th grade              |
| 3. 9th grade  | 7. Ungraded or other grade |
| 4. 10th grade | 8. I'm not in school       |

D17. Are you eligible for a free or reduced-price school lunch?

- |        |                 |
|--------|-----------------|
| 1. Yes | 3. I don't know |
| 2. No  |                 |

D18. During the past 12 months, how would you describe your grades in school? Are they...

- |                        |                         |
|------------------------|-------------------------|
| 1. Mostly As (90 +)    | 4. Mostly Ds (60 – 69)  |
| 2. Mostly Bs (80 – 89) | 5. Mostly Fs (below 60) |
| 3. Mostly Cs (70 – 79) |                         |

D19. Compared to other students in your class, what kind of student are you?

- |                     |                     |
|---------------------|---------------------|
| 1. One of the best  | 4. Below the middle |
| 2. Above the middle | 5. Near the bottom  |
| 3. In the middle    |                     |

Appendix B: Center for Epidemiological Studies Depression Scale (CES-D) Short Form

*This set of statements is about how you may or may not have felt during the last week. Select the response that best describes how often you felt like this in the past week.*

|       |  | Less than<br>1 day | 1-2 days | 3-4 days | 5-7 days |
|-------|--|--------------------|----------|----------|----------|
| CES1. | <u>During the past week</u> I felt that I could not shake off the blues even with help from my family and friends. | 1                  | 2        | 3        | 4        |
| CES2. | <u>During the past week</u> I felt depressed.  | 1                  | 2        | 3        | 4        |
| CES3. | <u>During the past week</u> I thought my life had been a failure.  | 1                  | 2        | 3        | 4        |
| CES4. | <u>During the past week</u> I felt fearful.  | 1                  | 2        | 3        | 4        |
| CES5. | <u>During the past week</u> my sleep was restless.   | 1                  | 2        | 3        | 4        |
| CES6. | <u>During the past week</u> I felt lonely.   | 1                  | 2        | 3        | 4        |
| CES7. | <u>During the past week</u> I had crying spells.   | 1                  | 2        | 3        | 4        |
| CES8. | <u>During the past week</u> I felt sad.  | 1                  | 2        | 3        | 4        |

Appendix C: Sexual Behavior, Last 3 months

If no lifetime oral, anal, or vaginal sex, skip to next section (If SH1, SH5, SH9, SH13, and SH17 = 0)

*Please think carefully about the following questions, and give your best estimate of the number of times you engaged in each activity. Remember, these questions only refer to the last 3 months. If you did not do a behavior, write a zero (0) in the space provided.*

(Range for ALL questions: 0-300)

RSB1. With how many people have you had vaginal sex (penis in vagina) in the past 3 months? (Range 0-98) [if 0, skip to RSB6] \_\_\_\_\_ people in the past 3 months

RSB2. In the past 3 months, how many total times have you had vaginal sex (penis in vagina) without using a condom? (rubber) \_\_\_\_\_ times in the past 3 months

RSB3. In the past 3 months, how many total times have you had vaginal sex (penis in vagina) where you or your partner used a condom (rubber)? [if 0, skip to RSB5 ] \_\_\_\_\_ times in the past 3 months

RSB4. In the past 3 months, when you used a condom (rubber) for vaginal sex, how many times did the condom leak, break, or fall off? \_\_\_\_\_ times in the past 3 months

RSB5. In the past 3 months, how many times did you use withdrawal during vaginal sex? Withdrawal is when a guy pulls out before coming. \_\_\_\_\_ times in the past 3 months

RSB6. With how many people have you had anal sex (penis in bottom) in the past 3 months? (Range 0-98) [if 0, skip to RSB9]. \_\_\_\_\_ people in the past 3 months

RSB7. In the past 3 months, how many total times have you had anal sex (penis in bottom) without using a condom (rubber)? \_\_\_\_\_ times in the past 3 months

RSB8. In the past 3 months, how many total times have you had anal sex (penis in bottom) where you or your partner used a condom (rubber)? \_\_\_\_\_ times in the past 3 months

RSB9. How many different *partners* have you given or received oral sex from in the past 3 months? (Range 0-98) [if 0, skip to RSB11] \_\_\_\_\_ people in the past 3 months

RSB10. In the past 3 months, how many times have you given or received oral sex (penis in partner's mouth) without a condom \_\_\_\_\_ times in the past 3 months

(rubber)?

RSB11. In the past three months, how many times have you talked with a sexual partner about safer sex or using condoms? \_\_\_\_\_ times in the past 3 months

RSB12. In the past 3 months how many times have you refused to have vaginal sex with a partner for any reason? \_\_\_\_\_ times in the past 3 months

RSB13. In the past 3 months how many times have you refused to have vaginal sex with a partner because he/she would not use a condom? \_\_\_\_\_ times in the past 3 months

RSB14. In the past 3 months how many times have you talked with a sexual partner about getting tested for an STD or HIV? \_\_\_\_\_ times in the past 3 months

RSB15 In the past 3 months how many times have you talked with a sexual partner about how to prevent getting an STD or HIV? \_\_\_\_\_ times in the past 3 months

RSB16 In the past 3 months how many times have you talked with a sexual partner about your partner's sexual history? \_\_\_\_\_ times in the past 3 months

Appendix D: Condom use, Last 3 Months, Relative Frequency Measure

We have one last question about your sexual behavior in the past 3 months.

|  | Never | Rarely | Some of the time | Most of the time | Nearly every time | Every time |
|--|-------|--------|------------------|------------------|-------------------|------------|
| <b>RSB17.</b> 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? Would you say that you used condoms never, rarely, some of the time, most of the time, nearly every time, or every time? <i>[SKIP: If RSB1=0, skip RSB17]</i> | 1     | 2      | 3                | 4                | 5                 | 6          |

Appendix E: Sexual Behavior – Most Recent Sexual Episode

Now all of the following questions ask about the LAST TIME you had vaginal sex.

RSB18. Did you drink any amount of alcohol before the last time you had vaginal sex?

- 1  No (Skip to RSB19)
- 2  Yes

RSB18a. How many alcoholic drinks did you consume before the last time you had vaginal sex?  
\_\_\_\_\_ drinks (Range 0-50)

RSB19. Did you take any drugs (for example, marijuana or cocaine) before the last time you had vaginal sex?

- 1  No
- 2  Yes

RSB20. The last time you had vaginal sex, what was your relationship with the other person?  
Was he/she...

- 1  someone you just met or a casual friend
- 2  someone you knew well, but not a regular or “steady” partner
- 3  a steady boyfriend or girlfriend

RSB21. The last time you had vaginal sex, did you or your partner use a condom?

- 1  no
- 2  yes

RSB22. The last time you had vaginal sex, what method did you or your partner use to prevent pregnancy? (Check all that apply.)

- 1  No method was used to prevent pregnancy
- 2  Birth control pills
- 3  Condoms (rubber)
- 4  Used Depo-Provera (injectable birth control)
- 5  Had sex during a safe time of the month (rhythm method)
- 6  Pulled out before ejaculating (“cumming”) / withdrawal
- 7  Some other method not listed above

## Appendix F: Condom Use Self-Efficacy Scale

*The next section asks you about using condoms under a variety of conditions. Even if you have never had sex or don't plan to have sex in the near future, answer these items as if you were in each situation.*

|   | Not at<br>all sure | Somewhat<br>sure | Sure | Extremely<br>sure |
|---|--------------------|------------------|------|-------------------|
| SEU1. How sure are you that you would use a condom when you have vaginal sex if you have been using alcohol or other drugs?                           | 1                  | 2                | 3    | 4                 |
| SEU2. How sure are you that you would use a condom when you have vaginal sex if you are sexually aroused?   | 1                  | 2                | 3    | 4                 |
| SEU3. How sure are you that you would use a condom when you have vaginal sex if you think your partner might get angry?                               | 1                  | 2                | 3    | 4                 |
| SEU4. How sure are you that you would use a condom when you have vaginal sex if you are already using another method of birth control?                | 1                  | 2                | 3    | 4                 |
| SEU5. How sure are you that you would use a condom when you have vaginal sex if you want your partner to know you are committed to your relationship? | 1                  | 2                | 3    | 4                 |

## Appendix G: Sex Refusal Self-efficacy

*Sometimes adolescents don't want to have vaginal sex. Please indicate how sure you are that you would be able to say NO to having vaginal sex with someone in the following situations.*

|  | I definitely<br><u>could not</u><br>say no | I probably<br><u>could not</u><br>say no | I probably<br><u>could</u><br>say no | I definitely<br><u>could</u> say<br>no |
|--|--|--|--------------------------------------|--|
| SRSE1. How sure are you that you would be able to say NO to having vaginal sex with someone if you have known the person for a few days or less? | 1  | 2  | 3                                    | 4                                      |
| SRSE2. How sure are you that you would be able to say NO to having vaginal sex with someone if you want to date him or her again?                | 1  | 2  | 3                                    | 4                                      |
| SRSE3. How sure are you that you would be able to say NO to having vaginal sex with someone if you want the person to fall in love with you?     | 1  | 2  | 3                                    | 4                                      |
| SRSE4. How sure are you that you would be able to say NO to having vaginal sex with someone if the person is pressuring you to have sex?         | 1  | 2  | 3                                    | 4                                      |
| SRSE5. How sure are you that you would be able to say NO to having vaginal sex with someone if you have been drinking alcohol or using drugs?    | 1  | 2  | 3                                    | 4                                      |

## Appendix H: Parental Supervision and Approval

*Now, a few questions about your parents...*

|  | They don't try<br>to know at all | They try to<br>know some of<br>the time | They try to<br>know most of<br>the time | They try to<br>know all of the<br>time |
|--|----------------------------------|---|---|--|
| PS1. How much do your<br>parents or guardians try to<br>know about where you go at<br>night?         | 1                                | 2                                       | 3                                       | 4                                      |
| PS2. How much do your<br>parents or guardians try to<br>know about what you do in<br>your free time? | 1                                | 2                                       | 3                                       | 4                                      |
| PS3. How much do your<br>parents or guardians try to<br>know about where you are<br>most afternoons? | 1                                | 2                                       | 3                                       | 4                                      |

## References

- Ahammer, I. M., & Baltes, P. B. (1972). Objective versus perceived age differences in personality: How do adolescents, adults, and older people view themselves and each other? *Journal of Gerontology*, 27(1), 46-51. doi:10.1093/geronj/27.1.46
- Alvidrez, J. (1999). Ethnic Variations in Mental Health Attitudes and Service Use Among Low-Income African American, Latina, and European American Young Women. *Community Ment Health J*, 35(6), 515-530. doi:10.1023/a:1018759201290
- Angold, A., Erkanli, A., Farmer, E. M., Fairbank, J. A., Burns, B. J., Keeler, G., & Costello, E. J. (2002). Psychiatric disorder, impairment, and service use in rural African American and white youth. *Arch Gen Psychiatry*, 59(10), 893-901.
- Bains, R. M. (2014). African American adolescents and mental health care: a metasynthesis. *J Child Adolesc Psychiatr Nurs*, 27(2), 83-92. doi:10.1111/jcap.12074
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ, US: Prentice-Hall, Inc.
- Bearden, C. E., Glahn, D. C., Monkul, E. S., Barrett, J., Najt, P., Villarreal, V., & Soares, J. C. (2006). Patterns of memory impairment in bipolar disorder and unipolar major depression. *Psychiatry Research*, 142(2-3), 139-150.  
doi:<http://dx.doi.org/10.1016/j.psychres.2005.08.010>
- Beidas, R. S., Birkett, M., Newcomb, M. E., & Mustanski, B. (2012). Do psychiatric disorders moderate the relationship between psychological distress and sexual risk-taking behaviors in young men who have sex with men? A longitudinal perspective. *AIDS Patient Care STDS*, 26(6), 366-374. doi:10.1089/apc.2011.0418

- Bettinger, J. A., Celentano, D. D., Curriero, F. C., Adler, N. E., Millstein, S. G., & Ellen, J. M. (2004). Does parental involvement predict new sexually transmitted diseases in female adolescents? *Arch Pediatr Adolesc Med*, *158*(7), 666-670.  
doi:10.1001/archpedi.158.7.666
- Biello, K. B., Ickovics, J., Niccolai, L., Lin, H., & Kershaw, T. (2013). Racial differences in age at first sexual intercourse: residential racial segregation and the black-white disparity among U.S. adolescents. *Public Health Rep*, *128 Suppl 1*, 23-32.
- Biringer, E., Lundervold, A., Stordal, K., Mykletun, A., Egeland, J., Bottlender, R., & Lund, A. (2005). Executive function improvement upon remission of recurrent unipolar depression. *Eur Arch Psychiatry Clin Neurosci*, *255*(6), 373-380. doi:10.1007/s00406-005-0577-7
- Brawner, B. M., Davis, Z. M., Fannin, E. F., & Alexander, K. A. (2012). Clinical depression and condom use attitudes and beliefs among African American adolescent females. *J Assoc Nurses AIDS Care*, *23*(3), 184-194. doi:10.1016/j.jana.2011.03.005
- Brawner, B. M., Gomes, M. M., Jemmott, L. S., Deatrck, J. A., & Coleman, C. L. (2012). Clinical depression and HIV risk-related sexual behaviors among African-American adolescent females: unmasking the numbers. *AIDS Care*, *24*(5), 618-625.  
doi:10.1080/09540121.2011.630344
- Brown, L. K., Hadley, W., Stewart, A., Lescano, C., Whiteley, L., Donenberg, G., . . . Project, S. S. G. (2010). Psychiatric disorders and sexual risk among adolescents in mental health treatment. *J Consult Clin Psychol*, *78*(4), 590-597. doi:10.1037/a0019632
- Brown, L. K., Tolou-Shams, M., Lescano, C., Houck, C., Zeidman, J., Pugatch, D., . . . Project, S. S. G. (2006). Depressive symptoms as a predictor of sexual risk among African

- American adolescents and young adults. *J Adolesc Health*, 39(3), 444 e441-448.  
doi:10.1016/j.jadohealth.2006.01.015
- CDC. (2014a). HIV Diagnosis, Care, and Treatment Among Persons Living with HIV — United States, 2011. *MMWR.*, 63(47), 1113-1117.
- CDC. (2014b). Men Living with Diagnosed HIV Who Have Sex with Men: Progress Along the Continuum of HIV Care – United States, 2010. *MMWR.*, 63(8), 829-833.
- CDC. (2016). Diagnoses of HIV Infection in the United States and Dependent Areas, 2014. *HIV Surveillance Report 2015*, 26.
- Chapin, J. (2001). It won't happen to me: The role of optimistic bias in African American teens' risky sexual practices. *Howard Journal of Communications*, 12(1), 49-59.  
doi:10.1080/10646170151143370
- Christopher, G., & MacDonald, J. (2005). The impact of clinical depression on working memory. *Cognitive Neuropsychiatry*, 10(5), 379-399. doi:10.1080/13546800444000128
- Collins, M. H., Kelch-Oliver, K., Johnson, K., Welkom, J., Kottke, M., & Smith, C. O. (2010). Clinically significant depressive symptoms in African American adolescent females in an urban reproductive health clinic. *J Clin Psychol Med Settings*, 17(3), 175-182.  
doi:10.1007/s10880-010-9200-9
- Corrigan, P. (2004). How stigma interferes with mental health care. *Am Psychol*, 59(7), 614-625.  
doi:10.1037/0003-066X.59.7.614
- DeVore, E. R., & Ginsburg, K. R. (2005). The protective effects of good parenting on adolescents. *Curr Opin Pediatr*, 17(4), 460-465.

- DiClemente, R. J., Wingood, G. M., Crosby, R. A., Sionean, C., Brown, L. K., Rothbaum, B., . . . Davies, S. (2001). A prospective study of psychological distress and sexual risk behavior among black adolescent females. *Pediatrics, 108*(5), E85.
- DiIorio, C., Dudley, W. N., Kelly, M., Soet, J. E., Mbwarra, J., & Sharpe Potter, J. (2001). Social cognitive correlates of sexual experience and condom use among 13- through 15-year-old adolescents. *J Adolesc Health, 29*(3), 208-216.
- Donenberg, G. R., Bryant, F. B., Emerson, E., Wilson, H. W., & Pasch, K. E. (2003). Tracing the roots of early sexual debut among adolescents in psychiatric care. *J Am Acad Child Adolesc Psychiatry, 42*(5), 594-608. doi:10.1097/01.CHI.0000046833.09750.91
- Donenberg, G. R., & Pao, M. (2005). Youths and HIV/AIDS: psychiatry's role in a changing epidemic. *J Am Acad Child Adolesc Psychiatry, 44*(8), 728-747. doi:10.1097/01.chi.0000166381.68392.02
- Ehrenberg, M. F., Cox, D. N., & Koopman, R. F. (1991). The relationship between self-efficacy and depression in adolescents. *Adolescence, 26*(102), 361-374.
- Fisher, C. M. (2011). Are Information, Motivation, and Behavioral Skills Linked with HIV-Related Sexual Risk among Young Men Who Have Sex with Men? *J HIV AIDS Soc Serv, 10*(1), 5-21. doi:10.1080/15381501.2011.549064
- Fisher, J. D., & Fisher, W. A. (1996). The Information-Motivation-Behavioral skills model of AIDS risk behavior change: Empirical support and application. In S. Oskamp, S. C. Thompson, S. Oskamp, & S. C. Thompson (Eds.), *Understanding and preventing HIV risk behavior: Safer sex and drug use.* (pp. 100-127). Thousand Oaks, CA, US: Sage Publications, Inc.

- Galavotti, C., Cabral, R. J., Lansky, A., Grimley, D. M., Riley, G. E., & Prochaska, J. O. (1995). Validation of measures of condom and other contraceptive use among women at high risk for HIV infection and unintended pregnancy. *Health Psychol, 14*(6), 570-578.
- Garrison, C. Z., Schluchter, M. D., Schoenbach, V. J., & Kaplan, B. K. (1989). Epidemiology of depressive symptoms in young adolescents. *J Am Acad Child Adolesc Psychiatry, 28*(3), 343-351. doi:10.1097/00004583-198905000-00007
- Garthe, R. C., Sullivan, T., & Kliwer, W. (2015). Longitudinal relations between adolescent and parental behaviors, parental knowledge, and internalizing behaviors among urban adolescents. *Journal of Youth and Adolescence, 44*(4), 819-832. doi:10.1007/s10964-014-0112-0
- George, D., & Mallery, P. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference 17.0 Update. 10th Edition.* . Boston: Pearson
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* New York, NY, US: Guilford Press.
- Jackson, J. M., Seth, P., DiClemente, R. J., & Lin, A. (2015). Association of depressive symptoms and substance use with risky sexual behavior and sexually transmitted infections among African American female adolescents seeking sexual health care. *American Journal of Public Health, 105*(10), 2137-2142. doi:10.2105/AJPH.2014.302493
- Jasuja, S., Thompson, N. D., Peters, P. J., Khudyakov, Y. E., Patel, M. T., Linchangco, P., . . . Gerber, S. I. (2012). Investigation of hepatitis B virus and human immunodeficiency virus transmission among severely mentally ill residents at a long term care facility. *PLoS ONE, 7*(8). doi:10.1371/journal.pone.0043252

- Kalina, O., Geckova, A. M., Klein, D., Jarcuska, P., Orosova, O., van Dijk, J. P., & Reijneveld, S. A. (2013). Mother's and father's monitoring is more important than parental social support regarding sexual risk behaviour among 15-year-old adolescents. *The European Journal of Contraception and Reproductive Health Care, 18*(2), 95-103.  
doi:10.3109/13625187.2012.752450
- Khan, M. R., Kaufman, J. S., Pence, B. W., Gaynes, B. N., Adimora, A. A., Weir, S. S., & Miller, W. C. (2009). Depression, sexually transmitted infection, and sexual risk behavior among young adults in the United States. *Arch Pediatr Adolesc Med, 163*(7), 644-652.  
doi:10.1001/archpediatrics.2009.95
- Kirby, D. (2002). Antecedents of adolescent initiation of sex, contraceptive use, and pregnancy. *Am J Health Behav, 26*(6), 473-485.
- Lee, Y. M., Cintron, A., & Kocher, S. (2014). Factors related to risky sexual behaviors and effective STI/HIV and pregnancy intervention programs for African American adolescents. *Public Health Nurs, 31*(5), 414-427. doi:10.1111/phn.12128
- Lehrer, J. A., Shrier, L. A., Gortmaker, S., & Buka, S. (2006). Depressive symptoms as a longitudinal predictor of sexual risk behaviors among US middle and high school students. *Pediatrics, 118*(1), 189-200. doi:10.1542/peds.2005-1320
- Lennon, C. A., Huedo-Medina, T. B., Gerwien, D. P., & Johnson, B. T. (2012). A role for depression in sexual risk reduction for women? A meta-analysis of HIV prevention trials with depression outcomes. *Soc Sci Med, 75*(4), 688-698.
- Lopez, V., Kopak, A., Robillard, A., Gillmore, M. R., Holliday, R. C., & Braithwaite, R. L. (2011). Pathways to sexual risk taking among female adolescent detainees. *J Youth Adolesc, 40*(8), 945-957. doi:10.1007/s10964-010-9623-5

- Muris, P., & Meesters, C. (2002). Symptoms of anxiety disorders and teacher-reported school functioning of normal children. *Psychol Rep, 91*(2), 588-590.  
doi:10.2466/pr0.2002.91.2.588
- Newman, L. M., & Berman, S. M. (2008). Epidemiology of STD disparities in African American communities. *Sex Transm Dis, 35*(12 Suppl), S4-12.  
doi:10.1097/OLQ.0b013e31818eb90e
- Odo, R. (2003). Hidden Epidemic: HIV/AIDS Among the Seriously and Persistently Mentally Ill. *Social Work in Mental Health, 1*(3), 19-34. doi:10.1300/J200v01n03\_02
- Piko, B. F., & Pinczés, T. (2014). Impulsivity, depression and aggression among adolescents. *Personality and Individual Differences, 69*, 33-37. doi:10.1016/j.paid.2014.05.008
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav Res Methods, 40*(3), 879-891.
- Romer, D., Sznitman, S., DiClemente, R., Salazar, L. F., Venable, P. A., Carey, M. P., . . . Juzang, I. (2009). Mass media as an HIV-prevention strategy: using culturally sensitive messages to reduce HIV-associated sexual behavior of at-risk African American youth. *Am J Public Health, 99*(12), 2150-2159. doi:10.2105/AJPH.2008.155036
- Rubin, A. G., Gold, M. A., & Primack, B. A. (2009). Associations between depressive symptoms and sexual risk behavior in a diverse sample of female adolescents. *J Pediatr Adolesc Gynecol, 22*(5), 306-312. doi:10.1016/j.jpag.2008.12.011
- Rushton, J. L., Forcier, M., & Schectman, R. M. (2002). Epidemiology of depressive symptoms in the National Longitudinal Study of Adolescent Health. *J Am Acad Child Adolesc Psychiatry, 41*(2), 199-205. doi:10.1097/00004583-200202000-00014

- Saddichha, S., & Schuetz, C. (2014). Impulsivity in remitted depression: A meta-analytical review. *Asian Journal of Psychiatry, 9*, 13-16. doi:10.1016/j.ajp.2014.02.003
- Sales, J. M., Lang, D. L., Hardin, J. W., Diclemente, R. J., & Wingood, G. M. (2010). Efficacy of an HIV prevention program among African American female adolescents reporting high depressive symptomatology. *J Womens Health (Larchmt), 19*(2), 219-227. doi:10.1089/jwh.2008.1326
- Sales, J. M., Monahan, J. L., Brooks, C., DiClemente, R. J., Rose, E., & Samp, J. A. (2014). Differences in sexual risk behaviors between lower and higher frequency alcohol-using African-American adolescent females. *Curr HIV Res, 12*(4), 276-281.
- Schroder, K. E., Carey, M. P., & Venable, P. A. (2003). Methodological challenges in research on sexual risk behavior: I. Item content, scaling, and data analytical options. *Ann Behav Med, 26*(2), 76-103.
- Seth, P., Patel, S. N., Sales, J. M., DiClemente, R. J., Wingood, G. M., & Rose, E. S. (2011). The impact of depressive symptomatology on risky sexual behavior and sexual communication among African American female adolescents. *Psychol Health Med, 16*(3), 346-356. doi:10.1080/13548506.2011.554562
- Seth, P., Raiji, P. T., DiClemente, R. J., Wingood, G. M., & Rose, E. (2009). Psychological distress as a correlate of a biologically confirmed STI, risky sexual practices, self-efficacy and communication with male sex partners in African-American female adolescents. *Psychol Health Med, 14*(3), 291-300. doi:10.1080/13548500902730119
- Shrier, L. A., Harris, S. K., Sternberg, M., & Beardslee, W. R. (2001). Associations of depression, self-esteem, and substance use with sexual risk among adolescents. *Prev Med, 33*(3), 179-189. doi:10.1006/pmed.2001.0869

- Shrier, L. A., Schillinger, J. A., Aneja, P., Rice, P. A., Batteiger, B. E., Braslins, P. G., . . . Fortenberry, J. D. (2009). Depressive symptoms and sexual risk behavior in young, chlamydia-infected, heterosexual dyads. *J Adolesc Health, 45*(1), 63-69.  
doi:10.1016/j.jadohealth.2008.11.016
- Sieving, R. E., Bearinger, L. H., Resnick, M. D., Pettingell, S., & Skay, C. (2007). Adolescent dual method use: relevant attitudes, normative beliefs and self-efficacy. *J Adolesc Health, 40*(3), 275 e215-222. doi:10.1016/j.jadohealth.2006.10.003
- Smith, B. (2013). Depression and motivation. *Phenomenology and the Cognitive Sciences, 12*(4), 615-635. doi:10.1007/s11097-012-9264-0
- Smith, M. D., Seal, D. W., & Hartley, S. (2008). HIV Risk Behavior Among Delinquent and Mentally 111 Teens. *Journal of HIV/AIDS Prevention in Children & Youth, 6*(2), 97-115.  
doi:10.1300/J499v06n02\_07
- Song, D., Sands, R. G., & Wong, Y. L. (2004). Utilization of mental health services by low-income pregnant and postpartum women on medical assistance. *Women Health, 39*(1), 1-24. doi:10.1300/J013v39n01\_01
- Starr, L. R., Donenberg, G. R., & Emerson, E. (2012). Bidirectional linkages between psychological symptoms and sexual activities among African American adolescent girls in psychiatric care. *J Clin Child Adolesc Psychol, 41*(6), 811-821.  
doi:10.1080/15374416.2012.694607
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics (5th ed.)*. Boston, MA: Allyn & Bacon/Pearson Education.
- Tomko, R. L., Lane, S. P., Pronove, L. M., Treloar, H. R., Brown, W. C., Solhan, M. B., . . . Trull, T. J. (2015). Undifferentiated negative affect and impulsivity in borderline

- personality and depressive disorders: A momentary perspective. *Journal of Abnormal Psychology*, 124(3), 740-753. doi:10.1037/abn0000064
- Vanable, P. A., Carey, M. P., Bostwick, R. A., Romer, D., DiClemente, R., Stanton, B., . . . Brown, L. (2008). Community partnerships in HIV prevention research: The example of Project iMMPACS. . *Chapter in B. Stanton et al. (Eds.), The uncharted path from clinic-based to community-based research*, 155-174.
- Vanable, P. A., Carey, M. P., Brown, J. L., DiClemente, R. J., Salazar, L. F., Brown, L. K., . . . Stanton, B. F. (2009). Test-retest reliability of self-reported HIV/STD-related measures among African-American adolescents in four U.S. cities. *J Adolesc Health*, 44(3), 214-221. doi:10.1016/j.jadohealth.2008.09.002
- Voisin, D. R., Hotton, A., Tan, K., & Diclemente, R. (2013). A Longitudinal Examination of Risk and Protective Factors Associated with Drug Use and Unsafe Sex among Young African American Females. *Child Youth Serv Rev*, 35(9), 1440-1446. doi:10.1016/j.chilyouth.2013.05.019
- Walsh, J. L., Senn, T. E., Scott-Sheldon, L. A. J., Vanable, P. A., & Carey, M. P. (2011). Predicting condom use using the Information-Motivation-Behavioral Skills (IMB) model: A multivariate latent growth curve analysis. *Annals of Behavioral Medicine*, 42(2), 235-244. doi:10.1007/s12160-011-9284-y
- Yang, X.-h., Huang, J., Zhu, C.-y., Wang, Y.-f., Cheung, E. F. C., Chan, R. C. K., & Xie, G.-r. (2014). Motivational deficits in effort-based decision making in individuals with subsyndromal depression, first-episode and remitted depression patients. *Psychiatry Research*, 220(3), 874-882. doi:10.1016/j.psychres.2014.08.056

Zimmerman, R. S., Sprecher, S., Langer, L. M., & Holloway, C. D. (1995). Adolescents' perceived ability to say "no" to unwanted sex. *J Adolesc Res*, *10*(3), 383-399.

# CURRICUM VITAE

Jacklyn D. Babowitch

---

## EDUCATION

**Syracuse University**, Syracuse, NY  
**Ph.D.** student in Clinical Psychology, 2014-present

**Brown University**, Providence, RI  
**B.S.** in Psychology, May 2012

## RESEARCH EXPERIENCE

**Syracuse University**, Syracuse, NY  
**Research Assistant**, 2015-2016  
Researched modifiable factors that are associated with subsequent sexual risk episodes, as well as anti-retroviral medication adherence among HIV+ outpatients and high-risk African American adolescents.

**Brown University**, Providence, RI  
**Research Assistant II**, 2012-2015  
Conducted research on doctor-patient communication focused on medical treatment and behavior change topics in HIV care settings, as well as Cardiology and Nephrology.

**Research Assistant**, 2011-2012  
Researched the neural mechanisms that support learning and decision-making based on reward pathways.

## TEACHING EXPERIENCE

**Syracuse University**, Syracuse, NY  
**Course Instructor**, Summer 2015  
Taught the course "Abnormal Psychology." Designed course structure and requirements; lectured and administered all grades.

**Teaching Assistant**, 2014-2015  
Assisted professor Tibor Palfai in his course "Foundations of Human Behavior." Instructed four weekly recitation sections; helped to draft quizzes and in-class assignments; graded all written work and determined final grades.

## CLINICAL EXPERIENCE

**Student Therapist**, 2016-present  
*Psychological Services Center*  
**Syracuse University**, Syracuse, NY

## **PROFESSIONAL PRESENTATIONS**

Babowitch, J.D., & Vanable, P. A. (2016, March). Correlates of Intentional and Non-Intentional Adherence Difficulties to Antiretroviral Therapy among HIV+ Outpatients Poster presented at the annual meeting of the Society of Behavioral Medicine, Washington, DC.

Babowitch, J.D., Vanable, P. A., Littlewood, R. A. (2016, March). The Importance of Provider-Patient Communication in Adherence to Antiretroviral Regimens among HIV+ Outpatients Poster presented at the annual meeting of the Society of Behavioral Medicine, Washington, DC.

Babowitch, J. D., & Vanable, P. A. (2015, April). Gender Differences in the Association of Depression to Sexual Risk Behavior among HIV+ African American Outpatients Poster presented at the annual meeting of the Society of Behavioral Medicine, San Antonio, TX.

## **PUBLICATIONS**

Babowitch, J. D., & Antshel, K. M. (2016). Adolescent treatment outcomes for comorbid depression and substance misuse: A systematic review and synthesis of the literature. *J Affect Disord*, 201, 25-33. doi:10.1016/j.jad.2016.04.018

## **FUNDING AND ACADEMIC AWARDS**

2015, 2016 - Syracuse University Graduate Student Organization Travel Award

2015, 2016 - Syracuse University Psychology Department Travel Award

## **PROFESSIONAL MEMBERSHIPS AND SERVICE**

2016 - 2017 Association for Psychological Science member

2015 - 2017 Society of Behavioral Medicine Member

2015 - 2017 Student Mentor

2016 - Psychology Action Committee – Friday Forum Coordinator