The Role of Implicit Measurement in the Assessment of Risky Behavior: A Pilot Study with African American Girls

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Abstract

With the aim of developing a novel strategy for identifying vulnerability for early sexual activity and adjustment problems, African American girls ($n = 39$) completed partially structured scenarios in which female characters of similar age faced circumstances characterized by varying levels of risk. Most girls indicated that they believed the characters would have sex, regardless of their own sexual history or the level of risk in the scenario. However, the *combination* of girls' sexual history *and* girls' predictions of characters' behavior in the scenario provided more information regarding the girls at greatest risk for adjustment problems. Implicit techniques offer an additional strategy for identifying girls most vulnerable to adjustment difficulties in the context of early sexual activity.

Keywords

Adolescent; Early sexual behavior; Implicit measurement; Partially structured scenarios; Pilot

Introduction

Sexual risk behavior is a major public health problem among adolescents, and particularly among African American youth (Center for Disease Control (CDC) 2008). African American girls (61%) are more likely to be sexually active than girls from other ethnic groups (44% European American; 46% Hispanic; CDC 2008) and more likely to suffer the consequences of early sexual activity including higher rates of pregnancy, HIV/AIDS, and other sexually transmitted diseases (CDC 2007a, b; Martin et al. 2009). In addition, sexual risk behavior co-occurs with adjustment problems among African American girls, including externalizing problems, which has more typically been the focus of research on African American boys (e.g., Brown et al. 2010; McLeod and Knight 2010; Schofield et al. 2008).

Two lines of work explain the link between sexual risk behavior and externalizing problems in youth: (1) in the first, information processing impairments associated with externalizing problems increase the risk for sexual behavior; (2) in the second, sexual behaviors are considered a part of a broader constellation of acting out behaviors (see Zimmer-Gembeck and Helfand 2008 for a review). The link between sexual risk taking and externalizing behaviors likely represents an interaction of both of these processes; yet, relatively little

research attention has been devoted to the development of measurement strategies that identify which girls are at greatest risk for early sexual behaviors in the context of externalizing problems.

Research on early sexual activity typically asks youth to self-report their sexual behavior as well as their *intentions* to engage in sexual behaviors (Howard and Wang 2004; Valois et al. 1997). With regard to self-report of past behavior, Vanable et al. (2009) and others have shown that gathering accurate self-report data from adolescents is challenging and the reliability of the report may vary depending on the extent of risk involved in the behavior in question (Catania et al. 1990; Schroder et al. 2003; Weinhardt et al. 1998). In addition, self-report measures of sexual behavior are influenced by some level of social desirability, so adolescent girls may underreport the extent of their risk (Rosenbaum 2006). Finally, such measures often do not allow for the identification of variability in risk for psychosocial adjustment problems among girls who report sexual activity, or among those who report that they have *not yet engaged* in sexual activity.

With the aim of better identifying vulnerability among youth at greatest risk for early sexual behavior, this study represents an effort to develop and pilot test an implicit methodology, partially structured scenarios, among African American girls. Partially-structured scenarios are a type of implicit measurement in which the respondent predicts the behavior of a third person character, rather than their own behavior (e.g., Cook and Selltiz 1964; Ross et al. 2003; Vargas et al. 2004). Implicit measurement has been widely successful in social psychology, and has demonstrated acceptable psychometric properties and relatively large effect sizes (Vargas et al. 2007), including in research examining a range of sensitive topics (e.g., prejudice, dishonesty) that may be difficult to capture on self-report measures, including health risk behaviors (Vargas et al. 2007). Specific to the study of HIV, implicit measurement has been used to predict adult risky behavior (e.g., lack of condom use; Czopp et al. 2004; Marsh et al. 2001; Stacy et al. 2000), but less attention has been devoted to the potential added value of implicit measurement among the highest risk adolescents who may be more guarded with reports of their own sexual behavior.

Building upon the success with the use of implicit strategies in prior studies on sensitive topics including risk for HIV, this study presents the development of an implicit measure to assess risky sexual behavior among African American girls, as well as the findings of a pilot study examining its association with self-reported risky sexual behavior and externalizing problems. It was predicted that a) African American girls who reported prior sexual intercourse would be more likely to predict that scenario characters would engage in sexual risk behavior, and (b) girls who were more likely to predict that the characters would engage in risk behavior across scenarios would display more externalizing problems than girls who were less likely to predict that characters would engage in risky behaviors.

Method

Participants

African American families of adolescent girls who participated in a prior study were called regarding the study. Fifty-two adolescent girls were identified as eligible, approximately half of whom reported a history of sexual intercourse on a previously-administered standardized self-report measure of risk behavior (CDC 2003). Of the 52 adolescents who were eligible, 75% ($n = 39$) agreed to participate and were mailed study materials. Mothers had to consent to girls' participation and girls provided assent. Materials took approximately 20 min to complete and girls were compensated $15. Reasons for lack of participation included inability to reach the families, families declining to participate, or failure to return packets

despite reminders. All procedures were approved by the Behavioral Institutional Review Board.

Development of the Implicit Measure: The Health Risk Perceptions Questionnaire

An interdisciplinary research team comprised of researchers in the areas of clinical psychology, social psychology, and public health collaborated to develop the implicit measure, the *Health Risk Perceptions Questionnaire*. The team reviewed extant implicit measures and designing partially structured scenarios that were relevant to the specific age group (adolescents ages 13–18), gender (female) and ethnicity (African American). In addition, an advisory panel consisting of four African American girls in the target age range reviewed the measure and provided suggestions regarding wording and cultural relevance. The resulting measure included nine different scenarios that assessed adolescent girls' perception of HIV/AIDS risk across various contexts (e.g., when dating an older boy, being in a bedroom, oral sex, using a condom, verbal pressure, when threatened, when no condom was available, and if the partner used emotional manipulation—e.g., "if you loved me").

Across scenarios, girls were asked to make four types of predictions: (1) if the female character in the partially structured scenario would engage in risk behaviors such as dating an older boy, having sex with a partner within various contexts (e.g., in presence of alcohol, oral sex, with protection, without protection, etc.); each of these items used a 6-point Likert-type scale (1 = *very unlikely* to 6 = *very likely*); (2) whether the character would have consequences (e.g., HIV/AIDS, other STDs, pregnancy) as a result of their behavior (1 = *very unlikely* to 6 = *very likely*); (3) how risky each behavior was (e.g., oral sex, sex with a condom, sex without a condom, etc.; 1 = *not at all* to 5 = *very risky*); and (4) how prevalent the girls perceived the risk behavior to be by rating how many girls out of a group of 100 girls would engage in that risk behavior if they were in a similar situation (e.g., 1 = 0–20% of the girls, to 5 = 81–100% of girls).

Youth Risk Behavior Surveillance System (YRBSS) Questionnaire Sexual intercourse was examined using items from the Youth Risk Behavior Surveillance System Questionnaire, a widely used self-report measure of vaginal intercourse, anal intercourse, and oral sex (Brener et al. 2002; Kann 2001). For the purposes of this study, youth responses to item 12 (which asks youth to report whether or not they have ever had sexual intercourse, 0 = no; 1 = yes) were analyzed. As demonstrated by Venable et al. (2009), dichotomous indices of sexual intercourse demonstrate the best reliability among adolescent measures of sexual behavior.

Child Behavior Checklist (CBCL) Youth-reported aggression and conduct problems were examined using the aggression and conduct problems subscales of the Youth Self-Report (YSR) form of the Child Behavior Checklist (CBCL; Achenbach 1991). The original CBCL principal factor analyses (Achenbach 1991) indicate that the aggressive and conduct problem subscales are correlated with a common Externalizing factor (aggressive behavior = 0.79, conduct behavior 0.78). The 30 items of the two scales were combined into an Externalizing scale and used as a youth-reported indicator of aggression/conduct problems. The items are also rated on a 3-point scale. Higher scores indicate more aggression/conduct problems, respectively. These subscales, selected because they assess the types of aggression/conduct problems typically displayed by children in the age range included in this study, have acceptable reliability and validity data (Achenbach 1991). Prior research has demonstrated that the YSR is a reliable instrument for African American samples in the current age range (e.g., Jones et al. 2002). The alpha for externalizing in the current sample was 0.91.

Results

On average, girls were 15 years old (M = 15.5 years old, SD = 1.43). Overall, 44% percent of girls (n = 22) reported a history of sexual intercourse on the YRBSS, 40% of those had engaged in sexual intercourse by age 13. On average, mothers were 38 years old (SD = 6.67, range = 26–64 years); half (52%) completed some college/ vocational school after high school/GED; most (83.5%) were employed; and incomes averaged $29,733.96 (SD = $17,457).

Factor Analysis and Psychometrics

The sample size (n = 39) was substantially below what is recommended for a factor analysis; however, given the pilot nature of the project we believed that this analysis would provide useful insights regarding the underlying concept that the items reflected, especially if clear item groups that were readily interpretable emerged. With these caveats in mind, we performed principal component extraction and oblimin rotation was used to discern the existence of any thematic patterns in the data. The items were recoded so that ascending numbers indicated higher levels of vulnerability to sexual risk taking, (e.g., see description of Likert scales above). An eigenvalue greater than 1.0 was used to determine how many factors to retain. Two factors, entitled *Risk Behavior Projection* (Factor 1) and *Risk Behavior Consequences* (Factor 2), were retained. These factor titles were based on the theoretical underpinnings of the latent variables that appeared to comprise the two subscales. Specifically, *Risk Behavior Projection* items required the subject to provide an estimate of how likely a character would be to engage in a sexual risk behavior or non-sexual risk behavior (e.g., drinking alcohol, going to a bedroom setting, dating older boys). The *Risk Behavior Consequences* Factor comprised items that reflected the consequences of involvement in risk behavior (e.g., pregnancy, HIV or another STD) and level of riskiness. The first factor, *Risk Behavior Projection*, had an eigenvalue of 4.49 and accounted for 49.93% of the total variance among the items. Furthermore, this factor revealed strong factor loadings ranging from .71 to .94, and the Cronbach's alpha for the subscale was .96. The second factor, *Risk Behavior Consequences*, had an eigenvalue of 2.95 and accounted for an additional 32.74% of the total variance among the items. Overall, both of the retained factors accounted for approximately 83% of the variance. The *Risk Behavior Consequences* factor also revealed strong factor loadings, ranging from .85 to .96, and the Cronbach's alpha for the corresponding items was .94.

Predictions of Character's Sexual Behavior

Given the pilot nature of the project, both statistically significant findings and trends are reported. Across scenarios, girls who reported having had sexual intercourse predicted that the character would likely engage in sexual behavior more often than girls who did not report a history of sexual intercourse. Though a one-way ANOVA revealed that the differences between the two groups were not significant (F = .64, *n.s.*), the trend was consistent with the direction of the hypothesis. As depicted in Fig. 1, girls who reported a history of sexual intercourse on the YRBSS were increasingly likely to predict that the characters would have sex across the following scenarios (in order of lowest to highest probability that the character would have sex if): (a) no condom available, (b) the character asked to engage in oral sex, (c) partner used verbal pressure, (d) the character was dating an older boy, (e) boy said "you would if you loved me," (f) character in a bedroom with a male partner, (g) characters were drinking alcohol, (h) condom was available, and (i) character was physically threatened.

Although girls who had not reported prior sexual intercourse displayed a similar pattern of increasing likelihood of sexual involvement across scenarios, these girls predicted that the

scenario involving oral sex was the least likely scenario for the girl to engage in sexual behavior. In both groups, girls were most likely to say that the character would have sex if threatened with violence from a male partner (though girls who reported prior sexual intercourse thought it was more likely that the character would have sex). The girls who reported a history of sexual intercourse predicted that the characters in the scenarios would engage in sexual behaviors at a higher rate than girls who had not reported a history of sexual intercourse; however, the predictions were most similar for both groups for the following three scenarios: (a) if the character was drinking alcohol (both groups consistently predicting that character was between *somewhat likely* to *very likely* to have sex in the presence of alcohol), and (b) if no condom was available (both groups predicted that it was *unlikely* that the character would engage in sex without a condom), and (c) if the character was physically threatened (both groups predicted that it was *somewhat* to *very likely* that the character would have sex).

Perceived Consequences of Sexual Risk Behavior Between girls who indicated prior sexual intercourse and girls who did not, there was a statistically significant difference in the pattern of responses predicting consequences of having sex ($\chi^2 = 39.0$, $p < .001$; see Figs. 2, 3). Follow-up descriptive statistics revealed two different trends within these groups. Among girls who reported a history of sexual intercourse, the majority (94%) predicted that the characters in the scenarios would engage in sexual behavior *and* have high consequences as a result (e.g., pregnancy, HIV, other STDs). This was determined by dichotomizing the girls' responses on items which assessed likelihood for the character to engage in sex and to have consequences (e.g., those who indicated that sex *and* consequences were "likely" on the relevant Likert-scale responses), averaging across responses, and then calculating the percentage of girls who rated both to be likely among the total number of girls in each sexual status group. Among girls who did not report prior sexual intercourse, the majority (73%) still predicted the character would engage in sexual behavior and have high consequences. Among girls who did not report having had sexual intercourse, 29% predicted that the character would not have sex; in contrast, only 6% who had reported a history of sexual intercourse predicted that the character would not have sex in the scenarios. Only 6% who reported having had sexual intercourse thought the character would have sex *without* consequences, versus zero girls in the group who did not report prior sexual intercourse.

Implicit Measure Response Style as an Indicator of Externalizing Difficulties Figure 4 depicts the externalizing differences among four subgroups: (a) girls who reported a history of sexual intercourse on the YRBSS *and* predicted the characters would have sex, (b) girls who did not report a history of sexual intercourse and predicted the characters would *not* have sex, (c) girls who did not report prior sexual intercourse and said the character would have sex and (d) girls who reported prior sexual intercourse and said the character would *not* have sex. In comparison to girls who did not endorse prior sexual intercourse and predicted the character would not have sex, girls who reported prior sexual intercourse and predicted that the character would have sex were marginally more likely to evidence externalizing problems (ANOVA, $F = 2.51$, $p < .10$). Overall, girls who predicted the characters would have sex exhibited higher levels of externalizing problems than girls who predicted that the characters would not have sex. The highest levels of externalizing problems were among girls who reported prior sexual intercourse on the self-report measure *and* predicted the character would have sex, whereas the lowest levels of externalizing problems were among girls who did not report prior sexual intercourse *and* predicted that the character would *not* have sex.

Discussion

Findings indicated that the majority of the girls in the sample—regardless of their prior sexual activity—believed the characters in the scenarios would have sex. This was true regardless of the level of risk to character's personal well being (made explicit in the scenario). However, girls who were more likely to predict the character would engage in risk behavior also evidenced higher levels of externalizing problems. The *combination* of girls' history of sexual intercourse *and* girls predictions of the characters' behavior in the scenario provided more information about the girls who are most vulnerable to externalizing problems.

In both groups, most girls said the character would have sex even as risk increased. This is consistent with neurobiological explanations of adolescent risk taking behavior. Steinberg (2008) has noted that while the socio-emotional network is rapidly developing at this stage, adolescents lack maturation of the prefrontal cortex, the area of the brain responsible for reasoning, decision-making and planning, placing them at greater vulnerability to engaging in sexual risk behavior. Thus, it is possible that the implicit measure, via its inclusion of potentially emotionally-arousing scenarios describing potential sexual encounters, is tapping adolescent propensities toward risk taking behavior rather than their extant behaviors. Across the board, whether an adolescent girl is sexually active or not, some work suggests that adolescents would gravitate toward predictions of risk behavior in the scenarios (Steinberg 2008).

The most salient correlates of whether girls predicted a character would engage in sexual behavior were the scenarios involving *alcohol use* and *threatened violence*. Alcohol significantly increases the likelihood that adolescents will engage in sexual intercourse (Kotchick et al. 2001; Levy et al. 2009). The increased likelihood of both groups' predictions that the character would have sex in the alcohol scenario suggest that girls may be aware of the positive correlation between alcohol use and increased sexual risk behavior. With regard to partner violence, 9–12% of adolescents in North Carolina report physical abuse in their dating relationships, with the highest incidence of dating violence being reported among minorities and youth from single parent families (Foshee et al. 2009). The findings from the current study highlights the importance of understanding the contextual factors (e.g., dating violence) associated with sexual risk behavior among minority youth.

The majority of girls, regardless of sexual history, predicted that the characters in the scenarios would engage in sexual risk behavior *and* would also have high consequences as a result (e.g., pregnancy, HIV, other STDs). Though initially surprising, this is consistent with research that suggests adolescents tend to overestimate their risk of suffering negative outcomes from activities like drinking and sexual risk behavior (Reyna and Farley 2006). Furthermore, Reyna and Farley (2006) showed that adolescents weigh benefits more heavily than the risks when making decisions. It is possible that adolescents completing implicit measures weigh the beneficial outcomes of sex (e.g., approval from a partner, interpersonal connection) more heavily than protection from negative consequences (e.g., STDs); thus, adolescent girls may predict character involvement in risk behavior at a higher rate than would typically be expected.

Despite the trend of the majority to predict that characters would have sex *and* experience high consequences, the two groups (girls who reported a history of sexual intercourse and those who did not) showed differences in the percentage of girls who thought that the character would *not* have sex. Among girls who did not report a history of sexual intercourse, there was a larger percentage who predicted that the characters would not have sex (e.g., 29% of girls who had not had sex versus 6% of girls who had sex). Though

evidence is mixed, this trend lends support to the idea that implicit measure maps onto participants' actual behavior (Czopp et al. 2004; Marsh et al. 2001; Stacy et al. 2000; Vargas et al. 2004, 2007). African American girls in our sample may possess an adequate knowledge of the risk factors and consequences associated with sex; however, they may overvalue positive outcomes of sexual risk behavior despite the known negative consequences. Given that negative consequences occur following sexual intercourse (rather than concurrently), it is possible that adolescents minimize the role of sexual intercourse in these outcomes (e.g., takes time for STD/HIV symptoms to be realized or for pregnancy to be detected) (Jackson and Foshee 1998).

Among the group of girls who reported having had sex, a small percentage (6%) predicted that the character would have sex but would not suffer consequences as a result. Though not characteristic of the majority of adolescents in this sample, the individuals who hold the mindset of "risks won't happen to me" remain an important group for HIV prevention and intervention efforts. This highlights the importance of identifying the extent to which some girls may not be receiving info about consequences of sexual risk behavior (HIV, STDs, etc.).

The *combination* of girls' history of sexual intercourse *and* girls predictions of the characters' behavior across risk scenarios on the implicit measure provided more information regarding the girls at greatest risk for externalizing problems. Within groups (those reporting a history of sexual intercourse versus not), girls who predicted that the character would have sex displayed higher levels of externalizing difficulties than adolescents who predicted that the character would not have sex. Moreover, the highest levels of externalizing problems were among girls who reported a history of sexual intercourse and *also* predicted that the characters in the scenarios would engage in risky sexual behavior; in contrast, the lowest level of externalizing problems was among girls who had not had sex and predicted that the character would not engage in risky sexual behavior. The combination of prior sexual activity and response patterns on the implicit measure may work together to predict vulnerability within and between groups.

The limitations of the study must be considered. Although this study represents a novel approach to assessment of sexual risk behavior, the sample was small ($n = 39$), limiting statistical power. In addition, the self-report measure of sexual risk behavior (Youth Risk Behavior Survey; CDC 2003) and the implicit measure were collected during the same wave of the larger study; therefore, there is no measure of future sexual behavior to compare to the implicit measure responses. Finally, the findings cannot be generalized to boys, or other ethnic groups.

This study also has strengths. First, this pilot affords a novel, less intrusive companion measure for the assessment of risk behavior vulnerability. Second, the implicit measure was piloted among a sample of 13–18 year old African American girls from single mother households, a group that is disproportionately affected by negative consequences associated with early sexual behavior (CDC 2007a, b; Martin et al. 2009). Third, this study yields information about the association between sexual status, more externalizing difficulties, and implicit measure responses, which may be helpful for clinicians who wish to identify girls who are most vulnerable by focusing on girls who display higher-risk profiles.

In summary, the findings from this study suggest that implicit measures may yield more information about vulnerability for risk taking behavior among African American girls, a group at heightened vulnerability for HIV risk behaviors and its consequences. Although replication of these findings with larger samples and in longitudinal studies is critical to fully understanding the utilizing of this measure in HIV prevention research, the current

findings suggest that implicit techniques hold promise for identifying variability within at risk adolescents.

Acknowledgments

References

Achenbach, TM. Manual for child behavior checklist 4–18 and 1991 profile. Burlington: University of Vermont, Department of Psychiatry; 1991.

Brener ND, Kann L, McManus T, Kinchen SA, Sundberg EC, Ross JG. Reliability of the 1999 youth risk behavior survey questionnaire. Journal of Adolescent Health. 2002; 31(4):336–342. [PubMed: 12359379]

Brown LK, Hadley W, Stewart A, Lescano C, Whitely L, Donenberg G, DiClemente R. the Project STYLE Study Group. Psychiatric disorders and sexual risk among adolescents in mental health treatment. Journal of Consulting and Clinical Psychology. 2010; 78:590–597. [PubMed: 20658815]

Catania JA, Gibson DR, Chitwood DD, Coates TJ. Methodological problems in AIDS behavioral research: Influences on measurement error and participation bias in studies of sexual behavior. Psychological Bulletin. 1990; 108(3):339–362. [PubMed: 2270232]

Center for Disease Control. Handbook for conducting youth risk behavior surveys. Atlanta, GA: US Department of Health and Human Services, CDC, National Center for Chronic Disease Prevention and Health Promotion; 2003. 2002

Center for Disease Control and Prevention. HIV/AIDS surveillance report, 2007. Atlanta, GA: U.S. Department of Health and Human Services; 2007a.

Center for Disease Control and Prevention. Racial/ethnic disparities in diagnoses of HIV/AIDS—33 states, 2001–2005. Morbidity and Mortality Weekly Report. 2007b; 56:189–193. [PubMed: 17347642]

Center for Disease Control and Prevention. Youth risk behavior surveillance United States, 2007. Morbidity and Mortality Weekly Report. 2008; 57(SS–4):1–131. [PubMed: 18185492]

Cook SW, Selltiz C. A multiple-indicator approach to attitude measurement. Psychological Bulletin. 1964; 62(1):36–55. [PubMed: 14176651]

Czopp AM, Monteith MJ, Zimmerman RS, Lynam DR. Implicit attitudes as potential protection from risky sex: Predicting condom use with the IAT. Basic and Applied Social Psychology. 2004; 26:227–236.

Foshee VA, Benefield T, Suchindran C, Ennett ST, Bauman KE, Karriker-Jaffe KJ, et al. The development of four types of adolescent dating abuse and selected demographic correlates. Journal of Research on Adolescence. 2009; 19(3):380–400.

Howard DA, Wang MQ. Multiple sexual-partner behavior among sexually active U.S. adolescent girls. American Journal of Health Behavior. 2004; 28(1):3–12. [PubMed: 14977154]

Jackson C, Foshee VA. Violence-related behaviors of adolescents: Relations with responsive and demanding parenting. Journal of Adolescent Research. 1998; 13(3):343–359.

Jones DJ, Forehand R, Brody G, Armistead L. Psychosocial adjustment of African American children in single-mother families: A test of three risk models. Journal of Marriage and Family. 2002; 64(1):105–115.

Kann L. The youth risk behavior surveillance system: Measuring health-risk behaviors. American Journal of Health Behavior. 2001; 25(3):272–277. [PubMed: 11322626]

Kotchick BA, Shaffer A, Forehand R, Miller KS. Adolescent sexual behavior: A multi-system perspective. Clinical Psychology Review. 2001; 21(4):493–519. [PubMed: 11413865]

Levy S, Sherritt L, Gabrielli J, Shrier LA, Knight JR. Screening adolescents for substance use-related high-risk sexual behaviors. Journal of Adolescent Health. 2009; 45(5):473–477. [PubMed: 19837353]

Marsh KL, Johnson BT, Scott-Sheldon LAJ. Heart versus reason in condom use: Implicit versus explicit attitudinal predictors of sexual behavior. Zeitschrift fur Experimentelle Psychologie. 2001; 48(2):161–175. [PubMed: 11392983]

Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Kirmeyer S, et al. Births: Final data for 2006. National Vital Statistic Reports. 2009; 57(7):1–102.

McLeod JD, Knight S. The association of socioemotional problems with early sexual intitiation. Perspectives on Sexual and Reproductive Health. 2010; 42:93–101. [PubMed: 20618748]

Reyna V, Farley F. Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy. Psychological Science in the Public Interest. 2006; 7(1):1–44.

Rosenbaum JE. Reborn a virgin: Adolescent's retracting of virginity pledges and sexual histories. American Journal of Public Health. 2006; 96(6):1098–1103. [PubMed: 16670225]

Ross MW, Timpson SC, Williams ML, Bowen AM. Situational correlates of condom use in a sample of African-American drug users who are primarily crack cocaine users. AIDS and Behavior. 2003; 7(1):55–60. [PubMed: 14534390]

Schofield HL, Bierman KL, Heinrichs B, Nix RL. the Conduct Problems Prevention Research Group. Predicting early sexual activity with behavior problems exhibited at school entry and in early adolescence. Journal of Abnormal Child Psychology. 2008; 36:1175–1188. [PubMed: 18607716]

Schroder KE, Carey MP, Vanable PA. Methodological challenges in research on sexual risk behavior: II. Accuracy of self-reports. Annals of Behavioral Medicine. 2003; 26(2):104–123. [PubMed: 14534028]

Stacy AW, Newcomb MD, Ames SL. Implicit cognition and HIV risk behavior. Journal of Behavioral Medicine. 2000; 23(5):475–499. [PubMed: 11039159]

Steinberg L. A social neuroscience perspective on adolescent risk-taking. Developmental Review. 2008; 28(1):78–106. [PubMed: 18509515]

Valois RF, Bryant ES, Rivard J, Hinkle KT. Sexual risk-taking behaviors among adolescents with severe emotional disturbance. Journal of Child and Family Studies. 1997; 6(4):409–419.

Vanable PA, Carey MP, Brown JL, DiClemente RJ, Salazar LF, Brown LK, et al. Test–retest reliability of self-reported HIV/STD-related measures among African American adolescents in four U.S. cities. Journal of Adolescent Health. 2009; 44(3):214–221. [PubMed: 19237106]

Vargas, PT.; Sekaquaptewa, D.; von Hippel, W. Armed only with paper and pencil: 'Low-tech' measures of implicit attitudes. In: Wittenbrink, B.; Schwarz, N., editors. Implicit measures of attitudes. New York: Guilford Press; 2007. p. 103-124.

Vargas PT, von Hippel W, Petty RE. Using partially structured attitude measures to enhance the attitude-behavior relationship. Personality and Social Psychology Bulletin. 2004; 30(2):197–211. [PubMed: 15030633]

Weinhardt LS, Forsyth AD, Carey MP, Jaworski BC, Durant LE. Reliability and validity of self-report measures of HIV-related sexual behavior: progress since 1990 and recommendations for research and practice. Archives of Sexual Behavior. 1998; 27:155–180. [PubMed: 9562899]

Zimmer-Gembeck MJ, Helfand M. Ten years of longitudinal research on U.S. adolescent sexual behavior: Developmental correlates of sexual intercourse and the importance of age, gender, and ethnic background. Developmental Review. 2008; 28:153–224.
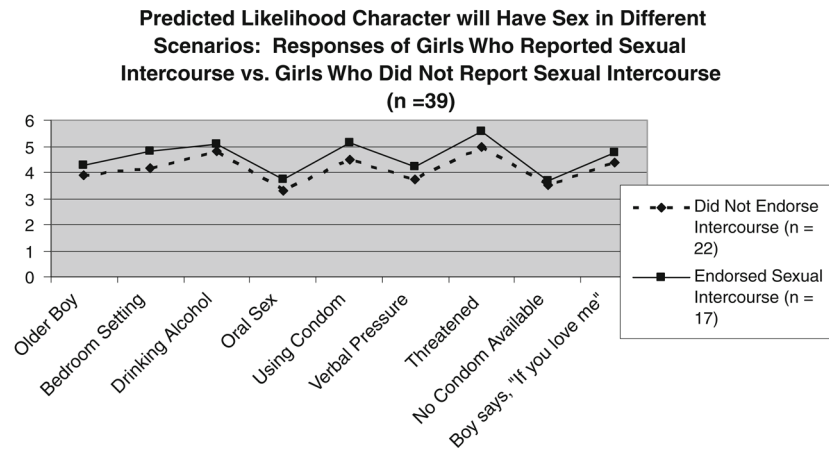
Fig. 1.
Girls with a history of sexual intercourse were more likely to predict that the characters in the scenarios would engage in the respective health risk behaviors than girls without a history of sexual intercourse

**Youth Who Reported Sexual Intercourse:
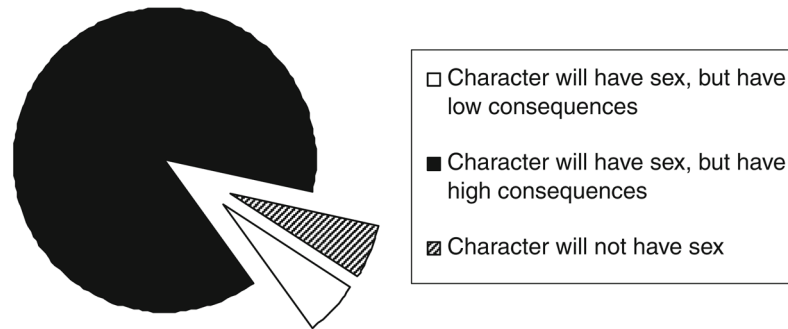Predicted Outcomes for Risk Scenarios (n = 17)**

Fig. 2.
Among girls with a history of sexual intercourse, the majority predicted that characters would have sex, but would also have high consequences (e.g., unplanned pregnancy, STDs, etc.)

**Youth Who Did Not Report Sexual Intercourse:
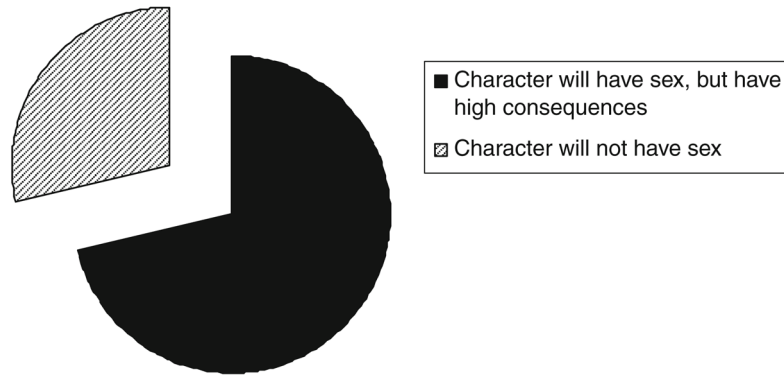Predicted Outcomes for Risk Scenarios (n = 22)**

■ Character will have sex, but have high consequences

▨ Character will not have sex

Fig. 3.
Among girls without a history of sexual intercourse, fewer predicted that the characters would engage in the risk behaviors
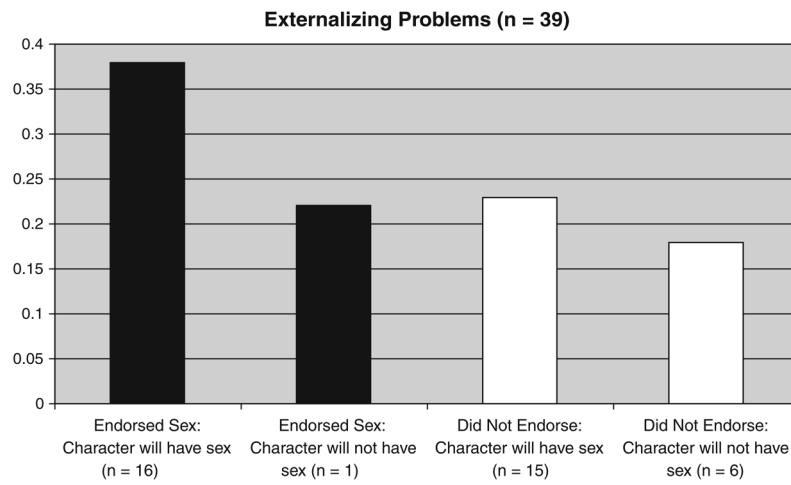
Externalizing Problems (n = 39)

Fig. 4.
Girls who reported a history of sexual intercourse and predicted the characters would also have sex were more likely to report higher levels of externalizing behavior