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A Theater-Based Approach to Primary Prevention of Sexual Behavior for Early Adolescents

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Abstract

Early adolescence is a crucial period for preventing teen pregnancy and sexually transmitted infections. This study evaluated STAR LO, a theater-based intervention designed to affect antecedents of sexual activity among urban early adolescents ($N = 1,143$). Public elementary/middle schools received the intervention or served as a wait-listed comparison group in a quasi-experimental study. Students completed pretest and posttest questionnaires. Multivariate regression models were used to examine treatment effects. Comparison students showed significantly greater increases in sexual intentions and decreases in pro-abstinence attitudes and intended age of first sex than treatment group adolescents. Comparison girls showed significantly greater increases in desire to be a teen parent than STAR LO girls. Treatment group adolescents exhibited greater increases in sexual knowledge than comparison group adolescents, with stronger effects for boys than girls. The results suggest that this theater-based prevention program

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can help early adolescents develop knowledge, attitudes, and intentions that may prevent future sexual risk behavior.

Keywords

sexual behavior (including pregnancy), middle school, pregnancy/abortion, STD prevention, intervention/prevention

Even with recent declines in teen birth and pregnancy rates, the United States still has the highest rates compared with other industrialized nations (Hamilton, Martin, & Ventura, 2010; Kost, Henshaw, & Carlin, 2010; Ventura, Mathews, Hamilton, Sutton, & Abma, 2011). Young adolescents are already engaging in behaviors that place them at risk for pregnancy, HIV/AIDS and other sexually transmitted infections (STIs) (De Rosa et al., 2010). Nearly one in five report sexual intercourse before age 15, rising from 4% to 5% of 12-year-olds to 18% to 19% of 14-year-olds (Albert, Brown, & Flanagan, 2003). Early adolescence may be a crucial period for preventing future teen pregnancy, STIs, and risk factors associated with sexual activity. The combination of physical and emotional development and exploration of new sexual feelings (Lindberg, 2008; Steinberg & Morris, 2001), coupled with the increasing need to conform to peer norms (Brown & Theobald, 1999) and to develop a personal identity distinct from their parents (Ausubel, Montemayor, & Svajian, 1977; Steinberg & Morris, 2001), renders this a period of enormous potential for influencing attitudes, beliefs, values, and behaviors around relationships and sexuality. Given the increasing prevalence of sexual behaviors from ages 12 to 15, the current study was designed to evaluate the impact of STAR LO, an innovative theory-driven, theater-based intervention, on antecedents of sexual activity among early adolescents.

Theory and empirical research link antecedents of sexual activity targeted by STAR LO to sexual decision making. For example, the theory of reasoned action suggests that youth attitudes about sex and abstinence contribute to intentions to have sex, which influence sexual decision making and increase the likelihood of sexual activity (Fishbein & Ajzen, 1975). Social cognitive theory suggests that self-efficacy beliefs are important proximal determinants of decision making, motivation, and behavior through cognitive and affective processes (Bandura, 1989). In addition, a review and synthesis of 22 years of literature has established that information and messages that are (or are not) communicated between parents and children have the potential to shape sexual decision making during adolescence (DiIorio, Pluhar, & Belcher, 2003).

Theater Education as a Prevention Strategy for Early Adolescents

Theater can create emotional and psychological appeal and provides a credible and compelling vehicle to explore sensitive issues, particularly with young people (Jackson, 1993). By involving the audience in an experience, theater affects the audience's emotions, potentially influencing attitudes in ways that traditional teaching may not (Dalrymple & Toit, 1993). Theater has been used as a tool in a wide variety of communities for education and social change (Glik, Novak, Valente, Sapsis, & Martin, 2002). Drama interventions have been used successfully in early adolescent populations to address academic, health-related, and social-emotional outcomes (e.g., Wright et al., 2006). For example, the Safe Dates program includes a theater production performed by peers (Foshee et al., 1996). This play, about how an adolescent victim of dating violence seeks help with her violent relationship, was performed at middle and high schools by students enrolled in a high school theater course. Demonstrating the potential effectiveness of drama-based interventions for adolescents, an evaluation study of Safe Dates found decreases in teen dating violence at each of four 1-year follow-up time points (Foshee et al., 1998, 2005). In a review of school-based drama interventions, Joronen, Rankin, and Astedt-Kurki (2008) identify a need for well-designed and theory-based evaluations of such programs for children and adolescents. The STAR LO evaluation is one such example, focusing on a program which embeds a theater intervention, built on several behavioral theories, directly into a classroom curriculum.

The STAR LO program (Lieberman & Berlin, 2005) was designed to reach early adolescents, before they begin sexual experimentation, with the message that they have the ability to set their own limits within physical or romantic situations, choose to abstain from sexual activity, and communicate their sexual questions and concerns with parents and other adults. STAR LO is unique in its use of a nonconventional theater-based educational program in which professional actor-educator adults perform live drama and remain in character portraying peer educator/role models for the duration of the intervention, led by a STAR LO staff facilitator. STAR LO's use of culturally diverse young adult professional actors playing the roles of middle school peers adds the dimension of simulated peer education, enabling young adolescents to see themselves reflected both culturally and developmentally on stage.

STAR LO builds upon the theory of reasoned action (Fishbein & Ajzen, 1975) and social cognitive theory (Bandura, 1986), which posit that young people are influenced most by persons whose opinions they value and that

they learn by observing others. The theory of reasoned action suggests that behavioral intentions are most influenced by persons whose opinions are valued and with whom compliance is desired. Social cognitive theory supports the concept of vicarious learning—observing behaviors that result in desired outcomes—and the importance of self-efficacy in influencing behavior change. Both theories have been shown to be relevant to contemporary adolescents and effective at predicting and modifying a variety of health behaviors among this population, including condom use, alcohol use, smoking cessation, help-seeking, and UV protection (Gibbons, Houlihan, & Gerrard, 2009; Koning, van den Eijnden, Verdurmen, Engels, & Vollebergh, 2011; Logsdon, Usui, Pinto-Foltz, & Rakestraw, 2009). These theories were chosen because of their focus on intrapersonal and interpersonal risk and protective factors, which reflect STAR LO's targeting of knowledge, attitudes, and beliefs, and its interactions between students and professional adult actors in the role of peer models.

The STAR LO program was designed as an intervention for both boys and girls. Some have suggested, however, that boys and girls have different intervention needs (Aarons et al., 2000), and some studies have shown that the impact of reproductive health interventions varies by gender (Coyle, Kirby, Marin, Gomez, & Gregorich, 2004; Kirby et al., 2004; Philliber, Kaye, Herrling, & West, 2002; Siegel, Aten, & Enaharo, 2001). Therefore, we examined whether STAR LO effects differed by gender.

Measures Related to Sexual Outcomes Among Early Adolescents

Because of the lower rates of sexual intercourse for the early adolescent age group targeted by the STAR LO program (Suellentrop & Narula, 2007; De Rosa et al., 2010), interventions implemented with this age group need to be evaluated using measures of intentions and other antecedents of sexual activity. In recognizing the specific experiences of early adolescents, including the onset of puberty and its accompanying newfound physical attractions, the STAR LO program focuses on factors which may be foundational for understanding and decision making about sex. In addition to intentions to have sex, STAR LO addresses and measures several risk and protective factors shown to predict adolescent sexual behavior and decision making, including self-efficacy to refuse sex (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Dancy, Crittenden, & Freels, 2006), building positive relationships, and/or communication with parents about sex (Ashley, 2007; Bachanas et al., 2002; Childs, Moneyham, & Felton, 2008; Gray et al., 2008; Guilamo-Ramos et al., 2007; Kirby, 2007;

National Campaign to Prevent Teen Pregnancy, 2004), attitudes about sex and abstinence (Gray et al., 2008), and intention to become pregnant as a teen (Rosengard, Phipps, Adler, & Ellen, 2004).

The Present Study

The present study hypothesized that young, urban adolescents in the STAR LO intervention would report higher levels of protective factors and lower levels of risk factors than those in the comparison condition across the 3 months from pretest to follow-up. These risk and protective factors included selected antecedents of sexual activity including intentions to engage in sexual behavior, knowledge, attitudes about sex and abstinence, self-efficacy, and parent-child communication. The study was a quasi-experimental design with schools assigned to the intervention or comparison condition and used multivariate regression models to test treatment effects. As other studies have suggested differential outcomes of reproductive health education programs between girls and boys (Coyle et al., 2004; Kirby et al., 2004; Philliber et al., 2002; Siegel et al., 2001), the analyses tested for gender-moderated prevention effects.

Method

Participants

In order to achieve 80% power to detect a 0.2 effect size on intentions to have sex while still a teenager, with a 0.05 level of statistical significance and using a two-sided test and assuming an intraclass correlation (ICC) of 0.001, we estimated that we would need at least 61 students per school at a total of 16 schools at final follow-up (total $N = 976$). All students in the highest grade at participating schools were invited to participate in the study. For some schools, this was fifth grade; for others, this was sixth grade.

Participants were 1,143 fifth- and sixth-grade students attending New York City (NYC) public elementary and middle schools in neighborhoods with higher teenage pregnancy rates (up to 152.1 per thousand) than for the city as a whole (85.4 per 1,000; New York City Department of Health and Mental Hygiene, 2009). The study used parental notification approved by St. Luke's Roosevelt Hospital Institutional Review Board (IRB) and each school's principal. Of the eligible families, only 0.1% denied permission for student participation. A total of 1,449 students completed a baseline assessment between Fall 2001 and Spring 2006. Of these, 1,143 (78.9%) students completed a follow-up assessment. Study attrition was due to both transience and

absenteeism, although data collectors returned to each school twice after the posttest to collect data from absent students. Analysis of whether there were systematic differences in loss to follow-up suggested patterns consistent with transience in the NYC school system and generally outside of the control of the study.

Students and schools receiving the intervention were oversampled, primarily due to the challenges of finding schools that were comparable with the intervention schools and also willing to participate in the research without receiving the intervention. Thus, there were 896 students from 9 schools in the STAR LO group and 247 from 7 schools in the comparison condition.

The mean age of the study group was 11.5 years ($SD = 0.8$). Slightly more than half of the participating students were female. Approximately, 37% were Latino, 29% were African American, 12% were White, 10% were multiethnic, 4% were Asian, and 8% indicated that they were from “Other” racial/ethnic backgrounds. Students participating in the study reflected the ethnic characteristics in the surrounding communities of these neighborhood schools.

Recruitment

This study used a quasi-experimental pretest-posttest design. To avoid contamination of the intervention across classrooms or individuals, study conditions were assigned at the school level. STAR LO is the middle school version of NiteStar, created originally as a high school intervention in 1985 and subsequently offering a variety of workshops, materials, trainings, and programs in NYC schools and other community settings (The Nitestar Program, 2011). Schools that had received interventions or materials from the NiteStar organization in previous years were recruited to the STAR LO intervention group for the current study. The researcher then reached out to schools which had expressed an interest in NiteStar programs to identify comparable schools willing to participate in the research, with the promise of a future intervention. Ultimately, nine schools received the intervention, seven of which served as a comparison site at some point in the study, for a total of 16 school “units.” Comparison schools received the intervention 1 or 2 years later, and data from those intervention participants were included as part of the study’s intervention sample. In two instances, a school which had served as an intervention site later served as a comparison. In both of these schools, however, students who had received the intervention in fifth grade had already moved on to a sixth- to eighth-grade middle school, by the time a new cohort of fifth graders served as a comparison group in a subsequent

school year. All follow-up data collection was completed within the school year; thus, no school served as both an intervention and comparison school within the same school year. Furthermore, the intervention was delivered by outside experts (i.e., STAR LO professionals) rather than classroom teachers, thereby limiting risk of contamination between intervention and comparison students via their classroom teachers.

Study Conditions

Students in comparison schools received regular health education programming, which did not include sexuality education or pregnancy prevention. Thus, the treatment effects were measured against typical maturational changes in this early adolescent age group rather than against other programs or educational approaches.

The STAR LO Program

The STAR LO program embeds theater performances within a classroom-based curriculum, using professional young adult actor/educators as teachers. This educational theater approach builds on students' observation of and interactions with role models as a critical part of learning. It is based on the theoretical understanding that young people are motivated to act in accordance with the beliefs of the people whose attitudes they value most highly (Arthur et al., 2002). Professional actor-educators portray characters, each with a personality, life circumstances, and choices that mirror those of young adolescents with respect to sexuality. The professional actor-educator adults remain in character after the performance and interact with the students, portraying peer role models. The characters, using planned and rehearsed short theater pieces, or vignettes, focus on building confidence; setting goals which include delaying sexual activity; increasing self-efficacy in refusal skills; improving knowledge about puberty, sex, pregnancy, and STI prevention; facilitating decision making around setting physical boundaries and limits; and encouraging communication with parents about these topics. Characters in the performance present various sexual health messages embodied in their "stories." For example, one character's sister is a teen mother, and another character likes to act older than her age and chat online with strangers and older boys. One adult professional actor portrays a 12-year-old rap singer who aspires to become an entertainment lawyer. He delivers a message about his decision to remain abstinent until marriage, using his own rap song.

The program consists of eight classroom sessions presented over a 10- to 12-week period. Fourteen professional adult actors received intensive training in adolescent development, sexuality, and classroom facilitation over a summer and at least 8 hours of training per week throughout the school year. These professional adult actors reflected the ethnic diversity of the NYC public schools, and their characters were specifically designed to portray late elementary and middle school peers of the STAR LO students. An experienced STAR LO health educator facilitated and monitored all sessions and recorded fidelity to the program, assuring completion of all shows, vignettes, and follow-up discussion and activities. If a topic was not covered or a full lesson was not delivered, an additional session was scheduled to assure program completion. Teachers recorded daily attendance and reported that attendance on STAR LO days was consistent with or higher than regular school attendance.

The STAR LO intervention was developed with strong community partnerships between the NiteStar organization and public schools and engaged in extensive pilot and field testing, with ongoing adjustments to the theater vignettes and content over the course of its development. Identification of potentially malleable adolescent protective factors from existing research provided the basis for building specific characters in the show who explore each of these factors (intentions to delay sex, setting limits, increasing knowledge and understanding of early puberty and pregnancy prevention, attitudes about delaying sex and/or maintaining abstinence, and desire to delay pregnancy). Formative research data also helped to ensure that the STAR LO program is culturally and developmentally appropriate for urban elementary and middle school students (Lieberman & Berlin, 2005).

Data Collection

Data were collected in classrooms by trained NiteStar staff not involved in the STAR LO intervention. Students completed a paper-pencil pretest survey in their classrooms immediately before the intervention began and a posttest survey 1 to 2 weeks after the last classroom intervention session. Teachers and STAR LO intervention staff were not present in the classrooms during the survey administration. Students in the comparison schools received pretests and posttests at the same time intervals (approximately 12 weeks between pre- and posttests). Students did not put names on their surveys but were asked to create a code using a combination of their birth date and the first and last letters of their last names. Pretest and posttest surveys were linked by these identification codes, which students used when they completed

each survey. After initial data collection, data collectors returned to each classroom once after the pretest and twice after the posttest to administer surveys to absentees.

Self-Report Measures

The unique needs of this age group and innovative intervention approach required both the adaptation of measures from previous studies (Lieberman & Berlin, 2005; Lieberman, Gray, Wier, Fiorentino, & Maloney, 2000) and the creation of several new measures. Two factor analyses (principal factors with Promax rotation) were performed on single imputed data sets to determine how to best reduce outcome data. The first-factor analysis included 43 candidate items. We examined solutions with between five and eight factors and selected the six-factor solution as having both simple structure and parsimony. Ten items with factor loadings below 0.3 were dropped, as was one item that was a poor conceptual fit with its highest loaded factor. Three of the six resultant scales were relevant to the current study: self-efficacy, parent-child communication, and pro-abstinence attitudes.

A factor analysis of 11 true/false items representing knowledge about puberty and reproductive health was also performed. After examining one- and two-factor solutions, a one-factor solution was selected, with three items with loadings of less than 0.3 omitted from the resultant knowledge scale. Table 1 presents the properties for all outcome measures at baseline, including the following:

Intention to have sex: Adolescents reported the likelihood that they would have sexual intercourse while still a teen and before they got married, using a scale ranging from 1 = *definitely not* to 4 = *definitely will*. Data collectors clarified that sexual intercourse was the same thing as “sex” and was sometimes called “going all the way.”

Intended timing and age of first sex: Adolescents were asked when they thought they would first have sex (i.e., “sexual intercourse” or “going all the way”), with possible responses of “I will not have sex until I am married,” “I will have sex around age ___, whether or not I am married,” “I really don’t know,” and “I have already had sex.”¹ Those who reported having already had sex (1.5% and 2.3% of baseline and follow-up respondents, respectively) were excluded from analyses of this item. Intended age of first sex, reported as part of this item, was also analyzed as a separate outcome of interest.

Table 1. Properties of Outcome Measures at Baseline

Variable	Item or sample item(s)	No. of items	Range	α
Intention to have sex	Do you think that you will have sexual intercourse while you are still a teenager, before you get married? Definitely not Probably not Probably will Definitely will	1	1-4	—
Intended timing of first sex	When do you think it is likely that you will have sexual intercourse for the first time? I will not have sex until I am married. I will have sex around age ____, whether or not I am married. I really don't know. I have already had sex.	1	—	—
Intended age of first sex	I will have sex around age ____, whether or not I am married.	1	12-46	—
Knowledge	If you say no to someone touching you in a sexual way, but they continue, this is sexual abuse.	8	0-8	0.61
Pro-abstinence attitudes	It is against my beliefs to have sex as a teenager before marriage.	5	5-25	0.64
Self-efficacy	If someone I liked wanted to kiss me, but I did not want to kiss, I am:" very sure," "pretty sure," "a little unsure," "very unsure," that I could say no.	5	5-20	0.76
Desire to be a teen parent	Absolutely do not want; not sure if I want; definitely want: To have a baby or become a parent while I am a teenager.	1	1-3	—
Parent-child communication	I could talk to my parent/guardian if: I had a problem at school I had a question or was concerned about sex	8	8-40	0.77

Knowledge: Adolescents answered eight true/false items reflecting facts presented in the curriculum about puberty, sex, and abstinence. Each adolescent's number of correct responses was summed.

Pro-abstinence attitudes: A five-item summative scale assessed adolescents' attitudes toward teen sex, teen pregnancy, and premarital sex (where 1 = *disagree a lot* and 5 = *agree a lot*, pretest $\alpha = .64$).

Self-efficacy: Adolescents answered five items concerning their confidence that they could resist a variety of pressures for risk behaviors

with someone they liked. Response options ranged from 1 = *very sure* to 4 = *very unsure* (pretest $\alpha = .76$). Responses were reverse coded and summed.

Desire to be a teen parent: Adolescents reported how much they wanted to have a baby or become a parent while a teenager, using a scale ranging from 1 (*definitely do not want*) to 3 (*definitely want to*).

Parent-child communication: A subsample² of adolescents reported comfort and feasibility of talking with their parents about sex and related topics, using an eight-item summative scale where 1 = *disagree a lot* and 5 = *agree a lot* (pretest $\alpha = .77$).

Moderator and control variables: Adolescents self-reported their gender, age at baseline, their race/ethnicity, and whether they had ever repeated a grade.

Statistical Procedures

Analyses were conducted using SAS version 9.2. First, chi-square and *t* tests (using two-tailed tests of significance) compared STAR LO and comparison youths on demographic characteristics and scores on dependent variables at pretest. Second, these same tests were used to compare adolescents who completed the follow-up assessment with those who were lost to follow-up.

Linear regression models (SAS PROC REG, version 9.2) were used to examine the impact of the STAR LO intervention on eight of the nine outcomes. The remaining categorical outcome (intended timing of first sex) was tested using a multinomial logistic regression model (SAS PROC CATMOD, version 9.2). These models controlled for baseline variables significantly associated with treatment or attrition status, as well as baseline score on the outcome of interest. To account for any systematic differences between schools (i.e., adjust for clustering), dummy codes for school were included in the models. After examining overall treatment effects, gender and a term representing a gender-by-treatment interaction were tested; any outcomes with a significant interaction term were analyzed separately by gender.

Results

Preintervention Differences

Chi-square analyses indicated that STAR LO and comparison youths were comparable at baseline on gender, self-efficacy, knowledge, pro-abstinence attitudes, desire to be a teen parent, intended timing and age of first sex, and

Table 2. Baseline Sociodemographic Characteristics, Sexual Intentions, Attitudes, and Related Variables, by Treatment Condition

Variable	N	Comparison group		STAR LO			χ^2	t
		%	M	SD	%	M		
Female	1,124	55.4			50.2			2.01
Age (in years)	1,121		11.5	0.8		11.0	0.7	9.42**
Race/ethnicity	1,108							31.3**
African American		39.5			26.1			
Latino/Hispanic		35.3			37.0			
White		7.1			14.8			
Asian		1.7			5.2			
Other		5.0			9.0			
Multiethnic		11.3			7.9			
Grade retention	1,105	26.1			16.7			10.79*
Intention to have sex	1,081		1.9	0.9		1.7	0.9	2.82*
Intended timing of first sex	1,062							3.34
Marriage		26.0			26.7			
Specified age		47.0			40.8			
Don't know		26.9			32.5			
Intended age of first sex	433		19.6	3.7		20.5	4.3	-1.93
Knowledge	1,090		3.7	2.0		3.5	1.9	1.17
Pro-abstinence attitudes	1,072		17.9	4.3		18.2	4.5	-0.99
Self-efficacy	1,097		18.2	2.4		18.2	2.8	0.43
Desire to be a teen parent	1,097		1.2	0.5		1.2	0.4	1.00
Parent-child communication	858		31.5	6.1		32.1	5.8	-1.24

* $p < .01$. ** $p < .001$.

parent-child communication (Table 2). Pretest differences emerged, however, for age, race/ethnicity, grade retention, and intention to have sex. The comparison group was significantly older ($M = 11.5$ years vs. treatment group $M = 11.0$ years), more likely to be African American (40% vs. 26%) or multiethnic (11% vs. 8%), more likely to have repeated a grade in school (26% vs. 17%), and had greater intention to have sex than the treatment group. These variables were controlled in subsequent analyses.

Attrition

There were no significant relationships between attrition and gender, age, or baseline measures of outcomes variables. However, students who dropped

out of the study were more likely than students who completed the follow-up survey to be in the control group, to be Latino or multiethnic, and to have repeated a grade in school.

Overall Intervention Effects

Multiple regression models of the outcome variables for the entire sample are presented in Table 3. STAR LO participants showed improvements from pre- to postintervention in relation to comparison group participants in intention to have sex; intended timing of first sex; and intended age of first sex; knowledge about puberty, sex, and pregnancy prevention; pro-abstinence attitudes; and desire to be a teen parent, controlling for pretest levels, school site, age, race/ethnicity, and grade retention. An examination of mean outcome scores by treatment group revealed that knowledge of both the comparison and STAR LO participants increased over time, but STAR LO participants experienced a larger increase. Comparison students demonstrated normative decreases in pro-abstinence attitudes and intended age of first sex, whereas STAR LO students did not. Conversely, comparison students reported increases in intention to have sex while a teenager and desire to be a teen parent, whereas STAR LO students did not.

STAR LO participants' decisiveness about sexual intentions improved from an "I don't know" response about timing of first sex to endorsing intentions to either wait until marriage or a specific age in the future. STAR LO youths did not exhibit improvements in self-efficacy or parent-child communication.

Intervention Effects by Gender

Inclusion of gender and the treatment-by-gender interaction term in the final step of each analysis identified significant treatment-by-gender effects on desire to be a teen parent ($\beta = -0.04, p = .009$) and knowledge ($\beta = -0.12, p = .04$). To describe these effects, the sample was stratified by gender, and the treatment main effects were calculated for each gender. Multiple regression results (Table 3) indicated that STAR LO girls exhibited a lower desire at follow-up than comparison girls to be a teen parent ($\beta = -0.17, p = .003$), and STAR LO boys' knowledge increased more than STAR LO girls' knowledge ($\beta = 1.91, p < .001$ for boys, $\beta = 1.63, p < .001$ for girls). There were no gender-moderated effects of STAR LO on intention to have sex, intended timing or age of first sex, self-efficacy, pro-abstinence attitudes, or parent-child communication.

Table 3. Multivariate Analyses of Group Differences in Outcome Variables for Youths in STAR LO and Comparison Groups

Outcome	N	Treatment effect				β
		Pretest mean		Posttest mean		
		Treatment	Comparison	Treatment	Comparison	
Intention to have sex	1,028	1.73	1.93	1.76	2.08	-0.16*
Intended timing of first sex	973					
Marriage vs. don't know		27%	26%	29%	23%	0.75*
Specified age vs. don't know		68%	73%	74%	67%	1.03***
Intended age of first sex	298	20.07	19.07	19.77	18.28	1.09*
Knowledge	1,016	11.58	11.68	13.91	12.24	1.76***
Early adolescent males	492	11.41	11.38	13.71	11.70	1.91***
Early adolescent females	523	11.73	11.92	14.09	12.67	1.63***
Pro-abstinence attitudes	990	18.32	18.07	18.13	16.97	1.10**
Self-efficacy	1,026	18.20	18.25	18.24	17.93	0.37
Desire to become a teen parent	1,028	1.19	1.22	1.20	1.33	-0.13**
Early adolescent boys	496	1.22	1.35	1.24	1.33	-0.07
Early adolescent girls	531	1.16	1.12	1.16	1.33	-0.17**
Parent-child communication	779	32.17	31.94	32.58	31.75	0.31

Note: Each analysis controlled for baseline scores on the outcome variable, school, respondent age, race/ethnicity, grade retention, and intention to have sex.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

The present study provides support for the use of this theater-based approach to sex education for a young adolescent group. This research examined the influence of urban fifth- and sixth-grade students' participation in the STAR LO intervention on intentions to delay sexual activity, attitudes, knowledge, self-efficacy, and parent-child communication. STAR LO appeared to offset normative developmental changes in pro-abstinence attitudes and sexual intentions. Comparison group students experienced decreases in pro-abstinence attitudes and age they predicted they would initiate sex and increases in intentions to have sex as a teen, whereas STAR LO students maintained their baseline intentions and attitudes. The STAR LO participants increased knowledge about sexual topics more than comparison group participants, and adolescent girls who participated in STAR LO reported a decreased desire to be a teen parent.

As with previous findings of different benefits for boys and girls (e.g., Aarons et al., 2000), we found gender differences in program effects on knowledge and desire to be a teen parent. STAR LO's impact on desire to be a teen parent was statistically significant only for adolescent girls, and the impact on knowledge was greater for adolescent boys than girls. Effects specific to adolescent girls have previously involved knowledge of reproductive health (Aarons et al., 2000), self-efficacy (Siegel et al., 2001), and behavior (Aarons et al., 2000; Philliber et al., 2002; Siegel et al., 2001) but not desire to have a baby. Perhaps this finding reflects the relevance of pregnancy and/or interest in babies being greater among girls than boys in this age group. Unfortunately, neither did we evaluate reasons for girls' versus boys' desire to be a parent nor were we able to account for the differences between girls and boys in their knowledge development. Thus, while these findings add to the literature suggesting a differential impact of intervention among girls and boys on selected variables, future research is needed to determine why the STAR LO intervention had an impact on the desire to be a teen parent only among adolescent girls and a greater impact on knowledge among boys.

Possible reasons for the null findings of other measured protective factors were considered. Most adolescents in this age group are at the early stages of pubertal development; thus, imagining themselves in potential sexual situations, which self-efficacy questions required them to do, may have been simply too abstract. Questions related to setting boundaries in physical situations which are not focused on intercourse per se may be more appropriate measures for this age group.

Contrary to prediction, the intervention did not impact parent-child communication about sexual behaviors. Because these behaviors may seem far off for adolescents in this age group, discussions with their parents may tend to focus on more immediate concerns, such as smoking, alcohol, and peer issues. Connections to parents shift as adolescents move on to seventh grade and beyond, where interventions may have greater potential to impact parent-child communication (Lieberman et al., 2000). It is also important to note that the STAR LO program did not address parents' receptivity to such communication, and parent responsiveness is an important predictor of parent-child communication (Miller et al., 2009). Thus, encouraging adolescents to talk with their parents may not be sufficient to promote self-efficacy or behavior surrounding parent-child sex discussions. Subsequent to this intervention, the STAR LO program designed multisession parent workshops to address parent comfort and receptivity to discussions with their young adolescents about sexual behaviors. Future research should explore program impact on parent-child communication among children whose parents participate in such workshops.

The intervention was specifically designed to reflect several relevant behavioral theories. Our study, however, was unable to measure all constructs from the theory of reasoned action and social cognitive theory. Additional measures, such as peer influence, could not be included in our questionnaire because of time constraints of classroom survey administration and early adolescent attention span. Future research is needed to assess whether other components of these theories are also influenced by the STAR LO program or mediate its effects.

The study's focus on a theater-based intervention, use of a quasi-experimental design, use of multivariate analysis to control for potential confounders of program effects, and examination of early adolescents provide a unique contribution to the literature on school-based sex education programming. Previous work identified a need for well-designed and theory-based evaluations of school-based drama interventions for children and adolescents (Joronen et al., 2008), which the current study addressed directly. With health promotion becoming a more common focus of arts-based interventions, these results bolster the potential of theater-based classroom teaching as a public health approach to the primary prevention of sexual behavior for early adolescents.

The STAR LO program is promising in its impact on early adolescents' beliefs, intentions, and knowledge, which build a foundation for potential delay in sexual behavior. Discussions about sex education programs often focus on support for either abstinence or contraceptive education and how to teach specific skills to say no to sex and/or to negotiate safer behaviors. This

intervention emphasized the underlying attitudes, beliefs, and knowledge to make decisions that may enable young adolescents to set limits and determine how to handle the pressures that increase as they move through their teens.

STAR LO enjoys strong partnerships with schools and experiences high levels of participation and engagement by students, faculty, and parents. The community partnerships informed STAR LO's curriculum and sample retention strategies. Extensive and ongoing staff training, the use of professional young adults who stay in character portraying peer models throughout the intervention, and a highly engaging and entertaining approach have yielded a popular age-appropriate intervention among participating schools. Despite increasing pressure related to meeting academic goals and standards, participating schools carved out critical educational time for this program and sought to continue the program each year.

While it is not possible to draw conclusions about general theater education from this study, evidence from a process evaluation reported elsewhere (Lieberman & Berlin, 2005) highlighted students' engagement with the actors in the classrooms. Students' identification with and attraction to the strongest characters suggested that theater interventions like STAR LO may use relationships with professional adult actors portraying positive peer models to influence young adolescents by engaging and connecting them to characters who can feel like real friends.

Limitations and Future Directions

The present study takes a first step in evaluating a unique theater-education approach to intervention with young adolescents. However, there were limitations. Random assignment was not used; we did measure and control for significant treatment group differences at baseline, although it is possible that the groups differed on other unmeasured factors. In addition, two of the schools served as intervention sites before they served as comparison sites. In both cases, exposed students had already moved up to other middle schools. Any possible contamination would have weakened study findings, rendering results more conservative estimates of program effects. Study attrition was significant, due to student absenteeism and transience within the NYC public school system. Although we tested and controlled for variables associated with attrition, it is possible that students who were lost to follow-up differed from students who remained in the study in systematic but unmeasured ways. Future studies should use more aggressive follow-up efforts to minimize study attrition. Finally, the follow-up survey was administered 1 to 2 weeks after program completion, limiting measurement of

STAR LO's impact on behavior or long-term attitudinal outcomes. Notably, in another study of young adolescents in NYC public schools, improvements among the intervention group in relation to the comparison group on self-reported communication and relationships with their parents did not emerge until 1 year after intervention (Lieberman et al., 2000).

We considered using HLM to account for subjects nesting within schools, but Raudenbush and Bryk (2002) caution against using multilevel models in situations where there are a small number of Level 2 units. Our regression analyses controlled for clustering using dummy codes, consistent with evaluation studies of several well-known school-based prevention programs, in which multilevel models were not used for statistical analysis (e.g., Bauer, Lozano, & Rivera, 2007; Botvin, Griffin, Paul, & Macauley, 2003). To validate these results, we also estimated multilevel models for each outcome, and those results generally replicated the results reported here with the exception that the treatment effect for intended age of first sex was not statistically significant. Future intervention studies of this type should attempt to involve more schools in order to use a multilevel modeling approach.

Future research may also explore the application of Gibbons and Gerrard's prototype/willingness model, which expands on the TRA and has been shown to be more effective at predicting risk behavior, especially among young people and among people with little experience with the behavior (Gerrard, Gibbons, Houlihan, Stock, & Pomeroy, 2008; Gibbons et al., 2009). This model may be particularly appropriate for the behavior and target audience of STAR LO because it would address both the reasoned and less reasoned aspects of decision making among a group with limited sexual experience. It incorporates constructs of risk prototypes, which are images of people who engage in risk behaviors (such as the characters portrayed by the adult professional actors in the STAR LO program) and behavioral willingness or openness to engaging in risky behavior.

In order to assess STAR LO's long-term impact and impact on sexual behavior, future studies should continue to assess participants through their middle and high school years. By their own accounts, STAR LO students understood that they needed "more," reflecting in their evaluations that they wished the program lasted longer and/or would be repeated, for example, ". . . when I really have to start worrying about these things." These limitations notwithstanding, the results support the potential public health impact of a theater-based classroom prevention intervention among young adolescents. The STAR LO program used its unique theater-in-the-classroom approach to engage this very young urban population and demonstrated

short-term evidence that the intervention affected selected risk and protective factors for early sexual behavior, including sexual intentions, knowledge, and attitudes.

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Authors' Notes

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Notes

1. The intended age of first sex item was only asked of participants who responded that they would have sex at a particular age regardless of being married, so analyses of this outcome were restricted to the 326 respondents (254 STAR LO, 72 comparison) who responded that they would have sex at a specific age at both baseline and follow-up.
2. Items measuring parent-child communication were added to baseline assessments beginning in Year 2 of the study. Thus, the subsample for analyses related to parent-child communication excluded Year 1 participants and was limited to the 946

students completing baseline and follow-up assessments in Years 2 through 5 (735 in the STAR LO group and 211 in the comparison condition).

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