

**Contextualizing Relationship Education Effects on Adolescent Attitude toward Sexual
Behavior Delay: Considering Class Social Climate**

by

Sandra Upchurch Morrison

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Approved by

Francesca Adler-Baeder, Chair, Professor of Human Development and Family Studies

Kristen Bub, Professor of Human Development and Family Studies

Adrienne Duke, Professor of Human Development and Family Studies

Abstract

Using data from a statewide relationship education (RE) program targeting youth, this study used a more complex theory-driven and empirically-based model to explore the influence of the program on adolescent attitudes about delaying sexual behavior. Prior research on RE efficacy in the domain of sexual attitudes was inconclusive and relied on methods for assessing program effects that did not consider the shared variance within classes and the potential influence of individual demographics and social climate. This study examined RE efficacy with a diverse sample that included a significant number of African American students and explored whether gender and ethnicity moderated changes in attitudes about sexual delay. Further, multilevel modeling procedures allowed the examination of both individual and class level predictors. Class level predictors included RE participant/nonparticipant group, the proportion of African American students in the class, and the proportion of sexually active students in the class. Interactions among potential moderators of the RE program effects were also explored. Results indicated that gender influences attitude change regarding sexual delay, such that females demonstrated more overall attitude change. However, when examining moderators of the RE program effect, gender and gender by ethnicity were found to influence indicators of program efficacy regarding attitudes about sexual behavior. Females in RE classes were less likely to change their attitude towards endorsing waiting to have sex and African American females in RE classes were less likely to change their attitude towards endorsing resisting sexual pressure. Aspects of class context were also found to influence attitude change. While the

students in classes with a lower proportion of African American classmates had more attitude change in favor of delaying sex than students in classes with higher proportions of African American classmates, the contextual variable more predictive of program effects was the proportion of sexually active classmates. That is, students in classes with lower proportions of sexually active classmates were more likely to change their attitude in favor of delaying sex than students in classes with more sexually active classmates, indicating that behavioral norms are likely more influential than cultural norms. Overall, gender and class context moderated program efficacy confirming the importance of considering both individual social address and social context when assessing program effects. Implications for future research and practice are offered.

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I. Introduction

Nearly 50% of high school students have engaged in sexual intercourse (Center for Disease Control, 2011) and adolescents who engage in sexual relationships at earlier ages than their peers are at greater risk of having more sexual partners (Sandfort, Orr, Hirsch, & Santelli, 2008), increased risk of STIs (Weinstock, Berman, & Cates, 2004), and increased risk of unintended pregnancy (Finer, 2010). Adolescent perceptions of peer rates of risky sexual behaviors, such as number of partners and frequency of casual sexual experiences, are associated with risky sexual behavior (Whitaker & Miller, 2000) and those perceptions are often inflated (Lewis, Lee, Patrick, & Fossos, 2007). Adolescents who have sexual intercourse within the context of a relationship are more likely to use contraception to minimize sexual risks than adolescents who have sexual intercourse with a non-romantic partner (Manning, Longmore, & Giordano, 2000). However, adolescents who are anxious about their current relationship are more likely to participate in risky sexual behavior, believing it to be a way to achieve intimacy and decrease likelihood of rejection from that partner (Jones & Furman, 2011). Therefore, a program such as Relationship Education (RE) that focuses on teaching adolescents the knowledge and skills to develop and maintain a healthy dating relationship first and foremost, prior to engaging in a physical relationship, has the potential to influence adolescent sexual risk (Kerpelman, 2007). Developmentally, exposure to RE during adolescence may be beneficial because it is the time when youth are initiating dating relationship and potentially establishing life-long behavioral patterns (Gardner, Giese, & Parrott, 2004; Silliman & Schumm, 2004).

Sexual Education and Relationship Education

When exploring educational influence on adolescent sexual behavior, sex education is the most referenced intervention. The content and approach of traditional sex education differs from

that of RE. Sexual education provides students with information about human anatomy, STIs, and pregnancy, with comprehensive programs also providing information about contraception (Kirby, 2008). Most abstinence based sex education programs have not demonstrated significant reduction in adolescent sexual behavior, but some success has been seen with more comprehensive programs (Kirby, 2008). Even so, scholars have suggested that more should be done to improve the effectiveness of adolescent education programs that seek to reduce the prevalence of sexually risky behaviors (DiCenso, Guyatt, Willan, & Griffith, 2002; Kirby, 2002). Interestingly, gains in healthy attitudes and reductions of risky sexual behaviors have been demonstrated from intervention programs with main purposes as something other than sexual education. As examples, a program intended to increase a student's social competence during elementary school was found to influence whether a student had sexual intercourse by age 18 (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999) and a community service program for middle school students reported a significant program effect in reducing the sexual risk behavior index (O'Donnell et al., 1999). As some sexual behavior-focused programs have been ineffective at reducing sexual behavior and some non-sexual behavior based programs dedicated to social competence and community service have demonstrated beneficial influence on sexual behavior, it is evident that traditional sex education is not the solitary solution for addressing adolescent sexual risk.

Adolescents themselves have indicated that traditional sexual education is missing key components they need to deal with the feelings, decisions, and experiences related to sex (DiCenso et al., 2000). In contrast with sexual education, the focus of RE is teaching adolescents the skills they need to form and develop healthy interpersonal relationships (Kerpelman, 2007). Although the topics and purpose of RE is not primarily to reduce sexual activity, there are

messages inherent in lessons on the process of developing healthy relationships that may influence decisions about sexual intimacy and risk. In fact, Kerpelman (2007) argues that an important objective for relationship education targeting youth should include, “addressing adolescents’ knowledge of and attitudes towards risky sexual behaviors, reducing misconceptions about sexual activity, and increasing knowledge about healthy relationships and choices”(p. 4). RE programs address sexual behavior in various ways including promoting healthy relationships values and drawing attention to the over-sexualized media portrayal of relationships (Kamper, 2001/2004; Pearson, 2004/ 2007). Although there are variations between RE curriculum, curricula such as *Relationship Smarts* specifically address the timing of sexual intimacy in the development of a romantic relationship (Pearson, 2007). Despite the suggestion that RE may influence sexually risky attitudes and behaviors, researchers have given limited attention to sexual risk outcomes following RE participation. Therefore, the primary focus of this study is to explore changes in attitudes about delaying sexual behavior in a large, diverse sample of youth following exposure to RE.

We utilize several developmental, ecological, and cognitive perspectives to explicate the underpinnings of RE. We employ the life course perspective to support RE exposure during adolescence because it posits that attitudes and behaviors experienced during one stage of life will typically shape the attitudes and behaviors in future stages (Elder, 1998). Adolescents’ experiences with relationships often influence their current behavior and current relationship experiences during adolescence and are likely to frame future relationship choices. Furthermore, for every decision and experience, an adolescent is not only navigating past influences, but may be navigating contextual forces that are proximal, distal, and interdependent (Bronfenbrenner, 1979). In many situations, an individual’s personality and experiences are simultaneously

interacting with both the proximal social environments such as the family and the peer group and the distal social forces such as the community and the media.

Social learning theory provides descriptions of the contextual influences that adolescents are experiencing and assumes observations of others shape an adolescent's construct of relationships (Bandura, 1971). Relevant to the current study, adolescents see how parental figures interact, how friends involved in romantic relationships treat each other, how teenagers and adults in movies relate to each other, and how the media portrays famous couples. Importantly, early adolescence is the time in the life course that peer relationships become increasingly influential (Furman & Shaffer, 2003); therefore, education programs targeting adolescents must recognize the increasing social influence of peers. Since both modeling and verbal instructions can contribute to an adolescent's conceptual understanding of relationships (Bandura, 1977) and many adolescents do not have healthy relationship models from which to learn, RE can provide information and skills practice for adolescents who might otherwise not be exposed to healthy relationships within their environments.

Lastly, for there to be change in adolescent behavior, there must be an acquisition of new knowledge and skills in order to influence subsequent decision-making. The theory of reasoned action posits that attitude about the behavior, normative beliefs about the behavior, and perceived behavioral control influence intention to engage in a behavior (Ajzen & Fishbein, 1980). Therefore, attitudes and subjective norms are usually important predictors of whether a specific behavior will occur. Based on the expected relationship between intention and behavior, programs striving to reduce risky sexual behavior must effectively alter adolescents' attitudes, beliefs, and behavioral intentions in order to alter their behavior.

Multiple empirical studies have demonstrated that students who have been exposed to RE have gained valuable knowledge and skills. Evaluation studies of RE have shown effects on adolescents' inaccurate perceptions about relationships by addressing negative attitudes regarding the sustainability of positive relationships and by helping students explore faulty beliefs about how positive relationships are formed and maintained (Adler-Baeder, Kerpelman, Schramm, Higginbotham, & Paulk, 2007; Gardner, Giese, & Parrott, 2004). After RE, adolescents have reported improvements in positive attitudes about marriage and marriage education (Gardner et al., 2004; Kerpelman et al., 2009) as well as decreased favorability towards divorce (Gardner, 2001; Sparks, Lee, & Spjeldnes, 2012). In addition, students exposed to RE have shown gains in conflict management skills (Adler-Baeder et. al., 2007; Gardner et al., 2004) with some benefits maintained a year after the program intervention (Gardner & Boellaard, 2007; Kerpelman, Pittman, Adler-Baeder, Eryigit & Paulk, 2009).

Although, the influence of RE on multiple domains has been documented in the literature, the influence of RE on attitudes about delaying sexual behavior is less well understood. Only three studies have assessed these outcomes and the results were mixed. Gardner and colleagues (2004) were the first to examine changes in attitudes about delaying sexual behavior following exposure to *Connections*, a RE curriculum. The *Connections* curriculum included a focus on "how to establish clear expectations for self and partner in a dating relationship (sexual and general dating expectations)" (Gardner, et al., 2004, p. 521). Adolescents answered questions about their perceptions of their own ability to resist unwanted sexual pressure from a peer and about their intent to delay having sex until they are older. In the sample of 410 primarily European American and Hispanic American youth, Garner and colleagues (2004) found a positive trend for RE participants in student perceptions of ability to

resist unwanted sexual pressure, but not for students in the comparison group. However, Gardner and colleagues found no significant program effect in attitudes regarding waiting to have sex. In a second study, resisting sexual pressure was assessed again from a subsample of Gardner's previous sample who completed follow-up surveys, but this time there were no significant benefits reported in change in attitudes about delaying sexual behavior at one or four years after program participation (Gardner & Boellaard, 2007).

Lastly, in a primarily European American sample of 623 students exposed to another youth focused RE curriculum, *Relationship Smarts*, changes in attitudes regarding waiting to have sex and resisting sexual pressure after RE were found (Schramm & Gomez-Scott, 2012). *Relationships Smarts* focuses on many of the same broad concepts as *Connections*, but includes a specific discussion of the benefits of having "the physical expression of love" occur at the stage of the relationship that requires a commitment (Pearson, 2007, p. 56). *Relationship Smarts* provides information on adolescent sexual norms such as how many adolescents have had sex including the proportion that indicated they wish they had waited and reviews how media misrepresents healthy relationship through images that emphasize sexuality. Since the *Relationships Smarts* curriculum directly addresses sexual intimacy within the context of a healthy relationship, it may have a more robust influence on an adolescent's attitudes toward delaying sex.

Factors that Influence Adolescent Sexual Behavior

Gender and ethnicity are established predictors of adolescent sexual behavior (Zimmer-Gembeck & Helfand, 2008). In general, males are more likely to report an earlier sexual debut than females and African Americans earlier than other ethnic groups. Moreover, there is an interaction effect of gender and ethnicity such that African American males report earlier sexual

debut than European American males, but African American females' reported age of sexual debut does not differ significantly from European American females (Zimmer-Gembeck & Helfand, 2008). After studying patterns of gender and ethnic difference in age of sexual debut, Cavazos-Rehg and colleagues (2009) indicated that gender and ethnicity should be considerations for any program hoping to impact the age of sexual debut. Notably, past studies examining RE and attitudes towards sexual behavior have not included a significant number of African American students nor have those studies explored gender differences.

The environmental influence of the peer group becomes much more prominent during adolescence and perceptions of peer sexual activity norms influence adolescent risky sexual behavior (Brown & Larson, 2009; Furstenberg, Morgan, Moore, & Peterson, 1987; Gardner & Steinberg, 2005). For example, researchers found that students who report a majority of their friends are sexually active were 100 times more likely to be sexually active (Furstenberg, Morgan, Moore, and Peterson, 1987). Many studies exploring peer influence define peers as friends of the adolescent participant (Boislard & Poulin, 2011; Maxwell, 2002; Wolff & Crockett, 2011), but less is known about whether classroom social climate generates similar peer influence.

In a study that explored potential explanations for the differences in age of sexual debut between European American and African American adolescents, class composition predicted sexual behavior. African American students in a class of over 80% African American students reported higher rates of ever having sex compared to African American students in classes with less than 80% African American students (Furstenberg, Morgan, Moore, & Peterson, 1987). This relationship between class social climate and sexual behavior appeared to be stronger for male students than for female students, however gender was not tested as a moderator of the

association. Furstenberg and colleagues (1987) offered two explanations for the findings: 1) adolescent sexual behavior is more normative in African American subgroups so it is also more accepted or 2) the influence of the sexual activity prevalence itself may explain the association. A recent social context study utilized multilevel modeling to investigate neighborhood context and adolescent sexual activity, exploring both ethnic composition and sexual activity prevalence as distinct contextual factors. Both neighborhood ethnicity and normative sexual climate predicted age of sexual debut, but only normative sexual climate predicted likelihood of casual sex and number of sexual partners (Warner, Giordano, Manning, & Longmore, 2011).

Social Climate Influence on Program Effects

The studies of social context influence on adolescent behaviors are beginning to influence evaluation studies. There is growing recognition that students are not exposed to program content in isolation; individuals are nested within classrooms and the classroom environment may influence how individuals internalize information. Peer social influence on sexual attitudes has been examined in some areas such as confidence to discuss sexual issues with members of the opposite sex during a program (Wight & Abraham, 2000), but more research is needed to understand how classroom social context influences individual student attitudes. Differences in class social climate, such as the racial composition or the proportion of sexually active students in the class, may influence how receptive individuals are to changing attitudes about delaying sexual behavior. As such, composition of the classroom may be an important factor in determining intervention efficacy; students in one class may internalize messages from RE differently than peers in different social environments. Although research on class social environment and program outcomes that accounts for the nesting of students within classrooms

is relatively sparse, it is an important emerging area of study for intervention efficacy (Hattie, 2002). Just as aspects of an individual's peer group influence sexual behavior; so to, it may be that the class peer group influences changes in attitudes about sexual delay following RE.

Thus far, only one researcher has explored whether differences in social climate influence RE program efficacy. In the first of two related studies, benefits in interpersonal skills and social competencies were noted, but only for some students and only at three of the six high schools in which the RE program was delivered (Halpern-Meekin, 2011). The second study used qualitative methodology to explore factors that might explain why students in some schools experienced programmatic benefits while students in the others did not. The author concluded there were notable distinctions between schools in the time teachers dedicated to RE and in individual instructor's ability to successfully engage the students (Halpern-Meekin, 2012). Although these two studies began to explore environmental context and RE program effectiveness, the studies did not examine sexual risk outcomes and did not use advanced methods to differentiate individual and contextual levels of influence. To date, there are no published studies considering the influence of the classroom social context and RE program gains toward sexual delay.

A more complex research design is required than has been used thus far to explore the relationship between exposure to RE occurring within a social environment and individual adolescent sexual behavior outcomes. Research on other child and youth programs that considered contextual influence on program efficacy using multilevel modeling serve as a model for the current study. A recent study on the impact of a social-emotional learning intervention program targeting reduction in aggression examined whether first, second, and third grade students' individual and school characteristics moderated the efficacy of the intervention

(Conduct Problems Prevention Research Group, 2010). Using multilevel modeling to differentiate the individual and the school level influence, the school environment was found to significantly moderate the treatment effect for individual students such that intervention efficacy was highest in schools with the least socioeconomic disadvantage. A study of bullying prevention programs delivered to elementary and junior high students demonstrated that school climate factors such as openness to communication influenced differences in teachers' program implementation emphasizing the importance of distinguishing school level and classroom level influences (Kallestad & Olweus, 2003). It is worth noting that these referenced intervention studies examined class and school level influences on younger children only (i.e., those in early elementary school and junior high). Since the contribution of the social environment on intervention efficacy may be especially potent during the high school years (Brown & Larson, 2009), it is important in studies of RE efficacy to look beyond individual factors and explore whether the social environment may explain further variation in patterns of change.

In sum, reducing risky sexual behavior among adolescents has implications for their current and future social, emotional, and physical health and well-being. Various programs exist that explicitly or implicitly target sexual behaviors and some programs have demonstrated unintended positive spillover to reduce sexually risky behavior. Although the primary purpose of RE is not reduction in risky sexual behavior, RE may be an effective program for providing supplementary information that is absent in sex education curricula. RE effects have been demonstrated in domains such relationship knowledge and conflict management, but less is certain about the influence of RE on attitudes about sexual behavior and whether that influence varies by individual student characteristics. Informed by the ecological perspective and social learning theory, student learning is shaped by those in the shared environment; as programs

occur in a social context, program evaluations must account for that shared experience. Ethnic composition and sexual behavior norms have both been suggested as contexts that may influence individual attitudes about sexual behavior. Finally, advanced methodological techniques are available to explore the individual and contextual factors that influence program efficacy.

Therefore, the purpose of this study is to examine RE program effects on attitudes about delaying sexual behavior. Expanding upon previous research by including an economically and racially diverse sample, this study explores individual characteristics of gender, ethnicity, and the interaction of gender and ethnicity on change in attitude about sexual delay among participants and nonparticipants in RE. Moreover, this study explores whether the class social climate – specifically, the proportion of African American students and the proportion of sexually active students in the class – influences how receptive individuals are to messages about delaying sexual behavior after exposure to RE. Additionally, this study is the first to explore the influence of combinations of individual factors and classroom social climate factors on change in attitude about sexual delay. We expected RE program gains in the intention to wait to have sex and the perceived ability to resist sexual pressure. We determined whether there was sufficient class-level variation to necessitate the use of multilevel modeling. We explored whether two individual factors, gender and ethnicity, and the interaction of gender and ethnicity predicted changes in attitude about delaying sexual behavior. We examined whether program effects were demonstrated when considering shared class variance and explored whether gender, ethnicity, and the interaction of gender and ethnicity modified program effects. Next, we examined how class composition – the proportion of African American students in the class and the proportion of sexually active students in the class – influenced RE gains in perceived ability to wait to have sex and to resist sexual pressure. We then examined the interaction of the two levels of influence

(i.e., individual gender and ethnic characteristics and classroom social climate) and examined whether the program effects from RE were moderated by individual and classroom level interactions. Finally, after determining the best model for predicting waiting to have sex and resistance to sexual pressure considering both individual and class factors, we examine the explanatory benefit of allowing for both individual and class level variation for predicting change in attitude about sexual behavior.

II. Review of Literature

Overview

In the following chapter, we provide more detailed information on adolescent sexual behavior, program effectiveness in reduction of adolescent sexual risks, a theoretical framework for RE, and factors that influence RE program effectiveness. First, we review adolescent sexual behavior and we present a condensed account of the impact of sexual education on the reduction of risky sexual behavior across populations. Second, we introduce Relationship Education (RE) as a program that has successfully influenced multiple domains of adolescent development. We next present a theoretical framework for RE as well as empirical evidence of program benefits across multiple domains. We offer rationale for considering RE as an educational program to reduce adolescent sexual risk. Third, we examine factors that influence adolescent sexual behavior, focusing on gender and ethnic differences and social environment. Fourth, we consider the influence of classroom environment on programmatic efficacy, specifically looking at the influence of social environment on educational program effectiveness. Last, we list the hypothesis and research questions of this study regarding RE impact on adolescents' attitudes regarding delaying sexual behavior as predicted by gender, ethnicity, and class composition.

Adolescent Sexual Behavior

Many adolescents are having sex and many of those sexual experiences expose youth to substantive risk. Recent estimates show that almost 50% of high school students report that they have engaged in sexual intercourse, 15% have had four or more sexual partners, and, of those who had sex in the last 3 months, 40% did not use a condom during their most recent sexual event (Center for Disease Control, 2011). Sandfort, Orr, Hirsh, and Santelli (2008) found that young adults who reported having an earlier sexual debut, compared to their peers, reported more

sexual partners and greater likelihood of having sex with a high-risk partner—a person known to have used injection drugs or to be HIV positive—in the past five years. In fact, although adolescents and early adults made up less than a quarter of those who were ever sexually active, they accounted for nearly one-half of all new cases of sexually transmitted diseases (Weinstock, Berman, & Cates, 2004). When rates of unintended pregnancy were calculated based on the percent of females who were actually sexually active, the rates of unintended pregnancy were highest among 15 to 19 year olds, the youngest group studied (Finer, 2010). It appears the younger individuals are when they begin to engage in sexual behavior; the more likely they are to make riskier choices associated with being sexually active.

In an attempt to understand which adolescents engage in sexual behavior, Buhi and Goodson (2007) looked at predictors of sexual behavior and intention in a review of the literature. Informed by the theory of reasoned action (Ajzen & Fishbein, 1980), three predictors emerged. First, intention to have sex was consistently associated with adolescents engaging in sexual intercourse. Second, adolescents who spent more time home alone were more likely to have more time spent alone with members of the opposite sex and were more likely to report ever having sex. Third, the perception that peers are having sex also increased the likelihood of having an early sexual debut (Kinsman, Romer, Furstenberg, & Schwarz, 1998; Buhi & Goodson, 2007) and risky sexual behavior (Whitaker & Miller, 2000). Unfortunately, adolescents often have inflated perceptions about the sexual behavior of their peers. Lewis, Lee, Patrick, and Fossos (2007) found that adolescents believed their peers were engaging in risky sexual behaviors at rates greater than were actually reported such as having had more sexual partners, a higher frequency of casual sex, and a greater participation rate in alcohol-related risky sexual behavior. Interestingly, Lim, Aitken, Hocking and Hellard (2009) found that the

discrepancy between the number of sexual partners perceived and reported was only significant for females. Perhaps particularly for females, faulty assumptions about inflated rates of peer sexual activity may influence adolescents' willingness to participate in risky sexual behavior. Interventions targeting reduction in adolescent sexually risky behavior need to recognize the relevance of intention to act and perceptions about peer sexual behavior in order to be most effective and therefore should include components to address those factors.

A contextual predictor of risks associated with being sexually active is whether sexual activity occurs casually or within an established committed relationship. Manning, Longmore, and Giordano (2000) reported that over half of the adolescents who had just met their sexual partner used no contraceptive method during their first intercourse, but 75% of those who were going steady prior to first intercourse used at least one contraceptive method. Kusunoki and Upchurch (2011) found that within a committed relationship, negotiating contraception is more challenging for woman than for men and, for women in a casual sexual relationship, the better they know their partner the more likely they are to use contraception. Manlove and colleagues (2011) examined the length of dating prior to engagement in sexual intercourse and contraception. After finding differences in type of contraception use (barrier or hormonal) based on length of relationship, Manlove and colleagues (2011) recommended that intervention programs should include a focus on dating relationships by teaching communication and negotiation skills that may be needed for contraceptive use. Also relevant to the proposed study, Jones and Furman (2011) found associations between adolescents' mental representation of their relationship with others and their own sexual behaviors in adolescence; adolescents who reported being anxious about their romantic relationships were more likely to engage in risky sexual behavior. Relationally anxious adolescents may believe risky sexual behavior is a method for

achieving intimacy with their partner, thus eliminating the likelihood of rejection. Taken together, focusing on developing an understanding of the building blocks and characteristics of healthy adolescent relationships and enhancing interpersonal skills may be important considerations for reducing adolescent sexual risk.

In sum, many adolescents are sexually active and there is greater risk associated with being sexually active at younger ages (Finer, 2010; Sandfort, Orr, Hirsch, & Santelli, 2008; Weinstock, Berman, & Cates, 2004). The intent to have sex in the future and perceptions that more peers are sexually active contribute to an adolescent's decision to engage in sexual behavior (Buhi and Goodson, 2007). Furthermore, perceptions about peer rates of sexual activity are often inflated (Lewis, Lee, Patrick, and Fossos, 2007) particularly for females (Lim, Aitken, Hocking, and Hellard, 2009). As adolescent sexual behavior that occurs outside of a relationship carries higher risks (Manning, Longmore, & Giordano, 2000), improving adolescent relationship skills and knowledge about healthy patterns in relationship development may help adolescents develop healthy relationships and may buffer adolescent sexual behavior risks.

Sexual Education Programs

Historically, attempts to reduce adolescent sexually risky behaviors have relied on school-based sexual education. Two types of sexual education programs, those teaching abstinence-only and those teaching comprehensive sexual education, which encourages abstinence, but also teaches contraception (Kirby, 2001), have a substantial body of empirical research focused on their evaluation. In a literature review of the recent research, Kirby (2008) examined eight rigorous studies of abstinence-only sexual education programs and forty-eight rigorous studies of comprehensive sexual education. He concluded that the abstinence-only programs had no overall impact on indicators of sexual risk including age of sexual debut, return

to abstinence, number of sexual partners, or consistency of condom use. In contrast, comprehensive sexual education was associated with delays in sexual initiation in half of the studies, decreases in the number of sexual partners in half of the studies, and reductions in sexual frequency in a quarter of the studies. Furthermore, half of the studies documented increases in condom use and 60% reported reduction in at least one sexually risky behavior (Kirby, 2008).

Although taken together it seems that comprehensive sexual education reduces some adolescent sexual risk, researchers argue the intervention gains from sexual education can be further improved if supplemented with other components such as programs that improve a student's overall investment in their future. In a review of programs intended to reduce adolescent risky sexual behavior, Kirby (2002) indicated that programs that directly address both the antecedents of sexual risk taking such as sexual beliefs, sexual attitudes, sexual norms, and sexual self-efficacy as well as the non-sexual antecedents such as decreased dropout rate, improved school attachment, and higher academic and career aspirations will be more effective than programs that address only one type of antecedent. Kirby (2002) further suggested that a variety of programs that are not designed to be sexual education influenced sexually risky behaviors. For example, a program intending to increase student connection within their school reduced teen pregnancy (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999). Additionally, service-learning programs reduced teen pregnancy and delayed sexual initiation (e.g., O'Donnell et al., 1999). Kirby (2002) noted that any program targeting future orientations such as education and career aspirations may have an unintentional positive spillover effect of reduction in sexually risky behavior. Although not stated explicitly in his review, this connection is likely due to adolescents' recognition that an unintended pregnancy may alter their educational and career attainment goals. Unfortunately, most programs that do not expressly target reduction in

sexual risk fail to measure changes in adolescent sexual risk; yet, of those alternative programs that did measure sexual behavior, there have been empirically validated successes (e.g., Hawkins et al., 1999; O'Donnell et al., 1999).

Adolescents themselves have indicated that traditional sexual education is not enough. When DiCenso and colleagues (2000) explored adolescents' perceptions of sexual health education, the participants indicated that the focus was too much on the physiological aspects of sex. Students suggested that information about "emotional aspects of sexuality, relationship issues, communication with partners, and gender differences" should be added to sex education classes (DiCenso et al., 2000, p. 37). The adolescents reported friends, siblings, television, and magazines were the sources from which they received information about the feelings, decisions, and experiences related to sex. Adolescents also noted gender difference regarding sexual behaviors and discussions. Male adolescents indicated they had experienced peer pressure to have sex and that some males even encouraged risky sexual behaviors by talking about it as a competition. Females reported both pressure from friends and partners to have sex, and pressure from parents to resist sex. Both genders indicated that females were expected to be more responsible in sexual decision-making. Interestingly, the adolescents also stated that segregating the sexual education classes by gender reinforced traditional gender stereotyping indicating the class composition might impact how students internalize sexual education information. Unfortunately for review for this study, racial composition was not provided and DiCenso and colleagues (2000) did not explore ethnic differences.

Although comprehensive sexual education has resulted in reduction of some sexually risky behaviors (Kirby 2008), adolescents have indicated more program education is needed that incorporates aspects of the relationship context in which sex might occur and that classes should

be mixed gender. DiCenso and colleagues (2002) stated that sexual education programs are not “a clear solution to the problems” associated with adolescent risky sexual behavior and recommended programs be designed based on adolescent suggestions to include “negotiation skills in sexual relationships and communication” (p. 1432). As a supplement to traditional sexual education, RE may provide the information and skill building to ameliorate current deficiencies.

Relationship Education (RE)

RE is an educational intervention that strives to teach adolescents the knowledge and skills necessary for healthy romantic relationship formation and development (Kerpelman, 2007). Echoing the adolescent perspective that components are missing in sexual education, Kerpelman (2007) argued that RE should help students understand which relationship choices put them at risk both emotionally and physically. RE may be an important intervention for addressing adolescent sexual risk as adolescence is the time when youth are initiating dating relationships and establishing relationship patterns and this includes decision-making about physical intimacy (Gardner, Giese, Parrott, 2004; Silliman & Schumm, 2004). In fact, Kerpelman (2009) stated that the aims of RE need to include reducing adolescent misconceptions about motivators and ramifications of risky sexual activity while providing them with an understanding of healthy relationship development and skills.

Conceptual framework. Although most studies of RE are largely atheoretical, two previous empirical articles have included articulation of the theoretical basis of RE for adolescent populations. Silliman and Schumm (2004) explicated developmental and ecological theory as frameworks for the implementation of RE during the transition from youth to adulthood. Additionally, they indicated there are aspects of social learning theory and family

stress theory that suggest potential resource limitations for individuals entering into a marriage; limitations that may be buffered through RE (Silliman & Schrumm, 2004). Recently, Sparks, Lee, and Spjeldnes (2011) briefly touched on developmental theory, psychosocial theory, cognitive-behavioral theory, and social learning theory as rationale for the implementation and content of adolescent RE. They referenced the logic model as their conceptual link between changes in knowledge and attitudes and changes in behavior. The logic model, used by curricula developers, follows a four-step sequence of 1) conceptualizing goals, 2) specifying behavioral outcomes, 3) identifying factors than impact the desired behaviors, and 4) providing activities to increase factors that are positively associated with desired behavioral outcomes (Kirby & Laris, 2009). Although Sparks, Lee, and Spjeldnes (2011) articulated a curriculum model that was followed, they did not connect that model to established theory that suggests a relationship between adolescent attitude and behavior.

This study built on the few previous efforts to articulate theoretical assumptions used in youth-based RE research by explicitly synthesizing life course developmental, ecological, and cognitive-behavioral assumptions and presenting their theoretical relevance to RE implementation. Developmentally, adolescence may be an ideal period for exposure to RE. Life course theory (Elder, 1998) explains that although the timing of an experience is not necessarily prescriptive, the impact of an experience at one stage of development carries varying degrees of influence onto future experiences depending on that time point. Thus, the nature of an adolescent's romantic experience impacts the adolescent who is currently experiencing it, but also scaffolds that adolescent's future experiences since adolescence is a critical time point for relationship skills and development (Furman, & Shaffer, 2003). Furthermore, life course theory posits that, although individuals are agents of their own development, each experience occurs

within influential social and cultural contexts (Elder, 1998). Events are not necessarily universal across individuals; factors such as processes and meanings derived from past experiences will distinctly influence the sum total of an individual's experiences. Therefore, RE education is uniquely experienced by each student and that experience is shaped by the history of the individual, the current context, and is also likely to shape future relationships.

Just as life course theory acknowledges that current experiences are influenced by past experiences and current environment, the ecological perspective more specifically frames current experiences within a complex system of interdependent levels of contextual influences (Bronfenbrenner, 1979). Characteristics of the individual such as gender, ethnicity, and personality (ontogenic level) interact within proximal and distal social environments to influence individual development. Within each microsystem, proximal social environments such as family, friends, and classmates are in direct contact with and influence the individual. The mesosystem encompasses the interconnectedness of these microsystems. For example, relationships with friends and family members may influence an individual's receptivity to suggestions from classmates. Extending further to the distal influences of the exosystem and macrosystem, perceived cultural norms and media portrayal of relationships can shape how an individual thinks and behaves. The ecological perspective provides a framework for the elements of an individual's world that require consideration when predicting outcomes of interest, yet it does not identify intra-individual processes that may be occurring.

Aspects of social learning theory, integrated within an ecological perspective, guide assumptions about processes at work. Recognizing that learning occurs within a social context, social learning theory presumes that individuals learn through intraindividual processes that occur in response to exposure to others (Bandura, 1977). Accordingly, modeling of both familial

and peer relationships partially form the basis for an adolescent's knowledge and expectations for relationships. Although some adolescents may have had positive role models from which to cultivate healthy relationship skills, many will not. In addition to observational learning, Bandura (1989) stated that knowledge can be gained through inferences from direct experiences, new synthesis of previous knowledge, and information conveyed through verbal instruction. Therefore, it is assumed that RE can provide those adolescents who have not experienced positive relationship role modeling with experiences, information, and skills training and practice to begin to develop their own healthy relationship knowledge base that counteract more negative trajectories.

Content in the RE program used in this study includes information that addresses both thinking and behaviors, understanding there is an established relationship between an adolescent's thoughts and behaviors. The theory of reasoned action posits that intention to engage in a behavior is a significant predictor of whether a person will engage in that behavior and derives from both the attitude of the individual and perceived social norms (Ajzen & Fishbein, 1980). Gilmore and colleagues (2002) validated the applicability of the theory of reasoned action for adolescent sexual behavior. Using longitudinal data, intention to have sex predicted adolescent sexual debut over time. Intention to have sex was significantly associated with a positive general attitude about a futuristic sexual experience and perceptions of more positive adult and peer norms regarding adolescents having sex.

By encouraging exploration of personal values and future planning while also providing information to correct faulty assumptions about adolescent norms, RE may be effective in altering adolescent risky sexual behavior. Developmentally, because early adolescence is the time in the life course that peer relationships become increasingly influential (Brown & Larson,

2009), programs targeting adolescent behavioral change need to understand the increasing influence of peers in thinking, attitudes, and decision making processes. The more a RE program is designed to expose the differences between perceived and actual norms of sexual behavior and to promote knowledge of healthy relationship development and skills, the more effective it will be in correcting inaccurate perceptions and thus reducing the likelihood of risky decisions.

In sum, throughout the course of development, social and environmental forces are continually influencing adolescents' beliefs and attitudes about relationships. As beliefs and attitudes often determine behavior (Ajzen & Fishbein, 1980), the integration of experiences and influence from social surroundings form a foundation for determining current and future attitudes and choices. Educators use RE to expose adolescents to accurate information about the components of healthy relationships, to combat misinformation about social norms, and to provide information and skills that can increase the likelihood of healthy relational decision-making. Prior to this study, whether an experience such as RE was successful in changing sexual attitudes in the face of contextual influences had not been explored.

Empirical evidence. Over the past decade, the impact of RE on adolescent development has been evaluated for multiple outcomes. Comparison of student self-report prior to exposure to RE and self-report following exposure were used to assess program effectiveness. Across the published empirical studies, educators generally taught one of two curricula: *Connections* (Kamper, 2001/2004) and *Relationship Smarts* (Pearson, 2004/2007). *Connections* is comprised of four units that include personality, relationships, communication, and conflict resolution (Gardner, 2001). *Relationship Smarts* focuses on identity development, knowledge about dating relationship processes and healthy relationship development, communication skills, awareness raising in sexual behavior norms, patterns in unhealthy relationships, and marriage and future

planning (Kerpelman, 2007). Although generally similar in content, minor differences between the curricula may account for some variation in findings across studies. These programs are expected to influence adolescent knowledge of what a healthy relationship looks like, provide productive ways to work through the conflict that is inevitable in all relationships, and influence attitudes about current and future relationships.

Relationship knowledge. Relationship knowledge has been conceptualized as the ability to discern healthy relationship expectations from faulty relationship beliefs. To first validate the relevance of RE for a younger population, Silliman and Schumm (2004) compared adolescents' relationship knowledge with college students' relationship knowledge. When presented with faulty relationship beliefs, more high school students agreed with unrealistic expectations such as "couples should be aware of their partners' feelings without being told" than disagreed, indicating even greater need for RE for high school students than for college students. Silliman and Schumm (2004) recommended that RE interventions should target more immediate relationship issues for high school students to encourage adolescent interest and suggested that exposing adolescents to RE may serve as an informational foundation for future premarital education.

Gardner, Giese, and Parrott (2004) employed a 30-item true/false questionnaire to determine participants' relationship knowledge. Items focused on factors that contribute to a successful long-term relationship. Reporting significant group x time interactions after exposure to the RE curriculum *Connections*, students who were exposed to RE had significantly better relationship knowledge following the program than students in a control group. After exposure to the same curriculum and using an abridged version of the true/false relationship beliefs questionnaire (Gardner, 2005), Sparks, Lee, and Spjeldnes (2012) reported paired sample t-test

differences for female and male students from pretest to posttest. Female students' relationship knowledge after exposure to RE improved, but male student knowledge worsened.

Further program studies that used the RE curriculum *Relationship Smarts*, indicated additional improvements in relationship knowledge (Adler-Baeder and colleagues, 2007; Kerpelman et al., 2009). In those studies, relationship knowledge was conceptualized as knowing the difference between attraction and love, understanding how expectations influence behavior, recognizing relationship myths such as there is only one ideal partner or that love conquers all, and recognizing signs of unhealthy relationships. Using a post plus retrospective-pre research design, Adler-Baeder and colleagues (2007) further demonstrated beneficial improvements in realistic relationship beliefs with a large diverse sample of youth. Kerpelman, Pittman, Adler-Baeder, Eryigit, and Paulk (2009) employed latent growth curve analyses to test whether relationship knowledge benefits for participants, compared to controls, persisted over time and found significant benefits remaining at one year after RE, but fading by two years. Finally, recent work by Schramm and Gomez-Scott (2012) confirmed significant benefits from exposure to the *Relationship Smarts* curriculum with decreases in faulty relationship beliefs. Taken together, exposure to either curriculum has resulted in consistent findings that adolescents who have experienced RE have improved relationship knowledge for up to one year.

Interpersonal competence. A second domain that has garnered attention from RE researchers is the impact on interpersonal competence particularly through improvements in healthy conflict resolution skills and decreased use of aggression. Gardner, Giese, and Parrott (2004) explored gains in the three subscales of the conflict tactics scale – reasoning, verbal aggression, and physical aggression (Strauss, 1979) – finding significant decreases in the reported use of physical violence. Expanding on earlier work, Gardner and Boellaard (2007)

reported decreases in dating violence were significant both at one year and at four years after exposure to RE. Interestingly, Gardner and Boellaard (2007) found RE program effects for self-esteem and family cohesion that were not significant at immediate posttest, but they were significant four years later, indicating a lag in program effect. Lastly, both Adler-Baeder and colleagues (2007) and Schramm and Gomez-Scott (2012) reported decreases in verbal aggression after RE classes.

Kerpelman and colleagues (2009) utilized the conflict management subscale of the interpersonal competence scale (Buhrmester, Furman, Wittenberg, & Reis, 1988) to demonstrate gains in conflict management skills. Although Kerpelman and colleagues found gains for both the control and the program groups, students in the program group significantly improved above the general developmental effect in the control sample. Furthermore, Kerpelman and colleagues (2010) demonstrated improvement in conflict management skills, with gains stronger in socially and economically disadvantaged subgroups. In sum, robust evidence suggests RE participation influences interpersonal competence gains result across curricula and is influential for those students who may be most in need of the knowledge and skills.

Relationship attitudes. Student attitudes about marriage, divorce, and premarital counseling have been another focus of RE evaluation research. Gardner, Giese, and Parrott (2004) reported significant gains in the attitude that marriage is a good thing and reported greater willingness to participate in marriage counseling prior to getting married, if their marriage was having problems, and for marriage enrichment. Although Kerpelman and colleagues (2009) demonstrated similar significant gains at posttest and one year after RE in attitudes about participating in future premarital classes, those gains faded after two years. As favorable attitude towards divorce has been associated with lower marital quality over time (Amato & Booth,

1991), an intent of RE is to convey a realistic portrait of the challenges and outcomes associated with divorce. Gardner (2001) reported that adolescents generally become more positive about divorce over time, yet students in RE classes became less favorable about divorce. Finally, Sparks, Lee, and Spjeldnes (2012) found adolescents' attitude about divorce was dependent on the students' parental divorce history; students whose parents had undergone a past divorce viewed divorce more favorably and marriage less favorably than peers at pre-test, but those differences eroded following RE. Informed by the theory of reasoned action (Ajzen & Fishbein, 1980), changing adolescents' relationship attitudes may be a crucial step in changing future relationship behavior. RE participants demonstrated more positive attitudes about the benefits of marriage and future relationship education while also recognizing that divorce is not an easy way out.

Attitude about delaying sexual behavior. Less research has explored the impact of RE on adolescents' attitudes about sexual behavior. As intention to have sex predicts having sex (Gillmore et al., 2002), influencing adolescents' attitudes about the benefits of delaying sex may buffer adolescent sexual risks. Gardner, Giese, and Parrott (2004) were the first to explore whether RE affects adolescent sexual behavior attitudes using two variables: 1) waiting to have sex, which assessed the adolescent's future intentions to have or delay sex, and 2) resistance to sexual pressure, which assessed the adolescent's perceived ability to withstand peer pressure to have sex. Although a positive trend was suggested for resistance to sexual pressure, the group by time interaction was only marginal ($p = .08$) and there was no indication of any program effect on waiting to have sex. Gardner and Boellaard (2007) examined resisting sexual pressure in their longitudinal study exploring RE program outcomes, but found no significant benefit over the four years. Using the same measures as Gardner and colleagues (2004), but based on a

different curriculum, Schramm and Gomez-Scott (2012) used repeated measures analyses of variance to demonstrate significant group x time interactions for both resistance to sexual pressure and waiting to have sex. This time, students exposed to *Relationships Smarts* indicated a willingness to delay sex until later. Furthermore, students in the program group indicated greater confidence in their ability to resist sexual pressure, yet students in the control group reported less confidence.

Potentially, differences in program content and messages may explain the mixed results. *Relationships Smarts* focuses on many of the same broad concepts as *Connections*, but includes specific discussion of the benefits of delaying sex during the stages of building a healthy relationship (Pearson, 2007). For example, Lesson 3 uses two pyramids to illustrate two types of relationship development. The first pyramid represents a stable relationship in which sex occurs only at the highest level, the mature level. This relationship progression is contrasted with an inverted pyramid in which the relationship begins with sex; beginning a relationship with sex creates an unstable pyramid which often leads to the omission of the other steps required to make a relationship last and increases the likelihood that the relationship will mean more to one person than the other. Lesson 3 also provides information about national averages regarding adolescent sexual behavior, length of duration of average adolescent relationships, and percent of adolescents that wish they had delayed having sex. These types of more explicit information about sexual behavior norms and the timing of sex in a relationship may explain the difference in findings when utilizing *Relationship Smarts* rather than *Connections* to explore RE influence on adolescents' attitudes toward delaying sex and resisting peer pressure.

In sum, the few studies of RE on change in attitudes about adolescent sexual behavior present somewhat contradictory findings. These inconsistent findings may be due to curricula

content differences. Alternatively, differences in program efficacy in the three studies may also stem from unexplored differences in individual and contextual characteristics of the sample. As gender and ethnicity significantly predict age of sexual behavior, those features may be important factors in RE program efficacy for individuals. All three previous studies utilized a primarily European American sample. Further examination of the association between RE and adolescent attitude change regarding delaying sexual behavior is warranted given the variation in results and the small numbers of African American students in the previous samples. It may be that RE is more or less influential on sexual attitudes depending on individual and contextual characteristics.

Moderation by gender and ethnicity. Several studies have examined individual characteristics that may moderate how a student benefits from RE in various domains. Sparks, Lee, and Spjeldnes (2012) examined demographic risk and protective factors, reporting that gender significantly moderated relationship knowledge treatment gains such that girls gained more knowledge following exposure to RE than boys. Kerpelman and colleagues (2009) found gender differences and ethnic differences only in the faulty relationship belief that there is “one and only ideal mate” such that females were more likely than males and European American students were more likely than students of other ethnicities to change this faulty belief.

Adler-Baeder and colleagues (2007) explored whether the effectiveness of RE differed by race, SES, or family structure. Although there were ethnic difference in student physical aggression and verbal aggression prior to RE exposure such that African American students reported higher scores prior to RE, ethnicity, SES, and family structure were not significant predictors of program gains in either conflict management skills or relationship knowledge. Finally, Kerpelman and colleagues (2010) examined potential moderation by ecological risk

factors exploring the influence of social address characteristics, such as free lunch status and parental education as proxies for socio-economic status, race, and family structure on faulty relationship beliefs, finding no moderation by race for faulty relationship beliefs, but finding moderation by race for conflict management skills. More disadvantaged students, those who received free/reduced lunch and minority students, demonstrated significant improvements in conflict management following RE, but majority students and those not receiving free/reduced lunch did not. Although research explored gender and ethnic variation of RE program outcomes in other domains, gender and ethnic variation in attitudes about delaying sexual behavior after RE had not yet been studied. Furthermore, previous studies examining RE efficacy have not explored gender by ethnicity interactions. As gender by ethnicity interactions predict adolescent sexual behavior, examining a gender by ethnicity interaction for attitude change regarding delaying sexual behavior requires consideration.

In sum, the benefits of RE for adolescents have been established in multiple domains including relationship knowledge, conflict management, and attitudes about relationships (Adler-Baeder et al., 2007; Gardner et al., 2004; Kerpelman et al., 2010), but much less is known about how RE exposure impacts adolescents' attitudes regarding delaying sexual behavior. Although Gardner and colleagues (2004) found only marginal effect for resistance to sexual pressure and no effect for waiting to have sex after participation in *Connections*, Schramm and Gomez-Scott (2012) reported significant attitude changes in both variables following participation in *Relationship Smarts*. The influence of RE on adolescent sexual attitudes is much less definitive than in other domains. In all three previous studies, African Americans were underrepresented and the studies did not explore moderation by gender, ethnicity, or the interaction of gender by ethnicity on changes in attitude regarding sexual delay. Gender and ethnic differences moderate

change in some domains following RE. Therefore, gender and ethnic variation in sexual attitudes change needs investigation.

Gender and Ethnic Differences in Adolescent Sexual Behavior

Adolescent sexual behavior has historically received much attention and a significant body of literature has found differences by gender and ethnicity; therefore, gender and ethnicity are either predictors or covariates in most empirical work on the subject. Although males, as a group, tend to debut sexually at an earlier age than females, it is the race by gender interaction that provides more detailed patterns of sexual debut (Cavazos-Rehg et al., 2009). Recently, Zimmer-Gembeck and Helfand (2008) conducted a literature review of a decade of longitudinal studies examining the influence of gender and ethnicity on adolescent sexual behavior. Research substantiated associations between ethnicity and age of sexual debut in 11 of the 15 studies. Overall, sexual debut tends to occur earlier for African Americans (Furstenberg, Morgan, Moore, & Peterson, 1987). However, when researchers consider race and gender together, African American males are more likely to report earlier sexual debut than European males, yet the age of onset for African American females does not differ significantly from that of European American females (Zimmer-Gembeck & Helfand, 2008). Furthermore, both female and male Asian American adolescents are more likely to report later sexual debut than European American adolescents and the age of debut for Hispanic American adolescent males is comparable to European American adolescent males, but later for Hispanic females.

Cavazos-Rehg et al. (2009) found remarkably similar patterns of ethnic and gender differences for age of sexual debut using a large, cross-sectional, nationally representative sample. From a sample of over 65,000 students, African American males reported the youngest age of sexual debut and both male and female Asian Americans the oldest. Based on gender and

ethnic differences in adolescent sexual behavior, Cavazos-Rehg and colleagues (2009) suggested gender and ethnicity are important factors that require consideration by programs targeting delaying age of sexual debut. It is unknown whether there are similar gender and ethnic differences in attitude change about delaying adolescent sexual behavior following exposure to educational programs.

Social Climate and Adolescent Sexual Behavior

The influence of peers in risky adolescent decision-making is well established in the literature (Brown & Larson, 2009; Albert, Chein, & Steinberg, 2013). Previous studies have substantiated the significance of peer influence on risky behavior either defining peers as friends of the participant (Boislard & Poulin, 2011; Maxwell, 2002; Wolff & Crockett, 2011) or leaving the parameters for determination of peer group undefined (e.g., Evans, Griffin, Vincent, & Valois, 2004). For example, in one study students who report a majority of their friends have had sex were 100 times more likely to report having had sex (Furstenberg, Morgan, Moore, & Peterson, 1987). Exploring which peers create social influence, what factors contribute to social influence, and in what contexts social influence occurs may be important for understanding and predicting adolescent sexual behavior.

Using data from the National Survey of Children, Furstenberg and colleagues (1987) explored potential explanations for the differences in age of sexual debut between European American and African American adolescents and found an interaction of race by the racial composition of the school classroom. African American students reported higher rates of ever-having sex when in classes of over 80% African American students compared to African American students in classes that were composed of a majority of European American students. The study examined the influences of the percent of African American classmates and of

individual ethnicity separately for males and females and found significant relationships for both genders; however, whether gender moderated that association was not examined. One explanation suggested by Furstenberg and colleagues (1987) for the association was that adolescent sexual behavior is more normative in African American subgroups making it also more accepted. The alternative offered explanation was that it was the influence of the sexual activity prevalence itself, rather than ethnic culture, that explained the association with individual sexual activity. As such, exploring both the proportion of African American students and the proportion of sexually active classmates and their influence on program effectiveness to change individual attitudes regarding delaying sexual behavior is germane. It may be that composition of the classroom is an important factor in understanding adolescent sexual behavior and sexual attitude change from educational interventions. Students may internalize messages from RE differently than similar peers in dissimilar social environments.

In another study exploring social context and adolescent sexual behavior, Warner, Giordano, Manning, and Longmore (2011) examined the influence of neighborhood social context on adolescent sexual behavior examining ethnic subgroup and sexual behavior norms as predictors and utilizing multilevel modeling. As neighborhood disadvantage and percent African American were highly correlated ($r = .81$), only neighborhood disadvantage was kept in the model and served as the indicator for ethnic composition. Neighborhood disadvantage, also methodologically representing ethnic composition, and sexual behavior normative climate were both significant predictors of sexual debut. However, only normative sexual behavioral climate was a significant predictor for likelihood of having casual sex and number of sexual partners. Although this study examined neighborhood context rather than class context and did not include an intervention, it explored ethnic subgroup and behavioral norms as distinct contextual

predictors and utilized multilevel modeling to examine individual and contextual factors. The research of Warner and colleagues (2001) serves as a model for disattenuating the influence of ethnic subgroup and behavioral norms as contextual factors influencing adolescent sexual behavior.

Interventions within Context

School-based interventions are nested within school settings, but they are also nested within classroom settings. Although most intervention studies have not yet examined the peer influence as classmates rather than friends, classmate influence has emerged as an important factor in understanding individual academic achievement (Burns & Mason, 2002; Skibbe, Phillips, Day, Brophy-Herb, & Conner, 2012). The impact of class peer influence on program efficacy is crucial for further conceptualization of peer influence and for the evolution of program evaluation. With a longer empirical history, sexual education research has preceded RE research in exploration of the classroom environmental influence on programs efficacy. Historically, sexual education was taught in same-gender only classrooms. With findings similar to aspects of DiCenso and colleagues (2000) study that examined adolescents' perceptions of sexual education, Wight and Abraham (2000) explored gender segregation in a pilot study examining sexual education and reduction in sexual risk. Significant differences in the quality and quantity of discussion were noted, with the boys only class discussion being both lesser in quality and quantity than the girls only class discussion. After the same gender only experience, the students reunited to continue their discussion in a mixed gender setting. In qualitative comments, boys indicated that they participated differently in same-sex discussion and mixed-sex discussion confirming the influence of social context. The revised program included more mixed group lessons. Following the revision, students reported increased confidence to discuss

sexual matters with members of the opposite sex attributing it to the new mixed gender class format. The class environment itself was a factor in the intervention evaluation; class gender composition explained differences in intervention efficacy. As such, Wight and Abraham (2000) argued traditional sexual education programs needs to include preparation for and recognition of the social interactions in which sexual negotiations occur.

Limited previous RE evaluations have examined the social context within which programs take place when exploring individual student gains. The only exploration of social context has been two recent, related studies that focused on the school environment of RE classes and how variation in social environment influenced RE gains over and above individual factors. In the first study, Halpern-MeeKin (2011) used analysis of variance to examine enrollment status and program gains in students' interpersonal skills and social competencies. She discovered that students' benefits varied by which high school they attended, but not by age, academic grades, family structure, or ethnicity. As the two schools with the most disadvantaged student body also had the smallest average individual benefit from RE, Halpern-MeeKin (2011) suspected that student body composition may have been the biggest factor in determination of program effects. Informed by that work, Halpern-MeeKin (2012) further explored school variation utilizing qualitative analysis of interviews from a subsample of students at all six of the high schools that participated in RE from the previous study. The three high schools from which more students openly discussed learning about relationships were the same three schools that had significant RE gains in the previous study. Students indicated important school based differences relative to how students at the other schools discussed their program experiences. The students at the schools that showed more improvements emphasized the time spent on RE content and on teacher ability to engage the students. Interestingly, uniform curriculum selection did not appear

to ensure similar RE exposure nor consistent benefits across schools. As prior research on RE outcomes had focused only on individual characteristics that influenced change in knowledge and attitude, Halpern-Meekin's work was critical for highlighting the potential influence of the learning environment. Furthermore, although Halpern-Meekin (2011) examined the distal influence of the school environment on class-level variables to explain individual differences, she did not use advanced statistical analysis to differentiate the levels of influence and potential interactions to evaluate RE efficacy.

RE generally occurs in a group setting. Previous RE evaluation analyses have relied on statistical techniques that require an assumption of independence although individuals are receiving program education in a class. The current study utilizes assumptions from social learning theory that suggest the social context within which learning occurs is an important factor in what is individually internalized (Bandura, 1977). For empirical examples of incorporating this assumption into study design, we turned to education research that has explored the influence of school and classroom level factors with student academic outcomes including class size, class composition, and school climate to name a few (Sanders, Wright, & Horn, 1997). For example, Burns and Mason (2002) explored the influence of class composition on learning outcomes. Using multilevel modeling, aspects of class composition such as class level reasoning ability were assessed and found to moderate individual elementary school student's reasoning ability and instructional independence. Burns and Mason (2002) suggested three possible sources of classroom climate effects: instructional differences, social differences, and psychological difference, and indicated that social differences may influence learning via a more positive normative climate. Educational research has examined whether contextual factors, such as class composition, influence academic outcomes, but much less has been researched with

non-academic outcomes. When examined, the non-academic outcomes were often considered concurrently with academic ones. For example, in a literature review, Belfi, Goos, De Fraine, and Van Damme (2012) examined two aspects of class composition, gender and academic ability, on well-being, conceptualized as how much a student likes school and their academic self-concept. Ability grouping benefitted student well-being of stronger academic students, but was detrimental for the well-being of weaker students. In contrast, ability grouping had greater academic benefit for the students weaker in academic self-concept, but had less benefit for students with greater academic self-concept. Interestingly, gender composition was a modifier of the association; girls in single sex classes had advantages in both well-being and self-concept. Similarly, Barth, Dunlap, Dane, Lochman, and Wells (2004) examined the classroom environmental influence on both academic and non-academic outcomes. Using multilevel modeling, they examined relationships between aggregate classroom level and individual student levels of aggression, peer relations, and academic focus. Controlling for race and gender, class aggregate aggression was positively associated with individual aggression over time, class aggregate peer relations was positively associated with individual peer relations, and class aggregate academic focus was positively associated with individual academic focus.

Class composition can refer to many things including the demographic composition of the students in the class or the cohesiveness of classmates in regards to shared friendships, interests, values, and goals in the class which together form the class social climate (Wang, Haertel, & Walberg, 1990). Scholars agree that there is a notable lack of empirically supported research on the moderating effects of class composition on intervention efficacy that also accounts for the nesting of students within classes (Conduct Problems Prevention Research Group, 2010; Gregory, Henry, & Schoeny, 2007; Ringeisen, Henderson, & Hoagwood, 2003).

As such, Choi (2003) praised the exploration of multilevel contextual influences on both individual and collective behavior. He argued that just as multilevel influences of individual, class, and school characteristics impact students' academic achievement (Raudenbush, Rowan, & Kang, 1991; Raudenbush & Willms, 1995); multilevel influences will also affect whether an intervention is effective in achievement of the desired outcomes. Therefore, Choi (2003) called for utilization of multilevel analysis strategies with all intervention evaluations that occur in a social context. Even so, extremely limited effort has been made to account for the nesting of students within classes in studies of RE and other school-based interventions.

Improvements in statistical methodology have provided avenues for examining class environmental factors that influence intervention efficacy (Bryk & Raudenbush, 1992). Similar to what has occurred in education research, the contextual environment of a program intervention, in addition to content, has begun to receive more attention from intervention evaluations of non-academic outcomes such as mental health (Ringeisen, Henderson, & Hoagwood, 2003) and social development (Conduct Problems Prevention Research Group, 2010; Gregory, Henry, & Schoeny, 2007). Although educational research regarding class environment and non-academic outcomes that account for the nesting of students in classrooms is relatively sparse (Hattie, 2002), even less understood is the influence of class environment on program intervention outcomes. Studying the impact of the class environment on program efficacy may be crucial for understanding variation in program effectiveness.

Of the few studies that have examined the influence of social climate on interventions targeting sexual behavior reduction, the focus has been on connecting the school environment with teacher training or limitations with program dosage (e.g., Wight et. al., 2002). We did not find studies employing higher-level analysis to differentiate the influence of individual and class

or school level characteristics on interventions targeting change in attitude about sexual delay. Therefore, to examine previous work on the influence of school climate on intervention efficacy, we borrowed from research interventions directed towards other objectives. The Conduct Problems Prevention Research Group (2010) examined the influence of the school environment on children's exposure to a multi-year intervention program intent on decreasing elementary school aggression. On the individual level, students with higher ratings of aggression prior to the intervention had larger improvements than students with lower ratings of aggression at pretest. An aspect of the school climate, socioeconomic disadvantage moderated the individual program effect. Teacher report of student rate of change in authority acceptance, cognitive concentration, and social competence exposed to intervention was similar for students in high and low school-level socioeconomic disadvantage. However, there were significant differences in rate of change for students in the control groups within high or low school level socioeconomic disadvantage. Therefore, in schools that had the least socioeconomic disadvantage, the treatment effect was most pronounced.

Kallestad and Olweus (2003) used multilevel analysis to evaluate a Norwegian bullying prevention program that began in the early 1980s. The evaluation analysis examined factors related to the variability of implementation of the program at both the school level and the classroom level, but did not explore individual student outcomes. In a commentary on Kallestad and Olweus' (2003) research, Choi (2003) differentiated the proximal (classroom level) and the more distal (school level) influences and indicated each level may have distinct influence on intervention efficacy.

Although school level influences on intervention efficacy have only received minimal research attention thus far, the more proximal class level influences on programmatic

effectiveness have received even less. Complex evaluations of RE that explore both individual and contextual influence program effects on attitude changes are possible with advanced statistical techniques such as those occurring in evaluations of other types of interventions for youth (e.g. Conduct Problems Prevention Research Group, 2010). As multilevel modeling provides the statistical tools to examine both individual and contextual variables, exploring whether the class environment influences how individual students internalize interventions such as RE and whether individual characteristics modify the class-level influences are the next steps in intervention evaluation.

Current Study

Three past studies have examined attitude change regarding sexual behavior after exposure to RE and the results were mixed (Gardner & Boellaard, 2007; Gardner, Giese, & Parrott, 2004; Schramm & Gomez-Scott, 2012). A limitation of their research was that African Americans were underrepresented in all of their samples. Furthermore, the previous studies did not examine possible moderation by gender, ethnicity, or their interaction on change in attitude about sexual delay despite the significant evidence indicating demographic characteristics influence adolescent sexual behavior. Furthermore, no studies to date explored the potential influence of social climate on RE program efficacy for sexual risk-related outcomes. The current study begins to address these gaps by examining the influence of social climate and explored the distinct contextual influences of ethnicity, indicated by the racial composition of the classroom, and behavioral norms, indicated by the proportion of sexually active peers in the classroom. In sum, this study explored adolescent sexual behavior attitude change after exposure to RE, examined whether individual characteristics and class composition influence change in attitudes, and determined whether combinations of those features moderate treatment efficacy.

Specifically, the following hypotheses were tested and the following research questions explored:

Hypothesis 1: There are beneficial changes in attitudes about delaying sexual behavior (i.e., waiting to have sex and resistance to sexual pressure) for the program group.

Hypothesis 2: The class environment influences individual change in attitudes regarding sexual delay. That is, the intraclass correlation, the amount of variation that is attributable to between class differences, indicates the class environment is a non-trivial influence on individual change in attitude towards sexual delay.

Research Question 1: Are the program effects on attitudes about delaying sexual behavior moderated by gender, ethnicity, and the interaction of gender and ethnicity?

Research Question 2: Can program effects be determined using methods that consider shared variance within class?

Research Question 3: Do RE program effects determined using methods that consider shared variance differ by gender, ethnicity, and their interaction?

Hypothesis 3: Controlling for gender and ethnicity, the proportion of African American students in the classroom influences changes in attitude about delaying sexual behavior such that students in classes with higher proportions of African American classmates will have less attitude change promoting sexual delay.

Research Question 4: Is there a cross level interaction between individual level influences and class level ethnic composition influence? That is, do combinations of gender and ethnicity and the proportion of African Americans in the classroom differentially influence attitude change in delaying sexual behavior?

Research Question 5: Do combinations of gender and ethnicity and the proportion of African American students in the classroom differentially influence program groups (i.e., participants/ nonparticipants)?

Hypothesis 4: Controlling for gender and ethnicity, the proportion of sexually active students in the class influences changes in attitudes about delaying sexual behavior such that students in classes with higher proportions of sexually active classmates will have less attitude change promoting sexual delay.

Research Question 6: Is there a cross level interaction between individual level influences and class level proportion of sexually active students influence? That is, do combinations of gender and ethnicity and the proportion of sexually active students in the classroom differentially influence attitude change in delaying sexual behavior?

Research Question 7: Do combinations of gender and ethnicity and the proportion of sexually active students in the classroom differentially influence program groups (i.e., participants/ nonparticipants)?

Research Question 8: What are the benefits of allowing for both individual and class level variation for predicting change in attitude about sexual behavior? That is, after determining the best model, how much individual and class level variation is explained?

III. Methods

Participants

We utilized data from Year 5 of the Alabama Community Healthy Marriage Initiative statewide relationship education project for the study. This study included 1261 students; 935 of the students participated in RE and completed a pretest and posttest and 326 did not participate in RE and served as a comparison group. The average age of the students was 15.7 years old ($SD=1.2$) with the majority of students in 9th and 10th grade. Gender was relatively balanced: 58% female and 42% male. The sample was also racially diverse: 55% white, 37% African American, 3% Hispanic, 1% Asian, 1% Native American, and 3% biracial. We asked participants about their maternal education as a proxy for SES: 39% had mothers whose highest level of education is a high school diploma or less, 23% had mothers who have had some college, 9% had mothers who have had a 2 year college or technical degree, 19% had mothers who have had a 4 year degree, and 10% had mothers with a post college degree. The program group and the comparison group did not differ significantly on age, gender, and SES, but did significantly differ on ethnic composition. There were more African American students in the comparison sample than in the program sample $\chi^2(1174) = 10.03, p < .002$. We controlled for individual ethnicity in all statistical analysis.

Procedures

Family resource centers (FRC) located in eight counties in both rural and urban areas in the southeastern U.S. implemented the *Relationship Smarts* (Pearson, 2007) curriculum to teach RE in both school and non-school based classes. Non-school based settings included churches, after-school programs, and summer camps. Although researchers collected data as part of a five-year project, we included only participants from the fifth year of the project (2011) in the

analysis because this study's target variables were exclusively asked in the pretests and posttests that year. Data from a comparison group of 326 students were collected from students who were not exposed to RE, but were in similar high school classes.

We met all institutional review board expectations for participants. The youth and their guardians were made aware of the purpose of the study and both the youth and the guardians signed informed consent letters indicating agreement for the youth to participate in the study. For the program group, self-report questionnaires containing only participant codes were given prior to exposure to RE and again after exposure to RE. Numbered questionnaires were then paired based on the participant code provided to ensure confidentiality. For the comparison group, self-report questionnaires were given at similar time points and paired. All data gathered by the FRCs were mailed to research assistants in a central project office for processing and analysis apart from identifying documents (i.e., master code lists and informed consent letters).

Measures

Demographic variables. Students provided general demographic information on the pretest survey. Gender was dichotomized to 0 for males and 1 for females. Ethnicity was indicated with categorical options of 1 for Caucasian/White, 2 for African American/Black, and 3 for other. Two dummy variables were created, African American and Other, and were included in all analysis.

Independent variables. In order to construct the class level variable proportion of African American students in the class, students who indicated they were African American were coded as 1 and other ethnicities were coded as 0. We computed the proportion of African American students in each class with a possible range from 0% African American classmates to 100% African American classmates and that proportion was assigned to each student in the class.

In order to construct the class-level variable proportion of sexually active students in the class, students were asked if they were sexually active. Students who answered in the affirmative were coded as 1 and students who answered in the negative were coded as 0. We computed the proportion of sexually active students in a class with a possible range from 0 % sexually active classmates to 100% sexually active classmates and the proportion was assigned to each student in the class.

Dependent variables. *Waiting to Have Sex* was measured by agreement on six statements assessed with a 5-point scale ranging from mostly disagree to mostly agree (Appendix A; Gardner, Giese, & Parrott, 2004). Examples of statements include, “It is too risky for young teens to have sex,” “I intend to finish high school before I have sex,” and “Most people who are important to me think a person should finish high school before they have sex.” The six items were then averaged to create a composite score. Chronbach’s alpha reliability for the items in this study was $\alpha=.84$ at pretest and $\alpha=.86$ at posttest. Posttest waiting to have sex controlling for pretest waiting to have sex was auto-regressed in order to evaluate change in attitude endorsing waiting to have sex.

Resistance to Sexual Pressure was measured by agreement on five statements assessed with a 5-point scale ranging from mostly disagree to mostly agree (Appendix A; Gardner, Giese, & Parrott, 2004). Examples of statements include, “If my partner wanted to have sex, but I didn’t, I would find it pretty hard to say no,” “I intend to say no if I am pressured to have sex,” and “It’s okay for a boy to tell a girl that he loves her so he can have sex.” The five items were then averaged to create a composite score. Chronbach’s alpha reliability for the items in this study was $\alpha=.74$ at pretest and $\alpha=.76$ at posttest. Posttest resisting sexual pressure controlling for

pretest resisting sexual pressure was auto-regressed in order to evaluate change in attitude endorsing resisting sexual pressure.

Analysis Plan

In order to test for program effects (Hypothesis 1), we conducted a repeated measures mixed between-within analysis of covariance (RMANCOVA) to determine if there was a significant group by time interaction in attitude about waiting to have sex and perceived ability to resist sex controlling for gender and ethnicity.

Next, multilevel modeling was used to examine differences in scores from pretest to posttest for each individual student exposed to RE, accounting for the nesting of students within a class. After grand mean centering the individual level predictors and group mean centering the class level predictor, we conducted an interclass correlation (ICC) analysis to determine the proportion of individual student variance that was attributable to between class differences for each outcome (Hypothesis 2). We conducted the ICC on posttest scores controlling for pretest scores because we were interested in the difference in each outcome from pretest to posttest; auto regression was the most appropriate method for determining those differences even though ICCs generally do not usually include any predictor variables. In the first multilevel model, we examined whether change in attitudes about delaying sexual behavior differed by individual variables gender, ethnicity, and the interaction of gender and ethnicity (RQ1).

We next fit a model that included participant group and explored whether the individual characteristics moderated the treatment effect. We added the class level predictor program participation to assess treatment effects while accounting for shared class variance (RQ2). We next explored whether program effects on changes in attitudes about delaying sexual behavior differed by gender, ethnicity, and their interaction (RQ3). In order to test if the proportion of

African American students in the class influenced change in attitudes about delaying sexual behavior (Hypothesis 3), we fit a model that included the proportion of African American students in the class as a class level predictor. We then fit an intercepts and slopes as outcomes model to test for a cross-level interaction between the individual level predictors, gender and African American ethnicity, and the class level predictor of proportion of African American (RQ4). We then tested three-way interactions to determine if any cross-level interactions involving demographic characteristics and the proportion of African American classmates moderated the program effects (RQ5).

In order to test if the proportion of sexually active students in the class influenced change in attitudes about delaying sexual behavior (Hypothesis 4), we fit a model that included the proportion of sexually active students in the class as a class level predictor. We then fit an intercepts and slopes as outcomes model to test for a cross-level interaction between the individual level predictors, gender and ethnicity, and the class level predictor of proportion of sexually active students in the class (RQ6). Next, we tested three-way interactions to determine if the program effects were moderated by any cross-level interactions involving demographic characteristics and the proportion of sexually active classmates (RQ7). Finally, we determined final model selection based on substantive meaning, the deviance statistic ($\Delta-2$ Log Likelihood), and evaluation of the AIC and BIC fit statistics; calculated the global effect size of each best fitting model; and determined how much individual and class level variation we explained (RQ8).

Results

Preliminary Analysis

Correlations and descriptive statistics from the entire sample are available in Table 1. Classroom averages are provided from a random sample of ten classes for class proportion of African American students (see Figure 1), class proportion of sexually active students (see Figure 2), posttest waiting to have sex (see Figure 3), and posttest resistance to sexual pressure (see Figure 4) in order to demonstrate class-level differences in key predictors and outcomes. We present parameter estimates including both fixed and random effects as well as model fit statistics from the multilevel regression models predicting waiting to have sex in Table 2 and for resistance to sexual pressure in Table 3.

Hypothesis 1. We expected that there would be beneficial changes in attitude about delaying sexual behavior for the participant group in both waiting to have sex and resistance to sexual pressure. We conducted a Repeated Measures ANCOVA to determine if there was a significant program effect controlling for gender and ethnicity. For waiting to have sex, we found a significant time x program participant interaction controlling for gender and ethnicity ($F(1, 1185) = 3.88, p < 0.05$) suggesting that students in the program group had more change in attitude endorsing waiting to have sex than students in the comparison group. Exposure to RE was not associated with a statistically significant program effect for resisting sexual pressure from pretest to posttest. Therefore, Hypothesis 1 was partially supported.

Hypothesis 2. We expected the class environment would influence individual change in attitude regarding sexual delay. We fit an unconditional means multilevel model and calculated the intraclass correlation (ICC), which indicates the proportion of total variation in each outcome that can be attributed to class level variation. The conventional threshold for non-trivial class-

level variation is 10% (Singer, 1998). For waiting to have sex, there was significant variation in changes in waiting to have sex across students ($r_{ij}=0.399, p <.001$) and across classes ($\mu_{0j}= 0.074, p <.001$). Controlling for pretest waiting to have sex, 15.6 % of the individual variation in posttest waiting to have sex was attributable to between class variation. For resistance to sexual pressure, there was also significant variation across students ($r_{ij}=0.396, p <.001$) and across classes ($\mu_{0j}= 0.052, p <.001$). The ICC indicated that 11.6% of the individual variation in posttest resisting sexual pressure, controlling for pretest resisting sexual pressure, was attributable to between class variation. Therefore, for both outcomes, the ICC indicated that multilevel modeling was necessary to examine class level influence, thereby fully supporting hypothesis 2.

Research question 1. Using multilevel modeling, we then explored whether gender, ethnicity, and their interaction predicted changes in attitudes about delaying sexual behavior. As ethnicity was categorical, both African American and Other Ethnicity were included in all analysis. For waiting to have sex, only gender was a statistically significant predictor (Model B; $\beta_2 = 0.231, p <.001$). On average, females had bigger differences in waiting to have sex controlling for pretest waiting to have sex. There was not a significant gender by ethnicity interaction. Similar to waiting to have sex, only gender was a statistically significant predictor of change in resistance to sexual pressure (Model I; $\beta_2 = 0.339, p <.001$). On average, females had bigger differences in resistance to sexual pressure controlling for pretest resistance to sexual pressure. Again, there was not a significant gender by ethnicity interaction. Therefore, gender did predict changes in attitude about delaying sex, but neither ethnicity nor the interaction of gender or ethnicity were associated with change in attitude about delaying sexual behavior.

Research question 2. Next, using multilevel modeling to account for the shared experience within a class, we examined whether program effects could be determined. There was no significant treatment effect for either waiting to have sex or resistance to sexual pressure. It is worth noting that the class average initial attitude regarding waiting to have sex in classes that received RE was lower than that of the students in the comparison classes ($t(1221)=4.06, p < .001$). Even so, program participation did not influence attitude change about sexual behavior when class shared variance was considered.

Research question 3. We next explored whether the program effect differed by gender, ethnicity, and their interaction. The gender x participant group interaction predicted waiting to have sex such that females in the participant group had lower posttest waiting to have sex scores, accounting for pretest scores, than females in the comparison group or males in either group (Model C; $\gamma_{21}=-0.170, p < .05$). Neither ethnicity nor the combination of gender and ethnicity moderated the program effect for waiting to have sex. For resistance to sexual pressure, neither gender nor race independently modified the RE program effect on attitude change. The combination of race and gender moderated the treatment effect such that African American females exposed to RE had less change in resistance to sexual pressure than non-African American females or males exposed to RE (Model J; $\gamma_{51}=-0.492, p < .05$). Therefore, gender moderated the program effect for waiting to have sex and the interaction of gender and race moderated the program effect for resistance to sexual pressure.

Hypothesis 3. We expected that the proportion of African American would influence change in attitudes about delaying sexual behavior such that students in classes with higher proportions of African American classmates would have less change in attitudes about delaying sex controlling for individual gender and ethnicity. The class proportion of African American

students predicted waiting to have sex controlling for everything else (Model D; $\gamma_{02}=-0.284$, $p<.01$; see Figure 5). On average, students in classes with higher proportions of African American classmates had smaller differences in posttest waiting to have sex. However, class proportion of African American students did not predict posttest resisting sexual pressure. Therefore, Hypothesis 3 was partially supported; students in classes with a higher the proportion of African American students has less attitude change promoting waiting to have sex, but there was no ethnic composition influence for resistance to sexual pressure.

Research questions 4. We examined whether there were cross level interactions between individual level influences and class level ethnic composition influence on attitude change by exploring whether combinations of gender and race and the proportion of African American students in the classroom differentially influence attitude change in delaying sexual behavior following RE. We added the cross level interactions gender x the proportion of African American classmates and African American ethnicity x the proportion of African American classmates. Controlling for everything else in the model, gender did not moderate the influence of the proportion of African American classmates on posttest waiting to have sex. Also, race did not moderate the influence of proportion of African American classmates on posttest waiting to have sex. Similarly, neither gender nor race moderated the association between proportion of African American classmates and change in resistance to sexual pressure. Therefore, the relationship between proportion of African American students in a class and attitude change regarding delaying sexual behavior did not differ by gender or by race.

Research question 5. We explored whether combinations of gender and race and class level ethnic composition differentially influence program groups. To accomplish this we examined the cross-level interactions that included class composition (proportion of African

American classmates) and individual demographic characteristics (gender and African American ethnicity) to determine whether those combinations moderated the RE program effect. In order to explore these three way interactions, it was necessary to include all component two-way interactions in the model. The interaction of the proportion of African American classmates x program participation on attitudes about delaying sexual behavior for each outcome was tested, however, those interactions did not significantly predict either waiting to have sex or resistance to sexual pressure.

For waiting to have sex, we examined the three-way interactions including gender x proportion of African American classmates x program participant and African American ethnicity x proportion of African American classmates x program participant. Neither of these three-way interactions was significant for waiting to have sex. For resistance to sexual pressure we again tested the cross-level interactions of gender x proportion of African American classmates x program participant and African American ethnicity x proportion of African American classmates x program participant. Gender moderated the relationship between the proportion of African American classmates and RE program exposure (Model G; $\gamma_{24}=-0.844$, $p<.01$; see figure 6) such that females in class with a lower proportion of African American students had more change in attitude about resisting sexual pressure after exposure to RE than males in classes that had a low proportion of African American students. Furthermore, the influence of the proportion of African American classmates was most pronounced for females in the comparison group. Race did not modify the relationship between class ethnic composition and participation in RE. Thus, only gender modified the relationship between class ethnic composition and participation in RE and only for resisting sexual pressure.

Hypothesis 4. We expected that the proportion of sexually active students in the class would influence change in attitudes about delaying sex such that students in classes with higher proportions of sexually active classmates would have less change in attitudes supporting delaying sex controlling for gender and ethnicity. On average, students in classes with higher proportions of sexually active classmates had less differences in waiting to have sex (Model D; $\gamma_{03} = -0.927, p < .001$; see Figure 7). Similarly, there was an association between proportion of sexually active classmates and posttest resistance to sexual pressure such that students in classes with higher percentages of sexually active classmates had lower posttest resistance to sexual pressure (Model K; $\gamma_{03} = -0.433, p < .01$; see Figure 8). Therefore, hypothesis 4 was fully supported: students in classes with higher proportions of sexually active students had less attitude change promoting delay of sexual behavior.

Research question 6. We next examined whether there was a cross level interaction between individual level influences and class level sexual activity composition on attitude change by exploring whether combinations of gender and race and the proportion of sexually active students in the classroom differentially influence attitude change in delaying sexual behavior following RE. Although, gender did not modify the relationship between proportion of sexually active students in the class and posttest waiting to have sex, race moderated the influence of the proportion of sexually active classmates on posttest waiting to have sex, controlling for everything in the model (Model E; $\gamma_{33} = 0.653, p < .001$; see Figure 9). African American students in classes that were highly sexually active had more change in attitude about waiting to have sex than students of other ethnicities and non-African American students in classes with low proportions of sexually active classmates had more change than African American students. Neither gender nor race influenced the relationship between proportion of

sexually active students in the class and change in attitude about resisting sexual pressure.

Therefore, only race moderated the relationship between proportion of sexually active students in the class and attitude change and only for waiting to have sex.

Research question 7. We explored whether combinations of gender and race and class sexually active students composition differentially influence program groups. To accomplish this, we examined the cross-level interactions that included class composition (proportion of sexually active classmates) and individual demographic characteristics (gender and African American ethnicity) to determine whether those combinations moderated the RE program effect. We included all component two-way interactions including the interaction of the proportion of sexually active classmates x program participation on attitudes about delaying sexual behavior which were not significant for either waiting to have sex or resistance to sexual pressure. We next examined the two three-way interactions for waiting to have sex including the proportion of gender x sexually active classmates x program participant and African American ethnicity x proportion of sexually active classmates x program participant. The only significant three-way interaction was that gender x proportion of sexually active classmates moderated the program effect on waiting to have sex ($\gamma_{25}=1.813$, $p < .01$; see Figure 10). On average, exposure to RE in classes that had a lower proportions of sexually active classmates was associate with more attitude change supporting waiting to have sex for male students and exposure to RE in classes that have a higher proportions of sexually active classmates was associated with more attitude change supporting waiting to have sex for female students.

For resistance to sexual pressure, we looked at the same two three-way interactions: gender x the proportion of sexually active classmates x program participant, and African American ethnicity x the proportion of sexually active classmates x program participant. One

significant three-way interactions was found involving gender and program effect. Gender moderated the relationship between the proportion of sexually active classmates and RE program exposure (Model N; $\gamma_{25}=1.341, p < .01$; see Figure 11). Female students in RE programs occurring in highly sexually active classes had more change in resistance to sexual pressure than comparison females in high sexually active classes or males. Individual race did not modify the relationship between sexually active classmate composition and participation in RE. Once again, only gender modified the relationships between class composition and participation in RE and it did so for both waiting to have sex and resistance to sexual pressure.

Research question 8. After exploring all prior hypothesis and research questions, we determined which model provided substantive meaning and best fit for waiting to have sex and resistance to sexual pressure and how much variation each best fitting model explained. For change in waiting to have sex, we selected model G that included individual and class level predictors and significant cross level interactions as the final model for a number of reasons (see Table 2). Although Model F allowed for examination of each of the research questions and every cross-level interaction, it included multiple non-significant interactions. After removing the non-significant cross level interactions from Model F for the sake of parsimony, the deviance statistic improved ($\Delta -2 LL = 13.3, p < .01$), the AIC statistic decreased, and the BIC statistic decreased; taken together these statistic indicated improved model fit. Therefore the final estimated equation for waiting to have sex was

$$\begin{aligned} \hat{Y}_{ij} = & 4.148 + 0.624(\text{pretestWHS}) + 0.718(\text{female}) + -0.261(\text{African American}) \\ & + -0.037(\text{Other Ethnicity}) + -0.165(\text{RE}) + -0.739(\text{RE*female}) + -.281(\text{ClassPropAA}) + \\ & + -1.203(\text{ClassPropSexAct}) + -1.219(\text{ClassPropSexAct*female}) + \\ & 0.354(\text{ClassPropSexAct* RE}) + 1.731(\text{ClassPropSexAct*RE*female}) \end{aligned}$$

Taken together, the final model explained 4.3% of the within class variance and 70.3% of the between class variance.

Calculation of the global effect size indicated that 48.6% of the variation of differences in attitude about waiting to have sex was explained by individual gender, individual ethnicity, exposure to RE, the interaction between gender and exposure to RE, the proportion of African American classmates, the proportion of sexually active classmates, the interaction between the proportion of sexually active classmates and gender, and the interaction between the proportion of sexually active classmates and being African American, and the three-way interaction of the proportion of sexually active classmates, gender, and exposure to RE. Our baseline model (A) consisted of posttest waiting to have sex controlling for pretest waiting to have sex using autoregression to assess change in waiting to have sex. By examining both the individual and class level predictors, we improved our individual predictive ability for change in waiting to have sex by 14.6% relative to baseline. Moreover, we improved our class level predictive ability by 55.9% relative to baseline.

For change in resistance to sexual pressure, the final model (L) included individual level predictors and one class level predictor (see Table 3). Although we examined Model M which included cross-level interactions of individual and class predictors and Model N, which included cross-level interactions and program effects, in order to explore the research questions, the addition of cross level interactions (Model M) and the cross-level three-way program effect interactions (Model N) did not improve the amount of class level variation we could explain nor did it improve model fit. Therefore, we selected Model L that included individual characteristics and only the class level predictor proportion of sexually active students for the sake of parsimony. Model L did have improved model fit over its predecessor Model I which included

only individual predictors. From that comparison, the deviance statistic improved ($\Delta -2 LL = 5.8, p < .01$), the AIC statistic decreased, and the BIC statistic increased slightly; taken together these statistics generally indicated improved model fit. The increase in the BIC was likely attributable to the increase in number of parameters. The final estimated equation for resistance to sexual pressure was

$$\hat{Y}_{ij} = 4.124 + 0.514(\text{pretestRSP}) + 0.339(\text{female}) + -0.036(\text{African American}) \\ + -0.009(\text{Other Ethnicity}) + -0.456(\text{ClassPropSexAct})$$

Taken together, the final model explained 4.3% of the within class variance and 15.4% of the between class variance in resistance to sexual pressure.

We calculated the global effect size from the correlation of the actual and predicted values of differences in attitudes about resistance to sexual pressure; we explained 37.3% of the variation in change in resistance to sexual pressure by individual gender, individual ethnicity, and the proportion of sexually active classmates. Our baseline model (H) was the posttest resistance to sexual pressure controlling for pretest resistance to sexual pressure using autoregression to assess change in resistance to sexual pressure. By examining the individual and class level predictors, we improved our individual predictive ability for change in resistance to sexual pressure by just over 15.1% relative to baseline. Moreover, we improved our class level predictive ability by 12.3% relative to baseline.

Discussion

Although the primary outcome areas of focus following relationship education (RE) have been relationship knowledge, attitudes about relationships, and interpersonal competence (Adler-Baeder et al., 2007; Gardner et al., 2004; Kerpelman et al., 2009), scholars assert that messages contained in RE may also influence decision-making and behaviors related to sexual activity and risk-taking (e.g., Kerpelman, 2007). Only three past studies of RE program effects on attitudes about delaying sexual behavior exist. They reported mixed results and underrepresented the experiences of African American students (Gardner & Boellard, 2007; Gardner, Giese, & Parrott, 2004; Schramm & Gomez-Scott, 2012). Although RE interventions occur in class settings, previous evaluation studies on RE efficacy have employed basic evaluation designs that are limited to examination of individual level predictors of individual change. In fact, overall, few intervention evaluations have examined how aspects of the class context influence program efficacy while accounting for the nesting of students in a classroom. This study explored multiple levels of influence on RE program efficacy: individual characteristics that shape how each student's attitude about sexual delay evolve over time and contextual characteristics that interact with those individual characteristic as another layer of influence.

Program Effects

Initially, we followed procedures utilized in previous program evaluation studies that conducted Repeated Measures ANOVAs to determine whether there was evidence of treatment effects. We found a program effect for waiting to have sex, but we failed to find a program effect for resisting sexual pressure. Our findings contrasted with the Gardner, Giese, and Parrott (2004) who used similar methods and found no program effect for waiting to have sex and a marginal program effect for resistance to sexual pressure. Furthermore, our initial findings for

the full sample partially contradict with Schramm and Gomez-Scott (2012) who found program effects for both outcomes. Sample differences may explain these contrasting findings. Our sample included more African American students than previous studies and African American students, on average, have sexual debut at earlier ages than other ethnic groups (Zimmer-Gembeck & Helfand, 2008). Perhaps students who have already engaged in sexual behavior react differently to messages about sexual delay and convey different messages to their peers. Unfortunately, neither Gardner and colleagues (2004) nor Schramm and Gomez-Scott (2012) provided information regarding the actual level of sexual activity of the participants; therefore, we can only speculate that the differences in findings between the studies is related to the differences in the characteristics of the students and potentially the class social climate. If their classes were less sexually active, on average, prior to intervention, RE instructors may have been more successful at communicating their messages through a less resistant filter, making the program effect more pronounced for the broad sample.

Additionally, it may be that differences in curriculum emphasis account for the opposite findings relative to the Gardner, Giese and Parrot (2004) study. *Connections* may be more effective at addressing sexual pressure because it focuses on the skills to establish clear sexual expectations in a relationship (Kamper, 2004) and *Relationship Smarts* may be more influential for addressing attitudes regarding waiting to have sex because of the discussion of the timing of physical intimacy within healthy relationship development (i.e., emotional and social intimacy should be well established first) and the provision of accurate information about sexual norms in Lesson 3 (Pearson, 2007).

Importantly, we cannot conclude that the results from the ANCOVA tests best represent our findings for program effects. We did not find the same program effects when we used

multilevel modeling, which considers the shared variance within classes and is sensitive to class level differences; repeated measures ANOVA analysis does not. As we found a beneficial RE program effect from the repeated measures ANCOVA, this result was somewhat surprising. Differences in analysis likely explain the contradiction in the findings. Repeated measures ANCOVA assessed whether the differences in individual scores from pretest to posttest were associated with whether the individual was in the participant or comparison group. Multilevel modeling assessed the posttest, controlling for the pretest value, of the individual score and accounted for the nesting of individuals within program or comparison classrooms. Differences in the class environments of participant and comparison groups would not affect a repeated measures ANCOVA test, but would influence multilevel modeling analysis results. Interestingly, the class average initial attitude regarding waiting to have sex in classes that received RE indicated lower endorsement for delaying sex than that of the students in the comparison classes. Although the influence of the initial reported attitude about sexual delay was controlled, there remained differences in the class mean initial attitudes regarding sexual delay between the RE classes and comparison classes. Furthermore, there was remaining class level variation that we had not explained. Other analyses revealed a non-trivial class influence on change in attitude. Individuals with comparable initial attitudes about sexual behavior enrolled in different class contexts, one class that was more favorable, on average, towards sexual delay and another that was more opposed to delay, may experience different amounts of change following program participation.

It is important for program researchers to consider that for multi-class or multi-site program studies, multilevel modeling procedures are the more appropriate analytic technique. One of the key assumptions of analysis of variance and linear regression is the independence of

observations (Bryk & Raudenbush, 1992) and most program evaluations fail to address the violation of this assumption. Since students are being exposed to RE in a class setting, the influence of the class should not be ignored. It may be that class environment is a stronger influence in studies of adolescent program efficacy because of the elevated importance of peers during that developmental period making the class context even more salient. Moreover, multilevel modeling benefits the researcher by providing a method to examine class level factors while accounting for the nesting of students within classrooms. Taken together, the use of multilevel modeling ensured that we did not violate methodological assumptions and provided a method for explaining important class level variation that had previously been ignored. As adolescence is a time when messages from peers can be more influential than messages from adults (Brown & Larson, 2009), recognizing the social context for an intervention is both developmentally prudent and methodologically necessary.

Individual Level Influence

Female students demonstrated a stronger intention to delay sex from pre-program to post-program across both program and non-program classes. In a cross-temporal meta-analysis of young people's sexual behavior, adolescent females were found to have more change in sexual behavior and attitudes over time (Wells & Twenge, 2005). Therefore, this study supports previous research finding that adolescent females are more flexible than males to changing their attitudes about sexual delay even over a brief time period. It appears that, when we examined the influence of gender on program effects, that it was the comparison group females who demonstrated more change over time in a desired direction. We can only speculate as the reasons for this, as our expectation was that positive change would be stronger for the program group. Explorations of the class social climate then allowed us to uncover in more nuanced

fashion other variables' influence on shifts in attitudes about sexual delay by gender and participant group.

The current study found no evidence that individual ethnicity predicted change in attitude to delay sex prior to consideration of the class context. As expected from previous studies, we found that African American students in our sample were more likely to report having had sex. Furthermore, African American students had both lower pretest waiting to have sex and resistance to sexual pressure. It may be that there are ethnic differences in initial attitude towards delaying sex, but not in general change in attitude over time. When we examined individual characteristics' influence on program effects we found that females in the program group had less attitude change supporting waiting to have sex and African American females in the program group had less attitude change supporting resisting sexual pressure. It appears that participation in the program only influenced sexual delay for specific subgroups. This provided an indication that individual characteristics should be taken into account when examining the influence of class level contextual variables' influence on program effects.

Class Context

Our next steps were to explore several elements of class context and determine in what ways they mattered. The ecological perspective posits that the environment influences the individual existing within it and that individuals interact with their environment both shaping and responding to it (Bronfenbrenner, 1979). Social learning theory contends that learning occurs within a social context (Bandura 1977). Therefore, interactions with other students in a class likely affect the ability of an individual student to learn from a program. Although there is a strong theoretical reason for examining class context and intervention, only a few studies thus far have done so (e.g., Conduct Problems Prevention Research Group, 2010). Developmentally, the

time of greatest receptivity to peer influence in risky decision-making is adolescence (Albert, Chein, & Steinberg, 2013). We expected class environment would influence the degree to which individual adolescents change their attitude about waiting to have sex and resistance to sexual pressure. We, therefore, took an initial step not typically done in evaluation studies and examined the intraclass correlation (ICC). The ICC is a statistical indicator of the variation in individual outcomes that is attributable to group differences and represents the expected correlation among students in the same class. For both waiting to have sex and resistance to sexual pressure, the intraclass correlation was over 10% indicating a non-trivial influence of class (Singer, 1998). In short, as expected based on theory and validated methodologically, this study demonstrated that class context matters.

Peers, especially during adolescents, are the contextual filter through which education likely flows. Informed by previous studies of adolescent sexual behavior and context (Furstenberg et al., 1987; Warner, Giordano, Manning, & Longmore, 2011) we examined the influence of both the prevalence of sexually active peers in the class and ethnic composition of the class. Although, both aspects of class composition influenced attitude change about delaying sex for individual students, the proportion of sexually active peers was a more potent predictor; students in classes that were more sexually active were less likely to have greater differences endorsing delaying sex and the ability to resist sexual pressure. Although sexually active students have the potential to demonstrate the most attitude change because of where they start (i.e., likely with a corresponding lower endorsement for waiting to have sex), they may be least likely to change their thinking. Psychological phenomenon such as confirmation bias, the tendency of individuals to focus on information that confirms their currently held beliefs (Nickerson, 1998), and avoidance of cognitive dissonance, the discomfort felt when an individual

holds two contradictory beliefs at the same time (Festinger, 1962), may inhibit sexually active students from internalizing ideas promoting sexual delay. In a class setting, the more individuals that refute the messages endorsing sexual delay, the harder it might be for instructors to deliver messages supporting sexual delay. In fact, sexually active students may be more likely to communicate messages encouraging adolescent sexual behavior. Students exposed to classes that have a high proportion of sexually active students may interpret the actions and opinions of those peers as the norm for all students, thereby inflating perceptions of peer sexual norms and undermining communications that promote delay. Consistent with both the ecological perspective and social learning theory, this study found that individuals in a classroom were influenced by the behaviors of those sharing the learning experience.

After removing the influence of the sexual behavior of classmates, this study demonstrated a remaining subgroup influence such that students in classes that had a higher proportion of African American students reported less change in intent toward sexual behavior delay. Similar to the findings from the neighborhood study by Warner, Giordano, Manning, and Longmore (2011) in which both a proxy for ethnicity and sexual behavior norms each predicted timing of sex, there remained some aspect of attitude about sexual behavior delay and class ethnic composition that was not explained by differences in sexual behavior norms. There may be variables within the African American community that are influential towards attitudes about risky sexual behavior that are only starting to be explored. For example, ethnic identity may be a factor that contributes to African American students attitudes about risky sex. One study found that lower levels of ethnic affiliation were associated with more risky sexual attitudes for African American female adolescents (Belgrave, Marin, and Chambers, 2000). Alternatively, it may be that universal assessment models fail to appreciate the diverse competencies emphasized within

minority culture (Ogbu, 1981). Cultural influence on adolescent attitudes about risky sexual behavior is an area of adolescent sexual behavior research that needs further investigation.

It may be that remaining variation predicted by the proportion of African American students after removing the influence of the prevalence of the behavioral norm in the class inadvertently served as proxy for capturing another class context variable. For example, African American students in our study, on average, had lower GPA's than other ethnicities and lower GPA has been associated with higher sexually risky behavior (Luster and Small, 1994). Perhaps students in classes that had overall lower academic achievement had class environments that were less receptive to messages about sexual delay. Additionally, African American students, on average, had lower SES and greater likelihood of having a single parent family structure; factors that have been associated with higher likelihood of risky sexual behavior (Kotchick, Shaffer, Miller, & Forehand, 2001). It may be that these co-occurring characteristics better explain the results. Future research can provide a next step in disentangling these overlapping factors.

Both ethnic composition and behavior characteristics of the other classmates influenced individual outcomes. Taken together, these are noteworthy findings because most studies of peer influence on sexual behavior examine the influence of friends rather than classmates. The influence of friends is a complex phenomenon because of selections effects; students purposefully choose their friends creating a confounding bidirectional influence (Steglich, Snijders, & Pearson, 2010). However, when examining classmate influence, selection is not an issue as students do not choose their classmates. Therefore, classmate influence may be a more accurate way to assess peer influence on individual attitude. This study was one of the first to demonstrate that classmates influenced program efficacy and changes in attitudes about sexual behavior.

Finally, this study discovered several complex interactions involving gender, class context, and program participation such that females were more influenced by participation in RE and by social context than males. As females have been found to have larger discrepancies between perceived sexual norms and actual sexual norms (Lim, Aitken, Hocking, and Hellard, 2009), differences in male and female response to RE may be partially explained by differential reconciliation of those discrepancies. Our findings were consistent with the theory of erotic plasticity (Baumeister, 2000) that posits female sexuality is more responsive to cultural influence. Females in classes that were more sexually active received the most benefit from RE program exposure. It may be that RE activities that provide support for delaying sexual behavior in classes that are more sexually active serve to mitigate and even reverse those peer messages supporting sexual behavior and females were especially tuned into these messages within the curriculum. Therefore, as female sexuality may be more responsive to contextual influences than male sexuality (Baumeister, 2000), RE may be more beneficial for female students who are exposed to peer contexts that include higher rates of risky sexual behavior.

Limitations

The current study is one of the first to include examination of the class environment on intervention efficacy and provides some valuable information. Even so, there are limitations that need to be recognized. Unfortunately, the program participants and the comparison sample started with different initial attitudes regarding sexual delay. Although the individual score at pretest was controlled in order to assess change, we did not explain all of the effects of the shared class experience. As examining class influence is a rather new approach to program efficacy, it is likely that there were additional class level differences that may influence program effects which we did not explore. Therefore, findings regarding program effect may be driven

by differences in whole class attitude rather than program effect so caution in interpretation of program effects is highly recommended.

Another commonly encountered limitation of the study is that all data were single reporter and self-report. Adolescents, like adults, may be subject to social desirability issues with some exaggerating their sexual behavior and others minimizing it (Brener, Billy, & Grady, 2003). All data was from the participant and mono-reporter bias could drive the results. Furthermore, there may be variation in how adolescents defined sexual activity such as whether oral sex is included (Bersamin, Fisher, Walker, Hill, & Grube, 2007). The measure used in this study for sexual activity was simply, “are you sexually active” allowing for individual interpretation and providing no information about factors such as the age of debut, frequency, relational context, or other indicators of level of risk.

This study was limited to examining changes in attitude over the duration of the program (or the comparable length of time for the comparison sample). In order to establish whether attitude changes were lasting and if changes in attitude translated into changes in behavior, additional follow up reports would be necessary. There may be a time lag for RE program effects regarding sexual attitudes similar to those detected by Gardner and Boellaard (2007) for self-esteem and family cohesion or there may be a drop-off in program effects. Finally, the only indicators of adolescent sexual risk were measures of attitudes about timing of sexual behavior. In order to have a more complete picture of the influence of RE on sexual behaviors and sexual risk, future research should incorporate measures of multiple aspects of attitudes and behaviors related to sexuality.

Practical Implications

For educators, this study demonstrates the non-trivial class influence on program efficacy. Rather than suggesting that class assignment should be arranged to evenly distribute student characteristics, we are suggesting that facilitator awareness of the risk level for a class should inform program implementation. The class environment itself influenced student receptivity to changing their attitude about the timing of sexual debut. Instructors may be more successful in reaching students when the social context of an intervention is assessed prior to program implementation and instruction is tailored for the class environment. This could be accomplished by either having students complete anonymous pre-program surveys or utilizing evaluation surveys rendered anonymous by assigning codes and examining class frequencies and averages on relevant questions. In an RE class with more sexually active students, the class influence has the potential to temper or even reverse the intended program effect. Program-based discussions meant to highlight the benefits of sexual delay may backfire as information about peers' endorsement of sexual behavior becomes evident. Therefore, those classes may benefit from less open class discussion as that may provide opportunities for contradictory messages to be shared. Instead, a class potentially less receptive to messages about sexual delay may benefit from videos, structured role-plays, and guest role models (e.g., known athletes, etc.) that provide endorsement for and explanations of the value of sexual activity delay so that contradictory messages are less evident and messages about the benefits of delay are dominant. As attitude change can be facilitated through the process of argument generation (Cialdini, Petty, & Cacioppo, 1981), highly sexually active classes may especially benefit from activities in which the students themselves are tasked with generating arguments supporting delaying sexual behavior. Finally, providing accurate information about adolescent sexual norms may be

especially helpful in highly sexually active classes for rectifying inflated assumptions about broader norms for their age group and may need additional emphasis in those classes.

Informed by the life course theory, it may also be that facilitator-lead activities about where student values about sexual behavior come from will help students recognize what factors have influenced them from the past and are likely to influence their decision-making and choices in the future. This awareness may provide an opportunity for critical reflection that would not otherwise occur. From looking at the comparison groups, females in classes with higher sexual activity levels appear to be most susceptible to peer influence. Therefore, females in higher risk class contexts may benefit the most from exposure to RE. Furthermore, female students may benefit from additional program time being spent on lessons designed to help them practice skills to deflect peer influence. In fact, facilitators may want to talk more directly about the influence of peers during adolescent development and provide opportunities for skill enhancement aimed at promoting independent decision making. As an example of this approach, *Relationship Smarts* has recently added a new chapter to the curriculum that focuses on sexual decision-making and includes role-plays to practice exit strategies and refusal skills (Pearson, 2013).

Lastly, as adolescent decision-making is influenced more by the perceived benefits rather than the perceived risks in a situation (Parsons, Siegel, & Cousins, 1997), program information regarding reasons for sexual delay should be carefully assessed to ensure that the focus of the messages is on the benefits for relationship development. Although *Relationship Smarts* emphasizes the benefits the successful development of the non-physical aspects of intimacy such as verbal, emotional, social, spiritual, and commitment that contribute to a healthy relationship in which both partners are rewarded (Pearson, 2007), more can be done to emphasize the benefits of healthy relationships and de-emphasize risk aversion in all adolescent curricula. Lastly, the

findings from this study may indicate a higher program dosage is needed for classes with more sexually active students in order to spend time directly addressing social pressure.

Future Directions and Conclusions

Future evaluation researchers are encouraged to continue to explore which aspects of class climate improve or hinder intervention goals. This study opened the exploration of some aspects of class context that influence how receptive a student is to RE program information in one specific domain, attitudes about sexual behavior. There are many more aspects of class context that have the potential to influence individual receptivity to programs impacting sexual behavior such as religiosity of the class or engagement in other risky behaviors associated with risky sexual behavior such as underage drinking. A next step for research of RE efficacy and adolescent sexual behavior may be to explore additional indicators of sexual risk, particularly those known to be associated with being in a relationship such as frequency of casual sex, the number of recent sexual partners, and use of contraception. Furthermore, more general class context characteristics may be relevant for exploring program efficacy and class context across multiple domains such as the class receptivity to intervention, class academic ability, and class social competence.

In future research, it will be helpful to implement additional design and methodological procedures that improve group comparability. Although school-based programs do not provide the opportunity for random control assignment, community-based delivery models may allow for this procedure and enhance the likelihood of demographic comparability at baseline between the program and control groups. Lastly, in order to further explore how RE influences future sexual behavior, it is vital that additional points of data are collected over time. Understanding more

about the patterns of change and relationship between attitude and sexual behavior over time can better inform the developmental literature and models of best practices for youth-focused RE.

In sum, this study provides new insight into adolescent changing attitudes about sexual delay. This was the first study exploring RE efficacy and attitudes about sexual delay to examine a diverse sample that included a larger proportion of African American students. Perhaps the most important contribution of this study is its consideration of class context. Using multilevel modeling, this study examined both individual and class contextual factors in order to account for the nesting of students within classes and to examine predictors of class level variation. Importantly, as interventions occur within a class context, this was one of the first studies to demonstrate that aspects of class composition, ethnicity and prevalence of sexually active peers, influence change in adolescent attitudes about sexual delay. Recognition of the influence of the context within which individual students internalize information is relevant for both the educators providing the instruction and the researchers evaluating its efficacy. For intervention researchers, this study demonstrated the importance of considering class environment as a factor in individual receptivity to education. For researchers, this study demonstrates that it is important for studies that examine intervention efficacy to move beyond basic research design in order to consider the context within which the intervention is occurring. In short, this study has demonstrated that the ability of a program to reach individuals may depend on more than the individual themselves; it may also depend on who else is in the room.

Table 1. Correlations and Descriptive Statistics for Waiting to Have Sex (below diagonal) and Resistance to Sexual Pressure (above diagonal)

	1	2	3	4	5	6	7	8	Resistance to Sexual Pressure Means (SD)
1. Posttest	--	.62**	.45**	-.08*	-.01	-.04	-.06*	.11**	3.94 (.81)
2. Pretest	.70**	--	.51**	-.08**	.02	-.05	-.02	-.12**	3.92 (80)
3. Female	.30**	.31 **	--	.04	.03	-.01	-.06	.01	58%
4. Ethnicity African American	-.13**	-.07 *	.04	--	-.23**	.09**	.61**	.14**	36%
5. Ethnicity Other	.13	.03	.03	-.23*	--	-.02**	-.01	.04	8.4%
6. RE Participant	-.08 **	-.12**	-.01	.09**	.02	--	.14**	.24**	74%
7. Proportion of African American classmates	-.16**	-.07*	.06*	.61**	-.01	.14	--	.25**	.36 (.30)
8. Proportion of sexually active classmates	-.22**	-.24**	.01	.14**	.04	.24**	.25**	--	.39 (.16)
Waiting to Have Sex Means (SD)	3.56 (.89)	3.46 (.92)	58%	36%	8.4%	74%	.36 (.30)	.39 (.16)	

Table 2. A Taxonomy of Fitted Multilevel Models Investigating Waiting to Have Sex with Individual and Class Level Predictors.

Parameter	Model A Auto- Regressive Model	Model B Individual Level Predictors Model	Model C Treatment Effects * Individual	Model D Class Level Predictors	Model E Cross Level Interactions	Model F Cross Level Interactions and Txt Effects	Model G Final Model
FIXED EFFECTS							
Level I Predictors							
Intercept (β_0)	3.549 *** (0.039)	3.559 *** (0.038)	3.662 *** (0.077)	4.060 *** (0.077)	4.060 *** (0.078)	4.124 *** (0.130)	4.148 *** (0.121)
Pre- test Waiting to Have Sex (β_1)	0.667 *** (0.021)	0.625 *** (0.026)	0.625 *** (0.023)	0.627 *** (0.023)	0.625 *** (0.023)	0.625 *** (0.023)	0.624 *** (0.023)
Female (β_2)		0.231 *** (0.042)	0.348 *** (0.075)	0.355 *** (0.074)	0.294 *** (0.114)	0.651 *** (0.193)	0.718 *** (0.175)
Ethnicity							
African American(β_3)		-0.058 (0.051)	-0.049 (0.091)	-0.047 (0.051)	-0.314* (0.144)	-0.372 (0.145)	-0.261* (0.119)
Other (β_4)		0.010 (0.074)	0.015 (0.073)	0.015 (0.074)	0.034 (0.075)	0.040 (0.075)	0.037 (0.074)
Female * African American (β_5)		-0.002 (0.114)	0.260 (0.186)				
Female * Other (β_6)		0.038 (0.016)					
Level II Predictors							
Class Participation in RE (γ_{01})			-0.132 (0.088)	-0.044 (0.064)	-0.044 (0.065)	-0.136 (0.155)	-0.165 (0.144)
Class Participation in RE * female (γ_{21})			-0.170* (.088)	-0.177* (.088)	-0.164~ (.091)	-0.661** (.243)	-0.739*** (.227)
Class Participation in RE * African American(γ_{31})			0.147 (.107)			0.104 (0.298)	
Class Participation in RE * African American*female (γ_{51})			-0.424 (.231)				
Proportion of African American students in class (γ_{02})				-0.284** (0.094)	-0.283** (0.095)	-0.149** (0.271)	-0.281** (0.094)
Proportion of African American students in class * female (γ_{22})					-0.007 (0.138)	0.329 (0.364)	
Proportion of African American students in class * African American (γ_{32})					0.058 (0.276)	0.546 (0.592)	

Proportion of African American students in class *Class Participation in RE (γ_{04})							-0.148 (0.288)
Proportion of African American students in class * Female * Class Participation in RE (γ_{24})							-0.373 (0.393)
Proportion of African American students in class * African American * Class Participation in RE (γ_{34})							-0.604 (0.667)
Proportion of sexually active students in class (γ_{03})				-0.927*** (0.163)	-0.926*** (0.164)	-1.262*** (0.353)	-1.203*** (0.337)
Proportion of sexually active students in class * female (γ_{23})					-0.181 (0.291)	-1.284** (0.520)	-1.219* (0.516)
Proportion of sexually active students in class * African American (γ_{33})					0.653* (0.302)	0.409 (0.607)	0.601* (0.294)
Proportion of sexually active students in class* Class Participation in RE (γ_{05})						0.418 (0.397)	0.354 (0.380)
Proportion of sexually active students in class *female *Class Participation in RE (γ_{25})						1.813** (0.636)	1.731** (0.628)
Proportion of sexually active students in class * African American * Class participation in RE (γ_{35})						0.224 (0.710)	
RANDOM EFFECTS							
τ_{ij}	0.399 *** (0.017)	0.386*** (0.018)	0.384*** (0.017)	0.386*** (0.022)	0.385*** (0.017)	0.381*** (0.017)	0.382*** (0.017)
μ_{0j}	0.074 *** (0.018)	0.067 *** (0.017)	0.064 *** (0.016)	0.017 *** (0.009)	0.023 *** (0.009)	0.022 *** (0.008)	0.022 *** (0.009)
-2 LL (df)	2368.0 (4)	2207.2 (9)	2197.8(12)	2164.6(11)	2163.0 (14)	2149.1(22)	2151.3 (15)
Δ -2 LL (df)		160.8*** (3)	170.2*** (8)	203.4*** (7)	1.6 (3)	15.5 (8)	13.3 *** (4)
Comparison Model		Model A	Model A	Model A	Model D	Model D	Model D
AIC	2376.0	2225.2	2221.8	2186.5	2191.0	2187.7	2181.3
BIC	2396.3	2270.4	2282.1	2241.8	2261.3	2283.1	2256.7

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

Table 3. A Taxonomy of Fitted Multilevel Models Investigating Resisting Sexual Pressure with Individual and Class Level

Predictors.

Parameter	Model H Auto- Regressive Model	Model I Individual Level Predictors Model	Model J Individual Level Interactions Model	Model K Class Level Predictors	Model L Significant Class Level Predictors	Model M Cross Level Interaction	Model N Cross Level Interactions and Txt Effects
FIXED EFFECTS							
Level I Predictors							
Intercept (β_0)	3.940 *** (0.035)	3.945 *** (0.035)	3.990 *** (0.071)	4.141 *** (0.093)	4.124 *** (0.079)	4.140 *** (0.093)	4.083 *** (0.161)
Pre- test Resisting Sexual Pressure (β_1)	0.614 *** (0.024)	0.513 *** (0.028)	0.508 *** (0.028)	0.514 *** (0.027)	0.514 *** (0.028)	0.513 *** (0.028)	0.511 *** (0.028)
Female (β_2)		0.339 *** (0.045)	0.277 *** (0.076)	0.339 *** (0.045)	0.339 *** (0.045)	0.292 *** (0.118)	0.381 * (0.193)
Ethnicity							
African American(β_3)		-0.036 (0.051)	0.054 (0.090)	-0.036 (0.051)	-0.036 (0.051)	-0.089 (0.152)	-0.143 (0.232)
Other (β_4)		-0.010 (0.073)	-0.011 (0.073)	-0.009 (0.073)	-0.009 (0.073)	-0.003 (0.142)	0.004 (0.075)
Female * African American (β_5)			0.265 (0.185)				
Level II Predictors							
Class Participation in RE (γ_{01})			-0.053 (0.081)	-0.012 (0.078)		-0.012 (0.078)	-0.055 (0.188)
Class Participation in RE *female (γ_{21})			0.094 (0.087)			0.099 (0.091)	-0.102 (0.241)
Class Participation in RE * African American(γ_{31})			-0.124 (0.106)			-0.158 (0.110)	-0.068 (0.296)
Class Participation in RE * African American *female (γ_{51})			-0.492* (0.229)				
Proportion of African American students in class (γ_{02})				-0.044 (0.112)		-0.042 (0.112)	0.194 (0.335)
Proportion of African American students in class * female (γ_{22})						-0.049 (0.140)	0.657~ (0.360)
Proportion of African American students in class * African American (γ_{32})						-0.004 (0.274)	0.151 (0.585)

Proportion of African American students in class							-0.266
*Class Participation in RE (γ_{04})							(0.355)
Proportion of African American students in class * Female* Class Participation in RE (γ_{24})							-0.844*
Proportion of African American students in class * African American * Class Participation in RE (γ_{34})							(0.388)
Proportion of sexually active students in class (γ_{03})							-0.155
Proportion of sexually active students in class * female (γ_{23})							(0.659)
Proportion of sexually active students in class * African American (γ_{33})							-0.433*
Proportion of sexually active students in class* Class Participation in RE (γ_{05})							(0.192)
Proportion of sexually active students in class *female * Class Participation in RE (γ_{25})							-0.456*
Proportion of sexually active students in class * African American * Class Participation in RE (γ_{35})							(0.183)
							-0.432***
							(0.192)
							-0.507
							(0.429)
							-0.012
							(0.295)
							-0.924~
							(0.521)
							0.432
							(0.308)
							0.477
							(0.600)
							0.077
							(0.480)
							1.341*
							(0.631)
							-0.136
							(0.702)
RANDOM EFFECTS							
τ_{ij}	0.396 ***	0.378***	0.375***	0.379***	0.379***	0.377***	0.374***
	(0.017)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
μ_{0j}	0.052 ***	0.052 ***	0.052 ***	0.043 ***	0.044 ***	0.044 ***	0.044 ***
	(0.014)	(0.014)	(0.014)	(0.012)	(0.012)	(0.012)	(0.012)
-2 LL (df)	2345.7(4)	2182.8 (7)	2175.1(12)	2176.8 (10)	2177.0 (8)	2172.1 (16)	2163.3 (22)
Δ -2 LL (df)		163.5***	7.7 (5)	168.9***	5.8*** (1)	4.7 (6)	13.5 (12)
		(3)		(3)			
Comparison Model		Model H	Model I	Model I	Model I	Model K	Model K
AIC	2353.7	2197.8	2199.1	2196.8	2193.0	2205.7	2207.3
BIC	2374.0	2232.0	2259.4	2247.1	2233.2	2291.3	2317.9

~ $p < .10$; * $p < .01$; ** $p < .05$; *** $p < .001$

Figure 1. Proportion of African American Classmates from a Random Sample of Ten Classes

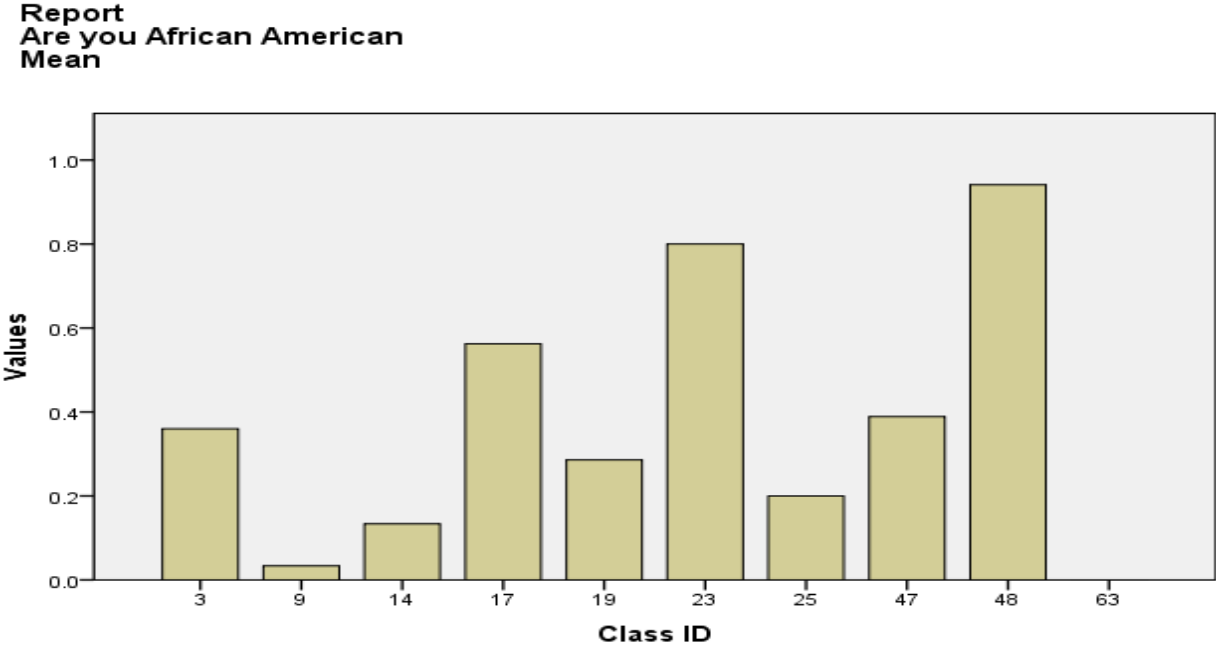


Figure 2. Proportion of Sexually Active Classmates from a Random Sample of Ten Classes

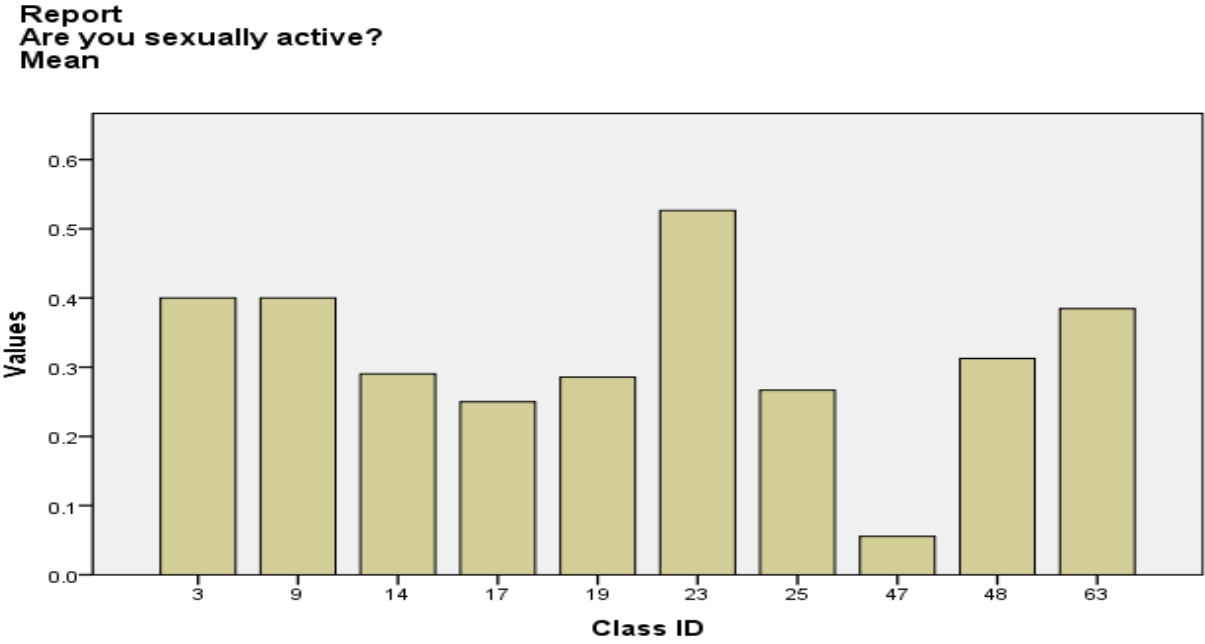


Figure 3. Posttest Waiting to Have Sex from a Random Sample of Ten Classes

```
Report  
COMPUTE POST_WaitToHaveSex=MEAN(post_WaitForSex1,  
post_WaitForSex2, post_WaitForSex3_RS, post_WaitForSex4,  
post_WaitForSex5, post_WaitForSex6)  
Mean
```



Figure 4. Posttest Resistance to Sexual Pressure from a Random Sample of Ten Classes

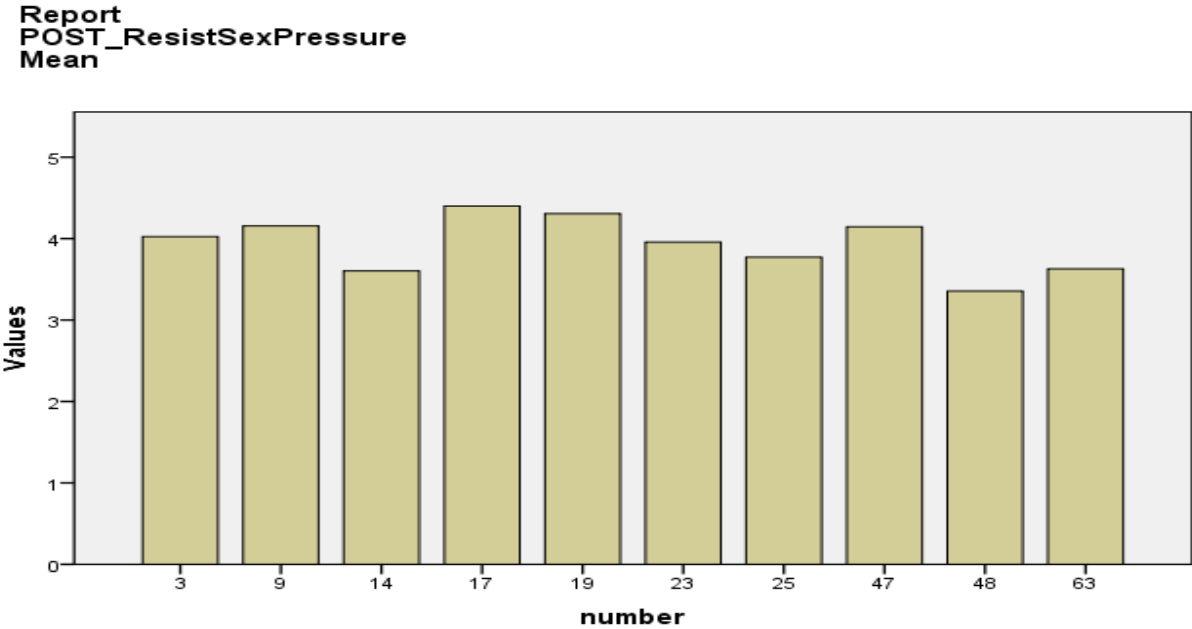


Figure 5. Prototypical Plot of the Proportion of African American Classmates and Waiting to Have Sex.

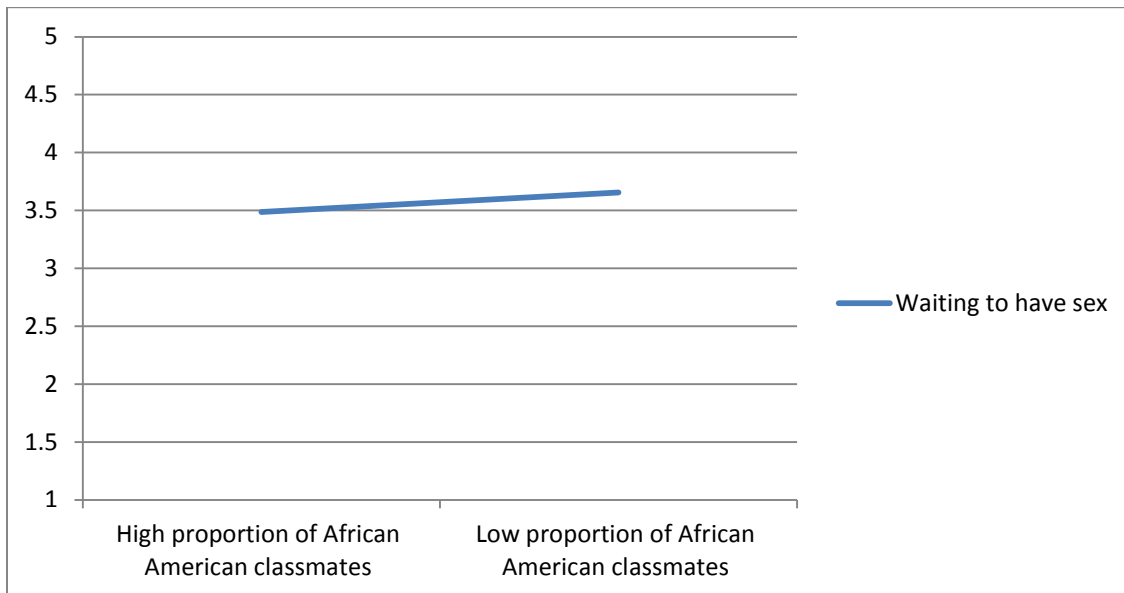


Figure 6. Prototypical Plot for Three-way Interaction including RE Program Participant, Gender, and the Proportion of African American Classmates on Resisting Sexual Pressure.

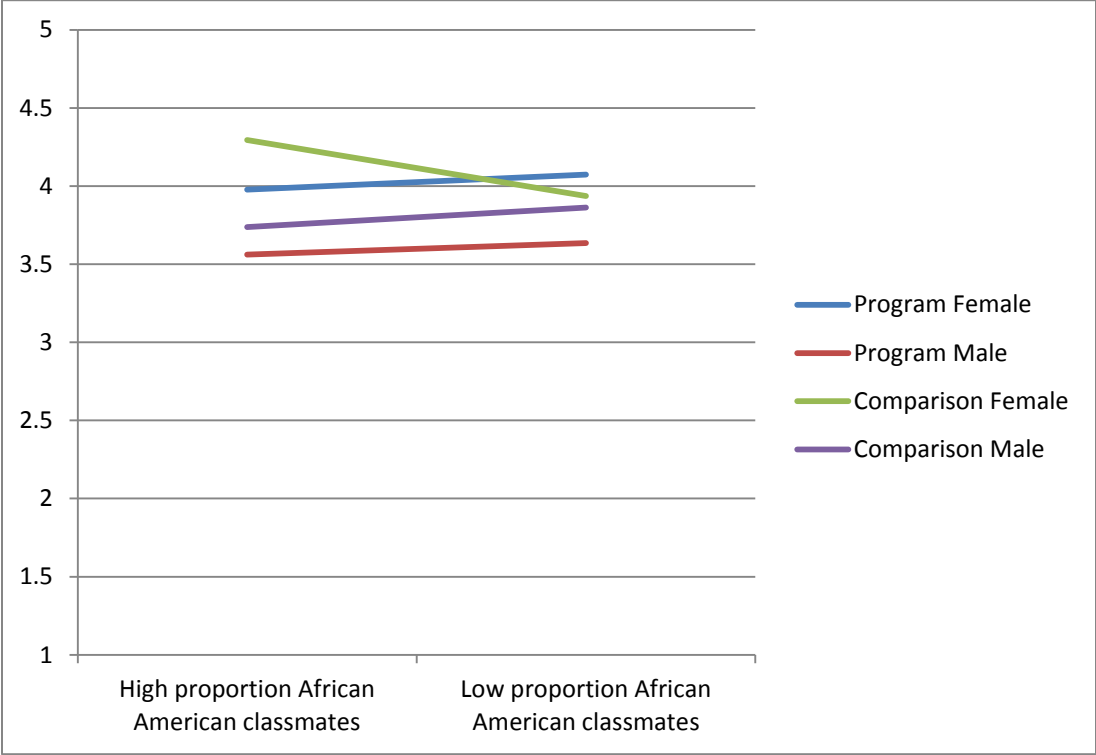


Figure 7. Prototypical Plot of the Proportion of Sexually Active Classmates on Waiting to Have Sex.

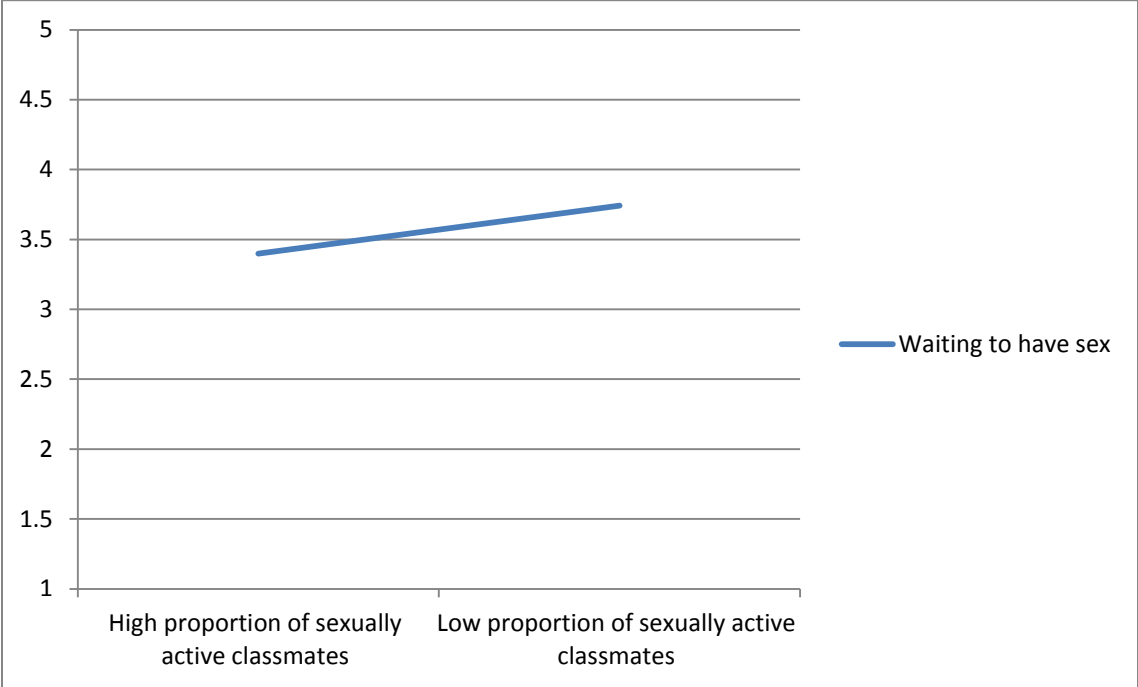


Figure 8. Prototypical plot of the Proportion of Sexually Active Classmates on Resistance to Sexual Pressure.

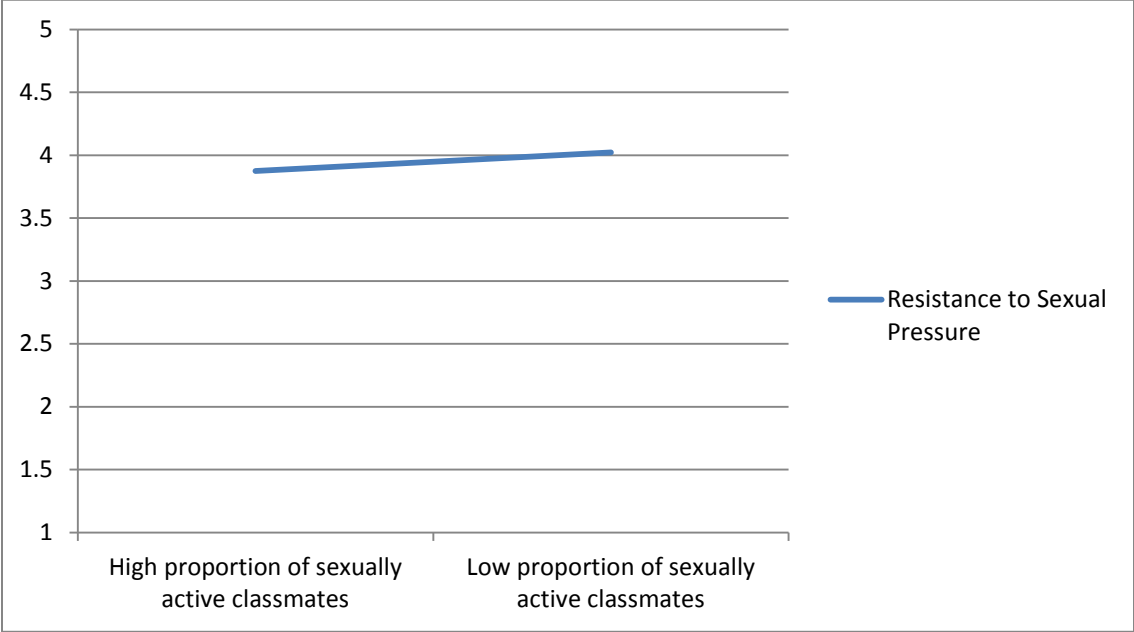


Figure 9. Prototypical Plot of the Interaction of Ethnicity and the Proportion of Sexually Active Classmates on Waiting to Have Sex.

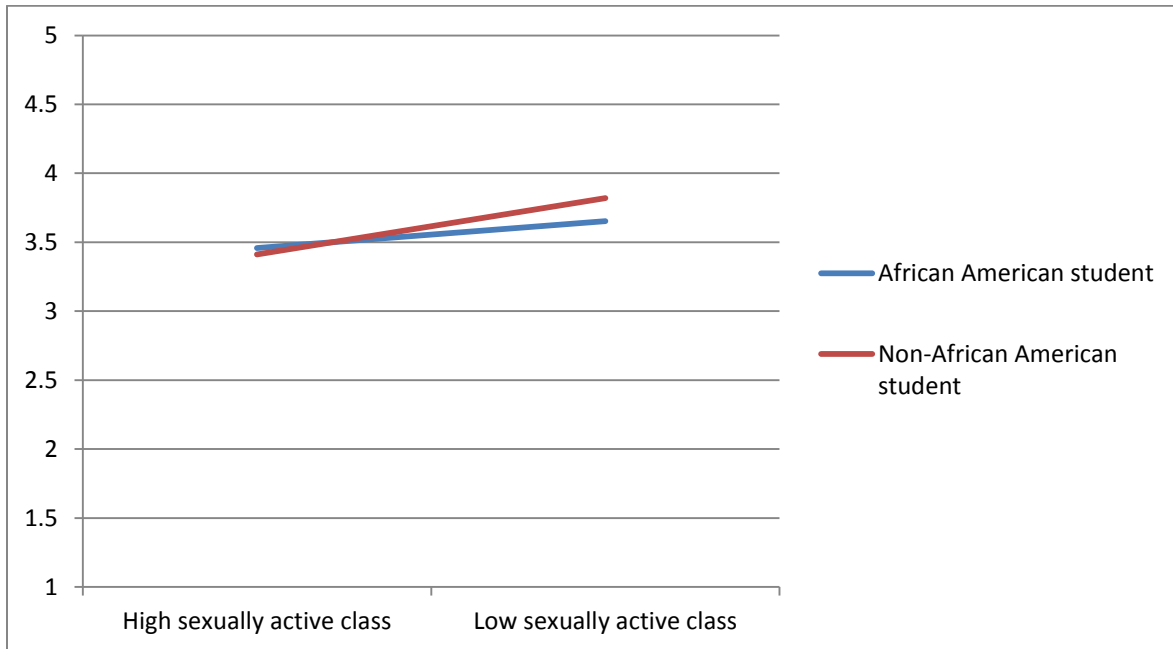


Figure 10. Prototypical Plot of the Three-way Interaction of Gender, RE Program Participant, and the Proportion of Sexually Activity Classmates on Waiting to Have Sex.

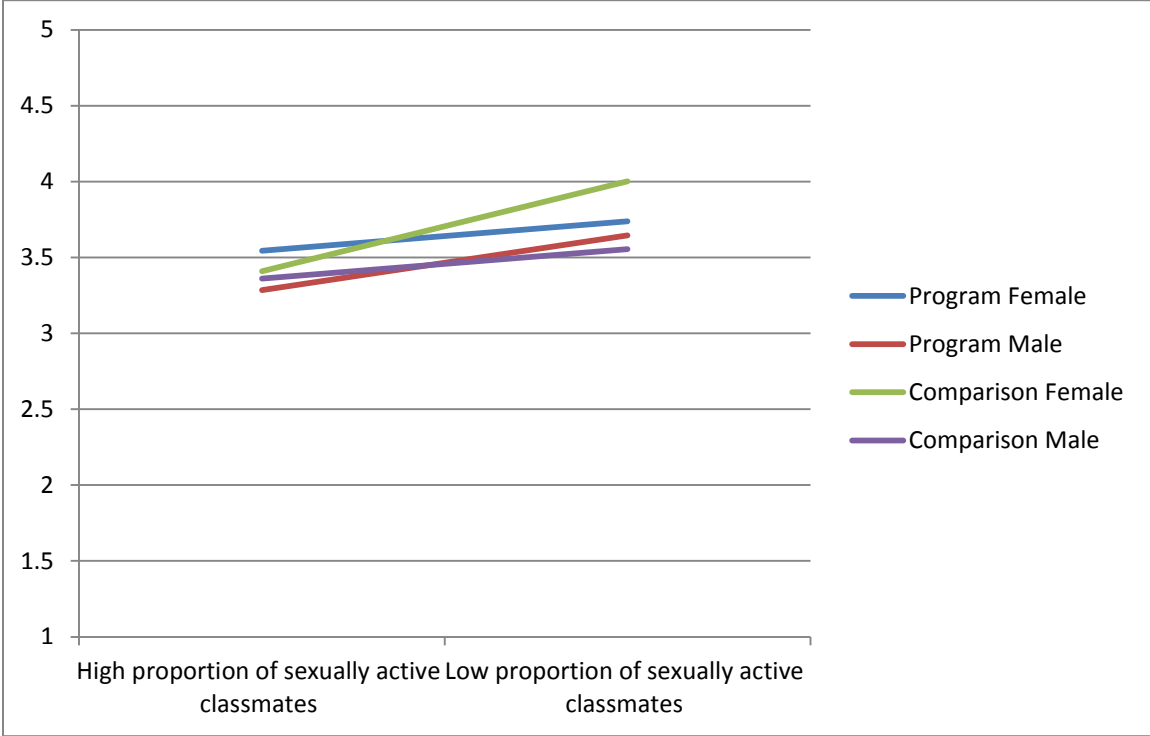
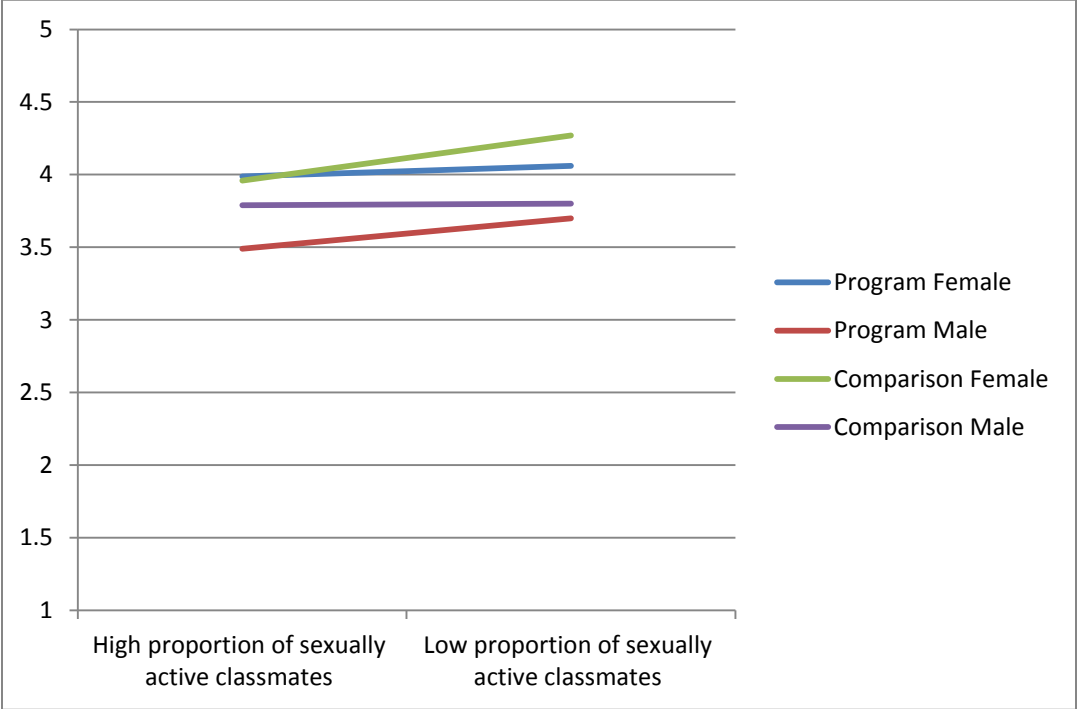


Figure 11. Prototypical Plot for the Three-way Interaction of RE Program Participant, Gender, and the Proportion of Sexually Activity Classmates on Resistance to Sexual Pressure.



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Appendix A

Waiting to Have Sex (Gardner, Giese, & Parrott, 2004)

Below are some questions about attitudes toward having sex before marriage. Please indicate the degree to which you agree/disagree with each statement by filling in the circle that describes you best. Some of these questions may seem extremely sensitive to you, but please try to answer them to the best of your ability. Remember that all your answers will remain completely confidential.

	Strongly Disagree	Disagree	Mixed/ Neutral	Agree	Strongly Agree
A. It is too risky for young teens to have sex.	○	○	○	○	○
B. Not having sex until marriage is the best choice a teen can make.	○	○	○	○	○
C. I intend to have sex when I am a teen.	○	○	○	○	○
D. I intend to wait to have sex until I can handle the things that may result from having sex.	○	○	○	○	○
E. Most people who are important to me think a person should finish high school before having sex.	○	○	○	○	○
F. I intend to finish high school without having sex.	○	○	○	○	○

Resistance to Sexual Pressure (Gardner, Giese, & Parrott, 2004)

Please indicate how much you agree/disagree with each statement by filling in the circle that describes you best.

	Strongly Disagree	Disagree	Mixed/ Neutral	Agree	Strongly Agree
A. If my partner wanted to have sex, but I didn't, I would find it pretty hard to say no.	○	○	○	○	○
B. I feel good enough about myself that I can say "no" to sex even if my friends are pressuring me to say "yes."	○	○	○	○	○
C. I intend to say "no" if I am pressured to have sex.	○	○	○	○	○
D. People should not pressure others into having sex with them.	○	○	○	○	○
E. It's okay for a boy to tell a girl that he loves her so he can have sex with her.	○	○	○	○	○