Published in final edited form as:

J Res Adolesc. 2011 December ; 21(4): 904–922. doi:10.1111/j.1532-7795.2011.00751.x.

Classroom Goal Structures and HIV/Pregnancy Prevention Education in Rural High School Health Classrooms

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Abstract

Over 5,000 adolescents enrolled in required rural high school health courses reported their perceptions of mastery and extrinsic goal structures in their health classrooms. Data were collected from all students at three time points (prior to HIV/pregnancy instruction, three months after instruction, and one year after instruction). Results indicated that classroom goal structures were related to both proximal and distal knowledge, attitudes, intentions, and efficacy beliefs. Results in particular indicate that the perception of a mastery goal structure in health education classrooms fosters knowledge, improved attitudes, enhanced efficacy beliefs, and lower intentions to have sexual intercourse.

School health classrooms represent one of the most potent venues for providing HIV/pregnancy prevention information to adolescent populations. Health education, which is a required course for most high school students in the United States (Education Commission of the States, 2006), offers teachers the opportunity to present effective curricula to adolescents, in order to prevent engagement in risky behaviors.

Although research clearly indicates that some prevention-based curricula are more effective than others (Kirby, 2001, 2007, 2009; Kirby & Laris, 2009), most research on classroom-based interventions aimed at HIV/AIDS prevention has focused on the development and evaluation of effective curricula, rather than the relations of specific instructional practices

to learning, attitudes, and motivation. In the present study, we extend previous research by examining the relations of students' perceptions of the motivational climates fostered in health classrooms to both proximal and distal outcomes within the context of HIV/ pregnancy prevention. Specifically, we examine the relations of students' perceptions of emphases on mastery goal structures (i.e., an emphasis on mastering the material because it is important and worth learning) and extrinsic goal structures (i.e., an emphasis on learning the material because it is required or will be on a test) to a variety of outcomes related to HIV and pregnancy prevention.

Motivation and Health Education

Motivation has been examined and considered as an important component in health education programs. However, as noted by Noar and his colleagues, most HIV and pregnancy prevention intervention programs have been framed in health-related theories of motivation, as opposed to theories that focus on achievement motivation (Noar, Anderman, Zimmerman, & Cupp, 2004). More specifically, previous research on HIV prevention has been framed in theoretical perspectives such as the Health Belief Model (Janz & Becker, 1984), Social Cognitive Theory (SCT) (Bandura 1986, 1997), the Transtheoretical Model (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994), Theories of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Theories of Planned Behavior (TPB) (Ajzen & Madden, 1986), the Information-Motivation-Behavioral Skills Model (Fisher & Fisher, 1992), the Multiple Domain Model (Zimmerman et al., 2007), the AIDS Risk Reduction Model (Catania, Kegeles, & Coates, 1990), and the Integrated Behavioral Model (IBM) (Fishbein & Capella, 2006; Montano & Kasprzyk, 2008). Noar et al. (2004) noted that when one looks across these theories, nearly all of them contain variables that assess attitudes, social norms, self-efficacy, and behavioral intentions. These all are important variables that have greatly contributed to our understanding of how to develop and implement effective HIV prevention programs. Nevertheless, these theories for the most part do not focus on psychological variables that are manifest *within the contexts of health classrooms*. Specifically, these theories do not focus on the social psychological phenomena that occur *during instruction*. We contend that the incorporation of motivational frameworks that emanate from studies of learning and from the fields of educational and social psychology should be applied to health education for adolescent populations (Anderman, Noar, Zimmerman, & Donohew, 2004; Noar et al., 2004). Specifically, in this study we propose that theoretical perspectives such as goal orientation theory, which are rooted in and were developed within the social contexts of classrooms, will yield new insights into the short- and long-term learning of health-related behaviors in adolescent populations.

Classroom Goal Structures

Research indicates that the instructional practices used by teachers in classrooms are perceived by students as being focused on several types of goals. Specifically, students perceive a *mastery goal structure* when teachers use a constellation of instructional practices that focus students on learning for the sake of learning, on truly mastering academic material, and on developing one's own understanding; students perceive an *extrinsic goal structure* in their classes when teachers use instructional practices that emphasize getting the

right answers and earning high test scores; and finally, students perceive a *performance-oriented goal structure* when teachers are perceived as using instructional practices that emphasize demonstrating one's ability relative to others (Ames, 1992; Ames & Ames, 1984; Kaplan, Middleton, Urdan, & Midgley, 2002; Midgley, 2002; Turner, et al., 2002; Wolters, 2004). Given the focus on testing in American schools, many classrooms are perceived as emphasizing multiple goal structures simultaneously; thus students in many classrooms can perceive both a mastery and an extrinsic goal structure (Midgley, 2002; Nichols & Berliner, 2007). In the case of HIV/pregnancy prevention instruction, students in classrooms characterized by a mastery goal structure would be likely to report that their health teacher encourages them to truly learn and understand information about HIV and pregnancy prevention; students in classrooms characterized by an extrinsic goal structure would be likely to report that their health teacher encourages them to learn material because it is a requirement, or because the students will ultimately be tested on what they have learned. As we review below, research suggests that these goal structures are in part created and maintained by teachers' instructional practices, and they are related in important ways to how students process and remember what they have learned.

Goal structures during adolescence

HIV and pregnancy prevention lessons in schools usually are provided for students during the adolescent years. Research indicates that perceptions of the goal structures in classrooms are related to the ways in which students cognitively process information that is presented to them; ultimately, these goal structures influence both short-term and long-term learning (E. M. Anderman & Wolters, 2006). Thus, it follows that in health education classrooms in particular, the types of goals that are stressed by teachers and perceived by students can have either positive or detrimental effects on important health-related outcomes. For example, learning about HIV and pregnancy prevention in a classroom characterized by a mastery goal structure should lead to more comprehensive and sustained learning about these issues, whereas learning in a classroom characterized by an extrinsic goal structure may lead to shorter-term learning (i.e., learning material for a test, but not for life) (Midgley, 2002).

Maehr, Midgley, and their colleagues have studied and described the types of instructional practices that lead to the perceptions of mastery or extrinsic goal structures in classroom settings (Maehr & Midgley, 1996). Specifically, instructional practices that are associated with perceptions of a mastery goal structure include: talking about and providing students with opportunities to learn academic material to the point of mastery; encouraging students to compare their current performance to *their own* previous performance; and encouraging students to focus on effort and personal improvement, rather than on social comparisons with others. In contrast, instructional practices that are associated with perceptions of an extrinsic goal structure include emphasizing grades and stressing the importance of tests and assessments (Anderman & Anderman, 2010).

Why Do Perceptions of Goal Structures Matter?

Although educators understand that outstanding curricular materials are important, research indicates that curricula alone do not necessarily lead to achievement. Specifically, the motivational climate or "goal structure" that is established in classrooms by teachers is

related to *how* curricular materials are implemented and learned. Although goal structures have been examined in traditional school subjects such as math, science, and English (e.g., Anderman & Midgley, 1997; Anderman, Griessinger, & Westerfield, 1998; Turner et al., 2002), research to date has not examined how goal structures are related to learning in health education. Unlike the content learned in traditional subjects, the information, attitudes, and efficacy beliefs related to HIV and pregnancy prevention that are acquired in health classrooms can have both immediate and long-term effects on health-related outcomes.

Research on classroom goal structures indicates that perceptions of a mastery goal structure are generally related to adaptive educational outcomes (e.g., increased motivation, use of more adaptive cognitive strategies, willingness to engage in challenging tasks, use of effective help-seeking strategies), whereas perceptions of an extrinsic goal structure are related to maladaptive educational outcomes (e.g., use of surface-level cognitive processing strategies, preference for simple tasks, increased academic cheating, limited effort) (Ames & Archer, 1988; E.M. Anderman, Griessinger, & Westerfield, 1998; L. H. Anderman, 1999; Midgley, 2002; Turner, et al., 2002). A thorough examination of the role of classroom goal structures might prove useful in explaining how health education classrooms can be more effective in their aim of promoting healthy lifestyles among adolescents. Therefore, in the present study, we specifically examine the relations of students' perceptions of mastery and extrinsic goal structures to proximal and distal outcomes related to HIV and pregnancy prevention.

HIV/Pregnancy Prevention in Rural Adolescents

Much of the research on the promotion of HIV and pregnancy prevention in adolescent populations has been targeted at youth living in urban communities (e.g. Jemmott, Jemmott, Braverman, & Fong, 2005; Jemmott, Jemmott, & Fong, 1998; Kirby, 2007). Indeed, for many years, researchers have treated HIV in particular as an urban problem (Grace, Soons, Kutzo, Alston, & Ramundo, 1999; Kirby, 2007, 2009). However, using data from the 2003 Youth Risk Behavior Survey (YRBS) and the National Longitudinal Study of Adolescent Health (Add Health), Snyder (2006) found no significant differences in the percentage of rural and urban adolescents who engage in sexual behavior. Other research (e.g., Hall & McKenna, 2005) indicates that HIV rates among adolescents and young adults are higher in some rural regions (e.g. Appalachia) than nationally. In addition, research suggests that rural adolescents may experience more boredom than do urban adolescents (Gordon & Caltabiano, 1996); the lack of opportunities in some rural regions may lead adolescents to engage in sexual behavior because there aren't enough viable alternatives for leisure-time activities. In the present study, we chose to focus on rural adolescents because prior studies have neglected this population. Indeed, with the exception of a few studies (e.g. Brody et al., 2005; Stanton et al., 2005), relatively little HIV/pregnancy prevention research has focused on adolescents living in rural regions.

In one study conducted in a rural setting, Stanton and colleagues (2005) attempted to modify a sexual risk reduction intervention, originally designed for urban youth, for Appalachian youth in West Virginia. Positive effects were reported for perceptions of abstinence, but not behaviors. The modified curriculum was not as effective as the original curriculum had been

in the urban setting because of unintended deviations in implementation and curriculum fidelity.

In his evaluation of fifty-four studies of STD/HIV education programs for teens, Kirby (2007) classified programs into five categories: curriculum-based programs, clinician-patient interactions in clinical settings, video- and computer-based programs, programs for parents and their families, and multicomponent programs. Across twenty-nine studies classified as comprehensive curriculum-based, two-thirds (66%) had a significant positive impact on one or more sexual behaviors or outcomes, and almost half (48%) had a positive impact on at least two or more behaviors. A large majority of the effective curriculum-based programs incorporated most of the common characteristics previously identified in successful curricula (Kirby, Laris, & Roller, 2006; Kirby, Roller, & Wilson, 2007). Put simply, results indicate that a substantial percentage of the successful comprehensive education programs significantly decreased one or more types of sexual behavior (Kirby, 2007, 2009). Unfortunately, fewer than 25% of the studies reviewed by Kirby (2007) included rural populations.

The Present Study

In the present study, we attempt to advance our understanding of rural adolescent HIV prevention by using a large sample of rural high school students to assess the relation of classroom goal structures to adolescents' knowledge, attitudes, intentions, and efficacy beliefs related to HIV and pregnancy prevention. We specifically examine the relations of goal structures to variables that have been identified as being important in terms of HIV prevention education. These variables include social cognitive variables such as self-efficacy for negotiating the use of condoms (Basen-Enquist et al., 1999; Corneille, Zyniewski, & Belgrave, 2008), self-efficacy for actual condom use (Brien et al., 1994; Cha, Kim, & Patrick, 2008), self-efficacy for refusing unwanted sex (Kasen et al., 1992; Seth, Paiji, DiClemente, Wingood, & Rose, 2009). We also examine other outcomes that have been recognized as being important health-related attitudes and behaviors including communication with parents about sex (Benavides, Bonazzo, & Torres, 2006; Halpern-Felsher, Kropp, Boyer, Tschann, & Ellen, 2004; Resnick et al., 1997), attitudes and intentions to have sex (Ajzen, 1991; Ajzen & Madden, 1986; Basen-Enquist et al., 1999; Zimmerman et al., 2007) knowledge about HIV/pregnancy prevention (Akpabio, Asuzu, Fajemilehin, & Bola, 2009; Kaponda et al., 2009; Rew, 2005), and expectancy and value beliefs related to HIV/pregnancy prevention (Anderman, Lane, Zimmerman, Cupp, & Phebus, 2009; Noar et al., 2004). We examine the relations of goal structures to these outcomes both at short-term follow up (4–6 months), and at long-term follow up (1-year), after controlling for background characteristics and the type of curriculum used in the classroom.

Based on previous research in other academic domains, we hypothesize that:

- (1) A perceived mastery goal structure in health education classrooms will be predictive of effective learning outcomes (e.g. knowledge about HIV/pregnancy prevention; communication with parents about health education topics) and the

development of protective attitudes (e.g. decreased intentions to engage in sexual intercourse) and efficacy beliefs, and

- (2) a perceived extrinsic goal structure in health education classrooms will be predictive of ineffective learning outcomes, and poorer attitudes, intentions, and efficacy beliefs.

Method

Participants

These data were collected as part of a five-year longitudinal study of HIV and pregnancy prevention in rural communities in Appalachia. Our study was conducted in this region because HIV is particularly prominent in rural regions of the United States, and because the proportion of all HIV cases in Appalachia is greater in youth aged 13–24 (14%) than it is for the same group nationally (11.1%) (Hall & McKenna, 2005). Two cohorts of students were followed from the beginning of 9th grade through the end of 10th grade.

School Sample

Thirty-eight high schools were initially recruited; of those schools, 32 agreed to participate. The six schools that chose not to participate were demographically similar to the others; one of the six schools was unable to participate because the health teachers already were using elements of our intervention, whereas another declined to participate because of strong religious beliefs in the community. In all of the participating schools, health education was offered during the 9th grade. Each school received \$1000 per year in return for participation in the study.

All students who participated in the study were enrolled in required health classes. Data were collected from two distinct cohorts at the same schools; it was necessary to utilize two cohorts because it enabled us to effectively double our sample size; in addition, our project staffing could not accommodate data collection from well over 5000 students within two years, but was able to manage this when split across two cohorts. Data were collected for the first cohort ($n = 3091$) during 2001 (waves 1 and 2) and 2002 (wave 3); for the second cohort ($n = 2784$), data were collected during 2003 (waves 1 and 2) and 2004 (wave 3).¹

Parental permission was provided for 76.8% of all ninth graders in the participating schools for all three waves of data collection prior to the administration of the baseline survey. A total of 5,798 ninth grade students completed the baseline survey (74.2% of all students). Retention rates (based on the original sample size) were 82% for the wave 2 survey, and 70.4% for the wave 3 survey. Forty-eight percent of the final sample was male, and 52% was female. In addition, 96.4% of the sample was European American, with the remaining 3.6% representing an array of ethnicities (1.1% African American, 1.3% other/mixed, 0.3% Asian/Pacific Islander, 0.5% Native American, and 0.5% Hispanic/Latino-American). There

¹We tested for differences between the two cohorts for all predictor and outcome variables. The only significant differences emerged for expectancy at time 3 [$t(3957) = 5.46, p < .001$; Mean cohort 1 = 4.86, Mean cohort 2 = 4.61], for value at time 1 [$t(5184) = 2.27, p < .05$]; Mean cohort 1 = 5.14, Mean cohort 2 = 5.06] and time 3 [$t(4006) = 4.17, p < .001$]; Mean cohort 1 = 4.84, Mean cohort 2 = 4.65], and for communication with parents at time 3 [$t(4054) = 2.48, p < .01$; Mean cohort 1 = 3.65, Mean cohort 2 = 3.55].

were 175 health classrooms in total, with an average of 31 students in each classroom. There were 65 unique health instructors, each of whom taught an average of three health classes per day.

Curriculum

Students received one of three different types of HIV/pregnancy prevention instruction, as part of their participation in a larger study of HIV/pregnancy prevention. Specifically, students in 13 schools received a shortened version of Barth's skills-based *Reducing the Risk* (RTR) curriculum (1996). RTR is a highly interactive, 17-unit classroom based intervention that focuses on decision-making and skill development in order to encourage adolescents to make deliberate and safe choices around sexual behavior. It is based in social learning theory (Bandura, 1977, 1986, 2001), social inoculation theory (Beck, 1995) and cognitive-behavioral theory (McGilly, 1994). The curriculum includes lessons on developing refusals, using refusal and delaying tactics, recognizing risky situations, getting and using protection, knowing and talking about protection, and integrating all of the aforementioned skills. Classroom discussions, role plays, discussions with parents, and reflective exercises are featured frequently in the lessons. For this study, we reduced the number of lessons to 12 in response to school concerns that they could not devote more lessons to the topic.

Twelve additional schools received a modified version of the skills-based curriculum (MRTR). The modified version of the curriculum, designed to reach high sensation seekers and impulsive decision makers, featured more interactive lessons and fewer role play activities, and included some redesigned activities that were unacceptable to some communities in original format (i.e., calling a clinic and shopping for condoms). In addition, in this version we modified the content of specific lessons in an attempt to make it more engaging, more edgy, and more interactive in order to have greater appeal for high sensation seekers. These modifications were designed to reach high sensation seekers and impulsive decision makers, and featured more interactive lessons and fewer role play activities. Students in the remaining seven schools were offered health education courses, but were not exposed to a skills-based sex education curriculum. Each of the thirty-two participating schools was randomly assigned to receive one of the three curricula. In all analyses, we controlled for the type of curriculum used in the school, so that we could examine relations between goal structures and our dependent variables, after having controlled for these curricular differences.

Measures

All scales were adapted from previously used measures. All measures that were selected for inclusion had excellent known psychometric properties. In addition, we calculated Chronbach's alpha for all measures at all waves to insure reliability with our sample. We included measures of condom negotiation efficacy (Basen-Enquist et al., 1999), condom self-efficacy (Brien, Thombs, Mahoney, & Wallnau, 1994), refusal self-efficacy (Kasen et al., 1992), communication with parents about sex (Resnick et al., 1997), and attitudes about waiting to have sex (Basen-Enquist et al., 1999). All continuous measures were calculated by using the mean response to the items in each scale; knowledge was assessed as the total number of correct responses to eight true/false items. The measures and corresponding

Cronbach's alpha coefficients are presented in detail in Appendix I. All measures except *knowledge* were averaged to create scales.

We assessed students' intentions to have sex with a single item. Specifically, we asked students, "How likely do you think it is that you will have sexual intercourse in the next four months?" Response choices were *1 = very sure I won't*, *2 = slightly sure I won't*, *3 = not sure if I will or won't*, *4 = slightly sure I will*, and *5 = very sure I will*.

In order to assess classroom goal structure, we adapted items from Midgley et al.'s *Patterns of Adaptive Learning Survey* (PALS) (Midgley et al., 1998; Midgley, 2002). The PALS has been used in many studies with diverse samples of adolescents. In previous research, the PALS has been adapted for use in a variety of academic domains, including mathematics, science, language arts, and social studies. In the present study, we adapted the measure for use in health classrooms by substituting the word "health" for other academic domains (e.g., instead of "math"). Goal structure scores were aggregated across classroom; we chose to aggregate goal structures so that we could model these measures at the classroom level. In terms of the validity of the items, the decision to aggregate is particularly useful in the present study because the items were all phrased in terms of students' perceptions of what happens "In this class" (see Miller & Murdock, 2007 and Murdock & Miller, 2009 for a discussion of aggregation of goal structures). The mastery and extrinsic goal structure scales were administered at wave 2 of the study.

Expectancies and values were assessed using measures that we adapted from Eccles and Wigfield's measures of these constructs (Eccles, Adler, & Meece, 1984; Wigfield et al., 1991). The expectancy measures assessed students' perceptions of their competence at learning new information about prevention, whereas the value items assessed students' beliefs about the utility, importance, and intrinsic value of learning about prevention HIV/pregnancy prevention. We previously have successfully adapted and tested these measures in other studies with different samples (e.g., Anderman et al., 2009).

We included a measure of impulsive decision-making (Donohew et al., 2000) as a control variable because research indicates that highly impulsive students are more likely to engage in risky sexual behaviors than are students who exhibit lower levels of impulsivity (Webster & Jackson, 1997). We also included a measure of respondents' perceptions of privacy while completing the survey instruments. This is a single item, developed by Zimmerman and Langer (1995). The item asks respondents "How much privacy do you feel you had when filling out this questionnaire?" with choices ranging from *1 = no privacy* to *5 = total privacy*.

Demographic data also were included in the analyses. These were all based on student self-report data reported at the baseline measurement. The measures included gender (*1 = female*, *0 = male*); age (*1 = 13*, *2 = 14*, *3 = 15*, *4 = 16*, *5 = 17*, *6 = 18 or older*); ethnicity (respondents indicated if they were (1) white (non-Hispanic), (2) Black/African-American, (3) Asian/Pacific Islander, (4) American Indian/Alaskan Native, (5) Hispanic/Latino(a), or (6) Other or mixed race); and grade point average (GPA) (*1 = Mostly A's*, ... *8 = Mostly below D*) (GPA was reverse-coded in our analyses, so that a high score represented a higher GPA). We used students' reports of whether or not they qualified for free or reduced-fee

lunch as a proxy for socioeconomic status (*1 = free lunch, 2 = reduced price lunch, 3 = pay full price*).

All independent variables were assessed at time 1 (baseline), including assessments of baseline measures for all dependent variables; all dependent variables were assessed both at time 2 and time 3, except the expectancy and value measures, which only were assessed at baseline and at time 3. Mastery and extrinsic goal structures were assessed at time 2.

Data Collection Procedures

Surveys were administered to students at three time points: (a) in 9th grade prior to receiving any HIV/pregnancy prevention instruction (baseline/time 1); (b) 4–6 months later (after having received instruction; time 2), and (c) at the end of the tenth grade (time 3). Given the primary nature of the study (reductions in risky sexual behaviors), it was necessary that ample time elapse between the baseline and follow-up surveys to allow for changes in the study variables to emerge; thus, students did not complete more than one survey in any given semester or classroom, but rather in three different classrooms over the course of two academic years.

The baseline questionnaires were administered during regular academic classes to all students who returned parental consent forms, and who gave assent; one class period (40–55 minutes) was allotted for students to complete the surveys. Standardized instructions were provided to all students. Follow-up questionnaires were administered either during physical education classes, or in communal spaces (e.g., the gym, the cafeteria, or the library, depending upon what was available at each school during the survey administration times). In addition, we took extra steps to insure the privacy of all students while completing the questionnaire. Specifically, each participant received a manila envelope containing a copy of the questionnaire. All students were told that their surveys were confidential. We used six different versions of the survey simultaneously, with different colors of paper and questions in different orders on each survey, in order to further increase privacy. Each student's survey was placed in a manila envelope, with a label indicating the student's name on the envelope; as the students received the envelopes with the surveys, the identification labels were removed in front of the student, so that they would see that their names did not visibly appear on any of the materials that they were completing. We used ultraviolet ink to mark identification numbers on the surveys, so that we could match surveys longitudinally (but so that students would see no visible identifiers on either their surveys or their classmates' surveys).

When surveys were returned to our offices, an ultraviolet light made the codes visible, and the ID code was then copied onto the front of each survey, using regular ink. The records indicating names and student codes were kept in locked filing cabinets, so that data were never directly linked with names. Approval of the research protocol was obtained from the Institutional Review Board at the University of Kentucky.

Results

Means, standard deviations, and correlations between measures assessed at multiple time points [baseline (T1), short-term follow up (T2) and one-year follow up (T3)] are presented in Table 1. Repeated measures were correlated over time, with the lowest correlation occurring between expectancy at T1 and at T3 ($r = .26, p < .001$), and the highest correlation occurring between attitudes toward waiting to have sex at T1 and at T2 ($r = .71, p < .001$).

Descriptive statistics for student-level predictor variables used in subsequent HLM models are presented in Table 2. The correlations in Table 2 indicate no potential multicollinearity issues among predictor variables; the strongest correlation was between grade point average and impulsivity ($r = -.30, p < .001$). In terms of the level-two predictors, there was a moderate positive correlation ($r = .30, p < .001$) between a perceived mastery goal structure (Aggregated Mean = 4.21, SD = 0.21) and a perceived extrinsic goal structure (Aggregated Mean = 3.48, SD = 0.39), suggesting that perceptions of mastery and extrinsic goal structures are likely to be related positively; thus in classrooms where there is a perception of a focus on mastery, there is also likely to be a perception of an extrinsic goal structure

Univariate analyses of variance were used to assess whether perceptions of classroom goal structures differed as a function of curriculum type. Results indicated no significant relations of curriculum type with students' perceptions of either a mastery or an extrinsic goal structure, $F(2, 4144) = 2.05, p = .129$ and $F(2, 4149) = .927, p = .396$ respectively.

Intraclass correlations (ICCs) are presented in Table 3. The ICC represents the percentage of variance that lies between level-two units (i.e., classrooms). The percentages of variance occurring between classrooms ranged from 5.5% (condom negotiation efficacy at time 2) to 11.6% (attitudes about sex at time 2).

Since students are nested in classrooms, we conducted all of our multivariate analyses using HLM 6.04 (Raudenbush & Bryk, 2002). All models were run using a full maximum likelihood estimation strategy in order to compare model fit across a series of nested models. We were interested in examining the relations of goal structures to both proximal (wave 2 - short term follow-up) and distal (wave 3 - one year after HIV/pregnancy prevention instruction) outcomes; therefore, separate HLM models were developed for the proximal and distal outcomes (all controlling for the measures at baseline). First, random-intercept models were run, including student-level predictors (gender, age, SES, grade point average, perceptions of privacy, and the baseline measure of the dependent variable). Second, classroom-level variables (aggregated perceptions of mastery and extrinsic goal structures) were entered as predictors of the intercept (while simultaneously controlling for the type of curriculum used in the classroom); slopes that varied significantly between classrooms were allowed to vary. In all cases where slopes varied significantly, aggregated perceptions of mastery and extrinsic goal structures were examined as predictors of those slopes. Finally, for all models, we compared model fit using deviance statistics for competing models. We also computed the percentage of between-classroom variance that was explained by each model. All student-level variables were group-mean centered, whereas classroom-level variables were grand mean-centered for the HLM analyses.

HLM Models for Self-Efficacy

We tested models examining predictors of proximal and distal indices of self-efficacy (condom negotiation efficacy, condom self-efficacy, and refusal self-efficacy). Results are presented in Table 4. After controlling for curricular differences at level-two, a classroom-level mastery goal structure was related both at time 2 and time 3 to higher condom negotiation efficacy and to higher refusal efficacy. For condom self-efficacy, a classroom-level mastery goal structure was related to higher efficacy only at time 2. Thus when students reported that their health teachers stressed mastery and improvement, students were more likely to report higher feelings of efficacy, after controlling for baseline measures, curriculum, and background characteristics, including impulsivity.

In contrast, a classroom-level extrinsic goal structure was related to lower condom negotiation efficacy at time 2, and to lower refusal self-efficacy both at time 2 and at the one-year follow-up. Perceptions of an extrinsic goal structure were unrelated to condom self-efficacy. Thus perceiving health instruction as being focused on memorizing facts and getting right answers was related to lower reports on various indicators of self-efficacy.

HLM Models for Attitudes, Parental Communication, Knowledge, and Intentions

We tested models examining predictors of attitudes about waiting to have sex, communication with parents, knowledge, and intentions to have sex. In all analyses, we again controlled for the time 1 measures as covariates. We used the time 2 and time 3 measures as separate outcomes in the HLM analyses.

Results are presented in Table 5. A classroom mastery-goal structure in health classrooms was related to more positive attitudes about waiting to have sex at time 2. Knowledge about HIV and pregnancy prevention, and communication with parents, also were related positively to the presence of a classroom mastery goal structure in health classrooms at time 2. In addition, the presence of a mastery-goal structure was related to lower intentions to have sex at time 2, even after controlling for intentions at baseline. Perceptions of a mastery goal structure were unrelated to these outcomes at time 3.

In contrast, a classroom extrinsic goal structure was related to poor attitudes about waiting to have sex both at time 2 and at the one-year follow up. An extrinsic goal structure also was related to lower knowledge both at time 2 and at one-year follow up. An extrinsic goal structure was unrelated to communication with parents.

HLM Models for Expectancies and Values

We tested models examining expectancies and values. In all analyses, we again controlled for the baseline measures. We used the time 3 measures as outcomes in the HLM analyses (expectancies and values were not measured at time 2 due to space limitations on the survey).

Results are presented in Table 6 for the one-year follow-up. Results indicate that when students perceived a mastery goal structure in health classrooms, both students' expectancies and valuing of learning about HIV and pregnancy prevention were related positively to the goal structure. Perceptions of an extrinsic goal structure were unrelated to either

expectancies or values. Female students reported higher expectancies and values than did males, and students with greater impulsive tendencies reported lower expectancies and values, after controlling for baseline measures of expectancies and values.

Additional Analyses

Additional analyses were conducted on all outcome variables to assess whether relations of mastery and extrinsic goal structures to outcomes were moderated by the type of curriculum used in the classroom (RTR, MRTR, or control). For nearly all outcomes, interactions were not present, indicating that the relations of perceived goal structures to the outcomes was unrelated to the type of curriculum used in the classroom. The only exceptions were that an interaction was found between perceived mastery goal structure and use of MRTR on attitudes toward waiting to have sex at Wave 2 ($\beta = .121, p < .05$) and knowledge at Wave 2 ($\beta = .225, p < .05$). In both cases, control and MRTR condition scores on the dependent variables were relatively similar in low mastery-focused classrooms (Wave 2 Attitudes: Control $M = .89$, MRTR $M = .88$; Wave 2 Knowledge DV: Control $M = 1.87$, MRTR $M = 2.36$), whereas MRTR scores were greater than the control condition in high mastery-focused classrooms (Wave 2 Attitudes: Control $M = .86$, MRTR $M = 1.09$; Wave 2 Knowledge DV: Control $M = .197$, MRTR $M = 2.90$). This interaction was also present for condom self-efficacy at Wave 3, ($\beta = -.089, p < .05$); condom self-efficacy was greater for the modified RTR condition in low mastery-focused classrooms (Control $M = 3.13$, MRTR $M = 3.19$), condom self-efficacy was greater for the control condition in high mastery-focused condition (Control $M = 3.24$, MRTR $M = 3.19$).

Explained Variance and Assessment of Model Fit

For each model, we calculated the amount of variance between classrooms that was explained by the level 2 predictors (aggregated goal structures and type of curriculum used) that were modeled as predictors of the intercepts. These are reported at the bottom of tables 4 through 6. In all cases, between-classroom variance was explained at both time 2 and at time 3. In most cases, more variance was explained at time 2 than time 3, as one would expect, since fewer months had transpired between survey administrations. Nevertheless, it is important to note that variance was still explained by the level 2 predictors at time 3 (one year later) in all of the HLM models; it also is important to note that the amount of variance explained varied widely across the different outcomes, beyond differences across waves.

In addition, since the level 2 predictors are of primary interest in the present study, we assessed the fit of each model by comparing the deviance statistics from the full model with the deviance statistics from the level-one model (i.e., the model that includes only student-level predictors). This is a more stringent and conservative model selection criterion than merely comparing the deviance of the empty (null) model to the full model. Specifically, a likelihood ratio test was used to assess model fit. The likelihood ratio test is used to assess the relative fit of a null model, which is nested within an alternative model (Snijders & Bosker, 2000). We used this test to assess the difference in the deviance (or lack of fit) of our models before and after the inclusion of our classroom-level predictors. When using Full Estimation Maximum Likelihood procedures in multilevel modeling, the difference between

two model deviances has a chi-square distribution with degrees of freedom equal to the difference in the number of estimated parameters between the two competing models.

Results for model fit are presented in Table 7. All of the full (two-level) HLM models displayed improved fit over the level-one models (i.e., models that included all student-level predictors without any classroom-level predictors), with the exception of condom negotiation efficacy at time 3, and communication with parents at time 3. Although these two models did not fit significantly better than the models that only contained student-level variables, each of those models did display better fit than the null models (i.e., the models with no predictors); specifically, the model for condom negotiation efficacy at time 3 fit the data better than did the null model (Deviance = 1620.97, $p < .001$), and the model for communication with parents at time 3 also fit better than did the null model (Deviance = 2109.77, $p < .001$).

Using the Raudenbush and Bryk (2002) convention for determining proportion of variance accounted for (*PVAF*), we found our classroom-level predictors explained variance in adjusted means for each dependent variable. *PVAF* for each outcome is presented at the bottom of tables 4 through 6. This statistic is comparable to the R^2 statistic in traditional OLS regression in that it represents reduction of residual variance as additional predictors are added to the multilevel model.

Discussion

In the present study, we examined the relations of classroom-level goal structures (mastery and extrinsic) to self-efficacy, attitudes, intentions, and motivational beliefs related to HIV and pregnancy prevention in a large sample of adolescents from rural areas of the United States. Results largely confirmed our hypotheses: the perceived presence of a mastery goal structure in health classrooms was related to a variety of outcomes that are highly valued in the public health domain. In contrast, the perceived presence of an extrinsic goal structure often was related to less desirable outcomes.

Mastery Goal Structures

When students perceived a mastery goal structure in their health classrooms, they reported higher levels of condom negotiation efficacy (both at T2 and one year later at T3), condom self-efficacy (at T2), and refusal self-efficacy (at T2 and T3). A classroom mastery goal structure also was related at Time 2 to more positive attitudes about waiting to have sex, better communication with parents, higher knowledge, and lower intentions to have sex. In addition, in classrooms where students on average reported a high mastery goal structure, both expectancies and values were high at one-year follow-up. All of the relations between mastery goal structures and the outcomes remain significant even after controlling for the measure at baseline, demographic variables, the type of curriculum that was used, and impulsivity.

The benefits of a perceived mastery goal structure have been well documented (e.g., Ames & Archer, 1988; L. H. Anderman, 1999; Midgley, 2002; Turner et al., 2002), but they have not previously been examined in the context of HIV and pregnancy prevention. Results of

the present study indicate that when students perceive that their health instruction emphasizes mastery, improvement, and self-comparisons, students develop more adaptive efficacy beliefs, attitudes, and motivation over time. For condom negotiation efficacy, refusal self-efficacy, and motivational beliefs (expectancies and values), these improvements were still evident one year after instruction occurred.

The results of this study suggest that a deliberate focus on mastery in health classrooms may lead to more effective learning. The benefits of a mastery goal structure in health classrooms are likely due to the fact that students are more likely to internalize information learned in this manner. As noted by Patrick (2004), the perception of a mastery goal structure involves both the cognitive recognition that the teacher wants the students to truly understand the material, and the feeling that the teacher is committed to supporting students' learning. Students in health classrooms that are characterized by mastery goal structures exhibit better and longer-term learning because of the instructional practices of their health teachers. Thus results of the present study indicate that when health teachers are perceived as emphasizing the importance of mastery of health-related information, students are more likely to internalize this information, and to show improved attitudes, beliefs, and intentions. Additionally, students in health classrooms that are characterized by mastery goal structures may be focusing on the global, long-term importance of learning about HIV and pregnancy prevention (e.g. enjoying one's youth, or maintaining a lifestyle free of major health complications), instead of the local, immediate pressures associated with retaining the material learned in their health classrooms (e.g. getting a high grade).

Extrinsic Goal Structures—The results of our study also suggest that an emphasis on learning for extrinsic reasons in health classrooms may be related to poorer learning outcomes for adolescents. When students perceived an extrinsic goal structure in their health classrooms, they reported lower condom negotiation efficacy at Time 2, and lower refusal self-efficacy both at Time 2 and at the one-year follow-up. An extrinsic goal structure also was related to students reporting that they would be less likely to wait to have sex (at both time points), and to lower levels of knowledge (at both time points). An extrinsic goal structure was unrelated to expectancies and values.

The deleterious effects of extrinsic goal structures also have been well documented (e.g. Anderman et al., 1998; Midgley, 2002; Wolters & Anderman, 2006), but not in the domain of HIV and pregnancy prevention. The present findings are salient because they suggest that instructional practices that focus students on learning about HIV and pregnancy prevention for extrinsic reasons (i.e., to get good grades) may actually undermine the teachers' instructional goals and long-term learning. When students are focused on getting good grades, they are likely to merely memorize facts, which may improve short-term factual learning, but is not likely to affect the long-term acquisition of skills (Anderman & Anderman, 2009). There is little reason for students to internalize and take ownership of information if they believe that they only need to learn it for a test.

It is important to note that goal structures were not predictive of all outcomes. Whereas perceived mastery and extrinsic goal structures were predictive of some proximal and distal outcomes, there were more significant relations for the proximal outcomes. This is in some

ways not surprising, since students are less likely to recall the specific goal structures emphasized in their classrooms one year later; nevertheless, the fact that perceived mastery goal structures were related to some distal outcomes (e.g., condom negotiation efficacy, refusal self-efficacy, and achievement values), and that perceived extrinsic goal structures also were predictive of distal outcomes (e.g., refusal self-efficacy and knowledge) suggests that the goal structures that are created by teachers in health classrooms are related to some important health outcomes over extended periods of time. We believe that qualitative studies that include interviews with students will allow for a better understanding of why goal structures are related differently to various outcomes.

Limitations

The present study has a number of limitations that must be acknowledged. First, all data are student self-report data. Whereas we went to great lengths to assure confidentiality and to provide privacy for respondents, some of the students may have been uncomfortable responding to some of the more sensitive items on our surveys. We did control for students' perceptions of privacy in all of our HLM analyses to at least partially account for this. Second, it is important to note that our sample exhibited limitations, including a lack of racial diversity, lower than desired response and retention rates, and the use of two separate cohorts of students. Third, although we collected data at three points in time, we chose not to present longitudinal analyses that examined change across the three waves of data. Instead, we deliberately decided to examine predictors of proximal and distal outcomes, controlling for the measures at baseline. We made that decision because we wanted to examine both the short- and long-term relations of classroom goal structures to student outcomes, rather than to examine predictors of change or rate of change. In addition, with only three time points, complex change (i.e., growth models) could not be easily modeled; additional time points are necessary for more accurate modeling of growth (Singer & Willett, 2003). Such models may help to explain the range of explained variance that was observed across the outcomes. Fourth, we recognize that perceived classroom goal structures are related to other characteristics of students and teachers (Midgley, 2002); consequently, it is important to note that the teachers who participated in this particular study may over- or under-represent teachers who emphasize either extrinsic or mastery goals in their classrooms. In addition, our data did not identify the specific mastery- or extrinsically-oriented instructional practices that were used in individual classrooms; this is clearly an important area for future investigations. Finally, although we controlled for type of curriculum used, it is still important to note that the fact that different curricula were used is a limitation; future studies using just one type of curriculum are warranted.

Implications for HIV and Pregnancy Prevention

There are important implications of these findings for HIV and pregnancy prevention efforts. Research strongly suggests that the goal structures (mastery and extrinsic) that are perceived in classrooms are related to the types of instructional practices that teachers use (Anderman & Maehr, 1994; Anderman, Maehr, & Midgley, 1999; Roeser, Midgley, & Urdan, 1996; Midgley, 2002). Specifically, when teachers focus students on truly mastering the material that is being covered in class, students are likely to adopt mastery goals; in contrast, when teachers focus on grades and extrinsic outcomes, students are likely to adopt

extrinsic goals. It is particularly noteworthy that the present results suggest that the same lesson can lead to either beneficial or deleterious outcomes, based on whether or not a mastery goal structure, and extrinsic goal structure, or both goal structures are perceived by the students in a particular health classroom.

Fortunately, research indicates that goal structures are malleable (Maehr & Midgley, 1996; Maehr & Anderman, 1993). Students are quite responsive to the types of instructional practices that are used in different classrooms; thus a student who perceives an extrinsic goal structure in one class may perceive a mastery goal structure in another class. In addition, students can certainly perceive both mastery and extrinsic goal structures in a health classroom at the same time (which is why we included both predictors in all of the HLM models). This is important, because the benefits of a mastery goal structure may be lessened when students also perceive an extrinsic goal structure (Midgley, 2002). Thus efforts to increase the presence of a mastery goal structure should not be blind to the need to decrease the perceived presence of an extrinsic goal structure. Consequently, future experimental research should examine how changes in teachers' instructional practices affect perceived goal structures in health classrooms, and ultimately how those changes affect student learning. Results of the present study suggest that future interventions aimed at training teachers to focus their students on mastery and improvement, and to de-emphasize test scores and extrinsic outcomes as reasons for participation, may lead to benefits for adolescents who are learning about HIV and pregnancy prevention in school.

A number of researchers have used Epstein's (1989) TARGET acronym as a suggested strategy for getting teachers to focus more on mastery and less on extrinsic outcomes during actual instruction. Although research on TARGET is reviewed in detail elsewhere (e.g., Maehr & Anderman, 1993), this research suggests that teachers in all subject areas (including health) should examine their instructional practices (in terms of their focus on mastery and extrinsic goal structures) in each of six domains described in TARGET: *tasks*, *authority* (control), *recognition*, *grouping*, *evaluation* and *time*. For example, when considering the academic "task" that is being used in any given health lesson, teachers should examine whether they are focusing students on truly mastering the task (i.e., on the inherent value of the task—that is, learning to use sexual refusal strategies in order to avoid unwanted sexual intercourse), or on simply on learning the material for a test; when considering "recognition," teachers should examine whether students are recognized for mastery and improvement (e.g., demonstrating mastery of refusal strategies), or for getting right answers and good grades. Research has clearly demonstrated that educators can learn to examine and change their practices using such systems, with beneficial results for students (Anderman et al., 1999; Maehr & Midgley, 1996).

Results of the present study also add to the literature on HIV and pregnancy prevention with rural adolescent populations. Research indicates that adolescents living in rural areas engage in sexual behavior as much as do adolescents in urban settings (Snyder, 2006); thus adolescents in rural regions clearly need to be educated about risky sexual behavior. Data from the present study suggest that professional development efforts that focus on the creation of adaptive classroom goal structures may be particularly important in for health teachers who work in rural high schools.

Conclusion—Results of the present study indicate that the instructional climates that are created in health classrooms via teachers' instructional practices are related to students' efficacy beliefs, knowledge, intentions to have sex, attitudes, and motivation. In general, perceptions of a mastery goal structure are related to beneficial student outcomes; in contrast, perceptions of an extrinsic goal structure are related to maladaptive student outcomes.

Instruction about complex and controversial topics such as HIV and pregnancy prevention in many ways does not fit well with a classroom extrinsic goal structure. The goal of most HIV and pregnancy prevention programs is to develop safer behaviors that students hopefully will carry with them throughout life. When teachers focus students on extrinsic outcomes (e.g., test scores) with such material, this may seem nonsensical to students, since so many of the take-home points of prevention curricula are subjective in nature. There simply are no clear right or wrong answers for much of what is learned. For example, an important outcome of HIV/pregnancy prevention curricula might be for students to display increased self-efficacy beliefs toward condom use; this is clearly a complex topic, and numerous strategies and skills must be taught, practiced, and discussed in order for students to develop positive efficacy beliefs. Instruction aimed at improving such efficacy beliefs fits well with a classroom mastery goal structure, since in such classrooms, teachers work with students to focus on understanding, learning, and improvement (i.e., teachers can work with students to improve over time the belief that adolescents can effectively negotiate the use of condoms). However, if the teacher focuses the students on extrinsic outcomes (e.g., memorizing information for a test), the subjective and complex nature of effectively implementing strategies to improve efficacy beliefs may become oversimplified in the students' minds, and the benefits may be lost in the students' attempt to memorize facts for a test. Students may not internalize these strategies as well if the teacher focuses the students on the extrinsic purposes of learning.

Implications of the results of the present study are important, because the goal structures that students perceive in health classrooms can be changed. Health education teachers can learn to adapt their instructional strategies so that mastery goal structures become more prominent, and extrinsic goal structures become less prominent, in high school health education classrooms. Ultimately, learning about HIV/pregnancy prevention, and perhaps other health-related issues, in classrooms that stress mastery may lead to improved health behaviors for adolescents and young adults.

Acknowledgments

The research reported in this paper was funded by a grant from the National Institutes of Mental Health (NIMH [R01MH061187](#)). We are indebted to Olga Dekhtyar for assistance with statistical analysis.

Appendix 1

Appendix 1

Items and Cronbach's Alpha

	$\alpha 1$	$\alpha 2$	$\alpha 3$
Attitudes toward Waiting to Have Sex (Basen-Enquist et al., 1999). I believe...	.87	.87	.85
<i>People my age should get as much sexual experience as they can.</i>			
<i>It is OK for people my age to have sex with a steady boyfriend or girlfriend.</i>			
<i>People my age should wait until they are married before they have sex.</i>			
<i>It is OK for people my age to have sex with someone they love.</i>			
Condom Negotiation Efficacy How sure are you that you would be able to...	.90	.94	.95
<i>Talk about using condoms with any sexual partner.</i>			
<i>Talk about using a condom if I were unsure of my partner's feelings about condoms.</i>			
<i>Talk a partner into using a condom when we have sexual intercourse.</i>			
Condom Self-Efficacy (adapted from Brien et al., 1994) I feel confident...	.83	.84	.86
<i>That I could put a condom on myself or my partner.</i>			
<i>That I could remember to use a condom even after I have been drinking alcohol.</i>			
<i>That I could use a condom correctly.</i>			
<i>That I could stop to put a condom on myself or my partner even in the heat of passion.</i>			
Communication with Parents About Sex	.86	.87	.88
<i>My parents try to understand how I feel about these topics.</i>			
<i>I can ask my parents the questions I really want to.</i>			
<i>My parents and I talk openly and freely about these topics.</i>			
Refusal Self-Efficacy (adapted from Kasen et al., 1992). How sure are you that you would be able to say no to having sexual intercourse with someone...	.92	.94	.94
<i>You want to date again.</i>			
<i>Who you want to fall in love with you.</i>			
<i>Who is pushing you to have sexual intercourse.</i>			
<i>Who refuses to use a condom.</i>			
<i>Who is older than you are.</i>			
<i>Who dates a lot of people.</i>			
Classroom Mastery Goal Structure (adapted from Midgley, 2002). In my health class.....		.86	
<i>It's OK to make mistakes as long as you are learning.</i>			
<i>It is important to understand the work, not just memorize it.</i>			
<i>Trying hard is important.</i>			
<i>Really understanding the work is the main goal.</i>			
<i>Learning new ideas and concepts is very important.</i>			
<i>How much you improve is really important.</i>			
Classroom Extrinsic Goal Structure (adapted from Midgley, 2002). In my health class.....		.89	

	a1	a2	a3
<i>It is important to get high scores on tests.</i>			
<i>Getting right answers is very important.</i>			
<i>Getting good grades is the main goal.</i>			
Impulsive Decision Making (Donohew et al., 2000).		.79	
<i>I think about all of my choices carefully.</i>			
<i>I do the first thing that comes into mind.</i>			
<i>I compare all the good and bad things that might happen.</i>			
<i>I go with whatever feels right to me.</i>			
<i>I consider what effect it will have on my health.</i>			
<i>I don't even think about it; I just do it.</i>			
<i>I do whatever I think will be the most fun.</i>			
<i>I do the opposite of what my parents think I should do.</i>			
<i>I like to do things as soon as I think about them.</i>			
<i>I consider if it will be good or bad for my future.</i>			
<i>I act on the spur of the moment.</i>			
Expectancy (adapted from Eccles, Adler, & Meece, 1984; Wigfield et al., 1991)	.72		.83
<i>Compared to most of your other subjects, how good are you at learning about the prevention of pregnancy and HIV? (a lot worse.....a lot better)</i>			
<i>How good would you be at learning something new about the prevention of pregnancy and HIV? (not good at all.....very good)</i>			
Value (adapted from Eccles et al., 1984; Wigfield et al., 1991)			
<i>Compared to most of your other activities, how useful is learning about the prevention of pregnancy and HIV?</i>			
<i>For me, being good at learning about the prevention of pregnancy and HIV is... (not at all important... very important).</i>			
<i>In general, I find learning about the prevention of pregnancy and HIV... (very boring.... very interesting).</i>			
<i>How much would you like learning about the prevention of pregnancy/HIV? (a little.....a lot).</i>			
<i>Compared to other things you learn about in school, how much would you like learning about the prevention of pregnancy and HIV? (not as much... a lot more)</i>			
Knowledge: Total Correct (true/false)	N/A	N/A	N/A
<i>Latex condoms are better than animal-skin condoms for preventing STD's including AIDS.</i>			
<i>Using a condom whenever you have sex with someone with an STD will probably protect you from getting the disease.</i>			
<i>The best time to talk to a partner about sex is right before sex, when it's on their mind.</i>			
<i>The chance of getting pregnant when no protection is used is 1 out of 25.</i>			
<i>Using condoms is the most effective way of all methods to avoid pregnancy AND sexually transmitted disease.</i>			
<i>The only teens who really need to worry about getting AIDS are homosexuals and injecting drug users.</i>			
<i>HIV is the only sexually transmitted disease that cannot be cured.</i>			
<i>Most people who have AIDS look sick.</i>			

Note. All scales used 5-point Likert-type response anchors, except the expectancy and value scales, which used 7-point anchors. For all scales, higher scores are indicative of more adaptive/positive outcomes. For the measures of knowledge,

we examined test-retest reliabilities; the measure at Time 1 was correlated at $r = .38$ with the measure at Time 2 and at $r = .35$ with the measure at time 3 ($p < .001$); the time 2 and time 3 measures were correlated at $r = .47$, $p < .001$.

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Table 1

Correlations and Descriptive Statistics

Variable	Mean T1	SD T1	Mean T2	SD T2	Mean T3	SD T3	T1 to T2	T1 to T3	T2 to T3
Condom Negotiation Efficacy	3.77	1.28	3.87	1.27	3.87	1.25	.33***	.27***	.32***
Condom Self Efficacy	4.38	0.88	4.35	0.90	4.33	0.90	.39***	.27***	.37***
Refusal Self Efficacy	3.58	1.23	3.57	1.24	3.61	1.24	.44***	.35***	.40***
Attitudes: Wait to Have Sex	3.40	1.24	3.23	1.23	3.17	1.16	.71***	.61***	.69***
Communicate with Parents	3.72	1.16	3.57	1.20	3.59	1.17	.58***	.52***	.58***
Knowledge	3.68	2.01	3.96	2.18	4.09	2.32	.38***	.35***	.47***
Intentions to Have Sex	2.33	1.41	2.93	1.53	3.26	1.53	.60***	.48***	.65***
Expectancy	5.19	1.35	--	--	4.72	1.43	--	.26***	--
Value	5.09	1.39	--	--	4.74	1.43	--	.38***	--

Note. All scales range from 1 through 5, except knowledge (range 1 through 8) and expectancies and values (range 1 through 7).

Table 2

Correlations Between Predictor Variables

Variable	Mean	SD	Age	GPA	SES	Privacy
Age	2.51	0.68	---			
GPA	5.75	1.73	-.23***	---		
SES	1.16	0.90	-.08***	.22***	--	
Privacy	3.89	0.99	-.02	.07***	.24***	
Impulsivity	2.80	0.61	.09***	-.30***	-.07***	-.09***

Table 3
Intraclass Correlations

	Tau	Sigma-Squared	ICC	$\chi^2(179, N=5,625)$
Attitudes About Sex T2	0.109	1.415	0.116	467.382***
Attitudes About Sex T3	0.069	1.290	0.100	367.115***
Condom Negotiation Efficacy T2	0.019	1.598	0.055	230.633**
Condom Negotiation Efficacy T3	0.032	1.542	0.068	269.065***
Condom Self Efficacy T2	0.016	0.789	0.064	277.660***
Condom Self Efficacy T3	0.015	0.789	0.066	283.558***
Communication with Parents T2	0.009	1.432	0.048	182.899
Communication with Parents T3	0.020	1.338	0.062	232.183**
Expectancy T3	0.094	1.949	0.096	357.135***
Value T3	0.058	1.977	0.077	310.266***
Intentions to Have Sex T2	0.097	2.255	0.088	415.224***
Intentions to Have Sex T3	0.076	2.261	0.081	324.720***
Knowledge T2	0.253	4.502	0.098	288.739***
Knowledge T3	0.191	5.202	0.084	287.040***
Refusal Self Efficacy T2	0.034	1.513	0.067	288.74***
Refusal Self-Efficacy T3	0.035	1.502	0.071	287.00***

Note. ICCs are adjusted for reliability of each measure. All variation between classrooms is significant, as per χ^2 tests, $p < .01$, except communication with parents T2 (NS) and T3 ($p < .01$).

Table 4

Full HLM Models Predicting Self-Efficacy

	Condom Negotiation Efficacy T2	Condom Negotiation Efficacy T3	Condom Self Efficacy T2	Condom Self Efficacy T3	Refusal Self Efficacy T2	Refusal Self-Efficacy T3
Intercept	3.91***	3.88***	4.41***	4.39***	3.52***	3.67***
Mastery	0.66***	0.38**	0.20*	0.10	0.50***	0.30*
Extrinsic	-0.23***	-0.10	0.06	0.03	-0.33***	-0.24***
RTR	-0.01	-0.01	-0.09	-0.11*	0.14*	-0.06
MRTR	-0.00	0.00	-0.02	-0.00	0.08	-0.03
Female	0.19***	0.24***	-0.08**	-0.05	0.50***	0.50***
Age	-0.08*	-0.07*	-0.04	-0.01	-0.06*	-0.04
GPA	0.06***	0.10***	0.02	0.06***	0.09***	0.11***
SES	0.07**	-0.00	0.01	0.02	0.03	0.02
Privacy	0.12***	-0.10***	0.04**	0.06***	0.07**	0.06**
Impulsivity	-0.06	-0.03	-0.02	-0.04	-0.22***	-0.14***
Baseline (T1)	0.28***	0.22***	0.38***	0.27***	0.28***	0.21***
Deviance	11925.80 (14)	11088.27 (14)	9150.131080 (14)	8715.827551 (14)	11114.791417 (14)	10552.417116 (14)
Tau	0.00493	0.04151	0.01932	0.01183	0.03435	0.04587
Sigma Squared	1.36345	1.35573	0.64656	0.71511	1.08825	1.19075
χ^2	185.51 (171)	286.90*** (171)	294.89775*** (171)	267.58353*** (171)	303.30024*** (171)	321.22419 (171)***
Level-1 N	3,785	3,504	3,776	3,464	3,775	3,473
Level-2 N	176	176	176	176	176	176
Variance Explained By Level 2 (compared to Level 1)	78%	10%	11%	18%	41%	18%

Table 5
Full HLM Models Predicting Changes Attitudes, Communication, Intentions, and Knowledge

	Attitudes: Wait to Have Sex T2	Attitudes: Wait to Have Sex T3	Communication with Parents T2	Communication with Parents T3	Knowledge T2	Knowledge T3	Intentions to Have Sex T2	Intentions to Have Sex T3
Intercept	3.03***	3.01***	3.52***	3.55***	3.43***	3.67***	3.17***	3.52***
Mastery	0.37**	0.04	0.25**	0.20 ^t	0.98***	0.32	-0.36*	0.02
Extrinsic	-0.28***	-0.17*	0.03	-0.04	-0.57***	-0.34**	0.12	0.17 (p=.055)
RTR	0.36***	0.30***	0.09	0.06	0.84***	0.75***	-0.41***	-0.43***
MRTR	0.26**	0.19*	0.02	0.03	0.65***	0.38***	-0.25**	-0.28**
Female	0.22***	0.21***	-0.04	0.07*	0.07	0.35***	-0.05	0.03
Age	0.01	-0.01	-0.00	0.05	-0.16**	-0.16**	0.05	0.00
GPA	0.08***	0.09***	0.01	0.00	0.25***	0.30***	-0.09***	-0.10***
SES	-0.01	0.01	0.02	-0.03	0.01	0.01	0.00	0.01
Privacy	0.06***	0.04	0.07***	0.08	0.07	0.11**	-0.03	-0.00
Impulsivity	-0.11***	-0.14***	-0.01	-0.04	-0.11*	-0.06	0.26***	0.24***
Baseline (T1)	0.60***	0.50***	0.60***	0.50***	0.36***	0.34***	0.57***	0.47***
Deviance	9885.37820 4 (14)	9535.249034 (14)	10864.887312 (14)	10134.117635 (14)	15847.42624 1 (14)	15227.83210 4 (14)	11870.13891 9 (14)	11882.93278 1 (14)
Tau	.12739	.08327	.01733	0.03669	.15288	.16235	.13126	0.06902
Sigma Squared	.70572	.80203	.95061	0.97187	3.58355	4.23812	1.38788	1.71886
χ^2	729.33*** (171)	490.35*** (171)	256.19*** (171)	312.42*** (171)	336.00*** (170)	314.73*** (171)	479.51 (171)	317.53*** (171)
Level-1 N	3,869	3,574	3,878	3,575	3,826	3,535	3,695	3,488
Level-2 N	176	176	176	176	175	176	176	176
Variance Explained By Level 2 (compared to Level 1)	22%	19%	22%	4%	53%	41%	19%	34%

^t
p=.07

Table 6

HLM Models for Expectancies and Values at One-Year Follow-Up

	Expectancy	Value
Intercept	4.57***	4.70***
Mastery	0.53***	0.40**
Extrinsic	0.02	0.12
RTR	0.23**	0.06
MRTR	0.14	-0.01
Female	0.41***	0.41***
Age	-0.07	-0.00
GPA	0.04**	0.05**
SES	-0.05	-0.06*
Privacy	0.14***	0.14***
Impulsivity	-0.10**	-0.11**
Baseline (T1)	0.23***	0.33***
Deviance	11891.147493 (171)	11780.878940 (171)
Tau	0.08556	0.06590
Sigma Squared	1.71768	1.63108
χ^2	346.72*** (171)	323.72*** (171)
Level-1 N	3,487	3,512
Level-2 N	176	176
Variance Explained By Level 2 (compared to Level 1)	20%	17%

Table 7

χ^2 Tests of Model Fit

Variable	Difference of L1 and L2 Deviance
Condom Negotiation Efficacy T2	39.581333***
Condom Negotiation Efficacy T3	9.259789
Condom Self-Efficacy T2	12.542881*
Condom Self-Efficacy T3	12.337558*
Refusal Self-Efficacy T2	40.816369***
Refusal Self-Efficacy T3	13.420831**
Attitudes: Waiting to Have Sex T2	32.727875***
Attitudes: Waiting to Have Sex T3	20.285902***
Communication With Parents T2	12.621023*
Communication With Parents T3	4.712467
Knowledge T2	73.442208***
Knowledge T3	37.811617***
Intentions to Have Sex T2	24.418429***
Intentions to Have Sex T3	25.97111***