Developmental Trajectories of Religiosity, Sexual Conservatism and Sexual Behavior among Female Adolescents

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Abstract

Understanding the role of socio-sexual cognitions and religiosity on adolescent sexual behavior could guide adolescent sexual health efforts. The present study utilized longitudinal data from 328 young women to assess the role of religion and socio-sexual cognitions on sexual behavior accrual (measuring both coital and non-coital sexual behavior). In the final triple conditional trajectory structural equation model, religiosity declined over time and then increased to baseline levels. Additionally, religiosity predicted decreased sexual conservatism and decreased sexual conservatism predicted increased sexual behavior. The final models are indicative of young women's increasing accrual of sexual experience, decreasing sexual conservatism and initial decreasing religiosity. The results of this study suggest that decreased religiosity affects the accrual of sexual experience through decreased sexual conservatism. Effective strategies of sexual health promotion should include an understanding of the complex role of socio-sexual attitudes with religiosity.

Keywords

adolescence; religion; sexual behavior; sexual conservatism; longitudinal study

Introduction

The majority of adolescents in the United States participate in religious groups or traditions (Smith, Denton, Faris, & Regnerus, 2002) and adolescent religiosity is associated with the expression of sexual behaviors (Steinman & Zimmerman, 2004). An interesting dynamic surrounds the relationship of adolescent religiosity and sexual behavior. Although evangelical Protestant youth hold less permissive sexual attitudes compared to other religious youth, they are among the youngest religious group to initiate intercourse (Regnerus, 2007). There appears to be a clash of cultures in which religious youth exist as "a unique dialectic of sexual-conservatism-with-sexual-activity, a combination that breeds

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instability and the persistent suffering of consequences like elevated teen pregnancy rates" (p. 206) (Regnerus, 2007). The present study will focus on how the "sexual-conservatism-with-sexual-activity" effect is shaped by measuring the developmental interactions of religiosity, sexual conservatism, and sexual behavior in a sample of mostly African-American young women.

Adolescent Religiosity and Sexual Behavior

Cross-sectional research has found greater adolescent religiosity is associated with lower sexual risk behavior including decreased number of sex partners, later age of first coitus and lowered proportion of sexual intercourse with an unknown partner (McCree, Wingood, DiClemente, Davies, & Harrington, 2003; Rostosky, Regnerus, & Wright, 2003; Steinman & Zimmerman, 2004). Age of first coitus, for instance, was later for African-American female adolescents who reported high religiosity or more frequent church attendance (McCree, Wingood, DiClemente, Davies, & Harrington, 2003). Cross-sectional research has consistently shown a relationship between higher religiosity and decreased sexual risk behavior.

Longitudinal research indicates that higher religiosity is associated with greater delay of first sexual intercourse and decreased sex frequency. For instance, adolescent virgins who reported high religiosity were less likely to have had sexual intercourse two years later (Hardy & Raffaelli, 2003). Additionally, parental reports of adolescent church attendance and adolescent self-reports of higher levels of satisfaction in attending church predicted increased age at first sexual intercourse (Miller et al., 1997). Meier (2003) used data from the Add Health study (1995 and 1996) to examine the relationship between religiosity and first sexual intercourse in 15- to 18-year-olds. Higher reported religiosity at baseline was associated with decreased likelihood that the adolescents had their first coital event by follow-up, especially among female adolescents. Lastly, in a sample of African-American adolescents, frequency of religious attendance was negatively associated with sexual frequency. Specifically, decrease in religious attendance was associated with increase in sexual intercourse frequency (Steinman & Zimmerman, 2004). A recent study explored the developmental change of religiosity, which decreased from adolescence to adulthood (Koenig, 2001; L. B. Koenig, McGue, & Iacono, 2008). Thus, there is evidence from cross-sectional and longitudinal data that adolescent religiosity affects adolescent sexual behavior outcomes.

The possibility for reciprocal or bidirectional effects between religiosity and sexual behavior has been assessed with mixed results. Cross-sectional research has found that change in intercourse frequency is associated with lower religiosity (Benda & Corwyn, 1997; Thornton & Camburn, 1989). However, research utilizing more than one time point has not found a bidirectional effect between adolescent religiosity and sexual behavior (Hardy & Raffaelli, 2003; Meier, 2003; Steinman & Zimmerman, 2004).

Religiosity, Sexual Conservatism, and Adolescent Sexual Behavior

A working definition of sexual conservatism is the endorsement of traditional sexual morés regarding adolescent sexual relationships (i.e., sexual intercourse before marriage is morally wrong). In general, religiosity has been associated with conservative attitudes towards sex (Lefkowitz, Gillen, Shearer, & Boone, 2004; Thornton & Camburn, 1989). Research with emerging adults has also found increased sexual conservatism to be associated with decreased sexual behavior (Lefkowitz et al., 2004) and later age of intercourse (Simons, Burt, & Peterson, 2009). There have been similar findings with adolescents. Cross-sectional research with adolescent samples has found religiosity to be associated with conservative attitudes toward sex, such as the disapproval of premarital sex (Miller & Olson, 1988;

Sheeran, Abrams, Abraham, & Spears, 1993; Thornton & Camburn, 1989) Similarly, in a study of African-American male adolescents, conservative sexual attitudes were related to decreased sexual risk-taking (Jemmott & Jemmott, 1990). Lastly, in a recent review of longitudinal research on adolescent sexual behavior, socio-sexual cognitions (i.e., less conservative sexual attitudes) were among the more robust predictors of first coitus (Zimmer-Gembeck & Helfand, 2008).

In a study that explored the longitudinal impact of religiosity and sexual conservatism on adolescent behavior, higher religiosity at baseline was associated with decreased likelihood of first coitus (Meier, 2003). Additionally, adolescents' permissive, or less conservative, attitudes toward sexual intercourse decreased the influence of reported religiosity on first sexual intercourse. The results from this study indicate "the dynamic process of religiosity and attitude change" in regards to sexual intercourse.

Religion and Race Effects on Sexual Behavior

Our understanding of adolescent sexual behavior has not been attentive to issues regarding race and sexuality (Thigpen, Pinkston, & Mayefsky, 2003). Although there are race differences for age of first sex and number of life-time partners (Centers for Disease Control and Prevention, 2006), too often research has focused on sexual risk behavior (HIV/STI and pregnancy) rather than the development of sexuality. The role of religiosity on the expression of sexual behavior has been strongest for minority women (Zimmer-Gembeck & Helfand, 2008). Hence, it is important to understand the normal sexual development and role of religion among African-American young women.

Relevant Covariates of Religion on Adolescent Sexual Behavior

Personal variables, other than religiosity and sexual conservatism, have been related to sexual behavior for adolescents. For instance, depression in youth has been linked to early age of first sex, lack of contraception and having a child (Zimmer-Gembeck & Helfand, 2008). Moreover, sensation seeking has been positively related to sexual permissiveness (Hendrick & Hendrick, 1987) and a risk preference personality trait labeled "adventure seeking" affected religiosity for men and women (Miller & Hoffmann, 1995). Because they have been shown to influence sexual behavior and religiosity among female adolescents, we included thrill-seeking and depressed mood as baseline predictors to control for them, and better assess whether religiosity and sexual conservatism had an effect on sexual behavior, independent of these two variables. Therefore, we will also assess the unique role of both depression and sensation seeking in the present study.

Theoretical Perspective

Reference group theory suggests that individuals use social groups as frames of reference for their attitudes and behaviors (Merton & Rossi, 1950). In modern society, because people identify with multiple groups, often ones with conflicting standards and norms, an individual will behave in accordance with the expectations of whatever group is serving as a reference point for that individual at the time (Mirande, 1968). Utilizing reference group theory, research with college students has found that greater religiosity is associated with less sexual activity (Lefkowitz et al., 2004; Zaleski & Schiaffino, 2000), and that sexual behavior tends to be consistent with the standards and behavior of the peers with which college students are affiliated (Mirande, 1968). Those in early and middle adolescence face conflicting pressures from peer groups, family, religious organizations and many other potential reference groups. Adolescents are generally still living with their families, but peers are beginning to exert more influence (Steinberg, 1986). Most adolescents in the United States also participate in religious traditions or activities (Smith et al., 2002). Reference group theory suggests that adolescents will align their sexual attitudes and behavior with the standards and expectations

of the group with which they feel most affiliated. Thus, we expect religiosity to predict sexual conservatism and behaviors.

Summary

In this study, we assessed the reciprocal role of religiosity, sexual conservatism, and sexual behavior in African-American young women. Gaps in the research literature include a lack of developmental trend analysis. Most of the research reviewed on adolescent religiosity, sexual conservatism, or sexual behavior was cross-sectional or utilized only two time points, which precludes the assessment of developmental trends. Although research on adolescent religiosity and sexual behavior has included sexual conservatism, this is the first analysis to measure all three variables in tandem over multiple time points. Our study serves both to address the limitations of cross-sectional research and to expand on the longitudinal research of adolescent religiosity and sexual behavior. Additionally, we assessed these issues in a sample of African-American female adolescents, a group at increased risk for HIV and STDs. Religion plays a significant role in the lives of African-American adolescents; they have higher rates of church attendance than White or Latino youth, and are more likely to be involved in a religious youth group for all four years of high school than White or Latino youth (Smith et al., 2002). Previous research has addressed the effect of religion on sexual behavior in this population (Zimmer-Gembeck & Helfand, 2008), but, the developmental interactions of religiosity, sexual conservatism and sexual behavior have not been assessed longitudinally.

Based on previous research and our theoretical perspective, we explored three research hypotheses: 1) The first focuses on the *within variable* developmental change in religiosity, sexual conservatism and sexual behavior. Consistent with previous literature, we hypothesized that religiosity and sexual conservatism would decrease while sexual behavior would increase over time (Koenig et al., 2008). 2) We expected that decreased religiosity and sexual conservatism would predict increased sexual behavior over time rather than increased sexual behavior predicting decreased religiosity and sexual conservatism. 3) We also hypothesized that change in religiosity and sexual conservatism would continue to predict change in sexual behavior even when baseline influences of age, depressed mood, and thrill-seeking were included.

Methods

Procedures and Setting

The research reported here was part of a longitudinal study of the development of female adolescents' sexual behavior and sexually transmitted infections. The larger study was initiated in 1999, and data collection was completed in 2009. We examined the stability of self-reported religiosity and sexual conservatism, developmental trends, and the relationship between religiosity and depressed mood, thrill-seeking, and sexual conservatism. We included thrill-seeking and depressed mood as baseline predictors in the analyses to validate our measures of religiosity and sexual conservatism and to include variables that have been shown to influence sexual behavior and religiosity among female adolescents.

Data collection procedures included daily diaries; in-depth, quarterly in-person interviews; and yearly, self-report questionnaires. All of the measures and demographic data utilized in this report were extracted from questionnaires that were completed at Baseline, Year two, Year three, and Year four. The university institutional review board approved this study. Written informed consent was obtained from all participants as well as permission from parents. Adolescents were compensated $20 for the time and effort required to complete the questionnaires at each time point.

Participants

Participants were 328 adolescents recruited from one of three primary care adolescent clinics in Indianapolis, Indiana. These clinics serve primarily urban, minority areas with low-to-middle income residents. The neighborhoods are also characterized with high rates of teenage pregnancy and sexually transmitted infections (STIs). Adolescents were eligible for the larger study if they were between 14 and 17 years of age, spoke English, and were not pregnant at the time of enrollment since pregnancy can influence the expression of sexual behavior, a primary outcome for this project. Participants who subsequently became pregnant after enrollment, however, were allowed to continue. Previous sexual experience was not a requirement for study inclusion. Eligible clinic patients were approached at the time of clinic visit or were referred to the study by a health care provider. All eligible patients were invited to participate. The larger study had 387 young women. The majority of participants (91%) self-identified as African-American and the mean maternal level of education was 12th grade. Participants were between the ages of 14 and 17 at baseline, and between 18 and 21 at Year four.

Not all participants completed the full set of available questionnaires by the conclusion of the study. This resulted in "missing" data at different waves of the study. To reduce the impact of missing data, yet to maximize sample size available for analysis and permit modeling of nonlinear change, we included subjects who had completed at least two, but no more than four waves of data. For instance, we excluded 59 adolescents who completed only baseline questionnaires (59/387 = 15.2%), leaving 328 with two or more waves completed, and who were qualified for inclusion. Additionally, we excluded individuals (N = 18; 5.4%) with five waves of data to eliminate the potential influence of outliers, since they were significantly older and we were not able to gather additional data since the study concluded.

Of the 328 retained for this study, 13.8% (45/328) contributed two annual questionnaires, 26.9% (88/327) completed three annual questionnaires, and 41.1% (135/328) contributed four annual questionnaires. The impact of "missingness" was evaluated in two ways: between those who were and were not retained for the present study and between those who contributed two, three or four annual questionnaires. No significant differences were found in baseline age, sexual openness, sexual self-efficacy, or number of sexual partners between adolescents included and not included in the present analysis. No significant relationships were found in these same groups with sexual experience, oral sexual experience, and/or race. These analyses were then repeated among groups of the present study participants; no significant differences were found.

In total, young women contributed 1121 annual visits. About 29.9% of all visits occurred at baseline (328/1121), 27.5% of visits occurred at Year two (309/1121), 23.8% of visits occurred at Year three (267/1121), and 19.3% of visits occurred at Year four (217/1121). Participants averaged age 15 at Year 1 (Mean=15.8, SD=1.1), 16 at Year 2 (Mean=16.7, SD=1.1), 17 at Year 3 (Mean=17.6, SD=1.1) and 18 at Year 4 (Mean=18.6, SD=1.5).

Measures

Sexual behavior—Sexual behavior was assessed by asking if the adolescent had engaged in a list of sexual behaviors at any time in life (dichotomous scoring, yes or no). These nine behaviors included: my partner touched my breasts, touched my partner's genitals, my partner touched my genitals, deep kissing, oral sex received, oral sex given, coitus, sexy dancing, and anal sex. The item was totaled at each of the four waves. We utilized a hierarchical index of heterosexual sexual behaviors as the outcome measure. We conducted a Mokken scaling analysis with this measure, which will be described in the results section.

This sexual behavior scale is identical to scales utilized in similar studies with adolescent samples (Hennessy, Bleakley, Fishbein, & Jordan, 2008).

Religiosity—Four items were utilized to assess the adolescent's' degree of religiosity. They included the following items.

How important is it for you:

1. To rely on religious teachings when you have a problem?

2. To believe in God?

3. To rely on your religious beliefs as a guide for day-to-day living?

4. To be able to pray when you're facing a personal problem?

A three-point Likert scale was utilized for this measure ("Not Important," "Important," or "Very Important"). Total scores for this measure can range from 4 to 12, with higher scores indicating greater religiosity (Baseline coefficient alpha = .83). This scale is similar to other studies assessing a variety of religious beliefs or experiences (Meier, 2003).

Sexual conservatism—Four items were utilized to assess sexual conservatism. They included the following items. How important is it:

1. To wait to have sex until marriage?

2. To wait to have sex until you are older?

3. To wait to have sex until you are in love?

4. To be considered a virgin?

A three- point Likert scale was utilized for this measure ("Not Important," "Important," or "Very Important."). Total scores can range from 4 to 12, with higher scores indicating greater sexual conservatism (Baseline coefficient alpha = .78). The sexual conservatism scale is similar to other measures assessing attitudes toward abstinence (B. C. Miller, Norton, Fan, & Christopherson, 1998).

Depressed mood—Adolescents' depressed mood in the past six months was assessed using a four-item measure (Baseline coefficient alpha = .81). This measure has a three-point Likert response scale ranging from "not at all" to "a lot." An item example includes, "In the past 6 months, have you just felt really down about things?"

Thrill-seeking—We utilized three items to measure adolescents' thrill-seeking behavior in the past six months (Baseline coefficient alpha = .80). Responses were based on a three-point Likert scale ("hardly ever," "several times" or "often"). An item example includes, "How often in the past 6 months have you done something dangerous just for the thrill of it?" Thrill-seeking items are similar to scales assessing risk preferences, which have been utilized in previous studies assessing adolescent religiosity (Miller & Hoffmann, 1995).

Analysis

Mokken Scaling Analysis for Hierarchical Sexual Behavior Measure—We conducted a Mokken scaling analysis of the nine-item scale at each of the four time points. A Mokken analysis is particularly useful when the goal of the study is to measure the onset and accumulation of sexual behaviors (Hull, Hennessy, Bleakley, Fishbein, & Jordan, 2011; Van der Ark, 2007). A Mokken analysis allows for a version of the alpha coefficient for dichotomous items to be explored, and it also classifies items in terms of their difficulty, or

relative frequency. For instance, in a recent study validating a hierarchical measure of lifetime sexual behavior, "deep kissing" was the least difficult, or most often endorsed, item (68% endorsement for young men and women), while anal sex was the most difficult, or least often endorsed, item with 12% male and 9% female endorsement(Hennessy et al., 2008). The resulting summed score includes items that were passed, or endorsed. Scales are evaluated for unit dimensionality (i.e. less difficult or more common items are endorsed prior to more difficulty and less common items) by using Loevinger's *H* coefficient. H values above 0.5 are indicative of a "strong" scale (Mokken, 1971). We conducted the Mokken scaling analysis with R package (Van der Ark, 2007).

Analytic Framework—Latent growth curve (LGC) analysis was utilized to model change in religiosity, sexual conservatism, and sexual behavior over time (Curran & Hussong, 2002). LGC represents a useful tool for assessing not only the initial values and average change rates in these variables, but also for examining inter-individual differences in intra-individual variability (McArdle & Bell, 2000). Although there are several statistical methods available for establishing LGCs, this analysis employed a structural equation modeling (SEM) (Bollen & Curran, 2006) framework since we were interested in understanding how changes in developmental trajectories mutually affect one another over time. This question was enhanced through the introduction of exogenous predictor variables, as the SEM approach to LGC analysis also provides a direct method for simultaneous testing and evaluation of hypotheses (Bollen & Curran, 2006).

We conducted latent growth curve analysis using AMOS, 5.0 (Arbuckle, 2003) with a full information maximum likelihood (FIML) estimation method. FIML was utilized to adjust the analysis for respondents with differing numbers of annual visits.(Arbuckle, 2003; Bollen & Curran, 2006) Sample size was sufficiently large (N>200) (Bollen & Curran, 2006) for FIML analyses.

Because the same model fitting procedures were utilized for all models, the process is described followed by a description of only the final unconditional growth model for each variable. In evaluating the overall goodness-of-fit of individual models, authors have argued that nonsignificant ($p < .05$) chi-square values and a comparative fit index greater than 0.90 and 0.95 indicate, respectively, acceptable and excellent fit to the data (Hu & Bentler, 1999). The root mean square error of approximation (RMSEA) index measures the relative lack of fit for a model; values less than .05 and .08 are considered, respectively, to indicate a close fit and a reasonable fit. Comparisons across nested models were performed using a difference of chi-square test.

One advantage of LGC entails the ability to determine the optimum shape of the trajectory (for example, linear, quadratic, cubic, or freed loading). Thus analyses were conducted in three steps. In the first step, unconditional developmental trajectories were fit individually to religiosity, sexual conservatism, and sexual behavior. Each of these was tested against alternative models to determine the best fitting model for each variable. We began with a linear model (Figure 1) for each trajectory; more details are provided in a subsequent section. These unconditional models yield *within variable* information about the mean initial value and rate of change over time, any covariance between start point and rate of change, as well as individual variability in initial value and change over time.

In the second step, using the best fitting forms of each variable, a triple trajectory model was fit between religiosity, sexual conservatism, and sexual behavior. Causal paths were added between the religiosity and sexual conservatism intercepts to the sexual behavior intercept and between the religiosity and sexual conservatism slopes to the sexual behavior. Finally,

the intercept and slope factors for religiosity, sexual conservatism, and sexual behavior were covaried (Figure 2).

In the third step, we retained the model from the previous step and added age, depression, and thrill seeking as exogenous predictor variables of sexual behavior. This was done to examine the influence of baseline effects, *net* of the reciprocal influences examined in the second step.

Results

Mokken Scaling Analysis

Mokken scaling was conducted for the nine items at each of the four time points. Similar to other studies, the "sexy dancing" item was not selected as a scalable item (Hennessy et al., 2008) Loevinger's *H* of the resulting eight item scale at baseline was .66 for Year one, Year two was .63, Year three was .65, and Year four was .62. The value of *H* was over .5 at each time point, indicating "strong" scalability.

Descriptives

Table 1 includes the means and standard deviations of the study measures; Figure 3 illustrates the general pattern of change in each variable over four years. As shown, religiosity goes down from Baseline to Year three and then increases to the same score evidenced at Baseline. Sexual behavior increases steadily from Baseline (mean of four behaviors) to Year four (mean of six behaviors). Sexual conservatism decreases from Baseline (mean of six) to Year four (mean of five).

Unconditional Growth Trajectory Results

Unconditional growth curve models describe the basic *within variable* developmental change quality over time (Research Hypothesis 1). Unstandardized estimates for each model are presented in Table 2; standardized estimates, where appropriate, are provided below.

Religiosity

The growth trajectory indicates an initial religiosity score of about 10 (intercept: $M = 9.81$, $SE = 0.09$, $p <. 00$), with significant individual variability around this value (intercept: $var = 1.73$, $SE = 0.31$, $p < .00$). Over time, religiosity initially decreases (slope: $M = -0.19$, $SE = 0.06$, $p <. 01$), although individuals vary in this decrease (slope: $var = 0.42$, $SE = 0.15$, $p < . 01$). However, the freed loading estimate (B = 0.43, $p < .00$) suggested that, after an initial decrease, 43.3% of the developmental change (an increase) occurred between the 3rd and 4th year. The covariance between the intercept and slope was not significant (cov = −0.22, SE = 0.81). Excellent fit for the data was indicated (Table 2).

Sexual behavior

The two factor LGC suggested an average increase in sexual behavior over time (slope: $M = 0.60$, $SE = 0.05$, $p < .00$) from a start point of about four (intercept: $M = 4.08$, $SE = 0.13$, $p < .00$), with individual variability in initial value and in the rate of increase over time (intercept: $var = 4.13$, $SE = 0.45$, $p < .00$; slope: $var = 0.32$, $SE = 0.07$, $p < .00$). A significant, negative covariance of initial values and change rate (*cov* = −0.53, $SE = 0.07$, $p < .00$) suggested that those who began at lower initial scores of sexual behavior noted steeper increase in accrual of sexual behavior over time as compared to those who began at higher scores. Model fit indices (Table 2) suggest excellent fit.

Sexual conservatism

A two factor model, with the last time loading freed, provided the best fit for sexual conservatism. The growth trajectory indicates an initial sexual conservatism score of about eight (intercept: $M = 8.05$, $SE = 0.11$, $p < .00$), with significant individual variability around this value (intercept: $var = 2.51$, $SE = 0.41$, $p < .00$). Sexual conservatism decreased between Baseline and Year three (slope: $M = -0.56$, $SE = 0.06$, $p < .00$); individuals varied in this decrease (slope: $var = .13$, $SE = 0.31$, $p < .01$). The freed loading estimate (B = 0.49, $p < .00$) suggested that, after an initial decrease, 49.3% of the developmental change (in this case, an increase) occurred between the third and fourth year. The covariance between the intercept and slope ($cov = -.23$, $SE = 0.31$, $p = .05$) indicates that individuals with a higher initial score of sexual conservatism tended to report a more pronounced decrease. Excellent fit for the data was indicated (Table 2).

Unconditional Triple Trajectory Model

In the second step, a triple trajectory model (Figure 2) was specified using each best fitting model format of religiosity, sexual conservatism, and sexual behavior. This permitted us to isolate how baseline values and how change in religiosity and sexual conservatism reciprocally influence change in sexual behavior (Research Hypothesis 2). Latent factors between religiosity and sexual conservatism were covaried; causal paths were drawn from the religiosity and sexual conservatism latent factors to the sexual behavior latent factors (Figure 2). Unstandardized model estimates and fit statistics, as well as standardized effects, are presented in Table 3.

We also examined an alternative model in which the initial scores of sexual behavior predicted initial scores and qualities of change in religiosity and sexual conservatism, and change in sexual behavior predicted change in religiosity and sexual conservatism. These changes produced a higher chi-square (χ^2 (df) = 56.07 (34), $p = .02$) and decrement in model fit indices (*IFI* = .99; *TLI* = .96; *CFI* = .98; RMSEA (90% CI) = .04 (.02 - .06). Therefore, we retained the original model.

A significant covariance between the religiosity intercept and the sexual conservatism intercept ($cov = .88$, $SE = 0.26$, $p < .00$) and between the religiosity slope and the sexual conservatism slope ($cov = .23$, $SE = 0.09$, $p < .05$) suggested that, respectively, higher baseline religiosity was associated with higher baseline sexual conservatism, and that decrease in religiosity over time was associated with decline in sexual conservatism over time. Focusing on causal effects, higher initial sexual conservatism was associated with lower initial sexual behavior (B = $-.60$, $p < .00$). Further, decline in sexual conservatism over time predicted an increase in sexual behavior over time (B = $-.-0.43$, $p < .00$). Fit statistics indicate excellent model fit (see Table 3).

Conditional Triple Trajectory Model

In the third step, we retained the triple trajectory model and added age, depression, and risk taking as exogenous predictor variables on sexual behavior. This permitted us to isolate how religiosity and sexual conservatism reciprocally influence sexual behavior, *controlling for* baseline influences of age, depression, and risk taking on sexual behavior (Research Hypothesis 3). Older age (B = 0.34, $p < .00$) and higher baseline depression (B = 0.28, $p = .00$) were associated with higher initial scores of sexual behavior. Controlling for these influences, a higher initial score of sexual conservatism was associated with a lower initial score of sexual behavior (B = -0.95, $p < .00$), and a decline in sexual conservatism remained a significant predictor of increase in sexual behavior over time (B = -0.41, $p < .05$). Fit statistics indicate good model fit (see Table 4).

Discussion

The present study found young women's development to be characterized by an accrual of sexual experience, decreasing sexual conservatism, and initial decreasing religiosity. Religiosity predicted change in sexual conservatism and decreased sexual conservatism predicted increased sexual behavior. This suggests that decreased religiosity affects the accrual of sexual experience through decreased sexual conservatism. In the following discussion, we will highlight developmental patterns (Research Hypothesis 1), the interaction of these developmental patterns (Research Hypotheses 2 and 3), and future research directions.

Developmental Patterns

We found both similarities and discrepancies with previous research. For instance, decreased religiosity during adolescence has previously been reported (Jessor & Jessor, 1977; Kerestes, Youniss, & Metz, 2004; Smith et al., 2002; Steinman & Zimmerman, 2004). Our data, however, point to a more complex developmental trajectory for young women. Although religiosity decreased over time, by Year four religiosity scores had returned to baseline scores. Research has indicated that African-American young women have higher rates of religiosity in comparison to other race and gender groups (Zimmer-Gembeck & Helfand, 2008). Hence, it appears that over time our sample of primarily African-American young women was more apt to return to their religious roots. This suggests that in the face of multiple standards, there is first a rejection (or lessening of importance) and then a reaffirmation of religious beliefs.

Sexual conservatism also decreased until Year four when sexual conservatism rates stabilized. In contrast to religiosity, sexual conservatism did not reach the same score as baseline rates. It should be noted that the range of sexual conservatism was 4 to 12. Sexual conservatism at Year one averaged 6, and by Year four the average score was just over 5 (see Table 1), indicating low rates of sexual conservatism in our sample. Even though rates of sexual conservatism were low, change in sexual conservatism was statistically significant and, as will be discussed below, predicted change in sexual behavior.

Our measure of sexual behavior steadily increased over time. We utilized Mokken scaling analysis for this measure, which has been utilized with other studies assessing diverse sexual behaviors (Hull et al., 2011) rather than focusing only on coitus. We were able to assess a wide variety of sexual behaviors, which is important since coitus was endorsed by 62% of participants at baseline.

Interaction of Developmental Patterns

Reference group theory was utilized to understand how group affiliation affects behavior over time. According to reference group theory, when an individual is a member of multiple groups, they will align their attitudes and behavior with whichever group is serving as a reference point at that time (Mirande, 1968). Adolescence is a time when individuals discover and adopt new groups by whose standards they will judge themselves, and often, they will change their attitudes and behavior accordingly.

As previous studies have found with college students (Lefkowitz et al., 2004; Zaleski & Schiaffino, 2000), we found with our adolescent sample that higher levels of religiosity at baseline predicted lower sexual behavior at baseline. Using a longitudinal design with four time points, we were able to track changing attitudes and behavior. Consistent with reference group theory, as religiosity declined, sexual conservatism declined, and sexual behavior increased. This would indicate that, as adolescents used their religion less as a reference point, their attitudes and behavior were less consistent with the standards and

norms of that group. However, while religiosity and sexual conservatism decreased initially, by Year four, religiosity rates had returned to baseline scores and sexual conservatism had stabilized, while sexual behavior continued to increase. This may be explained by the exact nature of the religiosity variable that we assessed. Our religiosity measure assessed religious beliefs, rather than involvement in an organized religion or church. It has been found that as adolescents get older, religious service attendance and youth group participation both decline (Smith et al., 2002). It is possible that while adolescents return to their religious beliefs, they do not participate as much in group religious activities, and therefore, no longer use it as a reference group.

Researchers have argued that gender differences in religiosity (women evidencing higher rates of religiosity than men) are based on gender differences in risk-taking (Miller & Stark, 2002). In essence, they argue that women are more risk-averse and therefore are more apt to be religious, to reduce their risk of eternal judgment. In reviewing the results of the relationship between religiosity, temperament, and personality (Regnerus, 2007) it was concluded that although attitudes and personality (temper and risk aversion) are associated with religiosity, the role of religiosity on behavior remains significant. In the present study of African-American young women, we found that risk-taking did not significantly predict change in sexual behavior. Hence, the relationship between religiosity, sexual conservatism, and sexual behavior remain significant even when risk-taking and depression are included in the models.

Directions for Future Research

Our measure of sexual conservatism focused on views toward abstinence. Although this is consistent with previous measurements of sexual conservatism (Meier, 2003), it will be important to assess other aspects of conservatism and understand how sexual conservatism fits into a broader cultural conservative/religiosity framework. Our findings indicate the importance of longitudinal data in understanding the role of religion on adolescent sexual behavior. In particular, we found an increase at Year four in religiosity, and sexual conservatism rates stabilized among our sample. The transition from adolescent to young adult and its effect on religiosity and specific values, such as sexual conservatism, should continue to be assessed, particularly since our study contrasts other longitudinal studies. (Koenig et al., 2008) With that said, Year four has the highest level of missing data; hence, this effect should be interpreted with caution. We included primarily young African-American women in our study, and there are race and gender differences in rates of religiosity (Miller & Stark, 2002; Zimmer-Gembeck & Helfand, 2008). Future longitudinal studies involving young men and women as well as other race and ethnic groups would aid in understanding the interaction of religiosity, sexual conservatism, and sexual behavior.

Conclusion

Religious beliefs and activities, as well as engagement in affiliative and sexual behaviors, are a part of most American adolescents' lives (Wallace, Forman, Caldwell, & Willis, 2003). Previous research studying religiosity and sexual behavior has either utilized a cross-sectional design, or a longitudinal design with only two time points. The present study emphasizes the role of religiosity on sexual conservatism and sexual conservatism in predicting a repertoire of sexual behaviors. By using a longitudinal methodology with four time points, we were able to clarify the unique and changing roles of the assessed attitudes and behaviors. Future research is needed to understand the mediating relationships that affect the expression of adolescent sexuality. Specifically, it would be useful to study the possible mediating effect of sexual conservatism on sexual behavior outcomes within the context of school, or even church-based, sexual education curriculum trials.

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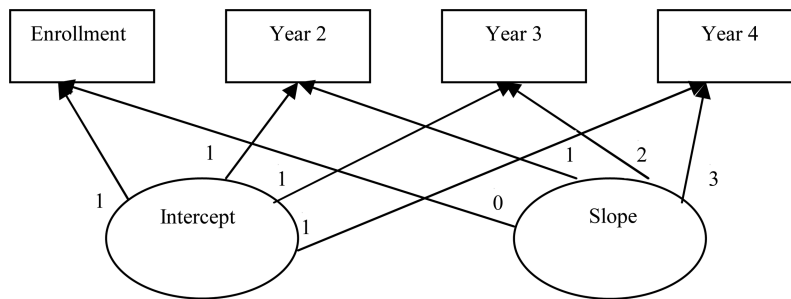
Figure 1.
Unconditional latent growth curve conceptual model for sexual behavior, religiosity, and sexual conservatism over four years for (N=328) young women
Note: Numbers next to paths in intercept and slope factors are the value of each factor's loadings. Values are available in Table 2.
*Loadings can be freed, or unconstrained, on any of the time frames desired; in this case, the number(s) would be removed. If freed, this information is available in Table 2.
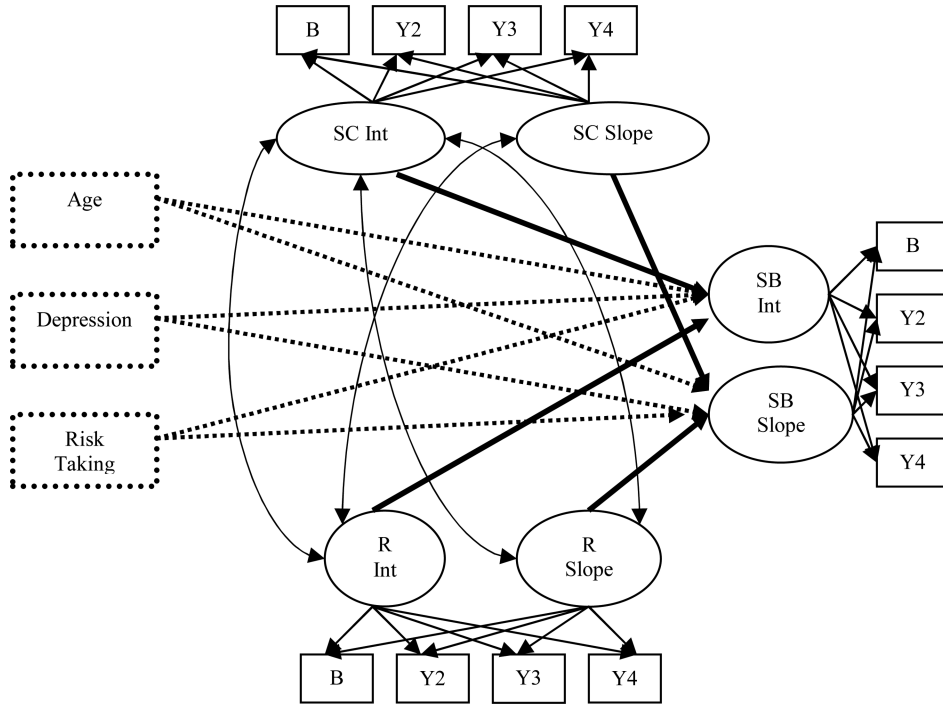
Figure 2.
Triple trajectory conceptual model for sexual behavior, religiosity, and sexual conservatism over four years, with and without controlling for baseline influences on sexual behaviors, among (N=328) young women
Note: B=Baseline; Y2=Year 2; Y3=Year 3; Y4=Year 4.
Note: Double headed arrows indicate covariance; single headed arrows indicate causal effects (Research Question 2); dashed lines indicate controlling for baseline influences (Research Question 3).
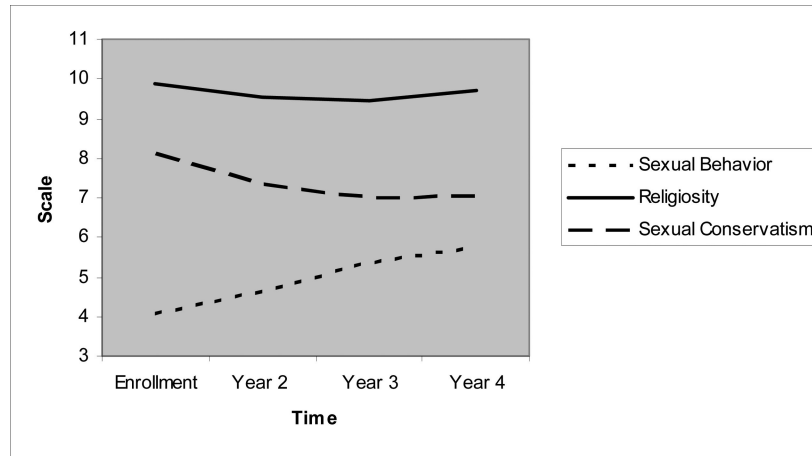
Figure 3.
Developmental patterns in sexual behavior, religiosity, and sexual conservatism over four years among (N=328) young women

Table 1

Means (standard deviations) for all variables

	N	M (SD)
Religiosity		
Baseline	328	9.93(1.78)
Year 2	328	9.55(1.74)
Year 3	328	9.41(1.89)
Year 4	328	9.92(1.99)
Sexual Behavior		
Baseline	328	3.60(2.24)
Year 2	328	4.32(2.14)
Year 3	328	5.02(2.09)
Year 4	328	5.38(2.06)
Sexual Conservatism		
Baseline	328	5.91(1.85)
Year 2	328	5.38(1.78)
Year 3	328	5.01(1.77)
Year 4	328	5.06(1.75)
Age	328	15.82(1.51)
Depression	328	7.11(2.19)
Thrill Seeking	328	2.26(0.83)

Table 2

Latent growth curve unconditional model comparison statistics and best fitting unconditional model unstandardized estimates and fit statistics for religiosity, sexual behavior, and sexual conservatism among (N=328) young women

Model	χ^2(df)	p	CFI	RMSEA (90% CI)	Models Compared	$\Delta\chi^2$(df)	p(d)	Intercept M(SE)	Intercept Var(SE)	Slope M(SE)	Slope Var(SE)	Intercept/Slope Cov(SE)	FL Value
Religiosity													
1) Two factor	18.3(5)	.003	.952	.090 (.048 – .136)									
2) Two factor, FL ^	10.5(4)	.032	.976	.070 (.019 – .125)	1 vs. 2	7.80(1)	<.05	9.84(0.09) ***	1.73(0.31) ***	−0.19(0.06) **	0.42(0.15) **	−0.22(0.81)	1.26(0.27) ***
3) Quadratic #	0.8(1)	.127	1.001	.000 (.000 – .140)	1 vs. 3	17.50(4)	<.05						
Sexual Behavior													
1) Two factor ^	11.9(5)	.036	.986	.065 (.015 – .114)				4.08(0.13) ***	4.13(0.45) ***	0.60(0.05) ***	0.32(0.07) ***	−0.54(0.15) ***	n/a
2) Two factor, FL	11.2(4)	.020	.985	.074 (.024 –.408)	1 vs. 2	0.70(1)	ns						
3) Quadratic #	1.63(4)	.164	.988	.054 (.000 – .168)	1 vs. 3	10.2(4)	<.05						
Sexual Conservatism													
1) Two factor ^	25.5(5)	.000	.942	.111 (.070 – .156)									
2) Two factor, FL	7.62(4)	.106	.990	.053 (.000 – .109)	1 vs. 2	17.88(1)	<.05	8.05(0.11) ***	2.51(0.41) ***	−0.56(0.06) ***	0.13(0.31) **	−0.23(0.20) *	1.95(0.21) ***
3) Quadratic #	0.04(1)	.894	1.003	.000 (.000 – .080)	1 vs. 3	25.46(4)	<.05						

Note: FL=Freed Loading

^ Model retained

Nonpositive definite covariance matrix; quadratic model not retained

*
$p<.05$

**
$p<.01$

***
$p<.001$

Table 3

Triple trajectory unstandardized model estimates and fit statistics, without controlling for baseline influences on sexual behavior among (N=328) young women

| | Sexual Behavior Growth Curve | | | |
| | Intercept | | Slope | |
Latent Factor Predictor	b(SE)	B	b(SE)	B
Religiosity Intercept	−0.14(0.11)	−0.01	0.01(0.04)	0.13
Religiosity Slope	-	-	0.45(0.11)	0.07
Sexual Conservatism Intercept	−0.63(0.12)[***]	−0.60	0.03(0.05)	0.13
Sexual Conservatism Slope			−0.28(0.12)[**]	−0.43

Note: χ^2(df) =35.046(34), p=0.224; IFI=0.995; TLI=0.989; CFI=0.995; RMSEA (90% CI) =.031 (.000 − .051).

Note: Religiosity intercept/Sexual Conservatism intercept *cov (SE)* =0.83(0.28)[***]

Religiosity intercept/Sexual Conservatism slope *cov (SE)* =−.12(0.13); Religiosity slope/Sexual Conservatism intercept *cov (SE)* =−0.18(0.15) Religiosity slope/Sexual

Conservatism slope *cov (SE)* =0.21(0.09)[*].

Note: Religiosity freed loading *b (SE)*: 1.39(0.29)[***]

Sexual Conservatism freed loading *b (SE)*: 1.93 (0.76)[***]

[*]p < .05

[**]p < .01

[***]p <. 001

Table 4

Triple trajectory unstandardized model estimates and fit statistics, controlling for baseline influence of age, depression, and risk taking on sexual behavior among (N=328) young women

| | Sexual Behavior Growth Curve | | | |
| | Intercept | | Slope | |
Baseline Predictor	b(SE)	B	b(SE)	B
Age	0.59(0.09)***	0.33	−.07(0.04)^	−0.05
Depression	0.25(0.05)***	0.27	−0.03(0.02)	−0.14
Risk Taking	0.08(0.11)	0.41	−0.03(0.05)	−0.10
Latent factor Predictor				
Religiosity Intercept	0.71(0.41)^	0.46	−0.04(0.07)	−0.16
Religiosity Slope	-	-	0.06(0.04)	0.04
Sexual Conservatism Intercept	−1.79(0.78)*	−0.94	0.05(0.04)	0.16
Sexual Conservatism Slope	-	-	−0.48(0.21)*	−0.40

**$p < .01$

Note: χ^2(df) = 65.290 (65), p = 0.467; IFI = 1.000; TLI = 1.000; CFI = 1.000; RMSEA (90% CI) =.004 (.000 - .033).

^$p < .10$

*$p < .05$

***$p < .001$