Developmental Precursors of Number of Sexual Partners from Age 16 to 22

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Abstract

This study examines family and child characteristics, parent and peer relationships, and early adolescent behavior as statistical predictors of trajectories of number of sexual partners from mid-adolescence through early adulthood using data from 527 participants in the Child Development Project. Early adolescent developmental antecedents accounted for modest variance in number of sexual partners. Latent growth models revealed that African American race, more advanced pubertal development, lower parental monitoring knowledge, association with more deviant peers, and lower GPA in early adolescence each predicted having more sexual partners at age 16. In addition, non-African American race, lower child IQ, higher parental monitoring knowledge, and lower early adolescent internalizing problems each was associated with a higher rate of growth in number of sexual partners over time at the ages following 16. Latent growth mixture modeling identified subgroups with distinct trajectories of involvement with sexual partners that were associated with family and child characteristics, parent and peer relationships, and behavior in early adolescence.

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Researchers, parents, and policymakers alike are concerned with adolescents' risky sexual behaviors because of both their immediate consequences (e.g., pregnancy, sexually transmitted diseases) and long-term psychosocial implications that may carry into adulthood (Cornelius, Clark, Reynolds, Kirisci, & Tarter, 2007). A large body of research situates risky sexual behavior in a cluster of other problem behaviors that may include aggression (Miller-Johnson et al., 1999), delinquency (Kotchick, Shaffer, Forehand, & Miller, 2001), substance use (Guo et al., 2002), and other behaviors not condoned by adults (Miller & Fox, 1987). The main focus of the present study is on understanding longitudinal precursors of an important indicator of

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risky sexual behavior: trajectories of number of sexual partners from mid-adolescence to early adulthood.

Although the most frequently examined indicator of risky sexual behavior in the literature is young age at first intercourse, in research that extends into early adulthood, aspects of risky sexual behavior other than age of first intercourse should also be considered. For example, Arnett (1991) found that 40% of unmarried college-educated adults ages 23 to 27 reported having sex without contraception in the last year and 23% reported having sex with someone they did not know well in the last year, suggesting that risky sexual behavior persists into adulthood. In the present study we focus on trajectories of number of sexual partners as a particularly important indicator of sexual risk for several reasons. The risk of sexually transmitted diseases and unplanned pregnancies increases with the number of sexual partners (Centers for Disease Control and Prevention, 2008; McDonald et al., 1990; Thomas et al., 2001). Relatedly, number of sexual partners has been found to be the best predictor of lower rates of condom use (Hebert, Bernard, DeMan, & Farrar, 1989). Continuing to have multiple sexual partners into early adulthood is also an indicator that individuals are not moving into more stable intimate relationships that are a hallmark of adaptive functioning in adulthood (Arnett, 2000).

Correlates of Risky Sexual Behavior

Problem Behavior Theory (PBT; Jessor, Donovan, & Costa, 1991; Jessor & Jessor, 1977) provides a framework within which to conceptualize correlates of risky sexual behavior and understand longitudinal trajectories of these behaviors. The fundamental principle underlying PBT is that all behavior is the result of person-environment interactions. PBT encompasses three categories of variables (perceived environment, personality, and behavior systems) that incorporate a range of contexts, including family and peers. Each system can encompass variables that instigate problem behavior or protect against it.

Our study was not designed to be a comprehensive test of PBT. Instead, within this framework, we are looking at trajectories of one particular problem behavior outcome in relation to several predictor variables. We considered three domains of correlates of number of sexual partners over time: family and child characteristics, parent and peer relationships, and adolescent behavior. First, as indicators of family and child characteristics we included child gender, race, socioeconomic status (SES), pubertal development, and IQ. Several studies have shown that individual family and child characteristics are related to risky sexual behavior; sociodemographic contexts often set the stage for developmental trajectories. For example, low family SES has been found to be related to earlier and more frequent sexual activity (Miller, Benson, & Galbraith, 2001), as has being African American (Kotchick et al., 2001). Given gender differences in many aspects of development (Maccoby, 1998), the inclusion of gender is important. Earlier pubertal development has been found to be related to earlier age of first intercourse (Dick & Mustanski, 2006) and would therefore be expected to be related to more sexual partners starting at a younger age. IQ may be a marker of neurocognitive function, which plays a role in the development of antisocial behavior (Moffitt, 1993) and may also be related to developmental trajectories of sexual risk.

The second domain of correlates of number of sexual partners over time we considered was parent and peer relationships, including parental permissiveness, psychological control, monitoring knowledge, and association with deviant peers. A number of studies have shown links between negative parent-child relationships and more risky sexual behavior (Ream & Savin-Williams, 2005). Parental permissiveness has been found to relate to more risky sexual behavior, including having more sexual partners, in both clinical and community samples (Donenberg, Emerson, Bryant, & King, 2006; Donenberg, Wilson, Emerson, & Bryant, 2002; Jemmott & Jemmott, 1992). High parental psychological control has been found to

increase sexually active girls' risk-taking, including having more sexual partners (Rodgers, 1999). In contrast to psychological control, which appears detrimental to adolescents' development (Pettit, Laird, Dodge, Bates, & Criss, 2001), parental monitoring appears to help regulate adolescents' behavior in a positive way (Barber & Harmon, 2002). In a sample of Scottish adolescents followed from age 13 or 14 to age 15 or 16, low parental monitoring was related to early onset of sexual activity for both boys and girls and more sexual partners for girls (Wight, Williamson, & Henderson, 2006). Parental permissiveness and low monitoring likely leave open more opportunities for adolescents to associate with deviant peers, and association with deviant peers has been linked to risky sexual behavior (Prinstein, Boergers, & Spirito, 2001). Other pathways from parental permissiveness to risky sexual behavior are also possible; for example, adolescents who are left to their own devices may not make the wisest decisions.

The third domain of correlates of number of sexual partners over time we considered was behavior in early adolescence, including internalizing problems, externalizing problems, and grades in school. Externalizing problems may relate to risky sexual behavior by virtue of being part of a cluster of problem behaviors (see Jessor, 1982). Internalizing problems may relate, perhaps in part because they mark impaired emotion regulation and low self-esteem (Boden & Horwood, 2006; Kosunen, Kaltiala-Heino, Rimpela, & Laippala, 2003). Adolescents with more sexual partners have been found to have lower grades than adolescents with fewer sexual partners (Luster & Small, 1994; Sorensen, 1973).

Given the array of correlates identified in cross-sectional and short-term longitudinal studies, it would have been possible to include many other potential correlates of number of sexual partners over time in the present study. However, our selection of correlates maintains a balance between parsimony and comprehensiveness by focusing on correlates that have good theoretical rationale and prior empirical support justifying their inclusion. One goal of the present study was to examine child and family precursors of number of sexual partners in a community sample followed prospectively from early adolescence through young adulthood.

A number of studies have demonstrated concurrent links between risky sexual behaviors and child, family, and peer risk factors (for reviews see Kotchick et al., 2001; Miller et al., 2001). Some risk factors appear to apply to risky sexual behaviors in both adolescence and adulthood. For example, in a cross-sectional survey of girls and women ages 12–24, higher impulsiveness was related to more sexual partners (Kahn, Kaplowitz, Goodman, & Emans, 2002). In addition, several longitudinal studies have found that early life experiences relate to subsequent risky sexual behavior. For example, Zimmer-Gembeck, Siebenbruner, and Collins (2004) provide a nuanced perspective on precursors of number of sexual partners by age 19. They found that positive attributes (sociability at 30 months and high quality friendships at 12–13 years) led to early initiation of romantic relationships and to more alcohol use at age 16, which in turn statistically predicted number of sexual partners by age 19.

In the data set used in the present study, Bates, Alexander, Oberlander, Dodge, and Pettit (2003) found that 26 of the 32 diverse early childhood, middle childhood, and early adolescence correlates they examined were significantly related to number of sexual partners at ages 16 and 17. The Bates et al. (2003) study focused on the number of sexual partners averaged across ages 16 and 17 as the outcome variable in a set of rich descriptive analyses (e.g., bivariate correlations with the potential antecedents for the entire sample and for demographic subsamples) and regression analyses. In addition, Bates et al. conducted one-way ANOVAs with four levels of sexual activity as independent variables predicting each of the correlates. Their findings were generally consistent with the predictions one would make on the basis of Problem Behavior Theory that having more sexual partners at ages 16 and 17 was related to higher levels of risk in other domains of the adolescents' lives.

Trajectories of Risky Sexual Behavior

We sought to examine prospectively the links between a diverse array of child and family characteristics and trajectories of number of sexual partners beginning in adolescence and extending into early adulthood. By adopting a trajectory approach, the present study is able to contribute to the literature in several novel ways that have not been possible in traditional longitudinal data analyses. For example, in traditional longitudinal analyses, researchers most often use a set of antecedents from one (or more) time points to predict statistically an outcome at a later time point. Much valuable knowledge can be gained from such an approach. However, these traditional longitudinal analyses do not contribute to understanding how a particular outcome develops and changes over time. Trajectory analyses are well suited to addressing this question.

Furthermore, using mixture modeling we are able to examine whether there are clusters of individuals who show similar patterns of risky sexual behavior over time. It is possible that some adolescents engage in sexual relations with a number of partners as they experiment with adult roles but that as adolescence ends and they enter legitimate adult roles, their experimentation with multiple sexual partners will end. This pattern would be consistent with a "strain toward maturity" or "transition proneness" explanation (Jessor, Costa, Jessor, & Donovan, 1983; Udry, 1990; Udry & Billy, 1987). These conceptual models posit that by engaging in sexual relations, adolescents may be attempting to engage in behaviors they perceive as defining adulthood as a way to assert their independence and autonomy from adults' control. Yet other adolescents may engage in risky sexual behaviors as part of a constellation of other problem behaviors that began early in childhood and that evolve in form as new experiences become developmentally salient (e.g., sexuality during adolescence). It is possible that other adolescents will not engage in risky sexual behavior and that these individuals will continue on this trajectory into adulthood or that these adolescents will begin to engage in risky sexual behavior in early adulthood.

Tubman, Windle, and Windle (1996a, 1996b) measured frequency of intercourse and number of sexual partners every six months over the course of two years when adolescents were in grades 10 and 11 as well as concurrent adjustment in other domains (such as substance use and delinquency) and retrospective reports of childhood behavior problems. They found that more frequent intercourse with multiple partners over time was related to higher concurrent rates and earlier onset of substance use and other antisocial behaviors, as predicted by Problem Behavior Theory. This study had the advantage of having frequent assessments of sexual behavior during adolescence but the disadvantage of having only retrospective reports of childhood precursors to risky sexual behavior. Siebenbruner, Zimmer-Gembeck, and Egeland (2007) also examined developmental trajectories leading to sexual behavior during adolescence; their study had the advantage of having prospective data on developmental precursors beginning at age 6 but the disadvantage of having data on sexual behavior at only one point in time (age 16). Siebenbruner et al. found that adolescents who had six or more sexual partners and who did not consistently use contraception (the high risk-taking group) were characterized by a developmental history of sociodemographic and interpersonal risk (e.g., their own mothers were more likely to be single at the time of their birth, childhood emotional climate in the home was worse, they had a pattern of externalizing behavior problems during childhood), and they were more likely to have concurrent behavior problems (e.g., substance use at age 16). The authors concluded that their results suggested that high-risk sexual behavior is part of a broader pattern of problem behaviors, as would be predicted by Problem Behavior Theory.

The Present Study

The present study builds on this previous research by addressing two main research questions. First, are there identifiable trajectories of number of sexual partners over time? We hypothesized that we would find trajectories that showed distinct patterns of numbers of sexual partners characterized by differences in mean levels as well as changes over time. Second, do family background and social environments distinguish different sexual risk trajectory groups? We hypothesized that more child and family, parent and peer, and adolescent behavior risk factors would be associated with a higher number of sexual partners at age 16 and with growth over time. In addressing these questions, the present study adds to the literature on early life experiences and risky sexual behavior by providing a long-term, prospective analysis of trajectories of number of sexual partners from mid-adolescence to early adulthood and developmental antecedents of these trajectories.

Method

Participants

The families in the current investigation were participants in an ongoing, multisite longitudinal study of child development (Dodge, Bates, & Pettit, 1990). Participants were recruited when the children entered kindergarten in 1987 or 1988 at three sites: Knoxville and Nashville, TN and Bloomington, IN. Parents were approached at random during kindergarten pre-registration and asked if they would participate in a longitudinal study of child development. About 15% of children at the targeted schools did not pre-register. Participants representing this group were recruited on the first day of school or by subsequent contact. Of those asked, approximately 75% agreed to participate. The sample consisted of 585 families at the first assessment; this sample was demographically representative of the schools and communities from which it was drawn. Males comprised 52% of the sample. Eighty-one percent (81%) of the sample were European American, 17% were African American, and 2% were from other groups. Follow-up assessments were conducted annually through age 22. Seventy-nine percent of the original 585 families provided age 22 data for the present analyses, but 90% ($n = 527$) of the original sample provided data on number of sexual partners during at least two years from age 16 to 22, and the analyses were conducted on this group of 527. The 527 participants were of higher SES in kindergarten than were the 58 original participants who did not provide sexual risk data, $F (1, 567) = 11.34$, $p < .01$ and were more likely to be female, $\chi^2(1) = 6.02$, $p < .05$; but these two groups did not differ significantly by race or mother-rated externalizing behavior problems in kindergarten. It is difficult to estimate power for SEM procedures, but the benchmark of 5 to 10 cases for each parameter (Kaplan, 1995) suggests that the sample had adequate power for the analyses conducted.

Procedures and Measures

Data were collected from mothers, teachers, youths, and school records.

Family and child characteristics—For this study, five variables were used to represent family and child characteristics: child gender, child race, family SES, pubertal development, and child IQ. Parents reported their child's *gender* (males were given a code of "0" and females a code of "1") and *race* (African American participants were coded as "1" and those of other races were coded as "0"). *Family SES* was measured by Hollingshead (1979) scores based on parental education and occupational status reported by the parents when the child was 12 years old. Mothers' and fathers' education levels were coded 1 = 1–6 years, 2 = 7–9 years, 3 = 10–11 years, 4 = 12 years, 5 = 13–15 years, 6 = 16–17 years, and 7 = 18+ years. Mothers' and fathers' occupations were coded on a 10-point scale ranging from 1 = unskilled laborers to 10 = major businesspeople and professionals. For each parent, the following equation describes how the Hollingshead composite was calculated: (occupation value x 5) + (education value x

3) = Hollingshead score. For two parent families, the above equation was computed for both partners; the resulting scores were added and then divided by two. In our sample, family SES ranged from 11 to 66, representing a range from unskilled laborers with little formal education to major businesspeople and professionals with high levels of formal education.

At the age of 12, adolescents completed the Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1988). This scale indexed the degree of progress toward puberty with three questions asked of all participants (growth in height, pubic and underarm hair, skin changes such as pimples), two questions just asked of boys (voice deepening, facial hair), and two questions just asked of females (breast development, menstruation). Each item (except menstruation, which was dichotomous depending on whether it had begun or not) was rated on a 4-point scale ranging from 1 = change has not yet begun to 4 = change seems complete. The items were averaged to create a scale (α = .67 for boys and .68 for girls). *Childhood IQ* was assessed at age 13 and was computed as the average of the Block Design and Vocabulary subtests on the WISC-R (Sattler, 1982).

Parent and peer relationships—We computed a measure of *association with deviant peers*, using 14 items assessing peers' frequency of behaviors such as drinking, smoking, or getting into trouble at school, adapted from Dishion, Patterson, Stoolmiller, and Skinner (1991). During the age 12 interview youths rated on a 5-point scale (1 = never, 5 = very often) the frequency with which their peers engaged in each behavior. Ratings from the 14 items were averaged to create a scale (α = .82).

Data on early adolescent relationships with parents were collected from adolescents in home interviews when they were 13 years old. Four items describing parental permissiveness scored on a 3-point scale (1 = not like them to 3 = a lot like them) were included in the adolescent interview (e.g., "My parents let me go out any evening I want."). *Adolescent-reported permissiveness* scores were computed as the mean of the four responses (α = .68). In addition, an index of *adolescent-reported maternal psychological control* was derived from 10 items suggested by the work of Barber (1996). Adolescents rated these items (e.g., "My mother is always trying to change how I feel or think about things") on a 3-point scale (1 = not like her, 2 = somewhat like her, and 3 = a lot like her). The scores were averaged to produce a maternal psychological control score (α = .76). Five items describing parents' monitoring knowledge (see Laird, Criss, Pettit, Dodge, & Bates, 2008; Pettit et al., 2001) scored on a 3-point scale (1 = don't know to 3 = know a lot) also were embedded in the adolescent interview (e.g., "How much do your parents know about who your friends really are?" "How much do your parents know about where you are most afternoons after school?"). *Adolescent-reported parent monitoring knowledge* scores were computed as the mean of the five responses (α = .65).

Adjustment in early adolescence—At age 12, adolescents completed the Achenbach (1991) Youth Self-Report Internalizing (31-item) scale. For each item, adolescents indicated whether the statement was not true for them (0), somewhat or sometimes true (1), or very or often true (2). We computed a score for the second-order factor of *internalizing* (α = .85), which included first-order factors of anxious-depressed, social withdrawal, and somatic complaints. At age 12, the child's teacher completed the 113-item Child Behavior Checklist- Teacher Report Form (Achenbach, 1991). For each item the teachers noted whether the statement was not true for the child (0), somewhat or sometimes true (1), or very or often true (2). We computed a score for the second-order factor of *externalizing* (34 items; α = .95), which included first-order factors of aggression (including disruption and noncompliance items) and delinquency. Measures of adolescent academic performance were obtained from school records in grade 7. Adolescents' grade point average (GPA) was recorded based on their grades in reading, math, language, spelling, social studies, and science (1 = F, 2 = F+, 3 = D−, …13 = A).

Number of sexual partners—From ages 16 to 22, participants were asked to describe their sexual activities in the last 12 months (except age 19 and 20 when participants were asked about their sexual activities in the last 24 months). They were asked "with how many different persons have you had sexual relations?" The majority of respondents reported having 0 to 3 sexual partners in a single year; the percentage of the sample reporting more than 3 partners in a given year ranged from 5% to 15%. Therefore, number of sexual partners in each year for ages 16 to 18 and for ages 20 to 22 was coded as 0 = none, 1 = 1 partner, 2 = 2 to 3 partners, and 3 = more than 3 partners to improve the distributional properties of these variables (resulting in variables that were nearly normally distributed). Because the responses at age 20 covered a period of 24 months, to be consistent with the scaling in other years, the number of sexual partners for age 20 was coded as 0 = none, 1 = 1 to 2 partners, 2 = 3 to 6 partners, and 3 = more than 6 partners. We excluded the response at age 19 from these analyses because of the double counting issue. We also re-ran the analyses reported below after treating the age 20 data as missing, but the substantive findings remained unchanged, suggesting that the difference in scaling for year 20 did not bias the results; therefore the age 20 data were retained for the analyses.

Results

Preliminary Analyses

Descriptive statistics and bivariate correlations are shown in Table 1. The number of sexual partners variables from age 16 to 22 were correlated with developmental antecedents, but the pattern of findings depended on the youths' age. For example, race, SES, pubertal development, permissiveness, psychological control, monitoring knowledge, and externalizing were associated with number of sexual partners only at the youngest ages, as was child IQ (with the exception of an additional significant association with number of sexual partners at age 20). Gender and internalizing problems were associated with number of sexual partners only at later ages. Association with deviant peers and GPA were more pervasively associated with number of sexual partners over time (with the exception of age 22 for association with deviant peers and age 21 for GPA). Preliminary analyses testing for gender and race moderation did not find evidence for moderation.

Are there Identifiable Sexual Risk Trajectories?

Three types of analyses were conducted to identify and predict trajectories of number of sexual partners from age 16 to 22. First, we investigated the overall course of involvement with sexual partners from mid-adolescence to early adulthood using an unconditional latent growth curve model. Second, we employed conditional latent growth modeling to examine which variables predicted trajectories of involvement with sexual partners from mid-adolescence to early adulthood. Third, we utilized growth mixture modeling to identify subgroups on the basis of distinct trajectories of involvement with sexual partners from mid-adolescence to early adulthood. We also compared trajectory-based subgroups on child and family characteristics and other development antecedents.

Unconditional baseline model—First, an unconditional latent growth model of number of sexual partners from ages 16 to 22 was fit using Mplus (Muthén & Muthén, 2004). Missing data were handled using full information maximum likelihood (FIML) estimation, which results in unbiased parameter estimates and appropriate standard errors when data are missing at random (MAR; Muthén & Muthén, 1998). Even when the MAR assumption is not fully met, FIML estimates are generally better than estimates obtained with listwise deletion or other ad hoc methods (Schafer & Graham, 2002). Time was centered at age 16 for this analysis. Thus, paths from the latent slope of sexual partners to the observed items were constrained to be 0, 1, 2, 4, 5, and 6, which corresponds to ages 16 (intercept), 17, 18, 20, 21, and 22, respectively.

Linear and quadratic growth models were fit; a delta chi-square test indicated that adding the quadratic term improved the model fit significantly ($\Delta\chi^2$ (4) = 40.39, $p < .001$). Thus, the unconditional growth model of number of sexual partners from ages 16 to 22 included three individual growth parameters: (a) an intercept parameter with time centered at age 16, which represents the number of sexual partners at age 16, (b) a linear slope parameter, which represents the linear change in number of sexual partners over time, and (c) a quadratic slope parameter, which represents non-linear change in number of sexual partners over time. The intercept, linear slope, and quadratic slope growth factors were allowed to covary.

We examined several indices to evaluate the model fit of the baseline latent growth model for number of sexual partners (see Table 2): χ^2 (7, $N = 527$) = 41.34, comparative fit index (CFI) = .97, Tucker Lewis index (TLI) = .93, root mean squared error of approximation (RMSEA) = .096, and standardized root mean squared residual (SRMR) = .044. In determining acceptable model fit, Hu and Bentler (1999) recommended values of CFI, TLI, RMSEA, and SRMR close to .95, .95, .06, and .08, respectively. Browne and Cudeck (1993) reported that RMSEA values above .10 are indicative of poor-fitting models. Kline (1998) recommended CFI and TLI values greater than .90. Using these standards, the baseline model had borderline acceptable fit (good fit based on CFI and SRMR indices, weaker based on TLI and RMSEA indices). The average intercept (.611, $p < .001$), average linear slope (.168, $p < .001$), and average quadratic slope (−.009, $p < .05$) were significantly different from zero, indicating that number of sexual partners each year increased during the early part of the time period under investigation (i.e., mid-adolescence through early adulthood), but the rate of acceleration declined during the latter part. Significant variance existed in both the intercept and linear slope factors but not in the quadratic slope factor. This result indicated that there was significant individual variation around the intercept and linear slope that could be further explained by adding the other predictors to the model.

Conditional growth model—Next, a conditional latent growth model was fit to test whether the significant variances in the intercept and slope factors were related to variation in the developmental antecedents: family and child characteristics, parent and peer relationships, and behavior during early adolescence. As shown in Table 2, the set of predictors together accounted for 12.9% of the variance in the intercept of number of sexual partners at age 16, and accounted for 2.9% of the variance in the linear slope of number of sexual partners from ages 16 to 22. Because the quadratic slope did not show significant variance between individuals in the unconditional base model, we did not use any predictors to predict the quadratic slope in the conditional model. This model fit the data well, χ^2 (55, $N = 527$) = 101.31, CFI = .96, TLI = .94, RMSEA = .04, and SRMR = .03.

African American race, more advanced pubertal development, association with more deviant peers, lower parental monitoring knowledge, and lower GPA in early adolescence each predicted a higher number of sexual partners at age 16 (i.e., intercept). Non-African American race, lower child IQ, and lower early adolescent internalizing problems each predicted a higher rate of growth (i.e., slope) in number of sexual partners over time. In addition, although higher parental monitoring knowledge during early adolescence predicted a lower number of sexual partners at age 16, higher parental monitoring knowledge also predicted greater growth in number of sexual partners from ages 16 to 22.[1]

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[1]Given the correlation in Table 1, it was surprising that externalizing behavior was not a significant predictor of number of sexual partners in the latent growth model. The primary reason for this lack of significance is multicollinearity among externalizing, association with deviant peers, and GPA (which are moderately correlated with each other, and which all are correlated with number of partners at ages 16, 17, and 18). To test this multicollinearity explanation, we re-ran the model without association with deviant peers and GPA as predictors; externalizing then became a significant predictor of both the intercept and slope (predicting more initial partners and more rapid increase over time).

Latent growth mixture model—LGMM (Muthén & Muthén, 2004) was used to identify subgroups with distinct trajectories of number of sexual partners. The model-fitting strategy followed recommendations from Muthén and Muthén (2000). According to Muthén and Muthén (2000), for latent class analysis, the basic model should be the model that shows the best fit in the unconditional model testing. In our case, the quadratic model showed better fit than the linear model. Therefore, the latent class analysis included all three parameters (intercept, linear slope, and quadratic slope). Fit indices were obtained for unconditional models with two, three, four, and five classes. Models with different numbers of latent classes were not nested, and thus the Bayesian Information Criteria (BIC) was used to compare the model fit, with lower scores representing better-fitting models. Although there is no general rule about what are appropriate values for BIC, BIC is the most recommended criteria for latent class analyses. One looks for the number of solutions (in our case, sexual trajectory groups) that both minimizes the BIC (indicating better model fit) and that still has a large entropy value (indicating how clearly distinguishable the classes are based on how distinct each individual's estimated class probability is). BIC statistics for the unconditional models were: 6168.63 (2 classes), 5958.96 (3 classes), 5967.73 (4 classes), and 5979.08 (5 classes). Considering the factors described by Jung and Wickrama (2008), the three-class growth mixture model was the best-fitting model. Additional details regarding the estimated class probabilities are available from the first author upon request.

Figure 1 displays the estimated trajectories for the three latent growth classes. Results of analyses of variance testing for trajectory class differences on the developmental antecedents, with follow-up LSD tests of the between class contrasts, are shown in Table 3. The largest class (Zero-Initial; $M = 0$, $SD = 0$ at age 16) accounted for more than half (65.8%) of the sample. This subgroup reported no sexual partners at age 16, a significant increase in number of sexual partners during the late adolescent years, and a significant decline in the rate of increase over the observed period. The second latent class (One-Initial; $M = 1$, $SD = 0$ at age 16) accounted for 14.8% of the sample. This subgroup reported one sexual partner at age 16, and a moderate but significant increase in sexual partners during late adolescence, followed by a significant decline in early adulthood. The third latent class (Multiple-Initial; $M = 2.4$, $SD = .49$ at age 16) accounted for 19.4% of the sample. This subgroup reported a much larger number of sexual partners at age 16 relative to the other two classes. This subgroup also reported a decrease during late adolescence but a significant attenuation in rate of decrease over the observed period and a significant increase again after the age of 20. At the age of 22, reports of number of sexual partners ranged from 0 to more than three in the last 12 months for each of the three groups, but the distributions differed across the groups, $\chi^2(6) = 30.96$, $p < .001$, with 26%, 14%, and 7% of the Zero-Initial, One-Initial, and Multiple-Initial groups, respectively, reporting having no sexual partner in the last 12 months, and 13%, 26%, and 36%, respectively, reporting having more than three sexual partners in the last 12 months.

Do these sexual risk trajectory groups show different characteristics in family background and social environments?

The three latent classes representing trajectories of number of sexual partners from mid-adolescence to early adulthood were compared on family and child characteristics, parent and peer relationships, and behavior in early adolescence. As shown in Table 3, significant overall differences among the three classes were found for family and child characteristics, parent and peer relationships, and adolescent behavior variables. Results of follow-up contrasts indicated that adolescents in the Zero-Initial subgroup were less likely to be African American, were more likely to be from higher SES families, and were less advanced in puberty than were adolescents in the One-Initial and Multiple-Initial subgroups, and adolescents in the Zero-Initial subgroup had higher IQs than did adolescents in the Multiple-Initial subgroup. All three classes differed significantly from one another on association with deviant peers, with the Zero-

Initial subgroup associating with the least deviant peers and the Multiple-Initial subgroup associating with the most deviant peers. Parents of Zero-Initial adolescents used less psychological control and had more monitoring knowledge than did parents of Multiple-Initial adolescents, and parents of One-Initial adolescents had more monitoring knowledge than did parents of Multiple-Initial adolescents. Members of the Zero-Initial subgroup had fewer externalizing problems than did the other two subgroups. The Zero-Initial and One-Initial subgroups had higher GPAs than did the Multiple-Initial subgroup.

Young Adult Context

To put these findings into context as the participants moved from adolescence into adulthood, we conducted ANOVAs to compare the trajectory classes of number of sexual partners on other socially relevant outcomes. By the age of 22, 79 participants (15% of the sample) had married, and 17 participants (3% of the sample) had separated or divorced. The One-Initial group was significantly more likely to have married by age 22 than was the Zero-Initial group (23% vs. 12%; 19% of the Multiple-Initial group had married, which did not differ significantly from either of the other two groups), and the Zero-Initial group was significantly less likely to have divorced by age 22 than were either of the other two groups (1% for the Zero-Initial vs. 6% and 7% for the One-Initial and Multiple-Initial groups, respectively). In terms of educational progress, 312 participants (59% of the sample) had attended college by age 22. Each of the sexual risk trajectory groups differed significantly from each of the others, with the Zero-Initial group most likely to have attended college (67%) and the Multiple-Initial group least likely (35%) to have attended college.

Discussion

The present study advances understanding of the development of risky sexual behavior by identifying trajectories of number of sexual partners through early adulthood and by examining early adolescent precursors of subsequent number of sexual partners and trajectories of sexual partner patterns. We identified three classes of sexual risk trajectories that differed both in their number of sexual partners at age 16 and the change in number of sexual partners over the next six years.

In the analyses of family and child characteristics, parent and peer relationships, and early adolescent behavior as statistical predictors of trajectories of number of sexual partners, most of the findings related to the intercept (i.e., having more sexual partners at age 16) were consistent with the hypotheses generated from Problem Behavior Theory. That is, African American race, more advanced early pubertal development, association with deviant peers, less parental monitoring knowledge, and lower grades in school all statistically predicted having more sexual partners at age 16. These findings are similar to Siebenbruner et al.'s (2007) finding that high sexual risk-taking at age 16 was associated with a developmental history of sociodemographic and interpersonal risk. Tubman et al. (1996a, 1996b) also found that more frequent intercourse with multiple partners over the course of grades 10 and 11 was related to higher concurrent rates and earlier onset of substance use and other antisocial behaviors.

The findings regarding predictors of the slope were more mixed: Non-African American race, lower child IQ, higher parental monitoring knowledge, and lower early adolescent internalizing problems each statistically predicted a higher rate of growth in number of sexual partners over time. The findings regarding parental monitoring knowledge and internalizing problems may seem non-intuitive. Because higher parental monitoring knowledge was related to both the intercept and slope, our interpretation would be that high parental monitoring knowledge is a protective factor against early sexual activity, but the group that had zero sexual partners at age 16 experienced growth in their number of sexual partners as they initiated intercourse

between the age of 16 and 22, thus accounting for the association between higher parental monitoring knowledge and growth in number of sexual partners over time. However, it is not clear why the other groups did not increase just as quickly in number of sexual partners. Perhaps there is a natural asymptote on the average annual number of sexual partners during this developmental period; this issue deserves future research attention.

In terms of internalizing, high levels of internalizing problems were found to be a protective factor against increases in number of sexual partners in the conditional growth models but were not related to the intercept. The three trajectory groups did not differ in their levels of internalizing problems in the mixture models, perhaps because the trajectories were based substantially in the intercept. Previous findings in the literature regarding internalizing problems have been mixed in terms of whether internalizing is related to more risky behavior, less risky behavior, or is unrelated. Our finding is similar to previous findings that internalizing problems can have a buffering effect on the development of substance use (Shedler & Block, 1990). Recall that our measure of internalizing used Achenbach's algorithms for combining subscales reflecting anxiety, depression, somatization, and withdrawal. In supplementary analyses in which we disaggregated these subscales, we found that all four subscales significantly contributed in the same direction to the parameter estimates involving number of sexual partners. Adolescents with internalizing problems may be risk-avoidant (Maner et al., 2007) and may withdraw from sexually adventurous peers, thereby having limited access to social situations conducive to sexual behavior (Windle, 1993). Given the mixed findings regarding the relation between internalizing problems and risky sexual behavior in the present and prior studies, more attention to this question is needed in future research.

The three sexual risk trajectory groups were similar in some ways to antisocial behavior trajectory groups described by Moffitt (1993) and Patterson, Capaldi, and Bank (1991), yet different in others. Both Moffitt and Patterson et al. describe divergent pathways to antisocial behavior, including a group characterized by onset of antisocial behavior in adolescence that desists as adolescents enter adulthood and another group characterized by life-long problems with antisocial behavior. In the present study, the Multiple-Initial trajectory group averaged between two to three and more than three sexual partners during the year when they were 16 and decreased to an average of 1.5 sexual partners per year in their early 20s, with a slight increase again by age 22. Although this group remained at higher risk than the other two groups (in terms of having the most sexual partners), they did report having fewer sexual partners during early adulthood than they did during adolescence. It is possible that early experimentation with adult roles (Moffitt, 1993) and a desire to assert their independence from adults' control (Udry, 1990) accounted for part of their high levels during adolescence and that these levels decreased as the adolescents moved into adult roles that may have included more stable, monogamous romantic relationships. The One-Initial group averaged one partner during the year when they were 16 and increased somewhat during late adolescence and early adulthood, with a slight decrease by the end of the study period. There was no group that remained consistently low in terms of having no sexual partners (as there are expected to be groups that consistently engage in no antisocial behavior). However, because establishing intimacy in romantic relationships is one key task of emerging adulthood (e.g., Arnett, 2000; Erikson, 1968; Zimmer-Gembeck & Petherick, 2006), having no sexual partner may not be "ideal" in the same way that engaging in no antisocial behavior is "ideal." Rather, the Zero-Initial trajectory group had no sexual partners at age 16 but by the age of 22 had, on average, one sexual partner each year. This pattern is similar to other findings suggesting that the large majority of individuals initiate sexual intercourse by early adulthood (e.g., 90% reported by Halpern, Waller, Spriggs, & Hallfors, 2006).

In comparing the trajectories of the three groups, one sees that although the groups begin their trajectories at different points, the trajectories begin to converge over time; the three groups

maintain their rank ordering on number of sexual partners, but the spread is much narrower. The Zero-Initial group might show a greater increase in number of sexual partners over time because they start so much lower (something like a regression toward the mean effect), because they are more likely to be in college, and because they are less likely to marry by age 22. Nevertheless, the Multiple-Initial group also shows a slight increase in number of sexual partners in early adulthood after their initial decrease; one possibility is that this group may be showing a tendency not to enter into permanent longer term monogamous relationships. This pattern of findings highlights the value of our person-centered approach above and beyond what would be apparent from a variable-centered approach. In particular, the trajectory groups initially look quite different from one another but come to resemble one another more closely over time. This pattern of change over time would not be apparent using a variable-centered approach focusing just on number of sexual partners at age 16 or at age 22 (the first and last time points examined in our trajectories). For example, if we had focused just on number of sexual partners at age 22, we would not have understood that the number of sexual partners at this time was a point on a continuum representing a higher number of sexual partners than at younger ages for some young adults and a lower number of sexual partners than at younger ages for others or that different child and family characteristics were associated with different patterns of arriving at the number of sexual partners at age 22. Thus, the inclusion of the trajectory analyses constitutes a major substantive contribution to the literature beyond what can be understood by examining sexual risk at a single point in time (e.g., number of sexual partners averaged across ages 16 and 17 as in Bates et al., 2003).

Although the specific risk groups differed from those described in the context of patterns of antisocial behavior more generally, many of the risk factors that have been found to relate to antisocial behavior were related to trajectories of number of sexual partners as well. For instance, family management practices and association with deviant peers differentiated trajectories of risky sexual behavior, as they differentiate adolescents who differ in the developmental course of antisocial behavior (Moffitt, 1993; Patterson et al., 1991). Nine of the 12 early adolescent predictors significantly differentiated the three classes of sexual risk trajectories. The Multiple-Initial group significantly differed from the Zero-Initial group on all nine predictors. The One-Initial group more closely resembled the Multiple-Initial group on child race, family SES, pubertal development, and adolescent externalizing problems, but the One-Initial group more closely resembled the Zero-Initial group on parental monitoring knowledge and adolescent GPA. These findings might be encouraging for parents who are trying to prevent their children from engaging in risky sexual behaviors; a direction for future research will be to investigate whether parental monitoring knowledge may offset the potentially negative effects of other risk factors and launch youths on sexual trajectories characterized by fewer partners over time.

Our measure of monitoring knowledge captured adolescents' perceptions of their parents' knowledge about their whereabouts, friends, and activities. As Stattin and Kerr (2000; Kerr & Stattin, 2000) have argued, this construct may reflect adolescents' willingness to disclose information to their parents rather than parents' active checking up on their child. In the context of the present study, it is possible that adolescents' own characteristics that might predict sexual risk behavior might also predict how the adolescent would answer these questions about their parents' monitoring knowledge. For example, adolescents who report that their parents have a lot of knowledge about who their friends are and where they are after school might be adolescents who have close relationships with their parents and are willing to disclose this information to their parents; adolescents who have close relationships with their parents may also be those who are less likely to engage in risky sexual behavior (see Ream & Savin-Williams, 2005).

Previous research has demonstrated that delaying sexual relationships is associated with better academic outcomes (Schvaneveldt, Miller, Berry, & Lee, 2001), less substance use (Cornelius et al., 2007), and fewer sexually transmitted diseases (Niccolai, Ethier, Kershaw, Lewis, Meade, & Ickovics, 2004), making such delay a worthy goal. Because younger age of first intercourse is associated with having more sexual partners (Seidman, Mosher, & Aral, 1994), a direction for future research will be to examine longitudinally how trajectories that capture timing of sexual experiences in adolescence and early adulthood contribute to adjustment later in adulthood.

Limitations

One strength of our study was the use of data from different sources (parents, teachers, youths, school records) to minimize biases and artificial inflation of estimates that can result from shared method variance. Another strength was the use of long-term longitudinal data. However, the study had limitations as well. We focused on only a small subset of possible correlates of number of sexual partners; future research could benefit from examining other correlates in relation to trajectories of risky sexual behavior. Findings from our community sample of predominantly African Americans and European Americans may not generalize to samples from other racial or ethnic backgrounds, to higher risk samples, or to other groups of youths. Three of our measures (parental permissiveness, monitoring knowledge, and pubertal development) had alphas that ranged from .65–.68, which is lower than would be desired using George and Mallery's (2003) criteria. Studies that have modeled sexual behavior over time in relation to substance use over time (e.g., Tubman et al., 1996a, 1996b) suggest that examining co-morbidity of sexual risk trajectories with trajectories of substance use and other forms of antisocial behavior will be a fruitful direction for future research. Future research should also examine mediators of links between early risk factors and subsequent risky sexual behavior to explore mechanisms through which factors such as low SES might be translated into sexual risk (e.g., through association with deviant peers).

We focused on only one possible indicator of risky sexual behavior; future research could incorporate additional indicators (e.g., condom use) to test the generalizability of the findings to other risky sexual behaviors. Our measure of sexual partners referred to the number of people with whom the person had "sexual relations." The participants may have interpreted this question as including several kinds of sexual relations that can be risky (e.g., oral sex, anal intercourse, vaginal intercourse) as well as other kinds (e.g., heavy petting) that are less risky. The proportion of participants in our sample who said that they had sexual relations with at least one person at each age is similar to the proportion of participants in other samples who reported having had vaginal intercourse by these ages during the same historical timeframe (e.g., Guttmacher Institute, 2006; Kaiser Family Foundation, 2005). Therefore, we believe that most participants likely interpreted this question as meaning vaginal intercourse, but this was not necessarily the case for all participants. Furthermore, the sexual partners in a given year may or may not have been the same partners as in previous years; taking on new partners would incur more risk, especially if condoms were not used.

Conclusions

Individuals' number of sexual partners is an important marker of sexual risk in the context of previous research findings that the majority of sexually active adolescents and young adults do not consistently use condoms or other forms of birth control, putting them at substantial risk for contracting STDs and creating unplanned pregnancies (Boyer, Shafer, Wibbelsman, Seeberg, Teitle, & Lovell, 2000). Across the years in which we asked about number of sexual partners, national data suggest that between 53% and 63% of 9th-12th graders reported using a condom the last time they had sexual intercourse (Kaiser Family Foundation, 2005). According to the Department of Health and Human Services, approximately one-fourth of all

sexually active adolescents contracts an STD each year, and nearly half of all new HIV infections are transmitted sexually to individuals younger than 25 years. Identification of early risk factors that relate to subsequent development of risky sexual behaviors is therefore an important task for preventive interventions. Finding ways to prevent adolescents' associations with risky peers might be an especially promising approach to preventing risky sexual behaviors.

Acknowledgments

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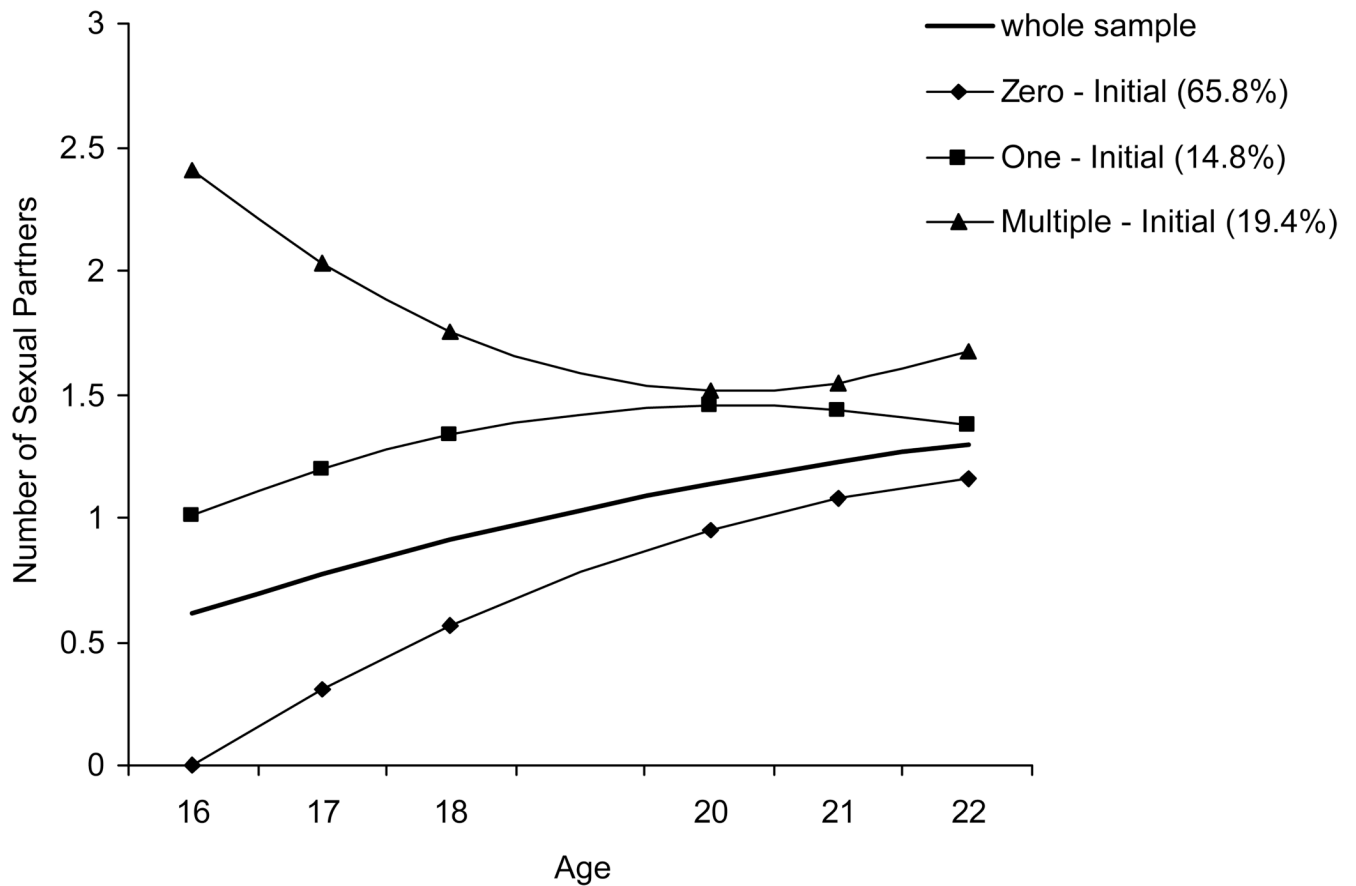
Figure 1.
Trajectories of number of sexual partners from ages 16–18 and 20–22 (*N* = 527). At ages 16–18 and 21–22, number of sexual partners was measured as 0 = none, 1 = 1 partner, 2 = 2 to 3 partners, and 3 = more than 3 partners in last 12 months; at age 20, number of sexual partners was measured as 0 = none, 1 = 1 to 2 partners, 2 = 3 to 6 partners, and 3 = more than 6 partners in last 24 months. Fit indices of three-class model: BIC = 5958.96, Entropy = .91.

Table 1

Descriptive Statistics and Correlations among Number of Sexual Partners at Age 16–22 and Developmental Antecedents at Age 11–13

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. # of partners (age 16)[1]	—																	
2. # of partners (age 17)[1]	.72***	—																
3. # of partners (age 18)[1]	.54***	.68***	—															
4. # of partners (age 20)[2]	.31***	.40***	.51***	—														
5. # of partners (age 21)[1]	.25***	.35***	.41***	.64***	—													
6. # of partners (age 22)[1]	.23***	.29***	.40***	.48***	.56***	—												
7. Child gender[3]	-.02	-.02	-.09	-.08	-.10*	-.10*	—											
8. Race[4]	.23***	.18***	.05	.09	.03	-.08	.03	—										
9. SES (age 12)	-.16**	-.17**	-.09	-.05	.04	.02	-.07	-.39***	—									
10. Pubertal development (age 12)	.11*	.11*	.02	.03	-.02	-.04	.42***	-.02	-.03	—								
11. Child IQ (age 13)	-.18***	-.15**	-.09	-.12*	-.03	-.08	-.13*	-.41***	.41***	-.12*	—							
12. Deviant peers (age 12)	.24***	.23***	.20***	.17**	.15**	.06	-.07	.11*	-.09	.14**	-.16**	—						
13. Permissiveness (age 13)	.12*	.19***	.06	.06	.07	.05	-.13*	.25***	-.05	-.03	-.08	.15**	—					
14. Psychological control (age 13)	.15**	.19***	.09	.01	.02	.04	-.00	.04	.02	.03	-.11*	.28***	.03	—				
15. Monitoring knowledge (age 13)	-.26***	-.29***	-.13**	-.05	-.09	-.01	-.02	-.07	-.03	-.09*	.09	-.31***	-.13**	-.30***	—			
16. Internalizing problems (age 12)	.04	.03	-.06	-.12*	-.14**	-.13*	.10	.05	-.11*	.01	-.20***	.19***	-.00	.25***	-.12*	—		
17. Externalizing	.26***	.18***	.16**	.08	.04	.06	-.13***	.35***	-.32***	-.12*	-.35***	.30***	.14**	.10*	-.18***	.10	—	

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
problems (age 12)																		
18. GPA (age 12)	-.27***	-.24***	-.16**	-.12*	-.08	-.14**	.19***	-.28***	.35***	.03	.36***	-.21	-.15**	-.12*	.19***	-.10	-.49***	—
Mean	.64	.81	1.06	1.07	1.15	1.40	.50	.16	39.08	2.63	98.33	1.38	1.59	1.43	2.52	11.47	6.49	9.31
SD	.97	1.03	1.09	.77	.88	1.02	.50	.37	13.07	.64	15.87	.38	.40	.34	.38	7.25	9.67	2.95
Range	0–3	0–3	0–3	0–3	0–3	0–3	0–1	0–1	11–66	1–4	48–135	1–3.71	1–3	1–2.8	1.1–3	0–36	0–53	1–13
N	450	412	438	479	461	464	527	527	451	420	430	420	429	425	429	399	415	401

Note.

[1] Measured as 0 = none, 1 = 1 partner, 2 = 2 to 3 partners, and 3 = more than 3 partners in last 12 months.

[2] Measured as 0 = none, 1 = 1 to 2 partners, 2 = 3 to 6 partners, and 3 = more than 6 partners in last 24 months.

[3] Child gender is coded as male = 0 and female = 1.

[4] Race is coded as non-African American = 0 and African American = 1.

*
$p < .05$,

**
$p < .01$,

***
$p < .001$.

Table 2

Predictors of Growth Parameters of Number of Sexual Partners from Age 16 to Age 22 (N = 527)

	Growth Parameters of Number of Sexual Partners[1]		
Unconditional Model	**Intercept**	**Slope**	**Quadratic[4]**
M (*SE*)	.611 (.046)***	.168 (.025)***	−.009 (.004)*
Variance (*SE*)	1.312 (.167)***	.225 (.045)***	.001 (.001)
Covariance (*SE*)	With slope: −.482 (.082)***	With quadratic: −.019 (.006)**	
	With quadratic: .050 (.010)***		
Predictors	*B* (*SE*)	*B* (*SE*)	
Family and Child Characteristics			
1. Child gender[2]	.030 (.090)	−.026 (.021)	--
2. Race[3]	.333 (.126)**	−.093 (.029)**	--
3. SES	−.005 (.004)	.002 (.001)	--
4. Pubertal development	.143 (.073)*	−.032 (.017)	--
5. Child IQ	.002 (.003)	−.002 (.001)*	--
Parent and Peer Relationships			
6. Deviant peers	.354 (.124)**	−.022 (.029)	--
7. Permissiveness	.078 (.106)	−.004 (.024)	--
8. Psychological control	.086 (.135)	−.011 (.031)	--
9. Monitoring knowledge	−.399 (.121)**	.078 (.028)**	--
Adolescent Behavior			
10. Internalizing problems	−.005 (.006)	−.003 (.001)*	--
11. Externalizing problems	.008 (.005)	−.002 (.001)	--
12. GPA	−.040 (.018)*	.003 (.004)	--
M (*SE*)	.780 (.644)	.265 (.150)	−.009 (.004)*
Residual variance (*SE*)	1.165 (.154)***	.205 (.043)***	.001 (.001)
Covariance (*SE*)	With slope: −.452 (.076)***	With quadratic: −.017 (.006)**	
	With quadratic: .049 (.009)***		
*R*²	.129	.029	--

Note. Model fit index of unconditional model: χ^2 (7) = 41.34, CFI = .97, TLI = .93, RMSEA = .096, SRMR = .044. Model fit index of conditional model with predictors: χ^2 (55) = 99.38, CFI = .96, TLI = .94, RMSEA = .039, SRMR = .030.

[1] At ages 16–18 and 21–22, number of sexual partners was measured as 0 = none, 1 = 1 partner, 2 = 2 to 3 partners, and 3 = more than 3 partners in last 12 months; at age 20, number of sexual partners was measured as 0 = none, 1 = 1 to 2 partners, 2 = 3 to 6 partners, and 3 = more than 6 partners in last 24 months.

[2] Child gender is coded as male = 0 and female = 1.

[3] Race is coded as non-African American = 0 and African American = 1.

[4] The variance of the quadratic slope was not significant, so no predictors were used to predict quadratic slope.

*
$p<.05$,

**
$p<.01$,

***
$p<.001$.

Table 3

Mean Differences in Developmental Antecedents by Trajectory Classes of Number of Sexual Partners from Age 16 to Age 22[1]

	Class 1 (Zero–Initial) $N = 347$ (65.8%)	Class 2 (One–Initial) $N = 78$ (14.8%)	Class 3 (Multiple-Initial) $N = 102$ (19.4%)	
Growth parameters				
Intercept	.002 (.002)	1.010 (.009)***	2.408 (.052)***	
Slope	.325 (.023)***	.211 (.054)***	−.428 (.050)***	
Quadratic	−.022 (.004)***	−.025 (.010)**	.051 (.009)***	
	M (SD)	M (SD)	M (SD)	F
Number of Sexual Partners at Age 16				
	0 (.00)[a]	1.00 (.00)[b]	2.40 (.49)[c]	4226.24***
Family and Child Characteristics				
1. Child gender[2]	.48 (.50)	.62 (.49)	.46 (.50)	2.64
2. Race[3]	.12 (.32)[a]	.22 (.42)[b]	.26 (.44)[b]	7.93***
3. SES	40.72 (12.46)[a]	35.94 (13.39)[b]	36.05 (13.95)[b]	6.83**
4. Pubertal development	2.56 (.63)[a]	2.77 (.66)[b]	2.73 (.62)[b]	4.51*
5. Child IQ	100.01 (16.30)[a]	96.31 (15.70)	94.35 (13.75)[b]	4.80**
Parent and Peer Relationships				
6. Deviant peers	1.32 (.30)[a]	1.43 (.47)[b]	1.56 (.46)[c]	13.88***
7. Permissiveness	1.56 (.38)	1.65 (.38)	1.65 (.47)	2.36
8. Psychological control	1.39 (.32)[a]	1.44 (.26)	1.53 (.44)[b]	5.11**
9. Monitoring knowledge	2.57 (.35)[a]	2.52 (.32)[a]	2.35 (.45)[b]	11.37***
Adolescent Behavior				
10. Internalizing problems	11.40 (7.08)	10.92 (7.72)	12.19 (7.44)	.56
11. Externalizing problems	5.01 (7.60)[a]	7.74 (13.08)[b]	10.40 (11.47)[b]	10.97***
12. GPA	9.75 (2.75)[a]	9.07 (3.07)[a]	7.98 (3.20)[b]	11.18***

Note. Means designated with the same superscript are not significantly different based on LSD post-hoc comparisons ($p < .05$).

[1] At ages 16–18 and 21–22, number of sexual partners was measured as 0 = none, 1 = 1 partner, 2 = 2 to 3 partners, and 3 = more than 3 partners in last 12 months; at age 20, number of sexual partners was measured as 0 = none, 1 = 1 to 2 partners, 2 = 3 to 6 partners, and 3 = more than 6 partners in last 24 months.

[2] Child gender is coded as male = 0 and female = 1.

[3] Race is coded as non-African American = 0 and African American = 1.

* $p < .05$,

** $p < .01$,

*** $p < .001$.