

Adolescent Sexual Debut and Later Delinquency

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Abstract Does sexual debut (i.e., experiencing sexual intercourse for the first time) increase the risks of participating in later delinquent behavior? Does this risk increase if adolescents experience early sexual debut relative to the timing experienced by one's peers? Although many factors have been linked to sexual debut, little research has examined whether sexual initiation is linked to later behavioral outcomes. Using data on adolescents participating in three waves of the National Longitudinal Study of Adolescent Health ($N = 7,297$), we examine the interconnections between sexual debut and later delinquency. In addition, we pay particular attention to the role of timing of sexual debut. We find that experiencing sexual debut is associated with delinquency one year later. In addition, those adolescents who experience early sexual debut relative to their peers are at higher risk of experiencing delinquency compared to those who debut on-time; adolescents who experience late sexual debut are the least likely to participate in delinquency. Moreover, the protective effect of late sexual debut appears to persist for several years. Findings are interpreted by drawing on developmental theory and life course research.

Introduction

Interest in the timing, prediction, and consequences of sexual initiation continues to garner much research attention. In part, this interest has resulted from the steadily declining age at which adolescents begin having sex and the finding that in the U.S. most adolescents report having had

sex by the time they graduate from high school (Singh and Darroch, 2000). Indeed, recent political discussion has focused on teen sexual activity and the promotion of abstinence education because of the concern that sex outside of marriage is likely to have deleterious consequences for youth. However, despite the common assumption that sexual initiation in general, and early sexual debut in particular, is likely to result in problematic behaviors, no research to our knowledge has systematically evaluated this claim. Although many factors have been linked to early sexual debut, little research has focused on whether early sexual initiation is linked to problem behaviors such as involvement in delinquency later in the life course. Therefore, the purpose of this research is to examine the association between sexual debut and later adolescent delinquency, with a particular focus on early sexual debut.¹

Although engaging in delinquency is not uncommon during adolescence (Moffitt, 1993) there is evidence that for some adolescents, delinquency can have lasting effects reducing social and human capital that can then result in diminished economic and social opportunities in young adulthood (Hagan, 1998; Hagan *et al.*, 1996). This may be particularly the case if adolescents engage in delinquency at a young age. For instance, if early sexual debut initiates or results in elevated delinquency. Therefore, examining the associations between sexual debut and later delinquency is warranted.

Developmental theory is instrumental in explaining how early sexual initiation can open the doorway to other behaviors. Of primary interest here, developmental theory and life course research suggest that timing of sexual debut is

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¹ By sexual debut we refer to transitioning from virgin to non-virgin status based on self-reported information on the experience of sexual intercourse.

consequential for later behavior if behavioral transitions are made off-time (i.e., earlier or later than transitions made by one's peers). That is, they can have negative consequences for individuals experiencing the transition. Using data from the National Longitudinal Survey of Adolescent Health, this study examines the interconnections between sexual debut and participation in later delinquency.

Conceptual framework

Past research has been instrumental in identifying the risk and protective factors associated with early sexual debut. In large part, this research looks at biological influences (e.g. pubertal development), environmental influences (through social learning), or internal values (through self/social control) and how they affect adolescent sexual behavior (see Bearman and Bruckner, 2001 or Meier, 2004 for a review of this research). In spite of this growing body of research examining factors associated with sexual debut, limited attention has been directed to behavioral outcomes that may result from sexual debut. Below we describe the small body of research that has examined outcomes associated with sexual debut, suggest why delinquency may be a particularly likely outcome resulting from sexual debut, and discuss the role of timing of sexual debut in shaping the association between sexual debut and later delinquency.

Sexual debut and later outcomes

Although not as common as the focus on antecedents of sexual activity, some research has explored the association between sexual activity and later outcomes. In particular, research has linked sexual activity to behavioral and psychological well-being of adolescent girls (Compas, 1987; Gibbs, 1988). For instance, Gibbs (1986) finds that sexually active girls are more likely to demonstrate disruptive and problematic behaviors than their non-sexually active counterparts. Sexually active females report running away from home more often, as well as a greater likelihood of using alcohol and drugs, than their non-sexually active peers. Similarly, sexually active adolescents have lower grade point averages than their non-sexually active counterparts (Small and Luster, 1994). While these studies suggest sexual activity may be associated with negative outcomes for girls, they are unable to demonstrate that sexual initiation resulted in these problematic outcomes (i.e., they do not control for prior involvement in problem behavior).

Other studies have examined the association between adolescent sexual activity and later social and psychological development for both male and female adolescents. Some find no overwhelming changes in the social psychological framework of adolescents who engage in sexual activity (Billy

et al., 1988) while others do find that sexual initiation is associated with an increase in depression levels (Joyner and Udry, 2000; Meier, 2000). Additionally, Meier (2004) finds that the effect of sexual initiation on depression is stronger for females and that it is tied to the context in which sexual debut occurred (i.e., whether or not the adolescent reported being in a romantic relationship).

Other research suggests that sexual initiation may influence the motivation adolescents have to do well in school and their likelihood of engaging in antisocial behavior. Jessor and Jessor (1975) compare high school and college males and females to determine whether making the transition from virgin to nonvirgin status is associated with problem behaviors. They find that sexually active adolescents place more value on their independence, have looser ties with their families, and are more likely to engage in other nonconventional behavior (1975). Additionally, they find that sexually active adolescents are more likely to report smoking marijuana and drinking. As with previous studies, this study is unable to demonstrate causal relationships (i.e. determine what came first—sexual initiation or drug use).

Although research has yet to examine the association between sexual debut and later delinquency, this association is consistent with research that views adolescent sexual activity as one of various problem behaviors (Reiss, 1970; Jessor and Jessor, 1977; Ensminger, 1987; Mott and Haurin, 1988; Rowe *et al.*, 1989; Rodgers and Rowe, 1990; Goff and Goddard, 1999). For instance, Ensminger (1987) argues that sexual behavior is generally not an isolated behavior, but instead is most likely to be associated with other behaviors viewed as unsuitable for adolescents (smoking, drinking, using drugs, etc.). Later empirical work specifically examined the overlap of adolescent sexual activity and drug use (Mott and Haurin, 1988) and mild deviant behaviors (Rowe *et al.*, 1989; Rodgers and Rowe, 1990). While this work is notable for suggesting the co-occurrence of sexual behavior and other problem behaviors among adolescents, it has not examined whether sexual initiation results in an initiation or elevation in delinquent behavior.

In sum, prior work is supportive of the idea that sexual debut may potentially open the doorway to problem behaviors such as involvement in delinquent behavior. There are several reasons to expect such an association between sexual debut and later delinquency. Involvement in sexual relations is likely to involve a reduction in adult control and time spent on other normative commitments (Hirschi, 1969). This then increases opportunities to become involved in delinquent behavior. In addition, sexual behaviors tend to occur within an overall peer context and may increase opportunities for adolescents to socialize with other youth in unstructured activities. In addition, participation in sexual activity may correspond to growing interest/concern in peer socialization and a corresponding shift from a parental orientation (Corsaro and

Eder, 1990). Participating in this peer context, therefore, increases risks of engaging in delinquent behavior (Haynie and Osgood, 2006). Moffitt's theory of adolescent delinquency is also consistent with the idea that sexual initiation can increase opportunities for involvement in delinquent behavior. The idea is that most youth experience a maturity gap in adolescence where they have reached biological maturity yet are not allowed the privileges and status that correspond with adult status. Adolescents who experience sexual initiation may feel particularly frustrated that adults around them continue to limit privileges and status that correspond with chronological age. This growing frustration may increase incentives for adolescents to attempt to bridge this maturity gap by engaging in adult behavior such as adolescent delinquency (also see Meschke and Silbereisen, 1997; Rosenthal *et al.*, 1999). Overall, the work reviewed above suggests the following hypothesis: *Sexual debut will be associated with increased risks of engaging in delinquent behavior one year later.*

Timing of sexual debut

Sexual activity is not deviant at all stages of life. Indeed, it is a normal part of human development and can have positive consequences for individuals if it occurs within an appropriate developmental sequence. However, many of the important transition behaviors that mark adolescent development involve age-graded behaviors that, when engaged in earlier, depart from the regulatory age norms defining what is appropriate at that age or stage in life (Jessor and Jessor, 1977). This suggests that most of what is considered problem behavior in adolescents is related to age-graded norms and expectations.

The relative timing of sexual debut may be particularly important to consider since age-graded norms regarding the appropriate timing of this behavior are likely to be strongly influenced by social context including the relative timing of debut experienced by one's peers (Bearman and Bruckner, 2001). Research on the relative timing of puberty is especially relevant here as it suggests that undergoing early pubertal development is linked to problem behaviors among both male and female adolescents (Felson and Haynie, 2002; Haynie, 2003; Haynie and Piquero, 2006; Magnusson, 1998; Moffitt *et al.*, 2001). Explanations for this association suggest that parent-child context, peer relationships, or social maturity account for the puberty-problem behavior association. For instance, among girls, the pubertal timing literature suggests that experiencing early pubertal timing changes girls' self-perception and how they are perceived by others, which together push them into non-normative peer contexts that encourage problem behaviors (Caspi *et al.*, 1993; Ge *et al.*, 1996; Haynie, 2003; Stattin and Magnusson, 1990). Just as the relative timing of pubertal development has been linked

to problem behaviors among both boys and girls (with early timing being associated with the most risky outcomes and late timing being associated with some protective effects) so is the effect of sexual debut on delinquency likely to depend on timing.

A handful of studies have examined how the timing of sexual onset is related to later behavior. For instance, Koyle and colleagues (1989) find that adolescents at age 19 who had their first sexual experience early, on-time, or late had different sexual practices later in life. Those who have an early sexual experience are, at age 19, more likely to have older sexual partners, a greater number of partners, and have sex more frequently. Another study looking at how the timing of sexual initiation affects later sexual behaviors finds that early sexual initiation increases the likelihood of not using a condom (Smith, 1997). These findings are important because they suggest that early sexual behavior may have an enduring effect over the life course and that early sexual debut and later sexual practices are correlated.

When transitions are made "off-age," they often have harmful consequences and affect other behavioral trajectories (Brim *et al.*, 1980). This suggests that making the transition from virgin to nonvirgin at an earlier age than one's peers is likely to have negative effects for individuals (Settersson and Hagestad, 1996; Whitbeck *et al.*, 1999). Because trajectories are interrelated, those who enter into the sexually active trajectory earlier than their peers are expected to experience different consequences associated with the behavior relative to peers who enter the transition at the normative time. These different consequences may then open up pathways to particular behaviors and trajectories of behaviors different than the pathways of those adolescents that continue to abstain from sexual activity. Similar to Jessor and Jessor's (1977) work on problem behaviors, engaging in sex, especially if sexual debut is earlier than one's peers, should increase the likelihood of engaging in other problem behaviors, such as delinquency. On the other hand, sexual debut when aligned with the timing of one's peers, may not be as problematic for adolescents, and thus be less likely to open the door to problem behaviors. This leads to our second hypothesis: *Adolescents who experience early sexual debut will be at increased risk of engaging in later delinquency compared to adolescents who experience sexual debut on time with their peers.*

In contrast to research that focuses on early sexual debut, no research to our knowledge has specifically examined the role of late sexual debut relative to one's peers (i.e., experiencing sexual debut later than the timing experienced by one's peers) on subsequent behaviors. However, research suggests that delaying sexual debut may offer some protective benefits to adolescents (Elliott and Morse, 1989). This may result because adolescents who delay sexual debut instead invest more of their time into conventional activities

and are better able to maintain a parental orientation that promotes sexual and delinquent abstinence. Therefore we hypothesize that *adolescents who experience late sexual debut will be at reduced risk of engaging in subsequent delinquency compared to adolescents who experience sexual debut on time with their peers.*

Data and methods

To evaluate our research questions we draw on data from the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a multi-survey, multi-wave study of U.S. adolescents, their parents, and their schools (Bearman *et al.*, 1997). In the initial in-school survey, conducted in 1994–1995, all students attending each of 132 high schools and their “feeder” middle schools (grades 7 through 12) on the day of the survey completed a self-administered survey. A randomly-sampled subset of about 20,000 of these students (including a few special over-samples) was subsequently interviewed at home (this is referred to as the Wave I in-home interview), as were (in most cases) one of their parents.

In a second wave of in-home interviews conducted in 1996, all adolescents in grades 7 through 11 who were interviewed in home at Wave I were re-interviewed, with a follow-up response rate among those eligible to be re-interviewed of 88% ($N = 14,738$). Then, between August of 2001 and April of 2002 a third wave of in-home interviews was undertaken with all Wave I in-home respondents who could be relocated ($N = 15,197$), with a response rate of approximately 80% (Wave I respondents who were outside of the country or were in the military and deployed overseas for the duration of the interviews were omitted from Wave III).

By the time of this third wave of interviews the majority of the original respondents were between the ages of 18 and 26, ages that coincide with emerging adulthood (Arnett, 2000). The longitudinal nature of the data, with adolescents interviewed for a second time in their homes at a one-year interval, allow us to measure the adolescents’ experiences at time one (measured in 1994–1995) on their behavior at time two (measured in 1996). In our final set of analyses, we make use of the third wave of data collection (collected 6 years later in 2002) to address whether sexual debut has lasting effects on behavior in young adulthood.

Our sample is limited to adolescents who completed all waves of the in-home interviews (approximately 12,000 respondents).² Only those adolescents who are identified as

virgins (i.e., they reported not experiencing sexual intercourse) at Wave I are included in our sample so that we can examine and compare adolescents who made the transition from virgin to non-virgin status during the next waves of data collection to those who remain virgins at Wave II (see also Bearman and Bruckner, 2001; Cavanaugh, 2004; Meier, 2004 who employ a similar strategy). In addition, we drop from our sample those respondents who reported an experience of forced sex (in the larger Add Health sample, there were 802 females who reported experiencing forced sex (3.9% of Wave I participants)). Controlling for virgin status as well as prior delinquency at Wave I allows for an examination of the relationship between sexual onset and later delinquency. With these sample selection criteria in place, our final sample contains 7,297 adolescents who were virgins at Wave I and who participated in all waves of the in-home survey.³

In the analyses that follow, we compare those who make the transition to sexually active status to those who remain virgins, and also examine how timing of first sex affects risks of delinquency involvement. In addition, we use Wave III data to ask whether any effect of early and late sexual debut persists several years later. An advantage of the Add Health data is that adolescents answered sensitive questions (e.g., those dealing with sexual activity and delinquency) using an audio computer assisted self-interview (CASI). This helped to reduce influence from the interviewer and the parents, and also helped maintain confidentiality.

As discussed in the previous literature, many factors influence the timing of sexual debut including age, race, SES, family structure, parental support, pubertal development, dating status, the importance of religion, and whether or not the adolescent took a virginity pledge (see Bearman and Bruckner, 2001 or Meier, 2003 for a review of these correlates of sexual debut). Because adolescents differentially self-select into sexually-active status, it is important to control for those factors associated with sexual initiation. In this paper, later delinquency, net of these important selection factors, is examined as a consequence of sexual initiation.

sample are not significantly different from a sample of respondents interviewed at Wave I. However, our restricted sample does contain slightly fewer Non-White youth (44% compared to 47%).

³ We dealt with missing data in a number of ways. If respondents failed to provide information on the timing of sexual initiation at Wave II we pulled this information from their Wave III interview (date of sexual initiation was collected at all three waves of interviews). While missing data on our other variables was relatively rare (each measure was missing less than 4% of responses) we used multiple imputation to fill in missing values (Allison, 2001). We also ran supplementary analyses where we employed case-wise deletion (where we lost approximately 900 cases) and found similar patterns of results.

² Supplementary analyses examined whether and how our sample of respondents (restricted to those respondents who participated in all three waves of in-home surveys) differs from a sample of Wave I respondents. Findings of the attrition analyses indicate that background demographic and behavioral characteristics (e.g., delinquency, substance use) of our

Dependent variable

We create two dependent variables for the analyses that follow. First, delinquency in the short-term is measured using information from the Wave II survey. Specifically, respondents were asked: “In the past twelve months, how often did you: paint graffiti or signs on someone else’s property, deliberately damage someone else’s property, take something from a store without paying for it, steal something worth more than \$50, steal something worth less than \$50, or sell marijuana or other drugs?” (Cronbach’s $\alpha = .84$). Each item ranges from 0 (never) to 3 (five or more times). All items are summed, creating an index that ranges from 0 to 18. To measure longer-term effects of sexual debut we measure delinquency using information from the Wave III survey. The same items described above are used to create the delinquency scale (Cronbach’s $\alpha = .72$). Descriptive statistics for all variables included in the analyses that follow are described in Table 1.

Sexual debut

The key variables in our study are measures of sexual debut. In order to measure sexual debut, respondents were asked in all waves of the in-home survey if they had ever had sexual intercourse. If they answered ‘yes,’ they were asked in what month and year did the act occur. Since only the individuals who were virgins at Wave I are included in our sample, those who did and did not have sex between Wave I and Wave II can be compared. Of our sample of 7,297 adolescents, 1,751 transitioned into sexual activity between Waves I and II. Therefore, 24% of the sample initiated sexual activity between the two waves of data collection and will be compared to the 5,546 adolescents who remained virgins between Wave I and Wave II.

To calculate whether respondents experienced early, on-time, or late sexual debut we compared respondent’s reported age of sexual debut to that of their peers in their schools. A school mean for sexual initiation is calculated by taking the average age reported by all of the respondents grouped by school identification number. By calculating the school mean age of debut, the respondents will be compared to their own peers rather than an arbitrary age deemed early, or a global mean age.

Overall, there is much variation in the school-level age of sexual debut with the average school having a mean age of debut of 14.78 (standard deviation = 1.08) and schools ranging from an average age of 11.25–17.5. Respondents who are more than one standard deviation below the school mean for their age and their respective sex are coded as

having experienced “early” sexual initiation.⁴ Respondents who are more than one standard deviation above the school mean for their age and their respective sex are coded as having experienced “late” sexual initiation. All other respondents are coded as having experienced “on-time” sexual initiation. Of the adolescents reporting sexual initiation between Waves I and II, 9% of them experienced early sexual debut, 58% experienced sexual debut on-time, and 33% experienced sexual intercourse later than their peers.

To determine whether the effect of the timing of sexual debut persists beyond one year, we incorporate information from the Wave III survey on timing of sexual debut to code all adolescents into one of three categories (early, on-time, and late debut). This allows us to determine whether adolescents who remained virgins between Wave I and Wave II eventually had sexual intercourse and whether the timing of this debut placed them in the early, on-time, or late debut category. Those adolescents who continued to abstain from sexual intercourse at the Wave III survey (when between the ages of 18–26) are classified as being in the late sexual debut category since their chronological age clearly places them in the upper end of the age distribution (for initiating sexual debut). Based on Wave III information, 12% of the sample was classified as experiencing early debut, 52% as experiencing on-time debut, and 36% as experiencing late debut. In addition, in supplementary analyses, we replicated Wave III analyses with a restricted sample that excluded Wave III virgins from the sample. Results from these analyses produced virtually identical estimates to those reported in Table 4.

Demographic controls

In order to control for compositional effects, we include in our analyses control variables for gender, age, race, family SES, and family structure. All control variables are measured based on information collected in the Wave I survey. *Female* is a dummy variable indicating the biological sex of the respondent (1 = female, 0 = male). In order to measure *race* we constructed dummy variables using the self-reported racial categories White, Black, and Other Race. Other Race includes Latino/as, Asians, Native Americans, and those who self-identify as Other Race. We limit our analyses to a focus on three race/ethnic groups since the sample becomes too small to permit a more nuanced description of race/ethnicity by age of sexual debut.

⁴ We choose to use one standard deviation as our gauge of early and late sexual debut since this placed approximately 40% of our sample in one of the two off-time categories. However, in supplementary analyses we examined whether using two standard deviations above or below the mean as a point of comparison changed our pattern of findings. Overall, these analyses indicated that using a more restricted definition of early- and late-debut produced substantively similar results.

We control for family SES using two measures, the parent's highest education level and receipt of public assistance. *Parent's education* is a scale indicating the highest education level the parent achieved, as reported by the respondent. When the respondent reported both parents' education, the level of the highest parent's education is used. In the cases when the respondent did not know, the highest educational level reported by parents in the parent questionnaire is used.⁵ *Receipt of public assistance* is a dummy variable indicating whether the family receives public assistance (1 = yes, 0 = no).

Family structure is measured with dummy variables indicating whether the respondent resided in a family with two parents, one parent or another family structure. *Two parent* family distinguished respondents who resided in a family with two parents (biological or non-biological). *One parent* family distinguished respondents who lived with either a single mom or a single dad. *Other family* structure includes all other family types. In the analyses that follow, two-parent family structure is the reference category.

In addition to these demographic controls, we include additional measures of factors associated with sexual initiation and/or delinquency (Meier, 2003). This includes a measure of prior delinquency. Delinquency at Wave I is calculated using the same items as included in the dependent variable (Cronbach's $\alpha = .83$).

Depression is measured using a modified depression scale from the Center for Epidemiological Studies (CES-D). The Add Health questions mirror those of the CES-D on many of the items, and are very similar for the remaining items. The scale used in this study ranges from 0 to 56 (Cronbach's $\alpha = .89$). As with the delinquency scale, we are also using the depression scale as a continuous variable.

In order to measure the student's performance at school, we use respondents' report of their grades in Science, Math, History, and English. The grades are averaged on a scale of 4.0 (A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = 0.0), allowing an *overall GPA* score to be calculated. In addition to respondent's grades, a measure of *school alienation* is included in the model. This index includes the following items, "how often have you had trouble...": getting along with your teachers? paying attention in school? getting your homework done? and getting along with other students?" Responses ranged from 0 (never) to 4 (everyday) and are summed across the four items (Cronbach's $\alpha = 0.69$).

⁵ Since not every parent was given the parent questionnaire, there was substantial missing data on that variable ($N = 3,218$), as compared to the number of missing cases in the in-home survey ($N = 95$). Rather than use only the parent questionnaire for this variable, it was more advantageous to use the respondent's report of the parent's highest education as the primary source of that information.

Parental support is measured as a scale comprised of responses to six questions measuring how close the respondents feel to their mom or dad. Respondents were asked to indicate how close they felt to their mom/dad, how satisfied they were with the way their mom/dad communicated with them, and how satisfied they were with their relationship with their mother/father. The response sets for each of the questions ranged from 0 (not at all/strongly disagree) to 5 (very much/strongly agree). For the respondents with only one parent present, the three questions for either the mom or dad were summed. When both parents were present, the six questions for both mom and dad were averaged, resulting in a scale ranging from 0 to 15 (Cronbach's $\alpha = 0.71$).

In order to measure the level of *illegal substance use*, we created a scale ranging from 0 to 7. Respondents were asked to report whether they had ever used marijuana, cocaine, inhalants, or other illicit drugs (1 = did at least once, 0 = never tried that particular drug). Additionally the respondents were asked to report their cigarette smoking (1 = smoked cigarettes regularly in the last month, 0 = else) and also their drinking behavior over the past year (1 = got drunk 2 or more times in the last month, 0 = got drunk once in the last month or less). These reports were summed across all of the drug categories, resulting in a continuous measure indicating the number of substances the respondent has used including: marijuana, cocaine, glue sniffing, or any other illegal drug, cigarettes, or alcohol (Cronbach's $\alpha = .75$).

We also include as controls four measures that past research has suggested are associated with sexual initiation (Meier, 2003; Bearman, 2001). *Relative pubertal status* is a self-reported measure indicating the respondent's physical development relative to his/her peers (1 = less developed, 5 = more developed). *Dating* is a dummy variable indicating whether the respondent was involved in a special relationship with anyone in the last 18 months. *Virginity pledge* is a dummy variable indicating whether the respondent took a virginity pledge (1 = yes, 0 = no). Finally, *ideal relationship* is a dummy variable indicating whether the respondent feels as if his/her ideal relationship would include sex (1 = yes, 0 = no). The descriptive statistics for all variables are included in Table 1.

Analyses and findings

Following the advice of Add Health researchers, it is necessary to adjust for the stratified and clustered nature of the data design with respondents nested within schools (Chantala and Tabor, 1999). Therefore all analyses are conducted in Stata using the survey-correcting techniques that allow for an adjustment of error terms to account for the clustering of adolescents within schools. In addition, we make use of the "subpop" command in Stata that adjusts

Table 1 Description of variables, Add Health sample limited to respondents identified as virgins, Wave I

Variable name	Mean/Percent	Std. Dev	Range	N	
Dependent variable					
Delinquency W II $\alpha = 0.840$	0.914	2.048	0	18	7,297
Delinquency WIII $\alpha = 0.795$	0.451	1.247	0	15	7,297
Exogenous variables					
Wave II sexual debut (Virgin reference)	24%		0	1	7,297
Wave II early sexual debut (on-time sexual debut reference)	9.4%		0	1	1,797
Wave II late sexual debut (on-time sexual debut reference)	32.9%		0	1	1,797
Wave III early sexual debut (on-time sexual debut reference)	12.2%		0	1	7,297
Wave III late sexual debut (on-time sexual debut reference)	35.5%		0	1	7,297
Controls					
Female (Male reference)	54%		0	1	7,297
Age	14.899	1.557	11	21	7,297
Black race (white race reference)	16.9%		0	1	7,297
Other race (white race reference)	26.6%		0	1	7,297
Receipt of public assistance	9.6%		0	1	7,297
Parent's highest education	3.012	1.302	0	5	7,297
Family structure					
One parent family (two parent family reference)	20.6%		0	1	7,297
other family structure (two parent family reference)	3.3%		0	1	7,297
Delinquency W I $\alpha = 0.829$	1.043	2.122	0	18	7,297
Substance use at W I $\alpha = 0.752$	0.376	0.834	0	7	7,297
Depression at W I $\alpha = 0.887$	10.103	6.974	0	48	7,297
Overall GPA	2.915	0.757	1	4	7,297
School alienation $\alpha = 0.691$	3.828	2.788	0	16	7,297
Parental support $\alpha = 0.825$	4.184	0.852	0	5	7,297
Dating in the last 18 months (1 = Yes, 0 = No)	40.1%		0	1	7,297
Importance of religion	3.004	1.287	0	4	7,297
Virginity pledge (1 = Yes, 0 = No)	19.4%		0	1	7,297
Relative pubertal status	3.144	1.069	1	5	7,297
Ideal relationship would include sex (1 = Yes, 0 = No)	24.7%		0	1	7,297

the weights to account for the restricted nature of our sample (limited to respondents who identified as virgins in Wave I).

In our multivariate analyses, survey-adjusted negative binomial regression is used since it closely approximates the distribution of the dependent variables (the delinquency indices have distributions with large numbers of zero-values and a variance that is greater than the mean indicating that a small number of respondents report very high levels of delinquency involvement). Negative binomial models differ from Poisson regression by adding a residual variance parameter capturing the over dispersion in the dependent variable (Gardner *et al.*, 1995). Since negative binomial regression models are designed for dependent variables that are counts of events, the models utilize a distribution that summarizes the likelihood of observing a specific number of events, given an underlying mean count of events (Osgood, 2000).

To address our first research question, does sexual initiation result in elevated risks of delinquency one year later, we turn to multivariate results described in Table 2. Of most importance, results indicate that net of control variables, experiencing sexual debut between Wave I and Wave II is

associated with elevated risks of engaging in delinquency. Compared to virgins, those adolescents who experience sexual debut increase their expected delinquency score by 58% (exp (.391)). Overall, this suggests that sexual debut is associated with risks of delinquency one year later controlling for initial levels of delinquency.

Consistent with prior research, results from Table 2 also indicate that female, older adolescents, Black youth, adolescents with higher GPAs, those with greater parental support, those who have taken the virginity pledge, and those who place more importance on religion are at lowest risk of engaging in delinquency. In contrast, other race youth, those residing in single-parent households, those who participated in prior delinquency or substance use, and those reporting school alienation are at heightened risk of engaging in delinquency at Wave II.

Next, we ask whether timing of sexual debut is associated with later delinquency. To conduct these analyses, we limit our sample to those respondents who experienced sexual debut between Wave I and Wave II ($N = 1,797$). Our intention here is to compare those who experience

Table 2 Negative binomial regression of delinquency at Wave II on sexual debut^a

Variable name	Model one				
	<i>b</i>	Std error	Exp (b)	95% Conf. interval (b)	
Constant	2.423***	0.356	11.280	1.72	3.13
Sexual debut (virgin wave II reference)	0.391***	0.065	1.478	.26	.52
Controls					
Female	−0.311***	0.066	0.733	−.44	−.18
Age	−0.191***	0.018	0.826	−.23	−.15
Black	−0.281**	0.081	0.755	−.44	−.12
Other race	0.129*	0.065	1.138	.00	.26
Receipt of public assistance	−0.013	0.093	0.987	−.20	.17
Parent's highest education	0.052*	0.023	1.053	.01	.10
One parent family structure	0.129*	0.065	1.138	.00	.26
Other parent family structure	−0.203	0.153	0.816	−.51	.10
Delinquency at W I	0.288***	0.111	1.334	.27	.31
Substance scale at W I	0.144***	0.034	1.155	.08	.21
Depression at W I	−0.001	0.004	0.999	−.01	.01
Overall GPA at W I	−0.090**	0.038	0.914	−.16	−.01
School alienation	0.055***	0.010	1.057	.03	.08
Parental support	−0.105***	0.028	0.900	−.16	−.05
Dating	−0.018	0.056	0.982	−.13	.09
Importance of religion	−0.046*	0.019	0.955	−.08	−.01
Virginity pledge	−0.203**	0.072	0.816	−.35	−.06
Relative pubertal status	0.036	0.026	1.037	−.01	.09
Ideal relationship includes sex	−0.003	0.057	0.997	−.12	.11
Pseudo <i>R</i> ²	0.09				
<i>N</i> = 7,297					

^aRespondents who remained virgins between Waves I and II are the reference category.

**p* < 0.05 (two-tailed tests).

***p* < 0.01.

****p* < 0.001.

early and late debut to those who experience sexual debut on-time (relative to the timing of one's peers). Results for these analyses are described in Table 3. Consistent with our hypotheses, findings indicate that early debut is associated with increased risk of participating in delinquency compared to risks experienced for those youth who experienced on-time sexual debut. Specifically, experiencing early debut is associated with a 20% increase in predicted delinquency compared to youth debuting on-time. In contrast, youth who experience debut later than their peers face lower risks of engaging in delinquency. In particular, their predicted delinquency score is 50% lower than the predicted delinquency scores for those who debuted on-time. In general, control variables continue to operate consistent with prior research.

Our final set of analyses, described in Table 4, asks whether the effect of timing of sexual debut persists beyond one year. In addition, these analyses allow us to classify all adolescents in our sample into early, on-time, and late sexual debut categories based on information on the timing of sexual debut provided in the Wave III interview when respondents were entering young adulthood (versus results

presented in Table 2 where we excluded those who remained virgins between Wave I and Wave II).

Results indicate that respondents experiencing early sexual debut continue to be at risk of experiencing higher delinquency levels in young adulthood compared to the risks faced by respondents who experienced sexual debut on-time with their peers. In contrast, experiencing late sexual debut continues to be associated with a reduction in delinquency in young adulthood. Again, we find that the effect of timing of sexual debut persists, net of a host of background individual and family factors that are related to delinquency involvement in young adulthood.

Conclusion

Despite a very public campaign promoting the benefits of sexual abstinence for adolescents, prior research in large part has limited itself to a focus on the predictors of early sexual initiation rather than examining how sexual initiation affects later behavior. Even when research does try to disentangle how sexual initiation and early sexual debut, in particular,

Table 3 Negative binomial regression of delinquency Wave II on timing of sexual debut^a

Variable name	Model one				
	<i>b</i>	Std error	Exp(<i>b</i>)	95% Conf. interval (<i>b</i>)	
Constant	2.915***	0.729	18.449	1.47	4.36
Early sexual debut (on-time reference)	0.187*	0.095	1.206	.00	.38
Late sexual debut (on-time reference)	-0.714*	0.364	0.490	-1.44	-.00
Controls					
Female	-0.498***	0.103	0.608	-.70	-.29
Age	-0.180***	0.039	0.835	-.26	-.10
Black	-0.469**	0.146	0.626	-.76	-.18
Other race	0.013	0.091	1.013	-.17	.19
Receipt of public assistance	-0.105	0.156	0.900	-.41	.20
Parent's highest education	0.038	0.040	1.039	-.04	.12
One parent family structure	0.100	0.100	1.105	-.10	.12
Other parent family structure	-0.379	0.246	0.685	-.87	.11
Delinquency at W I	0.196***	0.019	1.217	.16	.23
Substance scale at W I	0.150**	0.042	1.162	.07	.23
Depression at W I	-0.011	0.006	0.989	-.02	.00
Overall GPA at W I	-0.000	0.075	1.000	-.15	.15
School alienation	0.053***	0.014	1.054	.03	.08
Parental support	-0.105*	0.043	0.900	-.19	-.02
Dating	-0.087	0.090	0.917	-.27	.09
Importance of religion	-0.039	0.028	0.962	-.09	.02
Virginity pledge	-0.006	0.148	0.994	-.30	.29
Relative pubertal status	0.023	0.048	1.023	-.07	.12
Ideal relationship includes sex	-0.020	0.093	0.980	-.20	.16
Pseudo <i>R</i> ²	0.08				
<i>N</i> = 1,797					

^aLimited to respondents who made the transition into sexual debut between Waves I and II.

**p* < 0.05 (two-tailed tests).

***p* < 0.01.

****p* < 0.001.

affects later behavior, it has focused on the effects of early pregnancy, rather than sexual activity. The purpose of our research was to examine whether sexual debut resulted in elevated delinquency scores one year later. In addition, we placed particular importance on the role of timing of sexual debut and examined whether experiencing “early” or “late” sexual debut affected levels of delinquency relative to risks faced by adolescents who experienced sexual debut “on-time” with their peers. Finally, we consider whether any effect of the timing of sexual debut on later delinquency persists beyond a one-year time frame.

Overall, three important findings emerge from our study. First, our results indicate that controlling for the antecedents of early sexual initiation, transitioning to sexual debut increases risks of engaging in delinquency one year later. Although our study is not designed to evaluate the mechanisms underlying the association between sexual debut and later delinquency, our findings are consistent with the idea that transitioning to sexual debut increases the salience of a peer

social context that is conducive to engaging in delinquent activities.

Second, our study demonstrates that the timing of sexual debut relative to the timing experienced by one’s peers has important implications for delinquent behavior. Specifically, experiencing sexual debut earlier than one’s peers is associated with higher risks of engaging in delinquency compared to the risks experienced by adolescents debuting on-time with their peers. Perhaps these youth are least prepared to deal with the potential emotional, social, and behavioral consequences of engaging in behavior so much earlier than their peers. The increased strains, as well as opportunities to engage in the peer social context potentially explain their greater risks of participating in later delinquency. Similarly, experiencing sexual debut later than one’s peers offers a protective effect and reduces the risks of engaging in subsequent delinquency. These findings are consistent with life course theory and research that demonstrate that the timing and sequence of events such as sexual activity has

Table 4 Negative binomial regression of delinquency Wave III on timing of sexual debut

Variable name	Model one				
	<i>b</i>	Std error	Exp(<i>b</i>)	95% Conf. intervals (<i>b</i>)	
Constant	2.210***	0.562	9.116	1.10	3.32
Early sexual debut (on-time reference)	0.189 ⁺	0.101	1.208	.00	.24
Late sexual debut (on-time reference)	-0.234*	0.098	0.791	-.43	-.04
Controls					
Female	-0.965***	0.087	0.381	-1.14	-.79
Age	-0.231***	0.026	0.794	-.28	-.18
Black	-0.089	0.130	0.915	-.35	.17
Other race	-0.062	0.083	0.940	-.23	.10
Receipt of public assistance	0.031	0.132	1.031	-.23	.29
Parent's highest education	0.132**	0.039	1.141	.05	.21
One parent family structure	0.040	0.083	1.041	-.12	.20
Other parent family structure	0.039	0.231	1.040	-.42	.50
Delinquency at W I	0.151***	0.013	1.163	.12	.18
Substance scale at W I	0.115**	0.037	1.122	.04	.19
Depression at W I	-0.008	0.005	0.992	-.02	.00
Overall GPA at W I	0.149*	0.058	1.161	.04	.26
School alienation	0.081***	0.012	1.084	.06	.10
Parental support	-0.063	0.049	0.939	-.16	.03
Dating	-0.024	0.080	0.976	-.18	.13
Importance of religion	-0.042	0.034	0.959	-.11	.03
Virginity pledge	-0.206*	0.097	0.814	-.40	-.01
Relative pubertal status	-0.037	0.036	0.964	-.11	.03
Ideal relationship includes sex	-0.011	0.080	0.989	-.17	.15
Pseudo <i>R</i> ²	0.07				
<i>N</i> = 7,297					

**p* < 0.05 (two-tailed test).

***p* < 0.01 (two-tailed test).

****p* < 0.001 (two-tailed test).

⁺*p* < .005 (one-tailed test).

profound consequences, particularly when they take place prematurely.

Third, our findings indicate that the consequential effect of the timing of sexual debut persists beyond one year. Indeed, we find that experiencing early or late sexual debut continues to have consequences for delinquent behavior occurring in young adulthood. This interpretation is compatible with a life course perspective that assumes that the “problem” of early sexual debut is that it is off-time (normatively speaking) and may hinder the social development of the adolescent and result in other potentially problematic behaviors (e.g., delinquency, teenage child birth) that continue to have developmental consequences throughout the life course. Perhaps, experiencing early sexual debut sets the stage for other behaviors and experiences that reduce human and social capital acquired in adolescence and young adulthood. This would especially be the case if early sexual debut resulted in a teenage pregnancy. Similarly, postponing sexual debut may open up avenues for adolescents and young adults to invest in human and social capital that can protect them from en-

gaging in potentially problematic behaviors in adolescence and young adulthood.

While our study benefits from a longitudinal design that allows us to control for factors that are associated with adolescents' likelihood of engaging in delinquent behavior, as well as control for factors that have previously been demonstrated to influence the timing of sexual debut, our study is not without limitations. To study whether initiating sexual debut results in the initiation of delinquency or elevates delinquency we made the decision to limit our sample to adolescents reporting virgin status (i.e., having not experienced sexual intercourse) during the initial in-home interview. While others have taken a similar approach to understanding how sexual initiation affects later wellbeing (e.g., Bearman and Bruckner, 2001; Cavanaugh, 2004; Meier, 2004) it does introduce the possibility that our initial sample of virgins differs significantly from the overall population of adolescents. To address this we included a number of variables that have been found to facilitate or protect against sexual debut. Future research should continue to untangle

the causal associations underlying sexual debut and later behaviors.

In addition, while our research benefited from the use of a large nationally representative dataset on school-aged adolescents allowing our results to be generalized to other school-aged adolescents who report virginity status it is not able to capture the internal dynamics that shape adolescent decision-making about participating (or non-participating) in sexual behavior. Qualitative analyses that explore more of the mechanisms underlying decisions to engage in particular behavior would provide a useful extension of the current work.

While it was beyond the scope of this study to do so, it is imperative for future research to examine the role of gender, race, and social class in affecting the timing of sexual debut and behaviors resulting from this life course transition. Consequences of early sexual initiation may be especially problematic for females since they are at elevated risks of experiencing some of the more serious consequences of sexual initiation including pregnancy and child birth. In addition, research has consistently indicated that lower class African American females experience earlier sexual debut and higher rates of pregnancy and child birth compared to White females (Furstenberg, 1991; Furstenberg *et al.*, 1987; Hogan and Kitgawa, 1985; Zelnik and Shah, 1983). Therefore, it is important to better understand the role of gender, race, and social class in shaping the linkages between the timing of sexual debut and later behaviors.

In addition, future research should explore whether school characteristics affect sexual debut since our study finds evidence of considerable variability in the average age of sexual initiation across schools. This suggests that the timing of sexual debut may be shaped by school characteristics including the urbanicity of the school, religious climate, and resources available to promote sexual education within schools. Finally, future research should continue investigating the role of neighborhood characteristics in the sexual debut-problem behavior association. Perhaps in more affluent neighborhoods sexual behaviors are less likely to translate into other problematic behaviors since available resources can mitigate any detrimental effect of transitioning into sexual intercourse. On the other hand, if early sexual debut is more normative in disadvantaged neighborhoods, then the association between sexual debut and problem behaviors such as delinquency may be suppressed. Analyses focusing on the moderating effect of school and neighborhood characteristics are an important area of future investigation.

In sum, it is important to keep in mind that sexual intercourse is not always a “problem behavior” and it may even have positive consequences for many youth who experience it in the developmental unfolding of their lives. Our study demonstrates, however, that the timing of sexual initiation matters and that many adolescents are at heightened risk of

engaging in delinquent behavior if they experience sexual debut that occurs earlier than the timing experienced by their peers. It appears that early sexual debut is likely to occur before most adolescents are developmentally prepared to deal with the emotional and social consequences of initiating this behavior. In addition, failure to prepare for any unintended consequences of engaging in sexual intercourse (e.g., pregnancy, transmission of sexually transmitted diseases) can have developmental consequences that continue to play out over the life course.

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