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The Risks and Rewards of Sexual Debut

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The sex-positive framework of sexual development hypothesizes that healthy sexual experiences can be developmentally appropriate and rewarding for adolescents despite the risks involved. Research has not examined whether risky behaviors and rewarding cognitions actually change with sexual debut at a normative or late age. This study measured the longitudinal impact of sexual debut using 7 waves of data from 88 male and 86 female adolescents from a western U.S. city who were in the 10th grade at the study's onset. We used piecewise growth curve analyses to compare behaviors and cognitions before and after first sexual intercourse for those whose debut was at a normative or late age. These analyses revealed that sexual debut was related to rewards, including increases in romantic appeal and sexual satisfaction. In addition, internalizing symptoms declined over time after sexual debut, and substance use grew at a slower rate after sexual debut. We also examined whether differences existed among those whose debut was at an early, normative, or late age. Linear growth curve analyses revealed early sexual debut was related to risks, such as greater substance use, more internalizing and externalizing symptoms, and lower global self-worth. Rewards associated with an early debut included greater romantic appeal, dating satisfaction (males only), and sexual satisfaction (males only). Although there are some inherent risks with sexual activity, the results suggest that sexual debut at a normative or late age is also associated with a decrease in some risks and an increase in rewards.

Keywords: sexual debut, sexual onset, sexual intercourse, adjustment, substance use

The first intercourse experience, or *sexual debut*, is considered a stepping-stone to later sexual and relationship development and a significant milestone along the developmental transition to adulthood (Wight et al., 2008). By current national norms of the United States, debut is considered "early" if it occurs prior to age 15, "normative" if it occurs between 15 and 19 years of age, and "late" if it occurs after 19 years of age (Harden, 2012). Despite the importance of this event, there remains much to learn about the risks and rewards of sexual debut.

The effects of sexual debut have been largely assessed via between-groups comparisons among early, normative, and late debut groups. Such studies provide consistent evidence that early debut is associated with problematic outcomes. For example, as compared with those whose debut is at a normative or late age, those with an early debut are less likely to use contraception (Siebenbruner, Zimmer-Gembeck, & Egeland, 2007) and are thus more likely to be infected with a sexually transmitted disease (STD). Those who have an early debut have higher levels of substance use than those who have a later debut (see Zimmer-Gembeck & Helfand, 2008). Additionally, gender-specific effects of timing have been reported for externalizing symptoms and depression (see section on gender differences).

Though comparisons of those who debut at early, normative, and late ages yield valuable information, such between-groups comparisons carry inherent limitations. Specifically, cross-sectional comparisons of different timing groups tell us about relative differences among the groups but do not delineate changes that individuals undergo with the onset of intercourse. For example, we know that those who have an early debut have greater rates of substance use, but we do not know whether an early debut leads to increase in substance use after sexual debut, or if the rate is unaffected by debut. It is possible that the greater rate of substance use associated with an early debut occurs because those who have high rates of substance use are more likely to have an early debut—that is, a selection effect.

Even longitudinal studies of the different timing groups do not precisely describe changes at the time of debut. For example, Bingham and Crockett (1996) compared the frequency of drunkenness from the 9th grade to the 12th grade for early, normative, and late debut groups, but it is not clear if any differences among the groups reflected the effects of sexual debut or reflected preexisting differences among those who have an early, normative, or late debut—that is, a selection effect. Certainly, such analyses provide valuable information about the developmental trajectories of individuals who have their debut at different ages, but these analyses should be paired with complementary analyses to compare individuals' behavior before and after sexual debut. Those analyses would enable one to determine whether changes occur with debut.

Additionally, the comparisons of different timing groups have primarily focused on the results concerning those who had an early

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debut. The finding that early timing is associated with problem behaviors has important theoretical and applied significance. Because of this focus, however, experiences of normative and late timing groups have been primarily understood in terms of a relative comparison to the early group.

The Sex-Positive Framework

Given the risk-based focus on outcomes of individuals who have an early debut, we have yet to come to a holistic understanding of the effects of sexual debut. Many have begun to call for adolescent sexuality research to examine positive outcomes alongside negative outcomes (Diamond & Savin-Williams, 2009; Tolman & McClelland, 2011). The literature on adult sexual activity describes positive effects of sexual behavior, including health-promoting effects, increases in emotion regulation, and lower morbidity and mortality (Diamond & Huebner, 2012). Thus, it seems quite possible that sexual activity, including intercourse, may have some positive outcomes for adolescents as well. Such an examination of potential rewards is not to overlook the evidence provided by decades of research addressing risks associated with sexual behavior. Rather, extending research to encompass both rewards and risks reflects a change toward understanding sexual behavior as a complex phenomenon that may more fully reflect adolescents' actual experience of sexual debut.

The sex-positive framework provides a blueprint for the study and understanding of adolescent sexuality (Harden, 2014). It posits that consensual sexual experiences can be positive, healthy, and developmentally appropriate. The sex-positive framework, however, neither implies that all sexual activity is positive and healthy nor that abstinence is unhealthy. Moreover, the risks that sexual activity entails are not downplayed; in fact, the management of risks is an essential part of healthy sexuality. Thus, avoiding risky outcomes is critical but does not diminish the potentially positive rewards that could come with sexual behavior.

Decision making about sexual behavior is considered an essential component of the development of healthy adult sexuality. Accordingly, adolescents are viewed as active agents. When given the right tools, they are able to make well-informed, healthy decisions around sexual experiences to reduce risk and promote healthy development. In fact, cross-cultural research indicates that adolescents can be capable of reducing the risks that occur with sexual activity (Harden, 2014). Within this conceptualization of adolescent sexuality, those who are developmentally ready are best able to manage the development of healthy sexuality. Thus, it is important to identify the positive outcomes as well as the risks for those whose sexual debut is at a normative time or later and not focus solely on those whose debut is early.

Gender Differences

The variables associated with the timing of sexual debut differ for each gender. Males whose sexual debut is early have higher rates of minor deviance and aggression than do males whose sexual debut is later; such timing effects are not apparent in females (Bingham & Crockett, 1996). Females whose debut is at an early age are more depressed than are females whose debut is later, although such differences decrease over time (Meier, 2007; Spriggs & Halpern, 2008). For males, timing of sexual debut is not associated with depression.

Limited information exists regarding gender differences in the effects of sexual debut. Females whose debut is at an early age show increases in depression and decreases in self-esteem after their sexual debut, whereas males whose debut is early do not. It is important to note that neither males nor females whose debut is at the normative age or later show such changes after their debut occurs (Meier, 2007; Spriggs & Halpern, 2008). Such findings suggest that gender differences may apply only when sexual debut is early, whereas other findings suggest that such gender differences may be more general. Although both genders largely perceive first intercourse as a positive experience (see Vasilenko, Maas, & Lefkowitz, 2015), males generally report experiencing more sexual and psychological satisfaction, greater pleasure, less anxiety, and less shame and guilt than do females (Cuffee, Hallfors, & Waller, 2007; Higgins, Trussell, Moore, & Davidson, 2010; Sprecher, Barbee, & Schwartz, 1995). Thus, we know relatively little about gender differences in the effects of sexual debut, particularly with regard to whether they apply to all ages or whether they apply primarily to those whose debut is early.

Present Study

The current study used a sex-positive framework to examine both rewards and risks potentially associated with sexual debut. We conceptualized rewards or positive cognitions in terms of increases in global self-worth, romantic appeal, and feelings of dating satisfaction, and sexual satisfaction (Diamond & Savin-Williams, 2009; Tolman & McClelland, 2011). These are broad romantic cognitions that are likely to be central in individuals' romantic and sexual schemas. For example, romantic appeal assesses adolescents' confidence in their ability to attain the romantic relationships they would like to have. Most individuals report being sexually satisfied after the first sexual experience (see Vasilenko et al., 2015); such satisfaction may also lead to increased feelings of romantic appeal and global self-worth. With regard to risks or problem behaviors, we examined substance use, internalizing symptoms, and externalizing symptoms. These variables were chosen because they function as important markers of adjustment and are commonly examined in adolescent research.

We implemented two longitudinal analytic techniques over seven waves of data: linear growth curve modeling and piecewise growth curve modeling. Linear growth curve models were used to estimate the initial level and change in trajectory within each variable over time as a function of the timing of sexual debut and gender. Prior investigations largely used repeated-measures analyses of variance (ANOVA) to test the reported associations between timing of debut and problem behavior. Linear growth curve models examine the trajectory of a variable over time. We are thus able to determine whether differences associated with timing of debut exist at the onset of the study and increase, decrease, or remain the same over time. Thus, linear growth curve models provide a powerful statistical tool to replicate and extend the results of prior investigations.

We then examined the trajectory of change after sexual debut by using piecewise growth curve modeling, a quasi-experimental analytic approach. This technique is used to explore whether change ensues in the trajectory of a variable after the occurrence of a significant event—that is, sexual debut (see Duncan, Duncan, Strycker, Li, & Alpert, 1999). Such change in the trajectory could

be reflected in a change in intercept, a change in slope, or changes in both intercept and slope after sexual debut. By accounting for an individual's trajectory prior to an event, each individual essentially acts as his or her own control. In doing so, change that is observed at the time of the event is likely to reflect the effect of the event or something commonly associated with the event (Shadish, Cook, & Campbell, 2002).

We selected these two analytic approaches as their combination allowed us to obtain a more complete picture of the nature of the experience of sexual debut. In the present study, we conducted the latent growth curve models with all the participants who had their debut during the course of the study, but we were only able to conduct the piecewise growth curve analyses for the individuals who had sexual debut at a normative and late age, as we lacked the necessary data points prior to sexual debut for those who had their debut at an early age.

Hypotheses

Linear growth curve models. A first set of hypotheses was garnered for the linear growth curve analyses for the trajectories of both risks and rewards on the basis of extant research and the sex-positive theory. We predicted that earlier sexual debut timing would be associated with relatively higher initial levels (intercepts) of substance use (Bingham & Crockett, 1996; Zimmer-Gembeck & Helfand, 2008).

Regarding gender differences in the linear growth curve models, we predicted that earlier sexual debut for males would be associated with higher levels of externalizing symptoms than would later sexual debut for males, as would be expected from prior work (Bingham & Crockett, 1996; Zimmer-Gembeck & Helfand, 2008). On the basis of prior work (Higgins et al., 2010; Meier, 2007; Spriggs & Halpern, 2008; Vasilenko et al., 2015), we predicted earlier sexual debut timing for females would be associated with higher levels of internalizing symptoms and lower global self-worth. We anticipated that the associations of timing of debut with internalizing symptoms, and perhaps other risks, would subside over time (Spriggs & Halpern, 2008).

Piecewise growth curve models. For the piecewise growth curve analyses of individuals who had normative and late debut, we refrained from making hypotheses regarding risks as the sex-positive framework makes no predictions about changes in outcomes, such as internalizing symptoms, externalizing symptoms, and substance use. We predicted that individuals would experience increases in feelings of romantic appeal and global self-worth after sexual debut (i.e., intercept changes), due to a sense of acquired developmental achievement or adult status and increased feelings of desirability (Diamond & Savin-Williams, 2009). Such changes were also expected to lead to increased feelings of dating satisfaction and sexual satisfaction after sexual debut, as has been found in prior research (Vasilenko et al., 2015). We expected that males might experience greater increases in rewards with sexual debut than might females, in light of evidence indicating that males perceive first intercourse more positively (see Cuffee et al., 2007; Higgins et al., 2010; Sprecher et al., 1995).

Method

Participants. Participants were part of a longitudinal study investigating the role of relationships with parents, peers, and romantic partners on psychosocial adjustment. Two hundred 10th grade high school students (100 males, 100 females; *M* age = 15.83 years, *SD* = .49) were recruited. The participants came from 37 ZIP codes of working-class to upper middle-class neighborhoods in a large western metropolitan area. We sought to obtain a diverse sample by distributing brochures and sending letters to families residing in a number of different ZIP codes and to students enrolled in various schools in ethnically diverse neighborhoods. We were unable to determine the ascertainment rate because we used brochures and because letters were sent to many families who did not have a 10th grader. We contacted interested families with the goal of selecting a quota sample that had an equal number of males and females and had a distribution of racial/ethnic groups that approximated that of the United States. To ensure maximal response, we paid families $25 to hear a description of the project in their home. Of the families that heard the description, 85.5% expressed interest and carried through with the Wave 1 assessment.

The sample consisted of 11.5% African Americans, 12.5% Hispanics, 1.5% Native Americans, 1% Asian Americans, 4% biracial, and 69.5% White, non-Hispanic individuals. With regard to family structure, 57.5% were residing with two biological or adoptive parents, 11.5% were residing with a biological or adoptive parent and a stepparent or partner, and the remaining 31% were residing with a single parent or relative. The sample was of average intelligence (Wechsler Intelligence Scale for Children–III vocabulary score: *M* = 9.8, *SD* = 2.44); 55.4% of mothers had a college degree, indicating that the sample was predominately middle- or upper middle-class. At Wave 7, 89.3% said they were heterosexual or straight, whereas the other participants said they were bisexual, gay, lesbian, or questioning.

We compared our sample's scores with comparable national norms of representative samples for trait anxiety scores on the State−Trait Anxiety Inventory (STAI; Spielberger, 1983), maternal report of externalizing symptoms on the Child Behavior Checklist (CBCL; Achenbach, 1991), participants' reports of internalizing and externalizing symptoms on the Youth Self-Report (YSR), and eight indices of substance use from the Monitoring the Future Survey (Johnston, O'Malley, & Bachman, 2002). The present sample was more likely to have tried marijuana (54% vs. 40%; $z = 2.23$, $p < .05$); otherwise the sample scores did not differ significantly from the national scores on the other 11 measures, including frequency of marijuana usage (see Furman, Ho, & Low, 2009).

Variables were measured at every wave: Measurements were approximately 1 year apart during Waves 1 through 4, and measurements were 18 months apart in Waves 4 through 7. Attrition over the seven waves of data collection was low. All 200 adolescents participated in the first two waves of data collection, 199 in the third, 194 in the fourth, 185 in the fifth, 180 in the sixth, and 178 in the seventh.

The mother and a close friend nominated by the participant also completed questionnaires about the participant's psychosocial competence and risky or problem behaviors at each wave (Mothers: Wave 1, *N* = 191; Wave 2, *N* = 184; Wave 3, *N* = 167; Wave 4, *N* = 164; Wave 5, *N* = 156; Wave 6, *N* = 151; Wave 7, *N* = 142. Friends: Wave 1, *N* = 187; Wave 2, *N* = 156; Wave 3, *N* = 150; Wave 4, *N* = 134; Wave 5, *N* = 134; Wave 6, *N* = 122; Wave 7, *N* = 100). In some instances, the friend was the same

across waves; in other instances, the nominated friend changed. Participants, mothers, and friends were compensated financially for completing the questionnaires.

The University's institutional review board approved this study, and a Certificate of Confidentiality issued by the U. S. Department of Health and Human Services protected the confidentiality of the participants' data.

Measures.

Youth/Adult Self Report. Participants completed the Achenbach's (1991) YSR in Waves 1 through 3 and Achenbach's (1997) Adult Self-Report in Waves 4 through 7. Internalizing and externalizing symptom scores were derived from the 20 and 26 items that were comparable on the two versions (M α = .81 and .87, respectively).

CBCL and Adult Behavior Checklist (ABCL). Friends and mothers reported on the participant's externalizing symptoms by completing the externalizing items of the CBCL in Waves 1 through 3 and the externalizing items of the ABCL in Waves 4 through 7 (Achenbach, 1991, 1997). Friend and mother reports of externalizing scores were derived from the 19 items that were comparable on the two versions (M α = .84 and .89, respectively).

Beck Depression Inventory (BDI). Participants completed the BDI to assess depressive symptoms at each wave (Beck, Rush, Shaw, & Emery, 1979; M α = .86).

STAI. Participants completed the trait scale of Spielberger's (1983) STAI to assess anxious symptoms at each wave (M α = .92).

Drug Involvement Scale for Adolescence (DISA). Participants completed the DISA at each wave (Eggert, Herting, & Thompson, 1996). For the present purposes, we examined use of beer, wine, liquor, and other drugs (marijuana, cocaine, opiates, depressants, tranquilizers, hallucinogens, inhalants, stimulants, over-the-counter drugs, club drugs) over the last 30 days. Frequency of each substance use was scored on a 7-point scale, ranging from *never* to *every day*. Additionally, participants completed a 16-item measure assessing adverse consequences arising from substance use (M α = .94) and an 8-item measure assessing difficulties in controlling substance use (M α = .91). The questionnaires on substance use were administered by computer-assisted, self-interviewing techniques to increase the candor of responses.

Friend report of substance use. As part of their version of the Adolescent Self-Perception Profile (ASPP; Harter, 1988), the friend was asked four questions about the participant's use of alcohol and drugs and problems related to the use of those substances at each wave. The four items were averaged to derive the friend report of the participant's substance use and problems related to use (M α = .82).

Global self-worth. Global self-worth was measured by using an abbreviated version of Harter's (1988) ASPP at each wave. Participants, friends, and mothers rated the participant's global self-worth using an abbreviated form of Messer and Harter's (1996) scale on the ASPP. The scale consisted of five items using a 4-point structured alternative format (M α = .86).

Romantic appeal. Participants, friends, and mothers rated the participant's romantic appeal using an abbreviated form of Messer and Harter's (1996) scale on the ASPP at each wave. The scale consisted of five items using a 4-point structured alternative format (M α = .79). A sample item was, "Some youth feel that if they are romantically interested in someone, that person will like them back, BUT other youth worry that when they like someone romantically that person *won't* like them. Which is more like you?"

Dating satisfaction. Adolescents completed an item at each wave on the Dating History Questionnaire (Furman & Wehner, 1992a), measuring satisfaction with their dating life that read: "How satisfied have you been with your romantic or dating life (or not dating, if you don't date)?" Responses were rated on a 5-point Likert scale, ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*).

Sexual behavior. We were interested in assessing sexual debut, be it vaginal or anal intercourse, as we considered either to be the significant milestone of interest. Sexual debut was coded as the grade at which the participant reported first having had vaginal or anal sex (for those whose debut was the first year after high school, a score of 13 for grade was assigned, and so on). Accordingly, we asked: "How often have you had intercourse (sometimes called making love, having sex, going all the way, getting laid, or screwing)?" We included multiple vernacular terms in case participants did not know the formal term of "intercourse." To ensure that they included anal intercourse in their response, we also included a specific question about anal intercourse. If the participants reported engaging in intercourse or anal intercourse in Wave 1, we asked what grade they had first engaged in each and took the earlier grade as the grade of sexual debut. We repeated the questions about intercourse and anal intercourse in subsequent waves to determine the time of sexual debut for those who had not had their debut by Wave 1. The questionnaires on sexual behavior were administered by computer-assisted, self-interviewing techniques to increase the candor of responses.

Sexual satisfaction. On the Sexual Attitudes and Behavior Questionnaire (Furman & Wehner, 1992b), participants were asked at each wave about their sexual satisfaction with the question: "How satisfied are you with your sex life?" Responses were rated on a 5-point Likert scale, ranging from 1 (*very unsatisfied*) to 5 (*very satisfied*).

Derivation of composites. The derivation of composites involved several steps. The various measures used to create the composites had different numbers of points on their scales. Such differences among measures present problems in deriving composite measures, as the scores from the different measures in the composite are not comparable. Therefore, we first standardized scores on each measure across all waves to render the scales comparable with one another. In other words, all the data across the seven waves were compiled for each measure, and one set of standardized scores for all waves of each individual measure was derived. For example, we aggregated the seven waves of data on the BDI, determined the overall mean and standard deviation, and calculated a single set of standardized scores for all waves.

This procedure of standardizing variables over waves is recommended as it retains differences in means and variance across age, and neither changes the shape of the distribution nor the patterns of associations among the variables (Little, 2013). In the current study, the mean of scores from all seven waves was 0, but the mean scores for each individual wave could differ from 0. Had we separately standardized scores for each wave, the mean standardized score for each wave would have been 0, which would render impossible the measurement of developmental changes in a variable.

After each measure was standardized across waves, we generated several composites. BDI depression scores, STAI anxiety

scores, and Achenbach internalizing symptom scores at each wave were correlated with one another (*M r* = .66). Accordingly, they were combined to derive a composite index of internalizing symptoms. We used the same procedure for calculating each composite. Specifically, each of the three variables was weighted by its factor loading in the measurement invariance analyses described subsequently. We then averaged these scores to derive the composite.

Second, we averaged the mothers' and friends' report to derive another person's report of externalizing symptoms. The participants' and others' reports of externalizing symptoms at each wave were significantly correlated with each other (*M r* = .39) and were combined to derive a composite index of externalizing symptoms

With regard to substance use, we averaged the participants' reports of beer or wine drinking and their reports of drinking liquor to obtain a measure of alcohol use. Similarly, we averaged the participants' reports of marijuana use, and their reports of other drug use to derive a measure of drug use. The participants' reports of intra- and interpersonal problems, control problems, and adverse consequences of substance use were each averaged to derive a measure of problem usage. The alcohol, drug, problem usage, and friends' reports of substance use were all significantly correlated with one another (*M r* = .55) and thus they were combined to derive a composite measure of substance use.

With regard to global self-worth, the three reporters' perceptions at each wave were significantly correlated with one another (*M r* = .38). Similarly, the three reporters' perceptions of romantic appeal at each wave were significantly related to one another (*M r* = .47). Thus, we derived composite indices of global self-worth and of romantic appeal by combining the different reporters' perceptions.

Finally, to test for measurement invariance over time, we compared two models, one in which factor loadings for each of the dependent variables in a composite were constrained to be equal across time versus a model in which loadings were allowed to vary across time. For all but the substance-use composite, the model where variables making up each composite were constrained to be the same across time did not provide a better fit than the model where variables were allowed to vary across time. In the case of substance use, the constrained model provided a reasonable fit to the data—though not as good as the fit of the unconstrained model. Accordingly, the requirement of measurement invariance over time was met. Further details of these analyses are available.

Results

Data preparation. Prior to beginning analyses, outliers were identified and corrected by adjusting scores to fall 1.5 times the interquartile range below the 25th percentile or above the 75th percentile. The variables in the dataset were examined to ensure that they had acceptable levels of skew and kurtosis (Behrens, 1997). No violations were noted. Analyses were conducted using Mplus Version 6.12 software (Muthén & Muthén, 1998–2010). Means and standard deviations of all outcome variables are provided in Table 1.

Timing of debut and trajectories. In the initial set of analyses, we used linear growth curve models to measure the association of sexual debut timing with risk and reward trajectories. Each variable was modeled separately over seven waves of data with sexual debut as a time-invariant predictor of initial status (intercept at Grade 10) and growth rate (slope) of each outcome. The 22 participants (9 males, 13 females) who dropped out of the study before sexual debut or who had not reported sexual debut by Wave 7 were not included in this first series of linear growth curve analyses. We also omitted those who indicated that they identified as a sexual minority at their time of debut, as the process of debut as a sexual minority may not be accurately reflected in our measure of sexual debut. In particular, sexual debut for a sexual minority may entail some other form of sexual activity than anal or vaginal intercourse, which were the only acts the question asked about. With these omissions, the resulting sample consisted of 88 male and 86 female adolescents.

One hundred multiple imputation data sets were generated using the software packages R (R Core Team, 2013) and Amelia II (Honaker, King, & Blackwell, 2009). To determine whether scores varied at particular grades as a function of timing of debut, each variable was modeled three times (see Singer & Willett, 2003). We modeled the variable one time with the intercept set to the first data point (10th grade) as this type of analysis is typically modeled; a second time with the intercept set to 12th grade to permit comparisons with Bingham and Crockett (1996); and, a third time with the intercept set to Wave 7 (five to six years after high school), the end of the study.

We also tested for potential nonlinear slopes for each model. We compared two latent variable models for each outcome variable. The first included a quadratic term along with the linear slopes and intercepts and the second did not. In all but two instances the model with the quadratic term did not provide a better fit, as measured by improvement in chi-square value. In the two instances—substance use and romantic appeal—for which the model containing the quadratic term provided an improvement in chi-square, we also evaluated other measures of fit. The root mean square error of approximation (RMSEA) and comparative fit index

Table 1
Means and Standard Deviations (in Parentheses) of Risks and Rewards

Outcome variables	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7
Externalizing symptoms	.30 (.91)	.10 (.81)	.12 (.85)	.01 (.74)	−.18 (.65)	−.29 (.66)	−.35 (.65)
Internalizing symptoms	.12 (.92)	.10 (.96)	.02 (.90)	−.11 (.86)	−.10 (.89)	−.24 (.77)	−.24 (.94)
Substance use	−.33 (.66)	−.14 (.71)	−.04 (.79)	.16 (.69)	.35 (.69)	.32 (.69)	.25 (.58)
Global self-worth	−.01 (.61)	−.01 (.63)	.09 (61)	.08 (.62)	.08 (.61)	.13 (63)	.14 (.65)
Romantic appeal	−.23 (.62)	−.03 (.63)	.15 (.63)	.16 (.63)	.24 (.65)	.35 (.70)	.29 (.66)
Dating satisfaction	3.28 (.96)	3.44 (1.07)	3.43 (1.08)	3.58 (1.06)	3.61 (1.17)	3.64 (1.22)	3.68 (1.14)
Sexual satisfaction	−.33 (.66)	−.14 (.71)	−.04 (.79)	.16 (.69)	.35 (.69)	.32 (.69)	.25 (.58)

Note. Scores for all variables except dating and sexual satisfaction are standardized across waves.

(CFI) were satisfactory for the linear models, and, in almost all instances, the quadratic model was not substantially better in terms of RMSEA and CFI. In addition, grade of first intercourse was never significantly associated with a quadratic term when it was included in any of the models. Therefore, the linear growth curve models without the quadratic term were retained for all subsequent analyses. Further details of these analyses are available.

To determine whether the associations of timing of sexual debut and the risk and reward variables differed by gender, a series of multi-group analyses was conducted for each linear growth curve model. The effect of timing of sexual debut on slopes and intercepts was constrained to be the same across gender in one model. In the other model slopes and intercepts were free to vary, unconstrained by gender. If the linear growth curve model unconstrained by gender provided a significant improvement in fit over the constrained model, it was selected as the better fitting model. If the unconstrained model did not provide a significant improvement in fit, then the constrained model was retained. For most variables, the constrained model was retained (all ps $> .05$). However, for dating satisfaction and sexual satisfaction, the unconstrained model proved to be a better fit, $\Delta\chi^2(2, N = 174) = 12.22$, $p = .002$ and $\Delta\chi^2(2, N = 174) = 20.58$, $p < .001$, respectively. In these two cases, we then examined the slopes and intercepts of the growth curves separately by gender to determine how the associations with timing of debut differed by gender.

The linear growth curve model of dating satisfaction for males provided a good fit to the data, $\chi^2(28, N = 88) = 26.45$, $p = .55$ (CFI = .1.00, RMSEA = .00). A significant timing effect was observed both when the intercept was set to the 10th grade (the onset of the study) and when set to the 12th grade, but not when set to five to six years after high school, ($\beta = -.55$, $p < .001$; $\beta = -.54$, $p < .001$; $\beta = -.17$, $p = .21$, respectively). Earlier debut for males was associated with higher levels of dating satisfaction in the 10th and 12th grades, but this association was not sustained five to six years later. The linear growth curve model for females provided a good fit to the data, $\chi^2(28, N = 86) = 38.39$, $p = .09$ (CFI = .84, RMSEA = .07), but did not indicate significant differences in trajectories associated with debut timing.

The linear growth curve model of sexual satisfaction for males provided a good fit to the data, $\chi^2(28, N = 88) = 22.94$, $p = .74$ (CFI 1.00, RMSEA = .00). Once again, a significant intercept effect was observed both when the intercept was set to the 10th grade and when set to the 12th grade, but not when set to five to six years after high school, ($\beta = -.62$, $p < .001$; $\beta = -.56$, $p < .001$; $\beta = -.23$, $p = .08$, respectively). Earlier debut for males was associated with higher levels of sexual satisfaction in the 10th and 12th grade, but this association was no longer present five to six years after high school. The linear growth curve model for females provided a good fit to the data, $\chi^2(28, N = 86) = 25.06$, $p = .62$ (CFI = 1.00, RMSEA = .84), but did not indicate significant differences in trajectories based on debut timing.

Next, we conducted latent growth curve analyses on the remaining variables for which the associations with timing of sexual debut did not differ by gender. Table 2 presents these results. Externalizing symptom intercepts and slope changes over time were predicted by timing of sexual debut. Those who had a later debut had lower levels of externalizing symptoms in the 10th grade and the 12th grade, but this difference was no longer present five to six years after high school. For internalizing symptoms, those who had a later debut experienced lower internalizing symptoms in the 10th grade, but this difference was only a nonsignificant trend in the 12th grade and no longer approached significance five to six years after high school. In addition, intercept and slope differences in substance use were predicted by timing of sexual debut. Those who had a later debut had significantly lower levels of substance use in the 10th grade, the 12th grade, and five to six years after high school. The differences associated with timing were smaller, however, five to six years after high school.

For global self-worth, those who had a later debut experienced higher global self-worth in the 10th grade, but this difference was no longer significant in the 12th grade or five to six years after high school. Levels and slopes of romantic appeal were predicted by timing of sexual debut. Those who had a later debut showed lower levels of appeal in the 10th and 12th grades. A significant slope effect indicated that the timing effect was decreasing with age; indeed, this difference was no longer present five to six years post high school.

Changes in trajectories associated with sexual debut. Next, we used piecewise growth curve models to examine whether the event of sexual debut was associated with changes in subsequent perceptions of externalizing symptoms, internalizing symptoms, substance use, global self-worth, romantic appeal, dating satisfaction, and sexual satisfaction. To create piecewise growth curve models, data from each participant were centered around the wave of their sexual debut. For example, if a participant reported sexual debut in the months between the end of Wave 3 and the beginning

Table 2
Linear Growth Curve Models

Outcome variables	β slope	β intercept Early	β intercept Mid	β intercept Late	$\chi^2(28)$	CFI	RMSEA
Externalizing symptoms	.45***	−.40***	−.37***	−.10	36.54	.97	.04
Internalizing symptoms	.14	−.17*	−.15†	−.02	53.22***	.94	.07
Substance use	.38***	−.54***	−.50***	−.20*	73.44***	.85	.10
Global self-worth	−.16	.20*	.07†	.02	17.79	1.00	.00
Romantic appeal	.30*	−.35*	−.29***	−.05	26.68	1.00	.00

Note. Analyses were conducted in which the intercept as set at the 10th grade (early), 12th grade (mid), and five to six years after high school (late). A positive beta for an intercept indicates that later debut is associated with higher scores at that point, and a positive beta for a slope indicates that later debut is associated with an increase in scores over time. CFI = comparative fit index; RMSEA = root mean square error of approximation.
† $p < .06$. * $p < .05$. *** $p < .001$.

of Wave 4, she or he had three predebut data points (one data point for each of Waves 1 through 3) and three postdebut data points (one data point for each of Waves 4 through 6), aligned around the time between Waves 3 and 4. In modeling of data around each individual's experience of sexual debut, it was possible to estimate the trajectories before and after sexual debut. As participants experienced debut at different waves, the time between their various data points could be either 12 or 18 months apart; accordingly, we used the MPlus procedure for assigning a set of time scores that fit the specific timing between individuals' data points. These time scores were used for the piecewise analyses alone.

A model-fitting approach was implemented to statistically evaluate the piecewise growth curve models. The first step in this approach was to specify a linear growth curve serving as a baseline (*no change*) comparison model (Model 1). This version modeled a hypothesis that the trajectory of the variable did not change after the experience of sexual debut. To model this lack of change due to sexual debut, the slope and intercept for a particular variable after the incident of sexual debut were constrained to be equal to the slope and intercept before the event of sexual debut.

Model 2 (slope only) hypothesized that a change in slope occurred after experiencing sexual debut. The only difference from the Model 1 was that Model 2 allowed the slope after sexual debut to be different than the slope prior to sexual debut. The intercepts estimated from the pre- and post-trajectory were constrained to be the same.

Model 3 (*intercept only*) hypothesized that only the intercept after sexual debut varied from the predebut intercept. This model allowed for a change in level of a variable after the event of sexual debut by permitting the intercept estimated from the pre- and post-trajectory to differ. Slope was modeled to remain unchanged after debut. Model 4 (*dual change*) hypothesized that both intercept and slope after sexual debut varied from the intercept and slope prior to sexual debut. This model allowed the level and the slope of a variable to change after the event of sexual debut.

Model selection. To select the best-fitting model, we used the following procedure. If adolescents experienced a change in the trajectory after experiencing sexual debut, then a piecewise growth curve model allowing for this change provided a better fit to the data than Model 1, as reflected by a significantly lower Bayesian information criterion (BIC) score. BIC scores were used because more commonly preferred model fit indices (e.g., chi-square, RMSEA, or CFI) are not available with individually assigned time scores. We followed Raftery's (1995) recommendations for grades of evidence in BIC scores. Specifically, a difference in BIC scores of 6 or more was required to meet the criteria of "strong" evidence, which corresponds to posterior odds of a minimum of 20:1. Further, a difference in BIC scores of 10 or more was required to meet the criteria of "very strong" evidence, which corresponds to posterior odds of a minimum of 150:1 (Raftery, 1995). We then compared the BIC for Model 1 to each of the other three models (i.e., the slope only [Model 2], the intercept only [Model 3], and the dual change [Model 4]). If the difference in BIC did not meet the criterion of a minimum of "strong" evidence for an alternate model, the more parsimonious Model 1 was retained. If, for example, both Model 3 and the Model 4 demonstrated "strong" improvements over Model 1, we then examined the differences in BIC between these two alternative models. As before, unless Model 4 evidenced a "strong" improvement over Model 3, the more parsimonious Model 3 was preferred.

For the piecewise analyses, we included only the 159 individuals (79 males, 80 females) who had their sexual debut at some time from 9th grade (one wave prior to Wave 1) through five to six years after high school (Wave 7). Thus, we did not include individuals with an earlier debut (prior to 9th grade) or those who had not had their debut by Wave 7, as we would not have had the data points to estimate either the pre or post sexual debut trajectories for these individuals. Multiple imputation procedures including relevant auxiliary variables were used to estimate any missing pre- or post-data points (Schafer & Graham, 2002). One hundred multiple imputation data sets were generated using the software packages R (R Core Team, 2013) and Amelia II (Honaker et al., 2013). Analyses were conducted using MPlus Version 6.12 software where imputed data sets were each used to estimate model parameters (Muthén & Muthén, 1998–2010). These parameter estimates were then averaged, and standard errors were computed from the average standard errors and the between analysis parameter estimate variation.

Piecewise growth curve analyses—Gender differences. To determine whether the trajectories for the outcome variables differed by gender, multigroup analyses were conducted. Multigroup analyses tested a Dual-Change model in which the slopes and intercepts were constrained to be the same across gender, and an unconstrained Model 4, in which the slopes and intercepts were both free to vary by gender. Results indicated that for all variables, the unconstrained model was not a significant improvement over a constrained model for gender (all $ps > .05$); accordingly, these variables were subsequently analyzed with a constrained model.

Piecewise growth curve analyses—Risks. A summary of the model fitting comparisons for the four models used to examine both risks and rewards can be found in Table 3. For externalizing symptoms, Model 2, Model 3, or Model 4 did not fit better than Model 1. Thus, Model 1 was retained, meaning the trajectory of externalizing symptoms did not show evidence of change with debut.

For internalizing symptoms, Model 2 provided a significant improvement in fit over Model 1, whereas Models 3 and 4 did not. Thus, Model 2 was selected. After debut individuals' internalizing symptoms declined over time (see Figure 1).

For substance use, Model 2 provided a significant improvement in fit over Model 1, whereas Models 3 and 4 did not. Thus, Model 2 was selected. Substance use increased at a slower rate after debut than prior to debut (see Figure 2).

Piecewise growth curve analyses—Rewards. For global self-worth, Models 2, 3, and 4 did not fit better than Model 1. Thus, Model 1 was retained. Global self-worth did not change following sexual debut.

For romantic appeal, Model 4 provided a significantly better fit over Models 1, 2, and 3. Thus, Model 4 was selected as the best-fitting model. Consistent with our hypothesis, individuals experienced an increase in romantic appeal following sexual debut; romantic appeal also increased at faster rate after debut (see Figure 3). For dating satisfaction, Models 2, 3, and 4 did not fit better than Model l. Thus, Model 1 was retained. Dating satisfaction did not change following sexual debut.

For sexual satisfaction, a significant improvement in fit over Model 1 occurred for Models 3 and 4. Model 4 and Model 3 did

Table 3
Model-Fit Statistics (Bayesian Information Criterion) and Comparison of Piecewise Growth Curve Models

Outcome variables	Model 1 (no change) (*df* = 16)	Model 2 (slope change) (*df* = 12)	Model 3 (intercept change) (*df* = 11)	Model 4 (dual change) (*df* = 7)
Externalizing symptoms	**1972.07**	1974.85	1980.26	1975.56
Internalizing symptoms	2334.92	**2319.90**[b]	2354.14	2333.962
Substance use	1757.98	**1749.71**[a]	1774.33	1761.4
Global self-worth	**1689.59**	1685.98	1704.21	1693.973
Romantic appeal	1852.92	1851.06	1855.8	**1844.71**[a]
Dating satisfaction	**2981.51**	2987.12	2987.01	3000.231
Sexual satisfaction	2805.76	2810.99	**2784.86**[b]	2789.22

Note. Selected models are in bold.
[a] There is strong evidence that there is an improvement between Model 1 and this model. [b] There is very strong evidence that there is an improvement between Model 1 and this model.

not differ significantly. Thus, Model 3 was determined to be the best fit to the data as it was the more parsimonious. Following sexual debut, individuals experienced an immediate increase in sexual satisfaction (see Figure 4). Therefore, our hypothesis was supported.

For global self-worth and dating satisfaction, Models 2, 3, and 4 did not fit better than Model 1. Thus, Model 1 was retained for both variables. Neither global self-worth nor dating satisfaction changed following sexual debut.

Normative versus late groups. Finally, to determine whether the effect of sexual debut differed for the outcome variables by normative or late timing group, a series of secondary analyses were conducted. Normative timing was defined as having a sexual debut in Grade 9 through 1 year post high school ($N = 110$), whereas late timing was defined as having a sexual debut after 1 year post high school ($N = 49$). Just as with the primary analyses, those with an early timing or who had not had a debut were not included in these analyses.

As the first step, we examined whether measurement invariance across the normative and late timing groups was indicated. To test this assumption, a model in which the factor loadings of the manifest variables on a composite were constrained across timing of debut was compared to a model wherein the factor loadings were unconstrained (i.e., allowed to vary) for the normative and late debut groups. As before, determination of invariance was assessed by examining $\Delta\chi^2$. In all instances, the more parsimonious constrained models were chosen. Thus, measurement invariance across both subpopulations was found, allowing for multiple-group comparisons regarding timing of sexual debut.

Then, multiple group analyses tested Model 4, in which the slopes and intercepts were constrained to be the same across the normative and late timing groups, and Model 4 in which slopes and

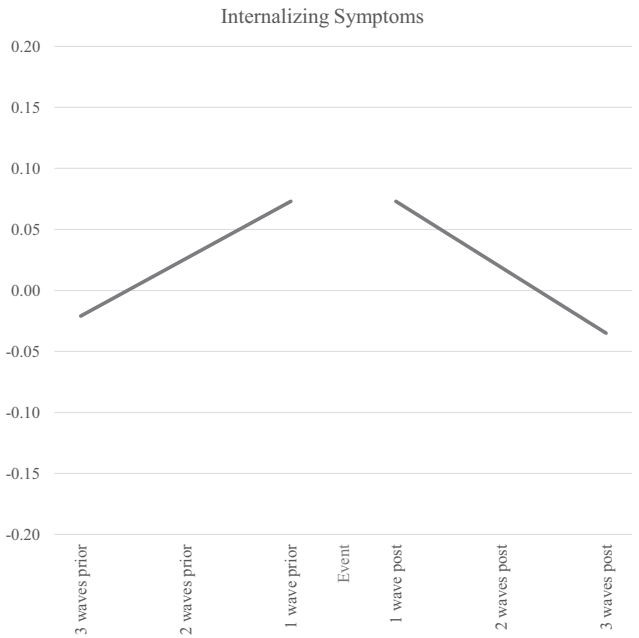

Figure 1. Predebut and postdebut trajectories of internalizing symptoms.

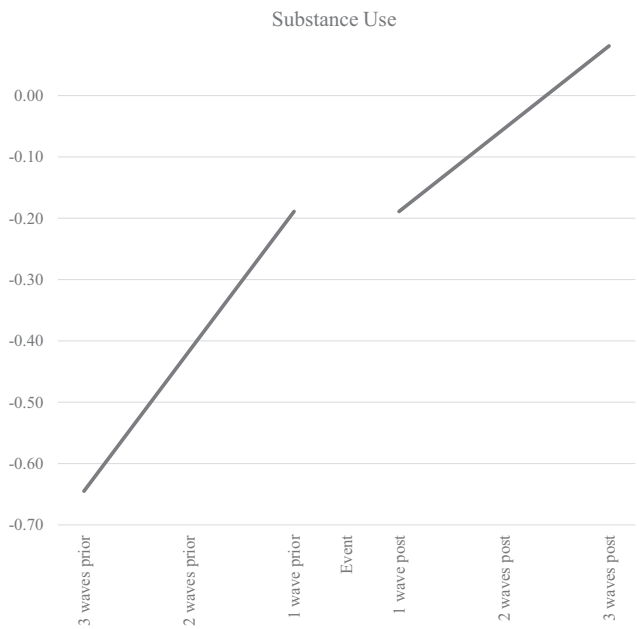

Figure 2. Predebut and postdebut trajectories of substance use.

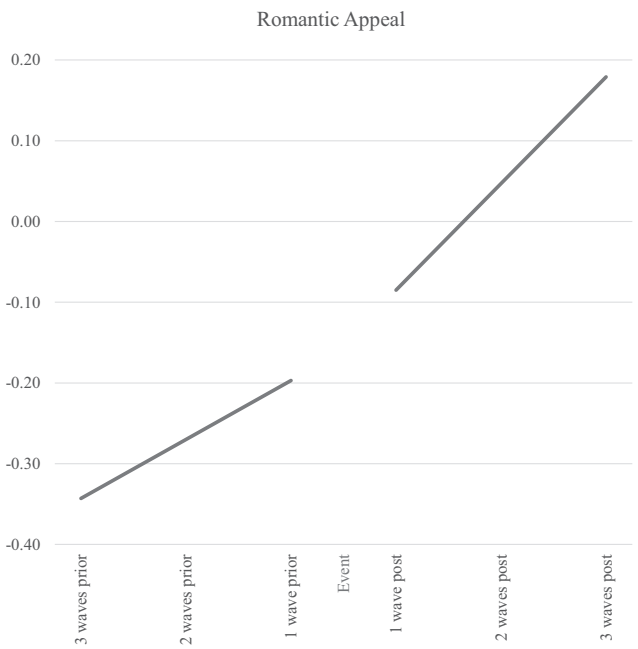

Figure 3. Predebut and postdebut trajectories of romantic appeal.

intercepts were free to vary by timing-group membership. Results indicated that for all variables, the unconstrained models were not significant improvements in fit over the constrained models for timing group membership, therefore there was not a significant difference in the effects of sexual debut for normative and late timing groups (all *p*s $>$ .05).

Discussion

The consequences of sexual debut, particularly at an early age, have garnered much study in the field. Early debut is largely associated with both short-term and long-term problem behaviors. Considering the attention paid to these outcomes by the field of psychology, the media, and public policymakers, one could think that sexual debut at any time in adolescence or young adulthood might be linked to problem behaviors. However, the current study broadens our understanding of sexual debut. In particular, this study demonstrates that sexual debut is well conceptualized within the sex-positive framework. This framework suggests that adolescent sexual behavior that is consensual can be healthy and normative. It embraces the complexity of adolescent sexual behavior, and allows for the examination of potential rewards. In the present study, such rewards included increases in romantic appeal for both males and females and increases in sexual satisfaction, and dating satisfaction.

Additionally, some timing of sexual debut-based findings from other studies were replicated, whereas others extended our knowledge about timing of debut. Namely, earlier timing of sexual debut was associated with substantial risks such as higher rates of internalizing symptoms, externalizing symptoms, and substance use, and lower global self-worth. Early debut was also associated with rewards such as greater romantic appeal, greater dating satisfaction (for males), and higher sexual satisfaction (for males). Notably, females with an early debut did not experience differences in dating and sexual satisfaction from their female peers who experienced normative or later debut.

Risks associated with sexual debut. The current latent growth curve analyses extended prior work in several important ways. Prior studies have relied on traditional techniques such as repeated measures ANOVA. In contrast, the analyses in the current study provided a contemporary statistical means of examining individuals' trajectories, including change over time. These methods allowed us to examine not only whether timing is associated with risks and rewards at the onset of the study, but they also allowed us to measure whether timing's associations with risks and rewards were sustained. The present study examined these trajectories over a longer period of time with a larger number of data points than existing studies, which have typically only examined behavior through the high school years.

With regard to externalizing symptoms, the latent growth curve analyses revealed both intercept and slope effects. Consistent with Bingham and Crockett (1996), earlier timing of debut was associated with greater externalizing symptoms in high school. Present findings extended that work by showing that this association decreased with time, and the difference was no longer present five to six years after high school. Also consistent with prior work (Meier, 2007; Spriggs & Halpern, 2008), earlier timing of debut was associated with greater internalizing symptoms in the 10th grade. Moreover, such timing effects were no longer present at the end of high school or in early adulthood, as Spriggs and Halpern (2008) had found. Earlier timing was associated with greater substance use in high school and early adulthood; the differences were smaller in early adulthood, but they were still maintained.

The piecewise growth curve analyses revealed internalizing symptoms decreased over time after debut. Individuals who experience debut at a normative or late age may experience some

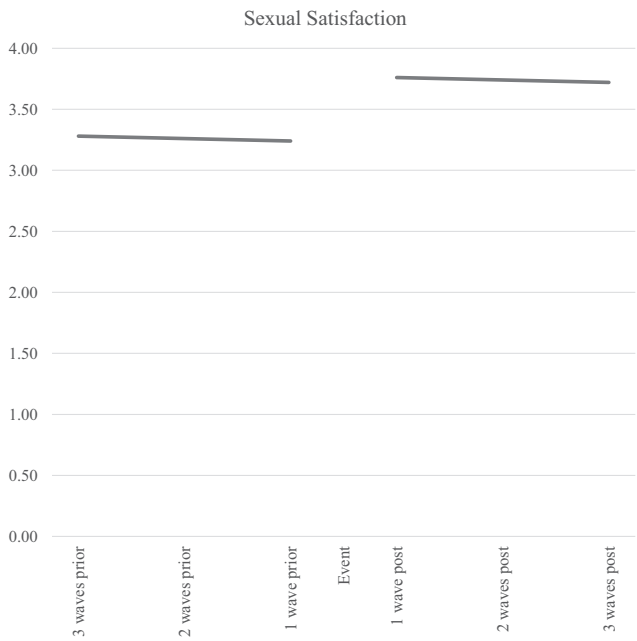

Figure 4. Predebut and postdebut trajectories of sexual satisfaction.

unhappiness prior to debut due to comparisons they make with sexually active peers about their sexual life; perhaps they may feel that they have not yet reached the developmental milestones of being sexually active. Debut itself may improve feelings of depression and anxiety as it may also be a signal of becoming an adult.

Substance use increased at a slower rate after debut for those who first had intercourse at a normative or late age. Substance use and sexual behavior are dynamically intertwined throughout adolescence (O'Neil, Conner, & Kendall, 2011). Perhaps as internalizing symptoms decrease postdebut, the rate of growth in substance use may decrease as well. Moreover, the growth in substance use may also decrease if individuals who have had their sexual debut become more comfortable interacting with others when they may be sexually or romantically interested. As they become more comfortable, they may feel less need to use substances to approach and interact with potential partners.

The analyses, however, did not reveal any significant changes in the level or slope of externalizing symptoms after debut by those who first have intercourse at a normative or late age. Such findings are consistent with prior work on early timing of debut that suggests that the observed associations between early sexual debut and externalizing symptoms may reflect differences that predated sexual debut and not the effect of debut itself (Miller, 2002). The present study, however, was unable to examine whether changes occur after first intercourse for those whose debut was at an early age; such a study would be important to conduct before concluding that sexual debut does not affect externalizing symptoms and other problem behaviors.

Rewards associated with sexual debut. Those who had an earlier debut had lower levels of global self-worth in the 10th grade but higher levels of romantic appeal in the 10th and 12th grades. Males with an earlier debut also had higher levels of sexual and dating satisfaction in the 10th and 12th grades, relative to males with a later debut. The lower level of global self-worth seems consistent with the findings that earlier timing of debut was associated with greater levels of risk. But why then, are greater romantic appeal, and sexual and dating satisfaction also associated with earlier debut? Perhaps these rewards are due to social comparisons with peers. Those who have an early debut may consider themselves more appealing and satisfied compared with peers because they have experienced an event that their peers have not yet experienced. The increases in these positive cognitions may not generalize to global self-worth, which is consistent with the idea that perceived competence and worth becomes increasingly domain specific with age (Goodson, Buhi, & Dunsmore, 2006; Harter, 1999).

The difference between the feelings of appeal and satisfaction of those with an earlier debut and their peers' feelings is not sustained over time. The results of the piecewise growth curve models, however, suggest that this is likely not because these feelings of greater appeal and satisfaction dwindle over time for those with an early debut, but instead it appears that feelings of appeal and sexual satisfaction also increase with sexual debut when it occurs at a later age. Adolescents may feel that sexual debut bolsters their sense of their own desirability as a partner, perhaps because of a belief in their own attractiveness playing a role in being selected as a sexual partner (Meston & Buss, 2007). For those with normative or later debut, such a bolstering of feelings of desirability may result in feelings of appeal and satisfaction eventually reaching comparable levels to their peers whose debuts were at an earlier age.

As noted previously, males with an earlier debut also had higher levels of sexual and dating satisfaction in the 10th and 12th grades than did males with a normative or later debut. Such a difference was not observed for females. Aside from these findings, no other gender differences were found. Indeed, no gender differences were found in the piecewise growth curve analyses examining the effects of sexual debut. Perhaps the absence of effects reflects changes in beliefs about female sexuality. Females may be more likely to embrace their sexuality and to seek out pleasurable experiences than they were previously, as they may feel less shame and guilt associated with their sexuality than in previous generations (Smiler, Ward, Caruthers, & Merriwether, 2005).

What is unique to this study is the combination of linear growth curve modeling and piecewise growth curve modeling. With these two methods, we were able to explore relative differences depending on timing of sexual debut, as well as the effects of debut. The latent growth curves revealed that multiple risks were associated with an early debut. However, the piecewise growth curve analyses revealed that increases in risks are not inherently associated with sexual debut per se, as such increases did not occur upon sexual debut for those who did so at a normative or late age. In fact, for those individuals, internalizing symptoms began to decline after debut, and were still declining 3 to 4 years after debut. The rate of substance use also grew at a slower rate after debut than before debut for those who did so at a normative or late age.

Further, the latent growth curve analyses revealed that earlier timing of sexual debut was associated with greater levels of romantic appeal and greater dating and sexual satisfaction (for males). However, the piecewise growth curve analyses revealed that adolescents experiencing sexual debut at a normative or late age also experienced increased levels of romantic appeal and sexual satisfaction after their sexual debut. The changes that occurred with sexual debut did appear to be enduring, as the increases in romantic appeal and sexual satisfaction lasted 3 to 4 years after sexual debut for those with a normative or late debut. This is not to say that risks do not occur as well with sexual debut. Considering the well-documented association between sexual intercourse and risk for pregnancy or an STD (Centers for Disease Control, 2013), debut at any age carries risks.

Our findings suggest that adolescents whose sexual debut is at a normative or late age may be better equipped with social-sexual skills such as partner selection, and negotiation of boundaries. These skills may allow adolescents to make better-informed, and more salubrious decisions about the sexual behavior they will engage in with a sex partner. The precise nature of such skills will require further study, but may include better partner communication and improved negotiation of precautions to take against risk. Such skills may aid in enhancing the rewards and reducing the risks of problem behaviors (Dixon-Mueller, 2008).

A practical implication to these findings would be their application to sexual education programs. For example, incorporating these findings into sexual education programs may help adolescents improve their ability to view sexual behavior as containing risks as well as rewards. Through this lens, adolescents could be better supported in learning to weigh risks and rewards, and act as more informed decision makers about their sexual behaviors. Such

an approach to sexual education may better allow for a comprehensive and realistic discussion with adolescents, thus making gains toward the goal of fostering safer sexual-debut outcomes.

Limitations and Future Directions

Piecewise growth curve models are a powerful but underused technique. In this study, observed changes around the time of debut do not simply reflect developmental changes, as individuals' pre- and post- scores were centered around their own time of debut. As debut happened at different ages for different individuals, continuous developmental changes would not result in a discontinuous, event-related change at the particular time of sexual debut. In effect, the prescores allowed each individual to act as his or her own control for stable third-variable influences. Similarly, third variables that are relatively stable over time (e.g., socioeconomic status) are also not likely to account for the observed change. Such stable variables may influence the general trajectory of a variable, but they are not likely to lead to the discontinuous change that specifically occurred at the time of sexual debut.

Despite the strength of our piecewise growth curve models, the data used in this study are not experimental, and causal inferences about the potential impact of sexual debut cannot be made. It is possible that the observed changes were not caused by the event of sexual debut, but rather by another event, or relationship condition that commonly occurs around the time of sexual debut (Shadish et al., 2002). For example, some of the observed rewards may stem from relationship changes prior to the event, such as feelings of love and enmeshment or decreased communication awkwardness, which characterize relationships in which intercourse subsequently occurs (Giordano, Manning, & Longmore, 2010).

Importantly, if the causal mechanism for change is such an alternative event or relationship condition, it needs to be discontinuous and relatively close in time to sexual debut for the piecewise growth curve models to reveal a change in the trajectory around the time of sexual debut. Thus, many alternative explanations for the effects, such as selection effects, can be ruled out.

It is possible that the effects of sexual debut may differ depending on the nature of the relationship with the partner (Harden, 2014). Unfortunately, we were unable to determine characteristics of the specific relationship in which the sexual debut occurred.

One of the strengths of the current study is that we examined a longer span of time (7.5 years) with more data points (seven) than almost any study on this topic. At the same time, we did not have data prior to debut for those who did so early or data about sexual debut for those who had not had their debut by the time they were in their mid-20s. As a consequence, we were unable to use piecewise growth curve models to measure the effect of the event of sexual debut for members of either of these groups. Indeed, almost all other studies have had to omit some subset of those who have an early debut, precluding the opportunity to observe any change that could occur. The inclusion of early timing of debut is of particular importance as the effects of sexual debut for those whose debut is early may be different than for those whose debut is at a normative or later time.

We also did not have all waves of predebut and postdebut data for some participants because those times were not part of the data set. For example, participants who reported sexual debut in Wave 6 were missing data from the third wave postdebut (i.e., what would have been Wave 8). We did not completely omit these participants from these analyses as multiple imputation provides a powerful alternative to listwise deletion and protects against bias in analyses (Schafer & Graham, 2002). Moreover, the analyses are not structured in terms of specific ages or in terms of Waves 1 through 7. Instead, they are structured in terms of waves before and after debut (e.g., three waves predebut to three waves postdebut), and we do have data regarding three waves predebut and three waves postdebut from other participants. Multiple imputation takes into account these data from other participants; we also included auxiliary variables as well as the actual age of all the participants at debut to help meet the assumption of multiple imputation and yield the most accurate estimate of the covariance matrix possible.

Smaller sample size may also have affected the power to detect effects between genders and between normative and late groups. More recent studies have also implicated the role of gendered beliefs (vs. biological sex) in differentiating outcomes (Lefkowitz, Shearer, Gillen, & Espinosa-Hernandez, 2014). However, this study was not able to explore these beliefs as they related to sexual debut.

Finally, we were unable to determine our ascertainment rate for our sample because of our recruiting procedure. The sample was comparable to national norms on intelligence, substance use, internalizing, and externalizing symptoms. However, mothers' average level of education was higher than national norms, indicating that the sample was predominately middle- or upper middle-class. Thus, it is very likely that the sample would differ from representative samples on other variables associated with socioeconomic status. Although the sample had a distribution of racial/ethnic groups that approximated that of the United States, the participants from different racial/ethnic groups would not be representative of those groups as the participants were predominantly middle- or upper middle-class. The sample is also likely to vary on other variables that we did not measure. On a related note, we also did not have a sufficient number of participants from specific ethnic or racial minority groups to determine if the findings were applicable to specific groups. Further, we did not have a sufficient number of individuals who identified as a sexual minority nor did we have an appropriate index of sexual debut for sexual minority youth. Therefore, we were unable to determine if the findings were applicable to those groups, and we were unable to explore any relative differences that might be present.

Despite these limitations, the current study provides important information about individuals who may have previously been understudied, and, thus, it imparts a better understanding of the impact of sexual debut particularly for those who have their debut at a normative or later age. Evidence from the current study underscores the need to clarify at what age sexual debut is associated with problem behaviors and to investigate the duration of those problem behaviors. The present study also used the emerging sex-positive conceptualization to bolster our understanding of longitudinal outcomes of sexual debut. Conceptualizing sexual debut as a complex experience that encompasses both risks and rewards enables parents, teachers, clinicians, and youth themselves to have a greater understanding of the potential impact of this important event. In doing so, we hope it may foster well-informed decisions about sexual debut, resulting in safer, more satisfying sexual-debut outcomes.

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