Longitudinal Consistency in Self-Reported Age of First Vaginal Intercourse Among Young Adults

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Abstract

We examined consistency in self-reports of age at first vaginal sex among 9,399 male and female respondents who participated in Waves III and IV (separated by approximately 7 years) of the National Longitudinal Study of Adolescent Health (Add Health). Respondents were coded as consistent if they reported an age at first vaginal intercourse at Wave IV that was within 1 year of the age they reported at Wave III. Sociodemographic, behavioral, and cognitive predictors of consistency were examined using bivariate and multivariate logistic regression. Overall, 85.43% of respondents were able to provide consistent reports. Among both males and females, consistency was associated with age, years since first vaginal intercourse, race/ethnicity, and lifetime number of other-sex partners in final multivariate models. Respondents who were older and had more recently had their first sexual experience were more likely to be consistent. For females only, those who reported a history of non-parental, physically forced sex were less likely to be consistent. Most young adults consistently report age at first vaginal intercourse, supporting the credibility of retrospective self-reports about salient sexual events such as timing of first vaginal intercourse.

Keywords

Reliability and Validity of Measures; Quantitative/Statistical/Survey; Childhood, Adolescence, Adolescent Sexuality; Assumptions of sex research

Introduction

Research on sexual behavior has primarily relied on retrospective self-reports, as numerous logistical, ethical, and cultural barriers often preclude alternate forms of measurement.

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However, throughout the literature, the validity and reliability of the resulting data have been questioned. Recall is subject to memory error and, given cultural attitudes and expectations about 'appropriate' sexual behavior, possible intentional under- or over-reporting (Fisher, Moore, & Pittenger, 2011; Schroder, 2003; Upchurch, Lillard, Aneshensel, & Fang Li, 2002). Further, determining the accuracy of the data is difficult, as existing external validation sources have significant limitations. Medical records on sexually related conditions such as pregnancy or sexually transmitted infections (STIs) can only capture subgroups of behaviors (e.g., specific instances of sexual activity that resulted in an infection), and biomarker tests, such as urinalysis to detect the presence of semen, are poor predictors of sexual activity other than recent acts of unprotected sexual intercourse (Brener, 2003). As a result, self-reported sexual behavior is often 'validated' through consistency analyses. Respondents are queried on the same behaviors at multiple time points and their answers are compared and examined for discrepancies and/or logical inconsistencies.

In analyses such as these, age at first vaginal intercourse is often selected as the primary proxy indicator. First incidence of vaginal intercourse, by definition, is a singularly occurring event, and the likely emotional and/or cognitive salience associated with its unique occurrence aids in its accurate recall. Events that are considered personal and cultural milestones, such as one's first sexual experience, are more likely to carry personal significance, increasing the likelihood that they will be accurately recalled even in the face of long-term recall periods (Catania, Gibson, Chitwood, & Coates, 1990). In addition, evidence suggests that when respondents are asked to retrospectively recall behaviors, events that occur more frequently are reported with less accuracy, particularly as length of recall period increases (Brener, 2003; Jaccard & Wan, 1995). With high-frequency events, such as counts of sexual intercourse within a specified time period, individuals are less likely to actively count specific instances, and instead are more likely to 'round,' and either estimate or infer a count based on recent behavior, or inadvertently lump occurrences together (Jaccard & Wan, 1995; Schroder, 2003).

To date, several studies have examined reliability and consistency in self-reports of timing of sexual initiation, though primarily in adolescent samples. Upchurch et al. (2002) found that only 22% of sexually active male and female respondents in Waves I and II of the National Longitudinal Study of Adolescent Health (a diverse, nationally representative sample of adolescents enrolled in grades 7 to 12 in the 1994-95 school year) reported exactly the same month/year of their first sexual intercourse at assessments one year apart (Upchurch et al., 2002). Somewhat better consistency has been demonstrated when timing of sexual initiation is reported as age in years. In a longitudinal analysis of rural adolescents in Maryland, Alexander et al.(1993) found that 67% of respondents consistently reported age of first sexual intercourse across assessments conducted while respondents were in ninth and tenth grades (Alexander, 1993). Results from additional studies with adolescent cohorts have found varying levels of consistency in self-reported age of first sexual intercourse, suggesting the possibility of distinct recall issues, whether cognitive or psychosocial, according to respondent age that may be differentially associated with variation in methodology (Capaldi, 1996; Lauritsen & Swicegood, 1997; McFarlane, 1999).

Only two studies have examined consistent reporting of age of sexual initiation in an adult population; both found substantially higher levels of consistency than has been observed in the adolescent literature. An analysis of 570 adult participants (ages 28 to 73) in the nationally-representative Australian National Health and Medical Research Council (NHMRC) twin panel found that across two assessments approximately 15 months apart, 84% of respondents consistently reported an age of first sexual intercourse, defined as reporting an age at the second survey that was within one year of the age reported at the first (Dunne, 1997; Rohan, 1994; Rohan, 1994). A smaller study examining reported sexual

history among 74 women (M_{age}=23.1 years, age range not reported) visiting an STD clinic in Toronto found that 80% of participants consistently reported age of sexual debut at assessments five months apart, and that 86% were able to consistently report at assessments four months apart (Rohan, 1994).

There is a small set of predictors of consistent reporting that is common to studies of both adolescents and adults. Females are more likely to be consistent reporters (Dunne, 1997; Lauritsen & Swicegood, 1997; Upchurch et al., 2002). Gender-race interactions have only been examined in the adolescent literature, but these analyses consistently identify white females and black males as the most and least consistent reporters, respectively (Alexander, 1993; Lauritsen & Swicegood, 1997; Upchurch et al., 2002). Cognitive and educational factors, such as grade point average (GPA) and vocabulary, have been found to be positively associated with consistent reporting in some adolescent studies (Lauritsen & Swicegood, 1997; Upchurch et al., 2002), though not all (Alexander, 1993; Capaldi, 1996; Dunne, 1997). Respondent age is predictive in studies of both adolescents and adults, but appears to have a differential association with consistency depending on the age range of the study population. Older respondents in the Australian adult twin sample, with an age range of 45 years, were less likely to be consistent (Dunne, 1997; Lauritsen & Swicegood, 1997), likely a function of the long recall period in combination with more advanced age. However, during adolescence, older respondent age is associated with increased consistency (Lauritsen & Swicegood, 1997; Upchurch et al., 2002). These latter studies, based on National Youth Survey (NYS) and Add Health respondents, reflect only a six-to-eight-year age range among a younger sample and capture a shorter recall period.

Given the developmental differences between adults and adolescents, as well as significant differences in length of retrospection periods for recalling first vaginal intercourse, the observed differences in consistent reporting rates between the two populations are hardly surprising. Adolescence is a period of both physiological and psychological transition and, for many individuals, comes with a heightened awareness of one's social and cultural environment and a particularly salient desire to fit in with one's peers. As sexuality and dating are also emerging as pivotal aspects of social interaction, self-reported sexual history from this subpopulation may be subject to boastful exaggeration or self-conscious omission, depending on the adolescent's cultural context and their motivation to appear in a socially desirable way. Adults, who are removed from the peer pressures of high school, and likely have been sexually active for longer periods of time, may be less susceptible to these self-presentation biases. However, as much less is known about adult-age reporting patterns, further exploration of predictors of consistent self-reports among adults, particularly through large-scale or nationally representative samples, is needed. A better understanding of the variables that predict inconsistent adult reporting may therefore serve to inform research and policy agendas for both age groups, by allowing for 'age-appropriate' interpretations of self-reported sexual history data.

To both inform the adolescent literature and address the gap in the adult literature, in the present analysis we use data from participants in the National Longitudinal Study of Adolescent Health (Add Health) to examine 1) the degree of consistency in reports of age at first sexual intercourse reported in late adolescence/emerging adulthood (Wave III) and young adulthood (Wave IV), and 2) predictors of consistency in adult self-reports of vaginal sex initiation. Sociodemographic, behavioral, temporal, and cognitive variables that parallel the adolescent literature are used to assess the consistency of reporting age at first vaginal intercourse in interviews approximately seven years apart among adults ages 24 to 32 at the time of the second report.

Methods

Data

Add Health is a prospective study that has followed a nationally representative probability sample of adolescents who were in grades 7-12 in the 1994-1995 school year. To date, one in-school and four in-home interviews have been completed. In the present analysis we use data from in-home interviews at Waves I, III, and IV. In the 1995 Wave I in-home interview, 20,745 adolescent respondents and 17,670 parents completed separate interviews. The Wave III interview (N=15,170) was conducted in 2001 when respondents were between the ages of 18 and 26. Wave IV (N=15,701) was conducted in 2008 when the respondents were between the ages of 24 and 32. Wave III and IV interviews were conducted using a combination of interviewer-led computer-assisted personal interview (CAPI) and, for more sensitive questions, respondent self-administered computer-assisted self-interview (CASI). All questions about sexual behavior were self-administered using CASI technology. See Harris et al. (2009) for more details about the Add Health study design (Harris et al., 2009).

Inclusion criteria for the present analysis were participation in Waves I, III, and IV (n=13,034), self-report of vaginal intercourse and age at first vaginal intercourse at both Waves III and IV (n=11,030), a valid sampling weight (n=10,397), and complete data on all analysis variables (n=9,399). Of the 9,399 respondents included in the final analysis sample, 4,153 were male and 5,246 were female.

Measures

Outcome Variable

Consistency of self-reported age at first vaginal intercourse: At both Waves III and IV, respondents were asked "Have you ever had vaginal intercourse? (Vaginal intercourse is defined as when a man inserts his penis into a woman's vagina.)" If the respondent answered yes, they were further asked to indicate their age, in years, at the time of first intercourse.

A binary variable was generated for consistency in reported age of first vaginal intercourse between Waves III and IV (0=inconsistent; 1=consistent). Respondents were coded as consistent if they reported an age of first vaginal intercourse at Wave IV that was within one year of the age reported at Wave III.

Independent Variables

Temporal

Age at Wave IV: We created a continuous age variable (years and fractions of years) by calculating the difference between the respondent's date of birth and the date of the Wave IV interview.

Years lapsed since first vaginal intercourse: To account for time since first vaginal intercourse, a continuous variable was constructed that reflected the maximum number of years lapsed. For respondents who were consistent, their reported age of sexual debut was subtracted from their age at the Wave IV interview. For respondents who were inconsistent, the younger of the two reported ages of debut was used, regardless of the wave at which it was reported.

Sociodemographic

Biological sex: Respondents self-reported biological sex.

Race/ethnicity: Respondents were categorized into one of five mutually-exclusive race/ethnicity groups based on Wave I self-report: "Hispanic, any race;" "non-Hispanic (NH) White;" "non-Hispanic Black;" "non-Hispanic Asian;" and "non-Hispanic Other" (American Indian and self-defined 'other;' there were too few American Indians to include a separate category). For all analyses, indicator (dummy) variables were created for each race/ethnicity group, and "non-Hispanic White" was used as the referent category.

Wave I parental education level: We used parent education as a proxy for socioeconomic status (SES) in the respondents' family of origin. In two parent households we used the highest level of education reported for either parent in the Wave I parent questionnaire. In single parent households, that parent's education was used. If a parental questionnaire was not available (approximately 15% of respondents), the respondent's Wave I report of parents' education was used. Indicator variables were created for the education categories "less than a high school diploma," "high school diploma or GED," "some college or vocational school," and "college graduate or higher." For all analyses, "college graduate or higher" served as the referent category.

Cognitive

Wave IV respondent educational attainment: Respondents' education level as of Wave IV was coded using the same categories as parent education.

Wave I respondent hearing vocabulary: We also included a measure of respondents' hearing vocabulary, based on their Wave I score on the Add Health Picture Vocabulary Test (AHPVT). The AHPVT is a modified version of the Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 1981). Standardized scores (M=100, SD=15) were coded as indicator variables: "84 and below," "85 to 99," "100 to 114" (referent), and "115 or higher."

Behavioral: sexual experiences

Childhood sexual abuse (CSA): At Wave IV, respondents were asked "Before the age of 18, how often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?" We used this question to construct a dichotomous indicator of history of childhood (pre-18 years old) sexual abuse (0=never; 1=one or more times).

Physically forced sexual encounter: We constructed a dichotomous indicator of lifetime history of non-consensual, physically forced sexual experiences based on the following Wave IV question: "Have you ever been physically forced to have any type of sexual activity against your will? Do not include any experiences with a parent or adult caregiver" As with CSA, if the respondent reported a physically forced sexual experience, they were coded as "1."

Lifetime number of sexual partners: In Wave IV, respondents were asked, in two separate questions regarding male and female partners, "Considering all types of sexual activity, with how many (male/female) partners have you ever had sex?" Respondents who indicated "don't know" were asked "*what is your best estimate?*" and given the options "0," "1 to 4," "5 to 10," "11 to 20," "21 to 30," and "more than 30." For the categorical follow up, we used the midpoint of the range as the count. Combining both answers, we created separate lifetime counts of other-sex and same-sex partners for each respondent. Continuous partner counts were recoded into categorical ranges based on the quartiles of other-sex and same-sex partner distributions. For other-sex partner counts, "0 to 1," "2 to 5," "6 to 10," and "11 or more" were used, with "2 to 5 partners" serving as the referent. For same-sex partner counts,

"0," "1," "2 to 3," and "4 or more" were used, with "0 partners" serving as the referent. The same categories were used for both male and female respondents.

Statistical Analysis

We fit bivariate logistic regression models to identify characteristics associated with reporting consistency. Characteristics significant at p<.05 in bivariate models were combined into a final multivariate logistic regression model. All analyses were conducted separately for males and females, using Stata 12.0 (StataCorp., 2011) with adjustments for sampling design and weights.

Results

Results from descriptive analyses, including weighted percentages and unweighted n's, are presented in Table 1. The mean age of our analysis sample at Wave IV was approximately 28.3 years (SD=1.81); on average, male respondents (m_{age}= 28.4 years, sd=1.76) were slightly older than females (m_{age}= 28.2 years, sd=1.83). The majority of respondents, approximately 67.7%, identified as non-Hispanic White. As of Wave IV, 38.4% of participants had started, but not completed, their college degree. Approximately one-third (30.3%) had obtained a bachelor's degree and in some cases pursued an advanced degree. Similarly, approximately 30% of respondents came from families where at least one parent had completed some college, with an additional thirty percent from families where at least one parent had obtained a bachelor's degree or higher. As of Wave IV, 90.7% of respondents had never had a same-sex sexual partner, though females were much more likely than males to report same-sex experiences; slightly more than fourteen percent of female respondents reported having had one or more same-sex partners, compared with approximately four percent of males. By contrast, more than a third (36.6%) of respondents reported having 11 or more other-sex lifetime sexual partners, though males were more likely than females to report higher numbers of other-sex partners: 68.2% of males reported six or more other-sex partners, compared with 58.1% of females. Females were more likely than males to have experienced both a physically forced sexual encounter and CSA by a parent/guardian.

Respondents reported a slightly older age of first vaginal intercourse at Wave III (M= 16.5 years, SD=2.26) than at Wave IV (M= 16.2 years, SD=2.42), and the average period of recall was approximately 12.3 years. Overall, most respondents (85.4%) were consistent in reporting their age at first vaginal intercourse, and females were more consistent than males (88.8% versus 81.7%, respectively).

Predictors of Consistent Self Report of Age at First Vaginal Sex

Because females were significantly more likely than males to be consistent in reports of age at first vaginal intercourse, (OR=1.8, p< .001, 95% CI [1.52, 2.07], analysis not shown), we conducted analyses separately for males and females. Results are presented in Table 2.

For males, all variables in bivariate models were predictive of consistency except for history of physically forced sexual experience and lifetime number of same-sex partners. In general, male respondents were less likely to be consistent if they were older, not White, had less educated parents, had achieved less education themselves relative to peers with a college degree, had a history of parental sexual maltreatment, had AHPVT scores below the mean, or if more years had passed since their first experience. Having fewer lifetime other-sex partners was associated with higher odds of consistency in reporting.

Patterns of bivariate associations were similar for females, with a few exceptions: non-parental forced sex was associated with lower odds of consistent reporting, and a higher

number of other-sex partners (11 or more) was associated with higher odds of consistency in reporting. In addition, no association was observed between chronological age at Wave IV and reporting consistency, nor between CSA and reporting consistency.

Only those variables found to have statistically significant associations (at p<.05) in bivariate models for either males or females were included in the final adjusted models. One exception to this strategy was made for Wave I AHPVT. Although the Wave I AHPVT score was significant in bivariate models, it was not included in the final multivariate model due to its high correlation with respondent/parental educational attainment. Alternative iterations of the multivariate model were run (not shown) with AHPVT included instead of respondent education and, as with respondent education, no statistically significant association was observed. Identical multivariate models were fit for male and female respondents. The variables included were Wave IV chronological age, years lapsed since sexual debut, race/ethnicity, parental and respondent education level, non-parental forced sex, CSA, and lifetime count of other-sex sexual partners.

For males, in the final adjusted model age, years lapsed since sexual debut, race/ethnicity, parental education level, and lifetime count of other-sex sexual partners retained significance; associations for respondent education level and childhood sexual abuse were non-significant when controls were added. Males were less likely to be consistent if more years had passed since their age of sexual debut (*OR*=0.7, p<.001, 95% CI [0.65, 0.75]), if they were non-Hispanic Black (*OR*= 0.6, p=.01, 95% CI [0.45, 0.89]), or if the highest level of education achieved by their parent was a high school diploma or GED, *(OR*=0.7, p=.04, 95% CI [0.54, 0.99]). Males who were older (*OR*=1.3, p<.001, 95% CI [1.18, 1.43]), had 6-10 other-sex sexual partners *(OR*=1.8, p<.001, 95% CI [1.28, 2.39]), or 11 or more other-sex sexual partners *(OR*=2.2, p<.001, 95% CI [1.58, 3.03]) were more likely to be consistent.[1]

Patterns of multivariate associations for females were very similar to those for males, except that non-parental forced sexual experience was significant, and parental education level was non-significant. Females were less likely to be consistent if more time had passed since their sexual debut (*OR*=0.7, p<.001, 95% CI [0.65, 0.75]), if they were Hispanic (*OR*=0.6, p=.02, 95% CI [0.42, 0.91]), or non-Hispanic Black (*OR*=0.5, p<.001, 95% CI [0.37, 0.64]), and if they had experienced a physically forced sexual encounter, *(OR*=0.7, p=.02, 95% CI [0.48, 0.94]). Females who were older (*OR*=1.3, p<.001, 95% CI [1.19, 1.44]), had 6-10 lifetime other-sex sexual partners (*OR*=1.4, p=.02, 95% CI [1.06, 1.80]), or 11 or more lifetime other-sex sexual partners *(OR*=2.6, p<.001, 95% CI [1.80, 3.73]) were more likely to be consistent. As with males, Black females were the least likely to be consistent, and females with 11 or more lifetime other-sex sexual partners were the most likely to be consistent.

Discussion

Despite a mean recall period of approximately twelve years, most young adults included in this sample consistently reported their age of first vaginal intercourse across two assessments seven years apart. More than 85% of respondents were consistent in their

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[1]In bivariate models for males, Wave IV age was negatively associated with consistency (older males were less likely to be consistent reporters), whereas in the final multivariate model, it was positively associated for both males and females (older respondents were more likely to be consistent reporters). We explored this change in additional analyses (not shown), and determined that 'years lapsed' and age are highly correlated (*r*=0.53, p<.001), and that 'years lapsed' is acting as a suppressor of the age variable when both are included in the model. When only age was included in the final model, it remained negatively associated with consistency. A suppressor is a 'third variable,' that, when included in a multivariate regression model, changes the relationship between a dependent variable (e.g., reporting consistency) and an independent variable (e.g., age) (Conger, 1974; MacKinnon, Krull, & Lockwood, 2000) . For other variables in the model, the associations (or lack thereof) with consistency were essentially unchanged when both or only one of the variables "age" and "years lapsed" were/was included in the model for both males and females.

reports, a percentage significantly higher than that observed in studies of adolescents, but strikingly similar to the figure reported by Dunne (1997) for a sample of adult Australian twins (Dunne, 1997). There are a number of potential reasons why we observed greater consistency among adults. First, following Dunne (1997), we used a broader definition of consistency, defined as age reports that differed by no more than a year (Dunne, 1997). In contrast, several previous studies considered responses to be consistent if the same exact age or date of sexual debut was reported across assessments (Alexander, 1993; Upchurch et al., 2002). Second, evidence suggests it is harder to recall the timing of behaviors when specific dates are requested (Jaccard & Wan, 1995) versus age. In the current analysis, respondents were asked to report their age at first vaginal intercourse, whereas in other analyses, such as that conducted by Upchurch et al. (2002) among high school-aged Add Health respondents at Waves I and II, respondents were asked to report the month and year at which first vaginal intercourse occurred (Upchurch et al., 2002). Our high observed rates of consistent reporting may therefore reflect this difference in recall ability.

However, despite these methodological differences, our analyses identified a number of demographic predictors of consistent reporting that closely match those observed in the adolescent literature. For example, we found that white adult females are more likely to be consistent reporters, and non-Hispanic Black adult males and females are less likely to be consistent. This pattern may reflect racial, ethnic and/or gendered differences in social norms around sexuality that could impact reporting. For example, first sexual experience may be more salient to females, who are more likely than males to be attuned to interpersonal and emotional aspects of sexual encounters, explaining gender differences in reporting accuracy (McCall, Rellini, Seal, & Meston, 2007). Racial/ethnic minorities, who tend to have earlier ages of first vaginal sex, may be more hesitant to truthfully report an age that is potentially seen as 'inappropriate' (Alexander, 1993; Jayakody et al., 2011). Alternatively, at Wave III, when respondents were still in their late adolescent years, they may have been more susceptible to 'sexual double standard' social norms that are less likely to proscribe sexual activity among racial/ethnic minorities and males, leading these groups to 'over-report' an age of sexual debut younger than their true age of first sexual intercourse (Kreager & Staff, 2009; Lyons, Giordano, Manning, & Longmore, 2011). By Wave IV, respondents had aged into young adulthood when sexual behavior is more normative, perhaps lessening the tendency to falsely report, thereby contributing to the inconstancy in reported age of first vaginal intercourse between the two waves.

Outside of these social determinants, cognitive processes may also play a role in reporting ability, as suggested by the significant positive associations between reporting consistency and respondent educational attainment, and in bivariate models, the PVT score. As observed elsewhere in the adolescent literature, respondents in the present analysis who scored in the lowest PVT category and/or had lower levels of educational attainment by Wave III were the least consistent reporters of their age of first sexual intercourse. In Upchurch's examination of reporting consistency among early adolescent respondents, she noted that across the entirety of the Add Health questionnaire, respondents who scored in the lowest PVT category were also more likely to answer 'don't know' or provide faulty answers outside of a logically 'correct' range, suggesting that cognitive ability plays a significant role in one's ability to accurately provide survey data (Upchurch et al., 2002). These commonalities suggest the importance of sociodemographic differences, rather than method- or age-dependent factors and processes, on survey responses, underscoring the fact that any survey will contain some amount of non-random error that should be addressed analytically. We did find, however, that older respondents were more consistent in reporting. This is similar to findings based on adolescent samples (Lauritsen & Swicegood, 1997; Upchurch et al., 2002), but in contrast to the inverse relationship reported by Dunne and colleagues in their examination of a much older adult Australian twin sample (Dunne, 1997). Given the

shorter timeline of retrospection in present analyses versus those of Dunne et al., the greater similarity of present findings to those during adolescence is reasonable.

Our analyses also identified several predictors of consistent reporting that are less often examined in this literature. One is a history of non-consensual sexual encounters. For females, experiencing a physically forced sexual encounter was predictive of consistency. Interpretation of these associations is clouded by the fact that Add Health questions about first vaginal intercourse do not specify voluntary experience. Thus, inconsistent reports for some respondents could be a function of including, or not including, forced experiences as "first sex" on different reporting occasions. Dunne and colleagues found that almost half of the women in their study population who had experienced sexual abuse were inconsistent in reporting their age of first vaginal intercourse, though relation to the abuser (i.e., parent or non-parent) was not specified (Dunne, 1997). To date, no other studies have examined the implications of past sexual abuse or assault for reliability in reports of timing of sexual experiences.

The emotional salience of an experience may also affect ability and willingness to recall and report its occurrence. Positive experiences may be more likely to be recalled, whereas negative emotions associated with an event can decrease the likelihood that it will be reported or accurately recalled (Catania et al., 1990). The literature on CSA has explored this extensively, particularly in relation to how conscious attempts to actively suppress or avoid traumatic memories of abuse and the surrounding emotions can result in a 'directed forgetting effect,' decreasing one's ability to recall details of the abuse at a later date. Proposed as the 'avoidant encoding hypothesis,' researchers have theorized that individuals who experience trauma, such as sexual assault, may become practiced in redirecting attention away from triggering and upsetting stimuli towards more innocuous ones, preventing traumatic experiences from being recalled due to their cognitive 'non-rehearsal' in comparison with more positive memories. (Gordon & Connolly, 2010). Currently, evidence for these theories is mixed. Although some theorists argue that survivors of CSA and sexual trauma may be less able to forget sexualized words in cognitive testing, a recent study found no difference in the ability to forget traumatic words associated with sex abuse (e.g., 'assault') between adult women who reported having repressed and/or recalled memories of CSA, and those who had never been abused or never had repressed/forgotten their abuse (Geraerts, Smeets, Jelicic, Merckelbach, & van Heerden, 2006). However, we speculate that if theories around directed forgetting and avoidant encoding are correct, there may be "spillover" implications for the recall consistency of respondents who experienced sexual abuse/assault in close temporal proximity to voluntary first sexual intercourse.

Additional individualized factors, along with the timing of a sexually traumatic event, may play a role in determining whether a person engages in such 'directed forgetting' or is able to become resilient against the trauma. For example, parental educational attainment, socioeconomic status, school engagement, and time since abuse have previously been found to be protective against psychological and emotional distress post-CSA (Williams & Nelson-Gardell, 2012). Among males, the bivariate association between CSA and consistency becomes insignificant when other controls are added to the model (the confidence interval for CSA becomes substantially wider), suggesting that CSA may be confounded with other variables we included as controls. For females, experience of a (non-parental) physically forced sexual encounter retains significance in the multivariate model. We cannot determine the timing of the forced encounter, and are therefore unable to suggest how timing may play a role in recall consistency.

A second unique predictor of reporting consistency identified in our analysis was number of lifetime other-sex sexual partners. For all respondents, having six to ten, or 11 or more,

lifetime partners was associated with higher odds of reporting consistency in multivariate models. One explanation for this observed association is that individuals who are more sexually active may have more positive attitudes towards sexuality, be more comfortable with the topic, and therefore more likely to recall reliably. The strong influence of attitudes towards sexuality on sexual behaviors and beliefs was highlighted by Byrne early on in his model of the 'Sexual Behavior Sequence,' which theorized how cognitive, emotional, psychological, and physiological expectations, beliefs, and responses predicted the likelihood of engaging in some form of sexualized behavior(Byrne, 1976). In this model, he proposed that a negative 'affective-evaluative subsystem' towards sex would decrease one's likelihood of engaging in any sort of 'preparatory sexual behavior' (e.g., masturbation, viewing of pornography, sexual information seeking), leading to distorted views of sexuality and a decreased and/or blocked inability to communicate about sex. In recent years, this theory has been further expanded on through discussion and study of the 'erotophilia-erotophobia' spectrum. Erotophilia, or an individual's comfort with discussing and engaging with sexuality, sexual topics, and sexual behaviors, has been associated among college undergraduates with higher self-reported frequencies of sexual behaviors, and lower likelihood of refusal to answer sensitive questions when told that answers would not be reviewed anonymously (Durant, Carey, & Schroder, 2002). Erotophilia, and its associated affect, has also been linked both to college undergraduates' self-regulated exposure to sexually explicit stimuli, and, subsequently, their ability to accurately report the sexual behaviors viewed: In a 1985 study, subjects were shown 21 sexually-explicit images and were allowed to view each image as long as they wanted; afterwards, they were asked to report the behaviors depicted on the slides (Becker & Byrne, 1985). Erotophilic subjects reported stronger feelings of positive affect towards the slides than erotophobic individuals, and therefore spent more time viewing each slide. This longer stimuli exposure time led to lower reporting error. Extrapolating these findings to the present analysis, higher lifetime sexual partner counts may suggest more positive affect toward sexuality in general, resulting in a better ability to report on sexual behavior due to the lack of interference of negative emotions.

There are several limitations to our current study. First, our findings only reflect consistency in reporting age at first vaginal intercourse, and thus are not applicable to individuals with exclusively same-sex sexual partners. Future studies should address recall reliability for other types of sexual behaviors. A second limitation is that we cannot determine which report, if either, is accurate, and so are limited to examining the degree of discrepancy rather than directional changes in reporting over time.

In conclusion, our findings suggest most adults are reasonably consistent in providing retrospective reports of age at first vaginal intercourse. To the best of our knowledge, this is the first study to examine predictors of the ability of adults to consistently self-report their age of first vaginal intercourse using a large-scale, US-based, nationally-representative study population. Given the primacy of self-reports when examining sexual behavior, and the common methodology of retrospective reporting, demonstration of the reliability of data obtained through protocols that safeguard confidentiality increases the credibility of self-reports about sexual experiences.

Acknowledgments

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Table 1

Descriptive Statistics for Males (*n*=4,153), Females (*n*=5,246), and Sample Population (*n*=9,399)

		Males	Females	Total
	Analysis Variables	**Mean (SD) / Weighted % (Unweighted N)**	**Mean (SD) / Weighted % (Unweighted N)**	**Mean (SD) / Weighted % (Unweighted N)**
Consistent Reporting *(%)*[1]				
	Wave III/IV	81.74 (3,333)	88.80 (4,618)	85.43 (7,951)
Age of First Vaginal Intercourse				
	At Wave III	16.54 (2.24)	16.37 (2.27)	16.45 (2.26)
	At Wave IV	16.25 (2.45)	16.19 (2.37)	16.22 (2.42)
Chronological Age				
	Wave IV	28.37 (1.76)	28.19 (1.83)	28.27 (1.81)
Years Since First Vaginal Intercourse				
	At Wave IV	12.43 (2.84)	12.20 (2.74)	12.31 (2.80)
Race/ethnicity *(%)*				
	Hispanic	11.73 (672)	10.64 (776)	11.16 (1,448)
	NH-White	67.51 (2,326)	67.83 (2,860)	67.68 (5,186)
	NH-Black	13.78 (765)	15.52 (1,184)	14.69 (1,949)
	NH-Asian	3.31 (255)	3.39 (288)	3.35 (543)
	Other	3.66 (135)	2.62 (138)	3.12 (273)
Parental Education at Wave I *(%)*				
	Less than HS	10.77 (445)	11.16 (671)	10.97 (1,116)
	HS/GED	26.31 (1,007)	29.23 (1,387)	27.83 (2,394)
	Some college	31.04 (1,283)	29.51 (1,535)	30.24 (2,818)
	Bachelors	31.88 (1,418)	30.10 (1,653)	30.95 (3,071)
Respondent Education by Wave IV *(%)*				
	Less than HS	9.55 (353)	7.20 (320)	8.32 (673)
	HS/GED	26.00 (1,034)	20.23 (1,053)	22.99 (2,087)
	Some college	37.15 (1,623)	39.57 (2,056)	38.42 (3,679)
	Bachelors	27.29 (1,143)	33.00 (1,817)	30.27 (2,960)
Wave I AHPVT (%)				
	84	10.13 (495)	11.76 (758)	10.98 (1,253)
	85-99	31.66 (1,314)	36.50 (1,941)	34.19 (3,255)
	100-114	39.13 (1,594)	35.26 (1,740)	37.11 (3,334)
	115	19.08 (750)	16.49 (807)	17.72 (1,557)
History of Sex Abuse (%)				
	Physically forced sexual encounter	1.77 (67)	14.95 (733)	8.66 (800)
	Childhood sexual abuse	2.15 (90)	7.11 (367)	4.74 (457)
Lifetime # Same-sex Sexual Partners (%)				
	0	96.01 (3,987)	85.75 (4,531)	90.65 (8,518)

	Analysis Variables	Males Mean (SD) / Weighted % (Unweighted N)	Females Mean (SD) / Weighted % (Unweighted N)	Total Mean (SD) / Weighted % (Unweighted N)
	1	1.28 (49)	7.07 (343)	4.31 (392)
	2-3	1.06 (46)	4.66 (238)	2.94 (284)
	4+	1.64 (71)	2.52 (134)	2.10 (205)
Lifetime # Other-Sex Sexual Partners (%)				
	0-1	6.91 (317)	8.83 (493)	7.91 (810)
	2-5	24.85 (1,034)	33.04 (1,811)	29.13 (2,845)
	6-10	23.44 (959)	28.98 (1,462)	26.34 (2,421)
	11+	44.80 (1,843)	29.15 (1,480)	36.62 (3,323)

[1] Consistent reporting defined as reporting an age at first vaginal intercourse in Wave IV that is within 1 year of the age reported at Wave III

Table 2

Unadjusted/Adjusted Odds Ratio for Consistent Reports of Age at First Vaginal Intercourse, by Gender

Predictors	Males				Females			
	Bivariate (Unadjusted)		Multivariate (Adjusted)		Bivariate (Unadjusted)		Multivariate(Adjusted)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Chronological Age								
Wave IV	0.91[*]	(0.85-0.98)	1.30[***]	(1.18-1.43)	0.95	(0.89-1.03)	1.31[***]	(1.19-1.44)
Years Since First Vaginal Intercourse								
At Wave IV	0.79[***]	(0.74-0.81)	0.70[***]	(0.65-0.75)	0.80[***]	(0.76-0.84)	0.70[***]	(0.65-0.75)
Race/ethnicity								
Hispanic	0.57[**]	(0.40-0.81)	0.83	(0.58-1.21)	0.60[**]	(0.42-0.86)	0.62[*]	(0.42-0.91)
NH-White	Referent	Referent	Referent	Referent	Referent	Referent	Referent	Referent
NH-Black	0.44[***]	(0.32-0.59)	0.63[**]	(0.45-0.89)	0.42[***]	(0.32-0.54)	0.48[***]	(0.37-0.64)
NH-Asian	1.07	(0.73-1.57)	0.86	(0.55-1.33)	0.65	(0.35-1.21)	0.56	(0.27-1.17)
Other	0.85	(0.46-1.55)	1.14	(0.63-2.08)	0.80	(0.39-1.64)	0.80	(0.37-1.75)
Parental Education at Wave I								
Less than HS	0.40[***]	(0.27-0.59)	0.65	(0.41-1.03)	0.50[***]	(0.34-0.72)	1.01	(0.68-1.52)
HS/GED	0.48[***]	(0.37-0.64)	0.73[*]	(0.54-0.99)	0.63[**]	(0.47-0.85)	1.03	(0.74-1.43)
Some college	0.67[**]	(0.53-0.86)	0.80	(0.62-1.04)	0.86	(0.63-1.19)	1.28	(0.91-1.81)
Bachelors	Referent	Referent	Referent	Referent	Referent	Referent	Referent	Referent
Respondent Education by Wave IV								
Less than HS	0.44[***]	(0.29-0.66)	1.08	(0.69-1.68)	0.36[***]	(0.24-0.54)	0.74	(0.46-1.20)
HS/GED	0.40[***]	(0.32-0.52)	0.77	(0.56-1.04)	0.48[***]	(0.35-0.66)	0.72	(0.50-1.04)
Some college	0.65[**]	(0.50-0.85)	1.01	(0.75-1.38)	0.55[***]	(0.42-0.74)	0.76	(0.56-1.02)
Bachelors	Referent	Referent	Referent	Referent	Referent	Referent	Referent	Referent
Wave I AHPVT								
84	0.61[*]	(0.41-0.90)	---	---	0.43[***]	(0.29-0.64)	---	---
85-99	0.62[**]	(0.47-0.83)	---	---	0.62[**]	(0.45-0.86)	---	---
100-114	Referent	Referent	---	---	Referent	Referent	---	---
115	1.76[**]	(1.25-2.47)	---	---	1.18	(0.74-1.87)	---	---
History of Sex Abuse								
Physically forced sexual encounter	0.74	(0.38-1.43)	1.07	(0.53-2.17)	0.64[**]	(0.46-0.88)	0.67[*]	(0.48-0.94)
Childhood sexual abuse	0.43[**]	(0.23-0.79)	0.63	(0.32-1.24)	1.00	(0.69-1.44)	1.35	(0.87-2.11)

Predictors	Males				Females			
	Bivariate (Unadjusted)		**Multivariate (Adjusted)**		**Bivariate (Unadjusted)**		**Multivariate(Adjusted)**	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Lifetime # Same-sex Sexual Partners								
0	Referent	Referent	---	---	Referent	Referent	---	---
1	1.15	(0.46-2.89)	---	---	1.05	(0.67-1.65)	---	---
2-3	0.73	(0.32-1.67)	---	---	0.74	(0.43-1.28)	---	---
4+	1.36	(0.59-3.14)	---	---	0.78	(0.42-1.46)	---	---
Lifetime # Other-Sex Sexual Partners								
0-1	1.73[*]	(1.07-2.79)	1.28	(0.74-2.23)	1.33	(0.90-1.35)	0.74	(0.48-1.13)
2-5	Referent	Referent	Referent	Referent	Referent	Referent	Referent	Referent
6-10	1.25	(0.94-1.67)	1.75[***]	(1.28-2.39)	1.05	(0.82-1.36)	1.38[*]	(1.06-1.80)
11+	1.18	(0.89-1.58)	2.19[***]	(1.58-3.03)	1.51[*]	(1.08-2.09)	2.59[***]	(1.80-3.73)

[*]
p<0.05

[**]
p<0.01

[***]
p<0.001